Public Utility District No. 1 of Skagit County

2013 Water System Plan

PUBLIC UTILITY DISTRICT NO. 1 SKAGIT COUNTY USA
Skagit PUD WATER

APPROVED
DEPT OF HEALTH NW DRINKING WATER
Jennifer Ingerdale 9/30/14
PLANNER DATE
Nancy Teagen
ENGINEER DATE

2014
AUGUST
FINAL

RECEIVED
SEP 19 2014
DEPARTMENT OF HEALTH
NW DRINKING WATER

1415 FREEWAY DRIVE • P.O. BOX 1436 • MOUNT VERNON, WA 98273
(360) 424.7104 • SKAGITPUD.ORG

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310, Kent Washington 98032-2388

September 30, 2014

GEORGE SIDHU, PE, ENGINEERING MANAGER
SKAGIT COUNTY PUD 1 JUDY RESERVOIR
PO BOX 1436
MT VERNON, WA 98273-1436

RE: Skagit County PUD 1- **Judy Reservoir, ID # 79500**
Skagit County
Water System Plans - APPROVAL
Submittal # 13-1206 **A - I**
And the eight Satellite systems:

Fidalgo Island, ID # 00932, B	**Alger, ID # 01400, C**
Cedargrove, ID # 11917, D	**Marblemount, ID # AA642, E**
Mountain View, ID # 03774, F	**Potlatch Beach, ID # 69034, G**
Rockport, # 73600, H	**Skagit View Village, ID # 96879, I**

Dear Mr. George Sidhu and the PUD Planning Team Members: Chris Shaff, Lora Elsom, and Bill Trueman:

The Skagit County PUD 1's water system plans (WSPs), received in this office on December 10, 2013, with revisions submitted on September 19, 2014, has been reviewed, and in accordance with the provisions of WAC 246-290-100, are hereby **APPROVED**.

Approval of these plans are valid as it relates to current standards outlined in Chapter 246-290 WAC, revised April 2012, Chapter 246-293 WAC, revised September 1997, Chapter 70.116 RCW, the Skagit County Coordinated Water System Plan (CWSP), and is subject to the qualifications herein. An approved update of these WSPs is required on or before **September 30, 2020** unless ODW requests an update or plan amendment pursuant to WAC 246-290-100(9).

The Satellite Management Agency Plan (SMA) has also been reviewed and in accordance with the provisions of WAC 246-295 is hereby **APPROVED.** Skagit County PUD is re-approved for SMA ownership and for operation and management services in Skagit County.

APPROVED NUMBER OF CONNECTIONS

Updated capacity information for the Judy Reservoir system and the Marblemount system was provided, and the plan demonstrates their physical ability to provide water service within the planning period. For the other seven systems, the system capacity analysis in the previous plan is still considered to be current and was not updated.

Based upon information by George Sidhu, PE, here is a summary of the Skagit PUD's water systems included in this plan approval:

Water System Name	Approved Capacity	Limiting Factor	Comments
Judy Reservoir	Unspecified	N/A	
Alger	219	Installed pump capacity	OK for build-out within LUD boundary
Cedargrove	466	Water right	OK for build-out within LUD boundary
Fidalgo Island	Unspecified	N/A	
Marblemount	106*	Storage	
Mountain View Subdivision	14	distribution system hydraulic capacity	source & treatment adequate for 16 homes
Potlatch Beach	182	Storage	OK for build-out within LUD boundary
Rockport	100 res. 6 non-res. Connections	Water right	
Skagit View Village	128	Water right	OK for build-out within LUD boundary

*Change in DOH Approval Number

CONSTRUCTION WAIVERS

Standard Construction Specifications for distribution main extensions have been approved. With this approval and consistent with WAC 246-290-125(2) the systems may elect to proceed with the installation of distribution main extensions provided that the systems maintains on file completed construction completion reports (a copy of which is attached) in accordance with WAC 246-290-125 (2) and WAC 246-290-120 (5) and make it available for review upon request by the department.

LOCAL GOVERNMENT CONSISTENCY

This document meets local government consistency requirements for WSP approval pursuant to RCW 90.03.386 and RCW 43.20.

SERVICE AREA AND DUTY TO SERVE

Pursuant to RCW 90.03.386(2), the service area identified in this WSP service area map may now represent an expansion in "place of use" for this system's water rights. Changes in service area should be made through a WSP amendment.

The Skagit PUD 1 has a duty to provide new water service within its retail service area. This WSP includes service policies to describe how your system plans to provide new service within your retail service area.

WATER RESOURCES

The department's approval of your water system design does not confer or guarantee any right to a specific quantity of water. The approved number of service connections is based on your representation of available water quantity. If the Washington Department of Ecology, a local planning agency, or other authority responsible for determining water rights and water system adequacy determines that you have use of less water than you represented, the number of approved connections may be reduced commensurate with the actual amount of water and your legal right to use it.

Ecology did provide a comment letter on February 5, 2014.

PLANNING ACCOMPLISHMENT

We recognize the significant effort and resource commitment involved in the preparation of this WSP. Thank you for your cooperation and we look forward to working with you in the future.

Sincerely,

Jennifer Kropack
Regional Planner
(253) 395-6769

Nancy Feagin, P.E.
Regional Engineer
(253) 395-6765

Enclosure: Construction Completion Report

Cc: Bob Powell, General Manager, Skagit PUD
Gary Christensen, Director, Skagit County Planning & Development Services
Corrina Marote, Environmental Health Specialist, Skagit County Environmental Health
Krista Chavez, DOH

CONSTRUCTION COMPLETION REPORT FOR DISTRIBUTION MAIN PROJECTS

In accordance with WAC 246-290-120(5), a ***Construction Completion Report*** is required for all construction projects. Under the submittal exception process for distribution main projects, designed by a professional engineer but not submitted to DOH for approval, the report does not need to be submitted. **However, the purveyor must keep the Construction Completion Report on file and make it available for review upon request by DOH in accordance with WAC 246-290-125 (2)(b).** Furthermore:

(1) The report form must bear the seal, date and signature of a professional engineer (PE) licensed in the state of Washington; and

(2) Per WAC 246-290-120(5)(c), the amount of change in the physical capacity of a system must be documented, if the project results in a change in physical capacity.

SKAGIT COUNTY PUD 1 JUDY RES
Name of Water System

DOH System ID No.: **79500**

DALE WARDELL
Name of Purveyor (Owner or System Contact)

Date Water System Plan that includes Standard Construction Specifications

PO BOX 1436
Mailing Address

Date Standard Specifications Approved by DOH: **9/30/2014**

MT VERNON, WA 98273-1436
City State Zip

PROJECT NAME AND DESCRIPTIVE TITLE:
(Include the name of any development project and number of services.)

Date Project or Portions Thereof Completed

PROFESSIONAL ENGINEER'S ACKNOWLEDGMENT

The undersigned professional engineer (PE), or his/her authorized agent, has inspected the above-described project that, as to layout, size and type of pipe, valves and materials, and other designed physical facilities, has been constructed and is substantially completed in accordance with construction documents reviewed by the purveyor's engineer. In the opinion of the undersigned engineer, the installation, physical testing procedures, water quality tests, and disinfection practices were carried out in accordance with state regulations and principles of standard engineering practice.

I have reviewed the disinfection procedures, pressure test results, and results of the bacteriological test(s) for this project and certify that they comply with the requirements of the construction standards/specifications approved by DOH.

P.E.'s Seal

Date Signed

Name of Engineering Firm

Name of PE Acknowledging Construction

Mailing Address

City State Zip

Engineer's Signature

State/Federal Funding Type (if any) _____

Please keep a completed, signed, and stamped copy on file.

☒ **NWRO Drinking Water Department of Health 20425 72nd Ave. S, Ste 310 Kent, WA 98032-2358 (253) 395-6750**	☐ **SWRO Drinking Water Department of Health PO Box 47823 Olympia, WA 98504-7823 (360) 236-3030**	☐ **ERO Drinking Water Department of Health 16201 E Indiana Ave, Suite 1500 Spokane Valley, WA 99216 (509) 329-2100**

For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

Approval of the

Water System Plan

for Public Utility District No. 1 of Skagit County

by

Board of Commissioners

Public Utility District No. 1 of Skagit County

Al Littlefield, President

James Cook, Vice President

Robbie Robertson, Secretary

Signed this 9th day of September 2014

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CERTIFICATE OF ENGINEER

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY

2013 WATER SYSTEM PLAN

The technical material and data contained in the plan were prepared under the supervision and direction of the undersigned, whose seal as a professional engineer licensed to practice as such, is affixed below.

George Sidhu, P.E.
Engineering Manager

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ACRONYMS AND ABBREVIATIONS

AC	asbestos-cement
ADD	Average Day Demand
afy	acre-feet per year
AHJ	Authorities Having Jurisdiction
AMR	Automated Meter Reading
AMSL	above mean sea level
APWA	American Public Works Association
As	arsenic
ASR	Annual Summary Report
AWWA	American Water Works Association
BAT	backflow assembly tester
CaRD	Conservation and Reserve Development
ccf	100 cubic feet
CCCP	Cross-Connection Control Program
CCL	Contaminant Candidate List
CCP	concrete cylinder pipe
CCR	Consumer Confidence Report
CCS	Cross-Connection Specialist
CEU	continuing education unit
CFE	combined filter effluent
CFO	Chief Financial Officer
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	colony forming unit
CI	cast iron
CIP	Capital Improvement Plan
ClO_2	chlorine dioxide
CO	Construction Order
Commission	Skagit County Public Utility District Board of Commissioners
CMMS	Computerized Maintenance Management System
CT	contact time
CU	color unit
CWSP	Skagit County Coordinated Water System Plan
DBP	disinfection byproduct
D/DBPR	Disinfectants/Disinfection By-Product Rule
DI	ductile iron
District	Public Utility District No. 1 of Skagit County
DNS	Determination of Non-Significance

DOH	Washington State Department of Health
DOSH/WISHA	Department of Occupational Safety and Health/Washington Industrial Safety and Health Administration
DSL	distribution system leakage
DWSRF	Drinking Water State Revolving Fund
Ecology	Washington State Department of Ecology
EOL	end of life
EPA	U.S. Environmental Protection Agency
ERP	Emergency Response Plan
ERU	equivalent residential unit
FBRR	Filter Backwash Recycling Rule
FEMA	Federal Emergency Management Agency
FSWM	follow-up source water monitoring
GED	General Educational Development
GIS	Geographic Information System
G.O.	General Obligation
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
GWUDI	groundwater under direct influence
HAA5	haloacetic acid
HDPE	high density polyethylene
HGL	Hydraulic Grade Line
Hp	horsepower
HPC	heterotrophic plate count
HVAC	heating, ventilation, and air conditioning
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ICS	Incident Command System
IDSE	Initial Distribution System Evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
IFE	individual filter effluent
IGEA	Investment Grade Efficiency Audit
IOC	inorganic chemical
IR	inactivation ratio
ISWM	initial source water monitoring
IWA	International Water Association
JOA	Joint Operating Agreement
Judy System	Judy Reservoir System
L&I	Washington State Department of Labor & Industries
Lab Rule	Drinking Water Laboratory Certification and Data Reporting Rule

LAMIRD	limited areas of more intensive rural development
LCR	Lead and Copper Rule
LFC	local facilities charge
LID	Local Improvement District
LRAA	locational running annual average
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
LUD	Local Utility District
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MDD	Maximum Day Demand
MDL	Minimum Detection Limit
MFL	million fibers per liter
MG	million gallon
MGD	million gallons per day
mg/L	milligrams per liter
MMM	Multimedia Mitigation
MOA	Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes
MRDL	maximum residual disinfectant level
MRDLG	maximum residual disinfectant level goal
mrem/year	millirem per year
MSDS	Material Safety Data Sheet
NaOH	caustic soda
NH_3	ammonia
NIMS	National Incident Management System
NO_2	nitrite
NO_3	nitrate
NOM	naturally occurring materials
NRF	National Response Framework
NTU	Nephelometric Turbidity Unit
O&M	operations and maintenance
OFM	Washington State Office of Financial Management
OSRSI	Open Space of Regional/Statewide Importance
pCi/L	picoCuries per liter
PHD	Peak Hour Demand
PIO	Public Information Officer
PNR	Public Notification Rule
PNWS	Pacific Northwest Section, American Water Works Association
ppb	parts per billion
ppm	parts per million
PRV	pressure-reducing valve

PSE	Puget Sound Energy
psi	pounds per square inch
PSV	pressure sustaining valve
PVC	polyvinyl chloride
PWS	public water system
PWSID	Public Water System Identification
PWTF	Public Works Trust Fund
Qa	annual quantity
Qi	instantaneous quantity
RAA	running annual average
RCW	Revised Code of Washington
RTCR	Revised Total Coliform Rule
SCADA	supervisory control and data acquisition
SCFM	standard cubic feet per minute
SDF	System Development Fee
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
SMA	Satellite Management Agency
SOC	synthetic organic chemical
sq ft	square foot
SR	State Route
SRD	Skagit River Diversion
SRL	State Reporting Level
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TOC	total organic carbon
TTHM	total trihalomethane
UCMR2	Unregulated Contaminant Monitoring Rule 2
UCMR3	Unregulated Contaminant Monitoring Rule 3
UGA	Urban Growth Area
ULID	Utility Local Improvement District
VFD	variable frequency drive
VOC	volatile organic chemical
WAC	Washington Administrative Code
WETRC	Washington Environmental Training Center
WISHA	Washington Industrial Safety and Health Act of 1973
WLCAP	Water Loss Control Action Plan
WMP	Watershed Management Plan
WQMR	Water Quality Monitoring Report
WSDM	Water System Design Manual

WSP	Water System Plan
WTP	water treatment plant
WTPO	Water Treatment Plant Operator
WUE	Water Use Efficiency
WUER	Water Use Efficiency Rule

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ACKNOWLEDGEMENTS

The Public Utility District No. 1 of Skagit County gratefully acknowledges the valuable time, comments, and expertise provided by the staff listed below who contributed to the 2013 Water System Plan.

Bob Powell	General Manager
George Sidhu, P.E.	Engineering Manager
Chris Shaff, P.E.	Planning Engineer
Bill Trueman	Environmental Services Coordinator
Jenni Minier	Asset Manager
Emilia Blake	Water Treatment Plant Lab Analyst
Mark Handzlik, P.E.	Assistant Engineering Manager
Kevin Tate	Community Relations Manager
Michael Fox	Operations Manager
Vanessa Dales	Treasurer
Gary Chrysler	IT Manager
Dale Wardell	Water Treatment Plant Superintendent
Larry Saunders	Engineering Supervisor
Kurt Van Burkleo	Operations Project Coordinator
Michael Benton	Project Manager
Doug McConnell	Contracts Administrator
Rebecca Zorn	Cross-Connection Control Coordinator
Darlene Holmstrom	Water Quality Program Coordinator
Michael Ostergaard	Drafting Technician
Lora Elsom	Former District Employee
Christine Blake	Former District Employee

Technical Review/Editing

Barb Whiton	Hieroglyph Writing and Editing

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1 EXECUTIVE SUMMARY

This Water System Plan (WSP) for the Public Utility District No. 1 of Skagit County (District) has been developed pursuant to Washington Administrative Code (WAC) 246-290-100, which requires that public water systems submit a water system plan to the Washington State Department of Health (DOH) every 6 years. Appendix A contains related procedural documents including the Standard Water System Plan Checklist, Municipal Water Law Checklist, Municipal Water Law Consistency Statements, and State Environmental Policy Act (SEPA) documentation.

The 20-year planning horizon for this plan is 2014 to 2033. At the pre-planning meeting with DOH, it was agreed that this plan update would focus on the District's Judy Reservoir System. The District's eight satellite systems were included in the 2007 plan and, with little change since that time, there was no need to update the planning figures. However, a summary of the satellite systems is provided in Chapter 12.

1.1 System Description

The District operates the most expansive water system in Skagit County with a total of over 23,000 installed services. The majority of the District's services are within the Judy Reservoir System (Judy System), DOH Public Water System Identification (PWSID) 79500E, which serves the cities of Mount Vernon, Burlington, and Sedro-Woolley, Washington, and surrounding rural and suburban areas. The District is a municipal corporation of the State of Washington, established at the general election of November 3, 1936. The organization meeting of the Commissioners of the District was held January 16, 1937. On November 4, 1939, the water system effectively came into existence when the water systems in Mount Vernon, Burlington, and Sedro-Woolley were purchased by friendly condemnation from the Peoples Water and Gas Company for the sum of $300,070. The area served by the District's Judy System is shown in Figure 2-2.

The responsibilities and powers of the District are exercised through a Commission of three members, elected by the voters, having 6-year terms expiring in rotation so that one Commissioner is elected every 2 years. The Board of Commissioners, as authorized by law, employs a General Manager, a Treasurer, an Auditor, counsel, and such other officials and special services as may be required to conduct the affairs of the District.

The main components of the Judy System are summarized below in Table 1-1.

Table 1-1. Judy System Components

Item	Description
Supply Source:	Gilligan Creek Mundt Creek Turner Creek Salmon Creek Skagit River
Treatment Facility:	Judy Reservoir and Water Treatment Plant 24 MGD treatment capacity
Transmission Pipelines:	Judy Reservoir to Mount Vernon Pipeline Judy Reservoir to Sedro-Woolley Pipeline Cook Road and Josh Wilson Road Pipelines Riverside Drive and Burlington Boulevard Pipelines Total length of about 20 miles
Distribution Pipelines:	Total length of about 589 miles
Storage Facilities:	22 Reservoirs and 3 Clearwells at WTP Total Volume of 29,881,000 gallons
Pump Stations:	18 Water Booster Stations
Pressure Zones:	27 Pressure Zones
Direct Resale Customers:	Samish Farms Water District North Fir Island Water Association

MGD=million gallons per day; WTP=water treatment plant

1.2 Related Plans, Agreements, and Policies

The District's program to deliver water to its customers has been developed over many years using various agreements, plans, and policies that address water supply and land use in Skagit County. Chapter 3 describes key agreements and plans that influence the District's water service policies and provides information about the authority and responsibility of the District to provide water. The documents discussed in Chapter 3 are listed in Table 1-2 below.

Table 1-2. Related Plans and Agreements

Category	Document	Year
Local and Regional Utility Planning	Skagit County Coordinated Water System Plan – Regional Supplement	2000
	District Water Policy Manual	2005
	Skagit County Comprehensive Plan	2007
	City of Burlington Comprehensive Plan	2005
	City of Mount Vernon Comprehensive Plan	2005
	City of Sedro-Woolley Comprehensive Plan	2011

Category	Document	Year
Water Supply	1996 Memorandum of Agreement	1996
	Cultus Mountain Watershed Management Plan	2013
	Skagit River Watershed Control Plan	2010
	Anacortes and District Joint Operating Agreement	1993
	Skagit County Franchise Agreement	1993
Customer Agreements	Samish Farms Water District Wholesale Agreement	1996
	North Fir Island Water Association Wholesale Agreement	1983 (expired)
	Sierra Pacific Retail Agreement	2008

1.3 Planning Data and Water Demand Forecasting

Chapter 4 discusses the planning data and water demand forecast information used to assess the current and future capabilities of the District's water system. It summarizes historical and projected population trends in the District's water service area as well as water use characteristics, including production, consumption, and related factors used to develop the District's demand forecast for the 20-year planning period.

Results for the demand forecast for key milestone years, including conservation, are as shown below in Table 1-3.

Table 1-3. Water Demand Forecast

Year	Average Day Demand (MGD)	Maximum Day Demand (MGD)
2014	8.05	13.93
2019	8.29	14.33
2033	9.49	16.42

MGD=million gallons per day

Figure 1-1 shows a graph of the average day and maximum day demands.

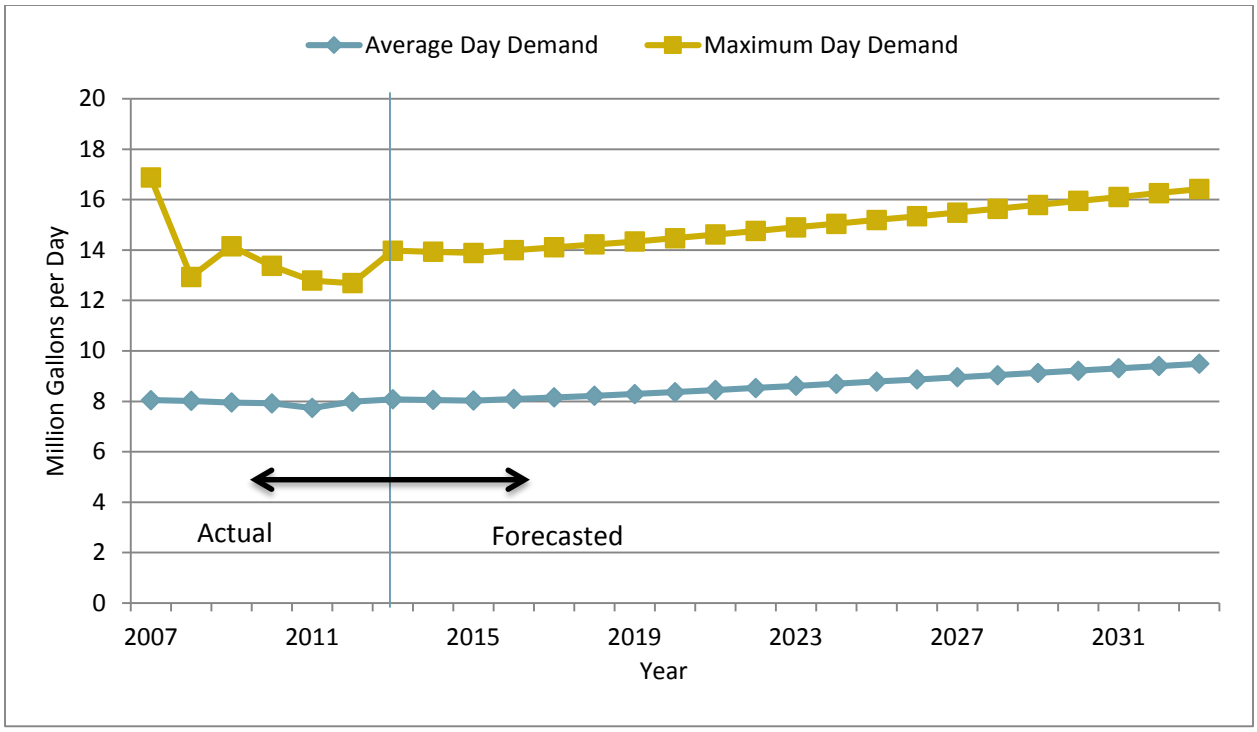

Figure 1-1. Demand Forecast Summary (With Conservation)

1.4 Water Use Efficiency

In January 2008, the District established measurable water saving goals for the 6-year period from 2008 through 2013 for both the supply- and demand-side of the District's distribution system. These goals were established through a public process as required by the Municipal Water Law. The goals provide a benchmark for achievement and play a significant role in defining the success of the District's Water Use Efficiency Program. To remain in synch with the update to the WSP, the District re-established its 6-year Water Use Efficiency (WUE) goals in 2013 for the 6-year period from 2014 through 2019.

The District's conservation program for 2014–2019 consists of the 10 measures listed in Table 1-4. Descriptions of each measure are provided in Chapter 5. All measures will be implemented during Years 1–6 of the plan. The program reflects a continuation and/or enhancement of many of the measures in the District's 2008–2013 program. The District will continue to use source meters, service meters, and system leak detection and repair, although those activities are not counted as official conservations measures under the WUE rule.

Table 1-4. 2014–2019 Water Use Efficiency Measures

Measure Number	Measure	New/ Existing
1	Public Outreach	Existing
2	Indoor Retrofit Kits	Existing
3	Shower Timers	Existing
4	School Outreach	Existing
5	Toilet Leak Kits	Existing
6	Soil Moisture Meters	Existing
7	Rain Barrel Program	Existing
8	System Leak Detection & Repair	Existing
9	Bill Showing Consumption History	Existing
10	Large Meter Testing	Existing

This program will help the District achieve its official water efficiency goal of saving at least 6 million gallons over the life of the 6-year efficiency program beginning in 2014 and running through the end of 2019.

1.5 System Analysis

The District's Judy System was analyzed to determine whether the source, storage, and distribution system are sufficient to support existing and future demands. A series of major capital projects were identified to remedy system deficiencies and upgrade the distribution system. A series of minor capital projects were also identified, which focus primarily on the District's pipe replacement program that targets aged, undersized, and leaky pipes. Both the major and minor projects were included in the Capital Improvement Plan (CIP) to ensure that projected system demands will be met over the planning period.

The source and storage analyses were performed using desktop calculations. The source for each given zone or combination of zones must be adequate to meet projected Maximum Day Demand (MDD). The storage analysis evaluated the overall storage requirements of each given zone or combination of zones and determined if the existing reservoirs were adequate to meet those needs. The results of the source and storage analyses are summarized below in Table 1-5.

Table 1-5. Source and Storage Analysis Summary

Pressure Zone	Source Capacity Adequate Through 2033	Storage Capacity Adequate Through 2033
180/214A,E (Burl-Custer)	Yes	Yes
195/214C,D,F (MTV-County)/290	Yes	Yes
214B (SW)	Yes	Yes
220/322A,B	Yes	Yes
230/270/290	Yes	Yes
284	Yes	Yes
290 (Pleasant Ridge)	Yes	No
322 (Cascade 1)	Yes	Yes
350	Yes	No
356A	Yes	Yes
365	Yes	Yes
412	Yes	No
430	Yes	Yes
450	No	No
456	Yes	Yes
459A,B,C	Yes	No
463	Yes	Yes
506/415	Yes	Yes
560/420/356B	Yes	Yes
592	Yes	No
645	No	Yes
684	Yes	Yes
705	Yes	No
858/720	Yes	No

A distribution system analysis was performed using the District's hydraulic model, which evaluated the water system during a peak hour demand analysis and a maximum day demand plus fire flow analysis. The most significant project that was identified during the peak hour analysis was the transmission line between Judy Reservoir and the City of Mount Vernon. The existing 24-inch-diameter concrete cylinder pipe exceeded design velocities during the analysis, which necessitates the completion of the redundant 36-inch-diameter transmission pipeline project from Judy Reservoir

to Mount Vernon. A portion of this project within Mount Vernon was completed and put into service in 2009, but the remaining pipeline is required to serve demands in Mount Vernon and provide a redundant supply to the District's most populated area.

Other smaller projects were identified in the peak hour demand analysis and in the maximum day plus fire flow analysis. The District has a very good distribution system and most of the projects identified are smaller lines in isolated or dead end areas that cannot meet fire flow. All of the projects identified during the analyses were included in the District's minor capital pipe replacement program.

1.6 System Reliability, Water Rights, and Source Water

The District has worked carefully and diligently to develop a multi-source water supply for the Judy System that provides a safe and reliable supply of water to our customers. Securing of long-term water rights, providing for additional storage and treatment capacity at Judy Reservoir, and planning for emergency and adverse events are the most significant items that have been managed by the District to establish a reliable water supply.

The District has sufficient water rights to meet the projected demands through the 20-year planning period of this WSP. The total water right available on an instantaneous basis that is partially subject to instream flow rules of the Skagit River is 35.80 million gallons per day (MGD). The water right available that is completely exempt from instream flow rules is 27.52 MGD. By comparing the water rights to the 20-year projected demands of the District's Judy System, it can be seen that the District has adequate water rights to meet these projected demands.

The District has developed several plans to provide system reliability. The District has an Emergency Response Plan that explains the steps to be taken during various water system emergency situations. The District also has a Water Shortage Response Plan that was developed as part of the 1996 Memorandum of Agreement (MOA) and addresses such issues as public awareness, voluntary reduction efforts, limiting water withdrawals, public education, and mandatory water use restrictions.

The District recently completed the Cultus Mountain Watershed Management Plan, which aims for more involvement in activities within the watershed to monitor land uses that may be detrimental to water quality and to identify and control potential sources of contamination to the streams that feed Judy Reservoir.

1.7 Water Quality

The District is accountable to multiple state and federal drinking water quality regulations related to treatment, finished water, distribution system and consumer confidence, and public notification. A review of monitoring procedures and water quality results from 2007 to 2012 indicates that the District has maintained compliance with all current and applicable state and federal drinking water regulations during the review period. Table 1-6 summarizes the District's regulatory status and provides associated recommendations for continued compliance.

Table 1-6. Applicable Safe Drinking Water Act Regulations

Water Regulation	Contaminants Affected	Date Rule Took Effect	District Status
Current Source Water and Treatment Regulations			
Surface Water Treatment Rule	Turbidity, *Giardia lamblia*, heterotrophic bacteria, *Legionella*, enteric viruses, disinfectant residual	December 1990	Monitoring
Interim Enhanced Surface Water Treatment Rule	Turbidity, *Cryptosporidium*	January 2002	Monitoring
Long Term 2 Enhanced Surface Water Treatment Rule	*Cryptosporidium*	March 2006	Started monitoring in 2013
Phase I Rules	Volatile Organic Compounds	January 1989	Monitoring
Phase II and V Rules	Inorganic and Synthetic Organic Compounds	January 1993	Monitoring
Arsenic Rule	Arsenic	January 2006	Monitoring
Radionuclides Rule	Combined radium, gross alpha, beta and photon emitters, and uranium	December 2003	Monitoring
Unregulated Contaminant Monitoring Rule 2	25 parameters	January 2007	Monitoring
Unregulated Contaminant Monitoring Rule 3	30 parameters	April 2012	Start monitoring in 2014
Filter Backwash Recycling Rule	Recycle flow	May 2001	Not applicable
Current Distribution System Regulations			
Total Coliform Rule	Total and fecal coliform, *E. coli*	December 1990	Monitoring
Lead and Copper Rule and revisions	Lead and copper, water quality parameters	December 1992 December 2007	Monitoring
Stage 1 Disinfectants and Disinfection By-products Rule	Trihalomethanes, haloacetic acids, disinfectant, total organic carbon	February 1999	Completed
Stage 2 Disinfectants and Disinfection By-products Rule	Chlorite, trihalomethanes, haloacetic acids	March 2006	Monitoring
Ground Water Rule*	Total/ Fecal coliform	November 2006	Monitoring

Water Regulation	Contaminants Affected	Date Rule Took Effect	District Status
Other Current Regulations			
Consumer Confidence Reports	Annual report addressing drinking water quality	September 1998	Reporting annually
Operator Certification	Minimum standards for operator certification	February 2001	Up-to-date

*Not applicable for Judy Reservoir

1.8 Operations and Maintenance

Chapter 9 summarizes the programs and procedures used to ensure the safe and reliable supply of potable water to District customers. It describes water system management and personnel, operator certification requirements, system operations, supervisory control and data acquisition (SCADA) and telemetry systems, asset management, the emergency response program, safety procedures, the cross-connection control program, the records keeping and reporting program, design and construction standards, and any recommended improvements.

The following recommendations may improve efficiency and provide value to the operation of the District's water system:

- Implement the new Computerized Maintenance Management System (CMMS) to focus on improved maintenance, while continuing the replacement of aging and undersized pipe.
- Improve the safety and emergency response training for key staff.
- Develop a central location where important and relevant system information can be found quickly.
- Implement a document management system so that the District can share electronic information more efficiently.
- Complete flow tests in each pressure zone to help calibrate the hydraulic model.

1.9 Capital Improvement Plan (CIP)

A capital improvement plan for District projects over the next 20 years was developed by determining major CIP projects and minor CIP projects. Major CIP projects were developed from the system analysis, which looked at source, storage, and distribution facilities, and from other major projects that were identified by staff to improve system reliability. The minor CIP projects were developed from a distribution system analysis as well as from the analysis of a database of information reflecting pipe age, material, size, and leak history. A summary of the CIP for the next 6 years is shown in Table 1-7.

Table 1-7. Capital Improvements 2014–2019

Project ID	Project	2014	2015	2016	2017	2018	2019
O-2	Dukes Hill PS	$150,000					
O-3	Cedar Hills PS	$60,000					
O-4	WTP Chemical Feed	$125,000					
O-5	Document Mgmt. System	$200,000					
O-6	WTP Dry Scrubber	$125,000					
	Water Loss Control Action Plan	$70,000					
R-1	E. Division Reservoir, PS and Piping		$10,000,000				
P-2	Josh Wilson Road Pipelines		$200,000	$1,500,000			
F-1	Josh Wilson Road Fiber			$130,000			
F-2	Old Hwy 99 Fiber			$60,000			
P-3	North 30th & Digby Pipelines		$2,400,000				
P-4	Judy-MV Transmission Line	$200,000	$800,000	$4,000,000	$9,300,000		
O-7	Computer Hardware				$175,000	$175,000	
P-5	Mclean Road Pipeline				$300,000	$4,400,000	
R-2	Cascade Ridge Reservoir				$50,000	$150,000	
F-3	Cascade Ridge Fiber					$250,000	
P-6	Best Road Pipeline					$300,000	$2,100,000
P-7	Burklund Road Pipeline					$300,000	$3,100,000
R-3	Big Lake Reservoir					$50,000	$350,000
P-8	North Fork Skagit River Crossing						$500,000
R-4	Pleasant Ridge Area Reservoir (240' HGL)						$100,000
FO-4	SW-Burlington Fiber						$150,000
	Annual Pipe Replacement	$3,430,000	$3,500,000	$3,500,000	$3,500,000	$3,500,000	$3,500,000
	TOTAL	$4,360,000	$16,900,000	$8,990,000	$13,325,000	$9,125,000	$9,800,000

1.10 Financial Program

Chapter 11, Financial Plan, provides reasonable assurance that the District has and will have the financial ability to maintain and operate the utility on an ongoing basis, plus have the capacity to obtain sufficient funds to construct the water system improvements identified in Chapter 10. A summary of the 6-year financial forecast for the District's Judy System is provided in Table 1-8. As shown in Table 1-8, the District's system is able to support operations over the next 6 years. The planned rate increases discussed in Chapter 11 will provide sufficient additional revenue to allow the District to meet the increase in debt costs from revenue bonds to help finance the CIP. It also verifies that the District can fund all of the recommended improvements while maintaining adequate cash reserves.

Table 1-8. 6-Year Financial Forecast

Revenue Requirement	2014	2015	2016	2017	2018	2019
Revenues						
Rate Revenues Under Existing Rates	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573
SDF Revenue Towards Debt	770,928	801,320	835,819	863,730	900,060	937,450
Rate Stabilization Revenue	-	-	-	-	-	-
Non-Rate Revenues	852,267	871,196	876,605	903,712	909,975	926,039
Total Revenues	**$ 17,678,041**	**$ 17,849,567**	**$ 18,013,631**	**$ 18,192,804**	**$ 18,360,853**	**$ 18,541,063**
Expenses						
Cash Operating Expenses	$ 11,868,263	$ 12,113,061	$ 12,363,403	$ 12,709,335	$ 12,928,610	$ 13,197,268
Existing Debt Service	2,965,108	2,980,095	2,971,158	2,962,609	2,751,807	2,027,030
New Debt Service	-	150,061	2,125,299	2,118,153	3,130,938	3,123,792
Routine Capital	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000
Total Expenses	**$ 18,133,371**	**$ 18,543,216**	**$ 20,759,860**	**$ 21,090,096**	**$ 22,111,355**	**$ 22,848,090**
Net Surplus (Deficiency)	**$ (455,330)**	**$ (693,649)**	**$ (2,746,229)**	**$ (2,897,293)**	**$ (3,750,502)**	**$ (4,307,027)**
% of Rate Revenue	**2.84%**	**4.29%**	**16.85%**	**17.64%**	**22.66%**	**25.83%**
Annual Rate Adjustment	**0.00%**	**8.00%**	**8.00%**	**8.00%**	**4.00%**	**4.00%**
Cumulative Annual Rate Adjustment	**0.00%**	**8.00%**	**16.64%**	**25.97%**	**31.01%**	**36.25%**
Rate Revenues After Rate Increase	$ 16,054,846	$ 17,471,215	$ 19,013,728	$ 20,691,226	$ 21,683,234	$ 22,723,269
Additional Taxes from Rate Increase	$ -	$ 65,084	$ 136,413	$ 214,530	$ 258,109	$ 304,038
Net Cash Flow After Rate Increase	**(455,330)**	**535,431**	**(170,121)**	**1,154,041**	**1,123,805**	**1,434,630**
Coverage After Rate Increases	**3.83**	**4.66**	**2.62**	**3.11**	**2.59**	**3.48**

1.11 Satellite System Management

Chapter 12 summarizes the status of the District's eight satellite systems. As part of the pre-planning meeting with DOH, it was decided that a full analysis was not required for each of the satellite systems because they have not changed drastically from the time when the 2007 plan was completed. As a result, Chapter 12 discusses the following four items for each of the eight satellite systems:

1. Coliform monitoring plans for the Ground Water Rule changes.
2. CIP needs for the next 6 years.
3. Sanitary survey corrections.
4. Water loss control action plan if distribution system leakage exceeds 10%.

2 System Description

2.1 Introduction

Skagit County is located in the northwestern part of Washington State, and stretches from Puget Sound to the crest of the Cascade Mountains. Also included are leeward islands of the San Juan Archipelago, together with the Skagit River delta and floodplain. The eastern two-thirds of Skagit County is dominated by the northern Cascade Mountains, which include Mount Baker, portions of North Cascade National Park, and Mount Baker National Forest. Mount Vernon is the largest city in Skagit County and the county seat. Other significant municipalities include Anacortes, Burlington, Concrete, Hamilton, LaConner, Lyman, and Sedro-Woolley.

Figure 2-1 is a general vicinity map of Skagit County.

As described in this chapter, the District operates the most expansive water system in the county with a total of over 23,000 active service connections. The majority of the District's services are within the Judy Reservoir System (Judy System), Washington State Department of Health (DOH) Public Water System Identification (PWSID) 79500E, which serves Mount Vernon, Burlington, and Sedro-Woolley and surrounding rural and suburban areas. Appendix B contains the District's Water Facilities Inventory for the Judy System, and Appendix C includes the most recent sanitary surveys of the Judy System and the water treatment plant. The District also operates remote water systems including the following:

- Fidalgo Island (PWSID 00932 Y)
- Alger (PWSID 01400 K)
- Cedargrove (PWSID 11917 4)
- Marblemount (PWSID AA642)
- Mountain View (PWSID 03774 Y)
- Potlatch Beach (PWSID 69034 L)
- Rockport (PWSID 73600 6)
- Skagit View Village (PWSID 96879 5)

As directed by DOH, this WSP focuses on the District's Judy Reservoir System because the satellite systems were addressed in the previous WSP update in 2007. See Chapter 12 for a statement on each remote system regarding coliform monitoring plans, CIP projects, sanitary survey corrections, and distribution system leakage (DSL). Figures 2-2 and 2-3 show District water systems and adjacent water purveyors in Skagit County.

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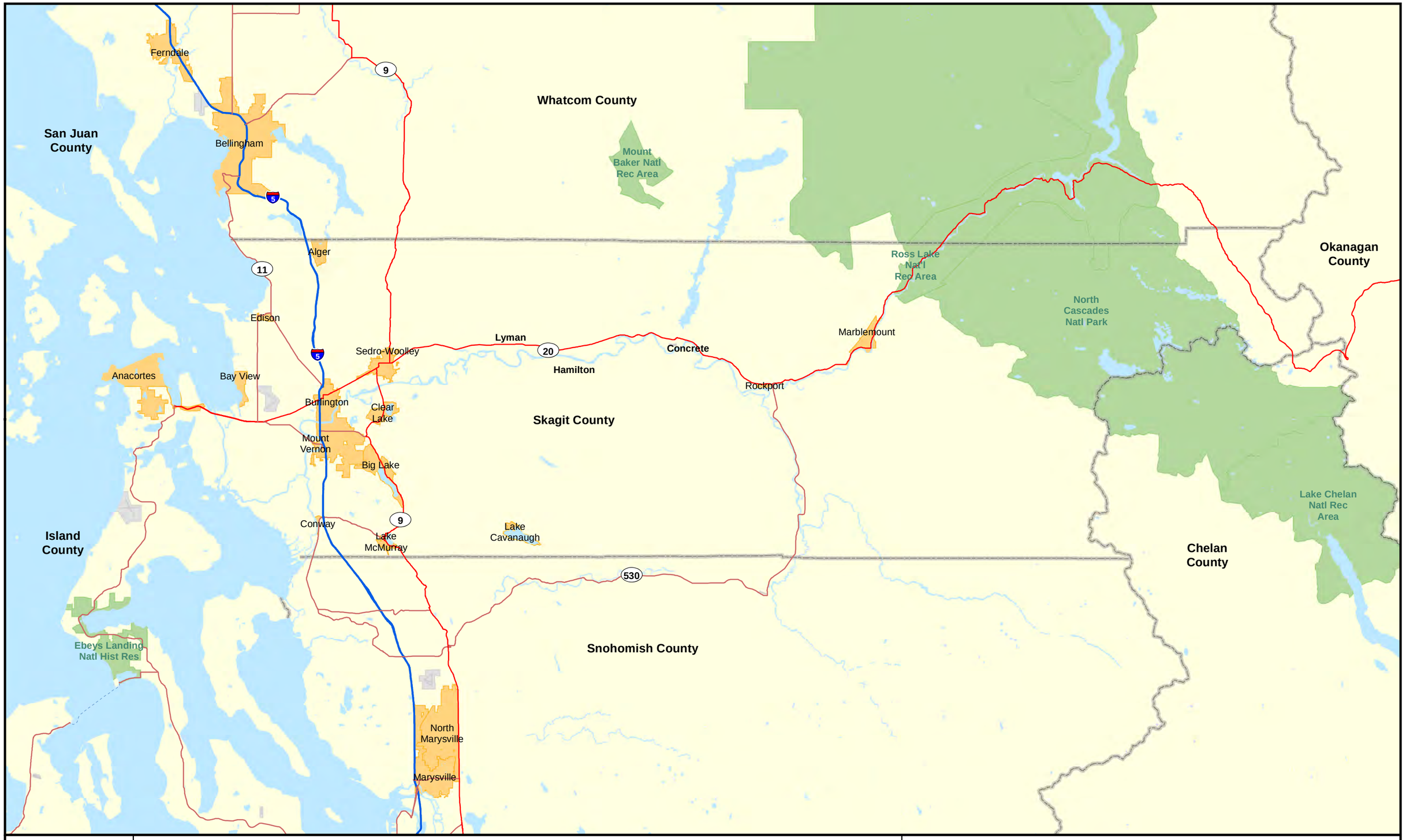

Ferndale
Bellingham
San Juan County
Whatcom County
Mount Baker Natl Rec Area
Alger
11
Edison
Sedro-Woolley
Lyman
20
Hamilton
Concrete
Marblemount
Ross Lake Natl Rec Area
North Cascades Natl Park
Okanagan County
Anacortes
Bay View
Burlington
Clear Lake
Mount Vernon
Big Lake
Skagit County
Rockport
Conway
9
Lake McMurray
Lake Cavanaugh
Island County
530
Chelan County
Lake Chelan Natl Rec Area
Ebeys Landing Natl Hist Res
Snohomish County
North Marysville
Marysville
Skagit PUD
PUBLIC UTILITY DISTRICT
County Boundaries
Water
Cities
National Park
N
General Vicinity Map
2013 Skagit PUD Water System Plan
Coordinate System: WA State Plan North, NAD83
0
10
Miles
Figure 2-1

Potlatch Beach
Samish Bay
Alger
Padilla Bay
Fidalgo Island
Skagit Bay
Skagit River
Judy Reservoir
Clear Lake
Mountain View
Day Lake
Big Lake
Ten Lake
Devil's Lake
Lake Sixteen
Lake McMurray
Bellingham
North Marysville
Everett

Adjacent Water Purveyors
- ANACORTES
- BLANCHARD EDISON
- DEL MAR
- HOLIDAY HIDEWAY
- LACONNER
- LAKESIDE ESTATES
- LEIF ERICKSON REC
- N. FIR ISLAND
- SAMISH FARMS
- SHELTER BAY
- SWINOMISH
- UPPER SKAGIT

Skagit PUD
PUBLIC UTILITY DISTRICT

- District Satellite Systems (Labeled on Map)
- Skagit County
- District Judy Retail Service Area

N

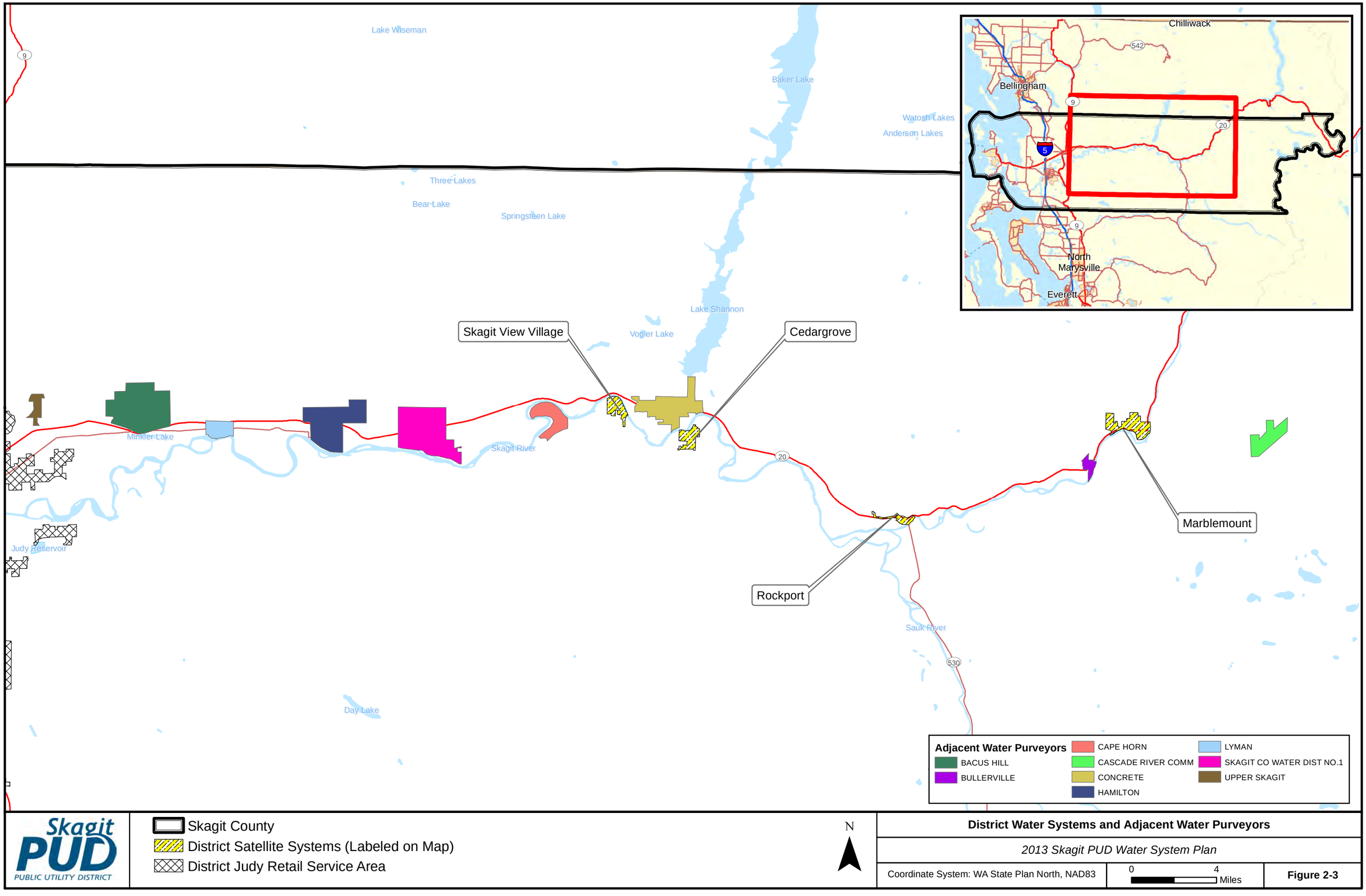
District Water Systems and Adjacent Water Purveyors

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 4 Miles

Figure 2-2


Lake Wiseman
Baker Lake
Watosh Lakes
Anderson Lakes
Three Lakes
Bear Lake
Springsteen Lake
Lake Shannon
Vogler Lake
Skagit View Village
Cedargrove
Minkler Lake
Skagit River
Judy Reservoir
Day Lake
Marblemount
Rockport
Sauk River
530
20
9
Chilliwack
542
Bellingham
5
North Marysville
Everett
Adjacent Water Purveyors
BACUS HILL
BULLERVILLE
CAPE HORN
CASCADE RIVER COMM
CONCRETE
HAMILTON
LYMAN
SKAGIT CO WATER DIST NO.1
UPPER SKAGIT
Skagit County
District Satellite Systems (Labeled on Map)
District Judy Retail Service Area
N
District Water Systems and Adjacent Water Purveyors
2013 Skagit PUD Water System Plan
Coordinate System: WA State Plan North, NAD83
0
4
Miles
Figure 2-3

2.2 Ownership and Management

The responsibilities and powers of the District are exercised through a Commission of three members, elected by the voters, having 6-year terms expiring in rotation so that one Commissioner is elected every 2 years. The Board of Commissioners, as authorized by law, employs a General Manager, a Treasurer, an Auditor, counsel, and such other officials and special services as may be required to conduct the affairs of the District. The General Manager, Auditor, and counsel are all independent entities employed by the Commission and work for the unified good of the District. There is no legal linkage between the District and Skagit County government, though there is a cooperative working relationship.

The General Manager is the chief administrative officer of the District and, assisted by the Treasurer, Auditor, Engineering Manager, counsel, and administrative and operations staff, carries out the policies set by the Board of Commissioners and all other duties as set forth in Revised Code of Washington (RCW) 54.16.100. To address the possibility that the General Manager could be absent or temporarily disabled, the General Manager has, with the approval of the Commission, designated the Auditor as Assistant Manager.

The day-to-day operations of the District's water systems are handled by various staff responsible for different aspects of the system. The Operations Manager is responsible for the piping, valves, reservoirs and pump stations, while the water treatment plant (WTP) is the responsibility of the Water Treatment Plant Superintendent. The mapping and data collection on the District's assets is handled by the Asset Manager. Figure 2-4 is a simplified organizational chart of the ownership and management of the District, with more detailed charts, including job descriptions, included in Chapter 9, Operations and Maintenance.

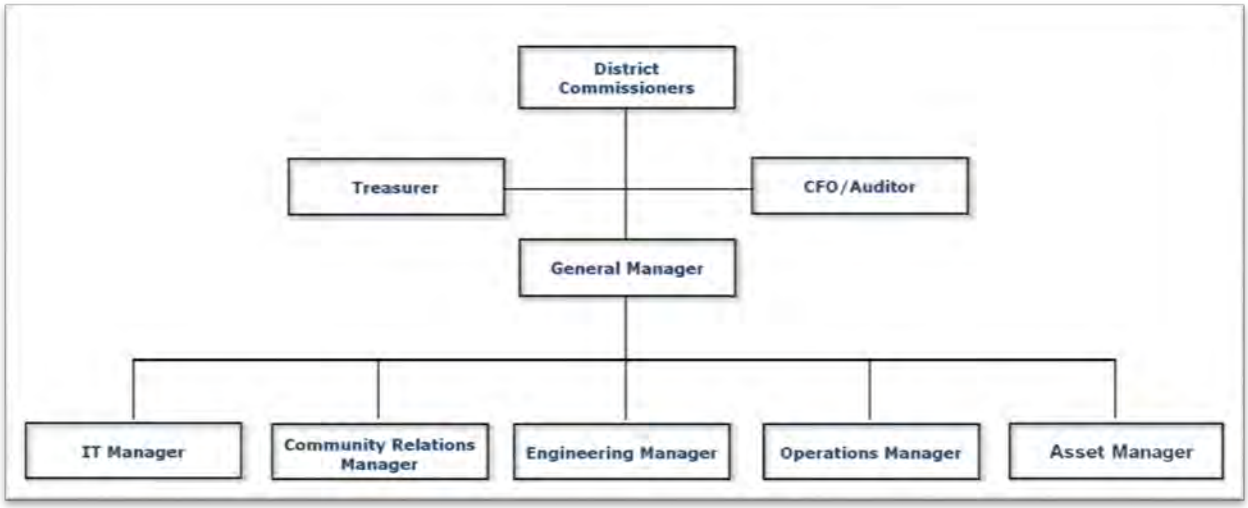


Figure 2-4. Simplified Organizational Chart

2.3 History of the Water System

The District is a municipal corporation of the State of Washington, established at the general election of November 3, 1936. The organizational meeting of the Commissioners of the District was held January 16, 1937. Since the District's organization, the Commissioners have observed regular meeting dates and, in addition, have held special meetings as circumstances dictated. Proceedings of each meeting of the Commission are recorded in an official minute book.

The water sources for the District have evolved over time, and the current water sources are the Skagit River and four creeks in the Cultus Mountains (Gilligan, Salmon, Turner, and Mundt creeks). Below is a summary of key milestones in the development of the District's water system.

1939 November 4. Purchased, by friendly condemnation, the water systems in the cities of Mount Vernon, Burlington, and Sedro-Woolley from the Peoples Water and Gas Company for the sum of $300,070. The water systems totaled 3,134 water services; 51.5 miles of pipeline; 3,940,000 gallons of distribution storage; 1.75 million gallons per day (MGD) in treatment facilities; and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt, and Turner creeks).

1940 March 7. Purchased the Clear Lake Water Corporation for $8,330.29, complete with 180 water services; 11.5 miles of pipeline; 500,000 gallons of distribution storage; and diversions on three Cultus Mountain streams (Gilligan, Salmon, and Turner creeks).

1940 July 1. Purchased 1.8 miles of water line from the Avon Mutual Water System for $2,650.00.

1940 Integrated the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon; this line was completed that same year through support of the Works Progress Administration.

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435 feet above mean sea level (AMSL).

1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.

1956 Acquired/constructed the Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.

1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.

1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.

1960 Extended Judy Reservoir System to Bayview through LUD No. 4.

1961 Expanded Fidalgo Island system to the Gibralter and Dewey Beach areas through LUD No. 5.

1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.

1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.

1965 Raised Judy Reservoir from elevation 435 feet AMSL to 451 feet AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.

1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.

1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley Skagit River crossing with concrete cylinder pipe.

1977 Installed a concrete cylinder pipe transmission line parallel to the wood stave distribution line between Sedro-Woolley and Burlington.

1984 Transferred service from the wood stave line to the concrete cylinder transmission line between Burlington and Sedro-Woolley.

1990 Completed and put on-line the District's multi-media direct filtration water treatment plant at Judy Reservoir to serve the Judy Reservoir System.

1991 Acquired and reconstructed the remote public water system at Rockport through LUD No. 11.

1991 Extended the Judy Reservoir System toward Big Lake along Gunderson Road through LUD No. 12.

1992 Acquired and reconstructed the satellite public water system at Cedargrove through LUD No. 10.

1993 Extended the Judy Reservoir System around Big Lake through LUD No. 16 and to Lake Sixteen through LUD No. 18.

1994 Extended the Judy Reservoir System south of Mount Vernon around Britt Slough through LUD No. 17.

1995 Extended the Judy Reservoir System to the Hoogdal area north of Sedro-Woolley through LUD No. 19.

1996 Signed the Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes (MOA).

1996 Extended the Judy Reservoir System north of Judy Reservoir to the Panorama area through LUD No. 20.

1997 Extended the Judy Reservoir System to Big Rock through LUD No. 21.

1998 Acquired and provided a reverse osmosis water source to an existing satellite public water system on Guemes Island through LUD No. 23.

1999 Acquired and reconstructed a satellite public water system in the Alger area through LUD Nos. 22 and 24.

2000 Extended the Judy Reservoir System south of Mount Vernon to the Stackpole Road area through LUD No. 25.

2000 Completed enlargement of Judy Reservoir, increasing its impoundment capacity from 1.01 billion to 1.45 billion gallons and raising the spill elevation from 451 feet AMSL to 465 feet AMSL.

2001 Sewer Authority granted to the District through a ballot measure.

2004 Acquired and reconstructed a satellite public water system named Skagit View Village through LUD No. 27.

2006 Constructed a satellite public water system serving Marblemount through LUD No. 28.

2006 Extended the Judy Reservoir System north of the community of Bayview through North Bayview LUD No. 29.

2007 Started construction on the Skagit River Diversion Pump Station and pipeline to Judy Reservoir to provide a redundant water supply to the WTP by having the ability to transfer existing water rights to the Skagit River.

2007 Completed construction of the new 18-inch diameter ductile iron Cook Road transmission pipeline from Sedro-Woolley to Burlington to increase the geographical distribution, capacity, and reliability of a gravity feed from Judy Reservoir.

2008 Completed construction of Clearwell #3 at the WTP to add 3.25 million gallons of storage to the Judy System.

2008 Completed installation of new radio-read water meters at each metered service.

2009 Added Samish River Park, LUD No. 30, to the Judy System.

2009 Finished upgrades to the WTP. Added four new filter beds and expanded the treatment capacity of the plant from 12 MGD to 24 MGD.

2009 Installed Phase I of the new 36-inch-diameter ductile iron Judy Reservoir to Mount Vernon transmission pipeline, from Laventure Road to College Way. This pipeline provides an increase in capacity and a redundant source of supply to the existing 24-inch-diameter concrete cylinder pipeline.

2009 Completed construction of the Skagit River Diversion.

2010 Completed installation of a fiber optic backbone from Sedro-Woolley to the Town of Lyman.

2010 Utilized the new Skagit River Diversion for the first time.

2012 Completed construction of the new 18-inch-diameter ductile iron Josh Wilson Road transmission pipeline from Burlington to Bayview. This new pipeline allows a gravity feed from Judy Reservoir to serve the District's customers in Bayview, without purchasing water from an intertie with the City of Anacortes.

2013 Completed installation of a new fiber optic line in the Town of Lyman for business customers; project funded by Skagit County.

2013 Completed installation of the new 14-inch-diameter HDPE Fir Island Road pipeline to increase the hydraulic capacity to Fir Island and the far reaches of the Judy System.

2.4 Service Area

The District is authorized by RCW 54.04.030 to operate water systems within and without the limits of Skagit County, Washington. This gives the District county-wide service authority and sets the legal boundaries of the District at, but not limited to, the boundaries of the county. The District has agreed with other water utilities participating in the Skagit County Coordinated Water System Plan (CWSP) process on the designated service areas for each water system. The District's service area is essentially the entire county except for those areas already served by another public water system.

The District's Judy Reservoir System has a retail service area that includes Mount Vernon, Burlington, and Sedro-Woolley as well as surrounding communities such as Bow Hill, Bayview, Fir Island, Conway, Big Lake, and Clear Lake. Figure 2-2 shows the District's retail service area and the service area for the Judy System. The formal Service Area Agreement for Skagit County, from the CWSP, is included as Appendix D, along with the service agreements from the other contracts that the District has entered into for the purchase or sale of water.

The District also wholesales water to the North Fir Island Water Association and Samish Island Farms; these entities purchase water to serve their mostly residential customer base. The District has agreements with each of its wholesale customers, and those agreements are discussed in detail in Chapter 3, Related Plans, Agreements, and Policies. The location of each customer is shown on Figure 2-2.

As evidenced by the regionally agreed-upon 2000 CWSP, the District is generally recognized as the most capable regional water purveyor in Skagit County. As a protection for future water customers, the District will not limit its retail service area. It is not to the benefit of the District's current or future customers to reduce the District's retail service area to something less than what was regionally agreed upon in the 2000 CWSP, which has been subsequently applied to the District's Judy Reservoir water rights. If the District were to reduce its retail service area, providing service to any potential customers outside the service area boundary would require public review of an expansion of the District's retail service area. Delays and challenges to that process could lead the customer to abandon the project, because obtaining an exempt well is not a likely solution based on recent Washington State Supreme Court rulings within Skagit County regarding availability of water.

2.5 Satellite Management Agency

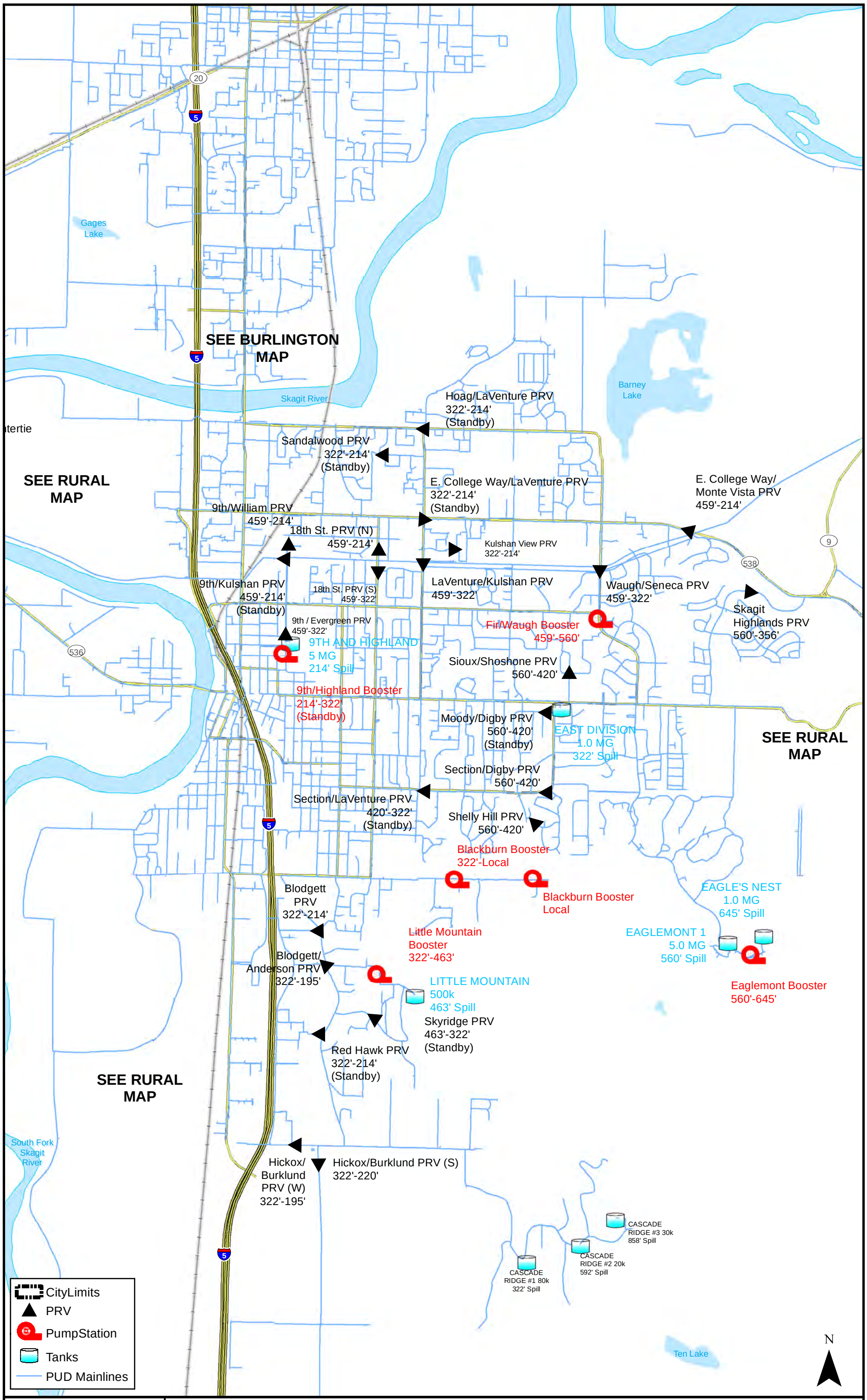
The District is the primary Satellite Management Agency for Skagit County (SMA #103) and, as identified in the CWSP, will work with any water system that is unable to provide service within or adjacent to its own designated service area, and will evaluate service to any new system in undesignated areas. The District will provide service whenever financially feasible and meeting the requirements of the District's Water Policy Manual, by line extension from an existing system or establishment of a new remote system. The Satellite Management Program is covered in greater detail in Section 12.

2.6 System Facilities

As mentioned above, this WSP focuses on the Judy System; this section provides details about the water system infrastructure that is a part of that system. The Judy System is comprised of the water sources, the WTP, transmission pipelines, and associated valves, booster stations, tanks, interties, and distribution pipelines. The major system facilities are listed below and are discussed in the sections that follow.

- Cultus Mountain stream diversions (Gilligan, Turner, Salmon, and Mundt)
- Skagit River diversion intake and pump station
- Judy Reservoir
- WTP at Judy Reservoir
- Transmission pipeline from the WTP to Mount Vernon
- Transmission pipeline from the WTP to Sedro-Woolley
- 22 reservoirs and 3 clearwells at the WTP
- 18 water booster stations
- 27 pressure zones
- 130 pressure-reducing valves

Figures 2-5, 2-6, and 2-7 show the facilities within each city, and Figure 2-8 shows the facilities in the rural areas. Specific details related to the piping are shown in separate figures and are discussed in Section 2.6.3.



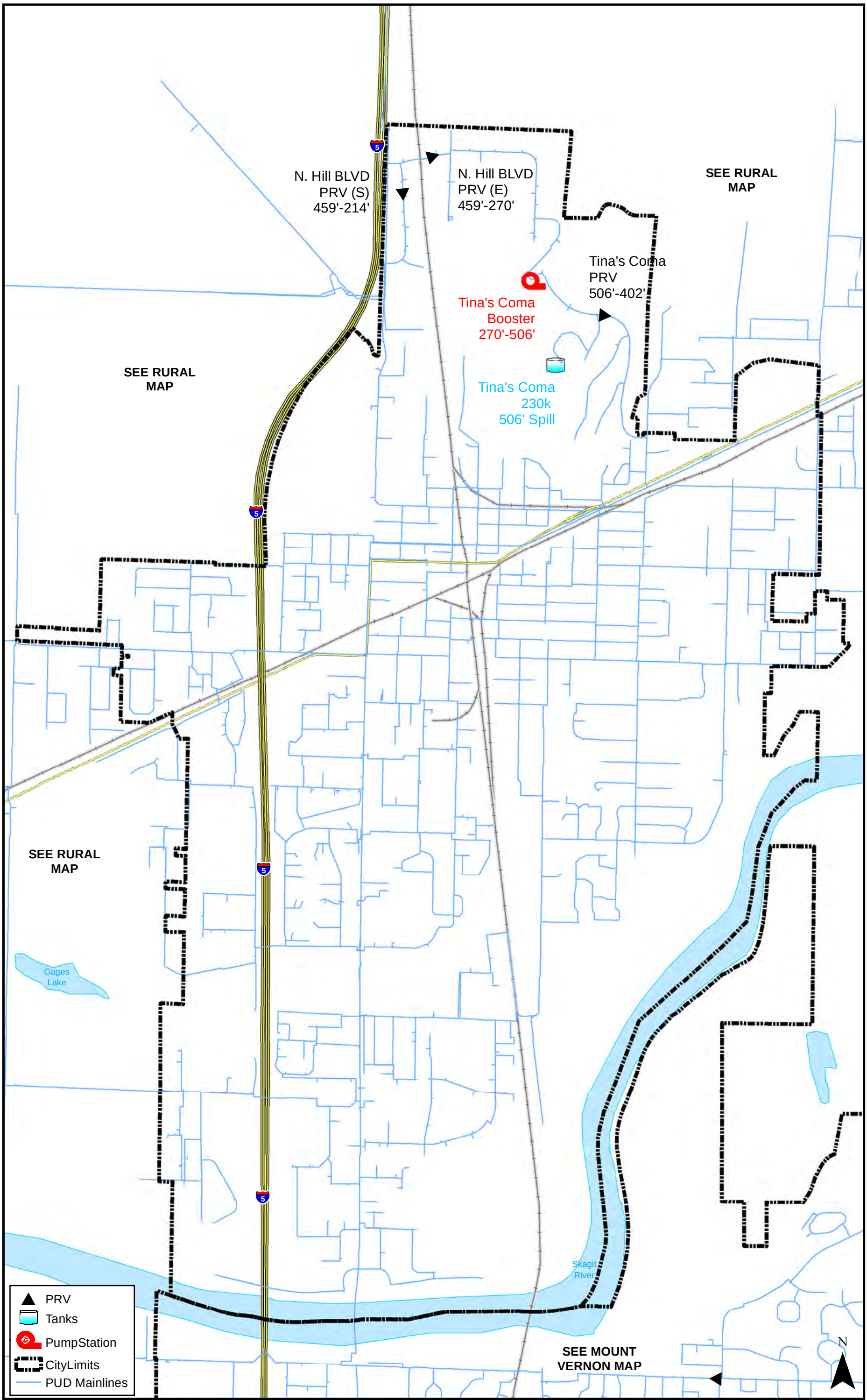
District Facilities - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 2-5



Skagit PUD
PUBLIC UTILITY DISTRICT

District Facilities - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 2-6

SEE RURAL MAP

Hoogdal Road
100k
430' Spill

SR 9 & Kalloch Rd.
459'-430'
(Typ Bypassed)

SR 9 & Bassett
459'-340'

Fruitdale & Portabello
459'-350'

Dukes Hill
5 MG
214' Spill

Dukes Hill
459'-214'

Bassett/Longtime
459'-340'

SR 9 & Marie Pl.
340'-214'

Janicki
459'-214'

SEE RURAL MAP

Rhodes Rd.
459'-214'

1st & Nelson
459'-214'

Township/Dunlap
459'-214'

SEE RURAL MAP
(FROM JUDY WTP)

PRV
PumpStation
Tanks
CityLimits
PUD Mainlines

N

Skagit PUD
PUBLIC UTILITY DISTRICT

District Facilities - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 2-7

BOW HILL
1.0 MG
456' Spill

Bow Hill Booster
438'-456'

Samish River Park PRV
459'-160'

HOOGDAL ROAD
100k
430' Spill

SR 9 & Kalloch Rd. PRV
459'-430'
(Typ Bypassed)

CITY OF
SEDRO-WOOLLEY
(SEE DETAIL)

Cook Rd PRV
459'-214'

BAYVIEW RIDGE
2.93 MG
290' Spill

BAYVIEW STANDPIPE
300k
270' Spill

8" Josh Wilson PRV
459'-290'

4" Josh Wilson PRV
290'-270'

Bay Meadows PRV
290'-270'

Peterson / Sunrise PRV
290'-235'

Peterson Booster
214'-290'

Country Club PRV
235'-214'

CITY OF
BURLINGTON
(SEE DETAIL)

Skagit River Diversion
Raw Water

WTP/Panorama
Pump Station
459'-705'

WTP CLEARWELLS
#1 - 1.22 MG
#2 - 1.22 MG
#3 - 3.25 MG
459' Spill

Clear Lake PRV
459'-284'

Buckanan / Maple PRV
365'-284'
(Standby)

Front St. / Beaver
Lake Rd PRV
365'-284'

Buckanan / Magnolia PRV
365'-284'

BUCHANON HILL
1.0 MG
365' Spill

Beaver Lake Road /
Big Lake PRV
459'-356'

Beaver Lake Road /
Clear Lake PRV
459'-365'

Fredonia Intertie
350'-290'
(Standby)

W. Bank Intertie
650'-214'
(Standby)

Lefeber PRV
290'-214'
(Standby)

Lefeber Intertie
350'-290'
(Standby)

E. Bank Intertie
350'-214'
(Standby)

CITY OF
MOUNT VERNON
(SEE DETAIL)

Rudene Booster
214'-290'

Bradshaw Booster
214'-290'

Nookchamps
Hills Booster
356'-450'

NOOKACHAMPS HILLS
500k
356' Spill

BIG LAKE - EAST
2x70k
356' Spill

BIG LAKE - WEST
140k
356' Spill

Cascade Ridge
Booster #3
592'-858'

Cascade Ridge
Booster #1
310'-322'

Cascade Ridge
Booster #2
322'-592'

CASCADE RIDGE #3
30k
858' Spill

CASCADE RIDGE #2
20k
592' Spill

CASCADE RIDGE #1
80k
322' Spill

Hickox / Burglund PRV
322'-220'

HERMWAY HEIGHTS
60k
413' Spill

Conway PRV
220'-195'
(Standby)

Bulson Alt
Valve PRV
220'-195'

BULSON RD
100k
195' Spill

Lk 16 Booster
412'-684'

LAKE 16 STANDPIPE
60k
684' Spill

Bulson Booster
195'-412'

CityLimits
PRV
Tanks
PumpStation
PUD Mainlines

N

Skagit PUD
PUBLIC UTILITY DISTRICT

District Facilities - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1 2 Miles

Figure 2-8

2.6.1 Water Source Facilities

The Judy Reservoir System obtains its water from four streams tributary to the Skagit River in the Cultus Mountain Watershed (Gilligan Creek, Salmon Creek, Turner Creek, and Mundt Creek). The new Skagit River Diversion (SRD) pump station, which went "online" in 2011, can provide raw water to the WTP from the Skagit River as an alternative source to the streams. The Cultus Mountain Watershed is located approximately 2 miles east of the Town of Clear Lake. The watershed boundary and District facilities related to the watershed are shown in Figures 2-9 and 2-10. A Watershed Management Plan (WMP) was prepared for the Cultus Mountain Watershed and is discussed in Chapter 3 (Related Plans, Agreements, and Policies). The complete WMP was reviewed and approved by DOH under separate cover and its table of contents can be found in Appendix E. A watershed control plan was also prepared for the Skagit River in 1994, in coordination with the City of Anacortes. The Skagit River Watershed Control Plan was updated by the City of Anacortes in 2010 and is provided in Appendix F.

Water is collected from the four Cultus Mountain streams at diversion structures and transported to an impoundment (Judy Reservoir) through two collector pipelines. Minimum instream flows established by WAC 173-503 limit the diversion quantities available from each stream based on the month of the year. Chapter 7 (System Reliability, Water Rights, and Source Water Protection) discusses water rights and instream flows in greater detail. When the stream flows measured on a downstream stream gage do not meet these minimum flows, the District will divert water as needed from its supplemental point of diversion on the Skagit River up to the maximum water right.

Judy Reservoir lies in a natural basin, through which Janicki Creek once flowed. In 1947, Janicki Creek was diverted around the eastern edge of the basin and dams were constructed with a spill elevation of 435 feet AMSL and a capacity of 450 million gallons. The dams are "A" Dam to the southwest and "B" Dam to the northeast. "B" Dam is actually two dams on either side of a rock knoll. Dams "A" and "B" were raised in 1965 to increase the reservoir spill elevation to 451 feet AMSL and the capacity to 1,010 million gallons. The dams were raised again in 2001 to increase the reservoir spill elevation to 465 feet AMSL and the capacity to 1,450 million gallons. Janicki Creek continues to flow in a new channel along the east side of the reservoir. It meets Judy Reservoir's spillway at the northeast corner of the reservoir. The spillway empties below the dam into the existing bed of Janicki Creek, a tributary to the Skagit River.

The level of Judy Reservoir varies throughout the year. Inflows from the streams primarily occur between the months of October through June during the periods when stream levels regularly persist above minimum instream flows. Inflows from the Skagit River are managed by the District throughout the year based on recent and anticipated inflows from the streams compared to anticipated needs of the WTP. As a result of this operating scenario, the reservoir is managed to a target elevation at the end of a calendar year and reaches the highest elevations of the year during the winter as inflows from the streams increase and customer demands decrease. The reservoir elevation begins to decrease significantly in the late spring due to the District's decreasing ability to divert water from the streams and increasing customer demand, generally reaching the lowest levels

during the summer. Inflows from the Skagit River are managed throughout the spring, summer, and fall to return the reservoir to a target elevation at year's end and begin the cycle again. If the reservoir drops below forecasted elevations, inflows from the Skagit River can be increased to maintain adequate supply to the WTP.

The average daily elevation of Judy Reservoir from 2002 through 2012 was 455 feet, which equates to approximately 970 million gallons (MG) of storage. When compared to the 2012 average and maximum daily production requirements at the WTP, this elevation would provide approximately 123 days and 76 days of storage for the respective usage rates.

The District also obtains water for the Judy System from the City of Anacortes through interties on an as-needed basis. These interties are connected to the City's transmission line system, which starts from its water treatment plant adjacent to the Skagit River in Mount Vernon and extends westward to Anacortes on Fidalgo Island. Water is purchased from the City of Anacortes under the terms of a water contract. The City obtains water from the Skagit River through its own certificated water rights.

Each of the District's source water diversions and their pipelines are discussed below.

2.6.1.1 Skagit River Diversion Pump Station

Located 1 mile northwest of Judy Reservoir, the SRD pump station is used to supply source water from the Skagit River to the Judy System. Commissioned in 2009, the facility uses five 900-horsepower electric pumps to transfer water from the Skagit River to Judy Reservoir through a 36-inch-diameter underground pipeline. The intake structure is constructed of concrete and the surrounding riverbanks are protected with large riprap.

SRD has the capability to provide the full cumulative water right of 35.8 MGD to Judy Reservoir if stream diversions are suspended due to emergency events such as storm damage.

Sediment deposits from the Skagit River can accumulate inside of and on the top of the concrete intake structure at SRD. Periodic maintenance is required to remove these deposits and reduce operational difficulties related to the pump station.

2.6.1.2 Gilligan Creek Diversion

The diversion at Gilligan Creek was constructed in 1958. While minor changes have occurred over the years, the basic function of the diversion has remained consistent. An underground pipeline was constructed within bedrock to access an intake screen located along the bottom of the stream channel. Stream flows drop through the screen, into the pipeline, and enter a vertical box-shaped structure. By manipulating the volumes of water passing through this structure, operators manage the amount of water that enters the source water pipeline to Judy Reservoir.

The Gilligan Creek Diversion can be affected by winter storms, and a major storm in January 2009 resulted in significant damage and an extended loss of the ability to divert water to the reservoir. The screen is susceptible to blockages caused by rock and gravel transported by the stream. Access is difficult and maintenance activities usually require the use of an aerial work platform ("man lift"). The District is considering replacement of the screen with a design intended to minimize malfunctions due to debris and improve resistance to winter storms. These improvements could increase protection of a large portion of the source water provided to the Judy System, because 42% of these volumes were diverted from Gilligan Creek in 2012.

2.6.1.3 Mundt Creek Diversion

Similar in design to the Gilligan Creek Diversion, the Mundt Creek Diversion collects water through a screen located on the streambed. The diversion was constructed in 1967 along with the Turner Creek Diversion and the combined source water pipelines to Judy Reservoir.

Sediments and debris traveling through the stream system usually pass across the intake screen without causing significant damage or operational difficulties. Larger debris transported during major storms could damage exposed portions of the diversion, and the intake screen requires periodic cleaning to remove fine sediments.

2.6.1.4 Turner Creek Diversion

The Turner Creek Diversion includes a concrete structure that functions as a dam to divert water into the source water pipeline. Constructed in 1967, the diversion connects to the pipeline from Mundt Creek for eventual discharge to Judy Reservoir.

The Turner Creek Diversion is susceptible to operational difficulties if large amounts of sediments build-up behind the structure. This situation can inhibit diversion of water into the source water pipeline until the debris is removed.

2.6.1.5 Salmon Creek Diversion

The diversion at Salmon Creek was constructed in 1997. A steel structure is located across the stream channel and functions as a dam. A spillway is manipulated to control the amount of water that enters the source water pipeline to Judy Reservoir. Salmon Creek is a relatively low velocity stream and is not significantly affected by debris or storm damage.

2.6.1.6 Source Water Pipelines

Underground pipelines used to convey source water from the stream diversion facilities to Judy Reservoir are primarily located along public roadways or gravel logging roads. The existing concrete and ductile-iron pipelines were constructed in two phases in 1967 and 1990 with an average depth of 3 feet to the top of a pipeline.

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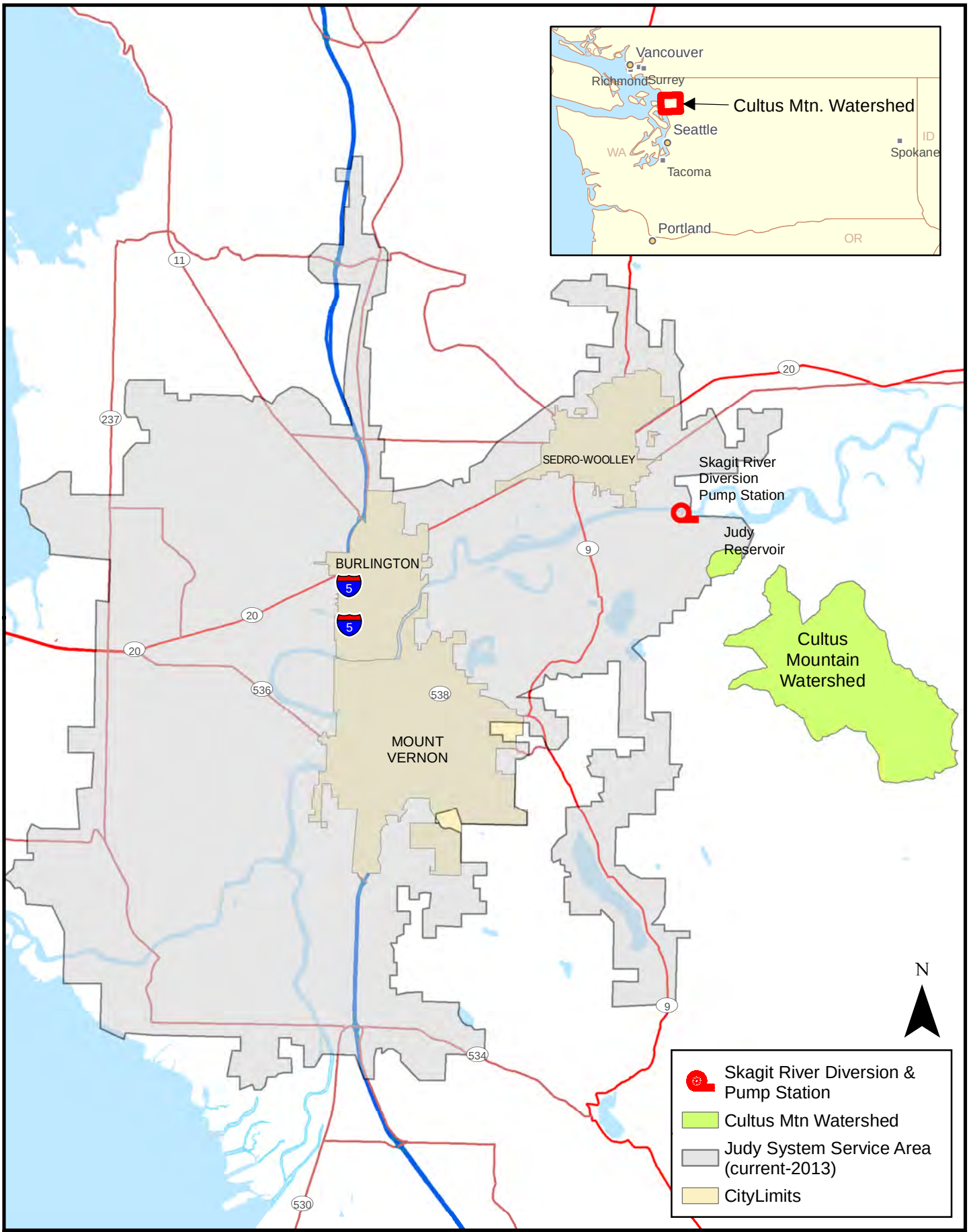


Skagit PUD
PUBLIC UTILITY DISTRICT

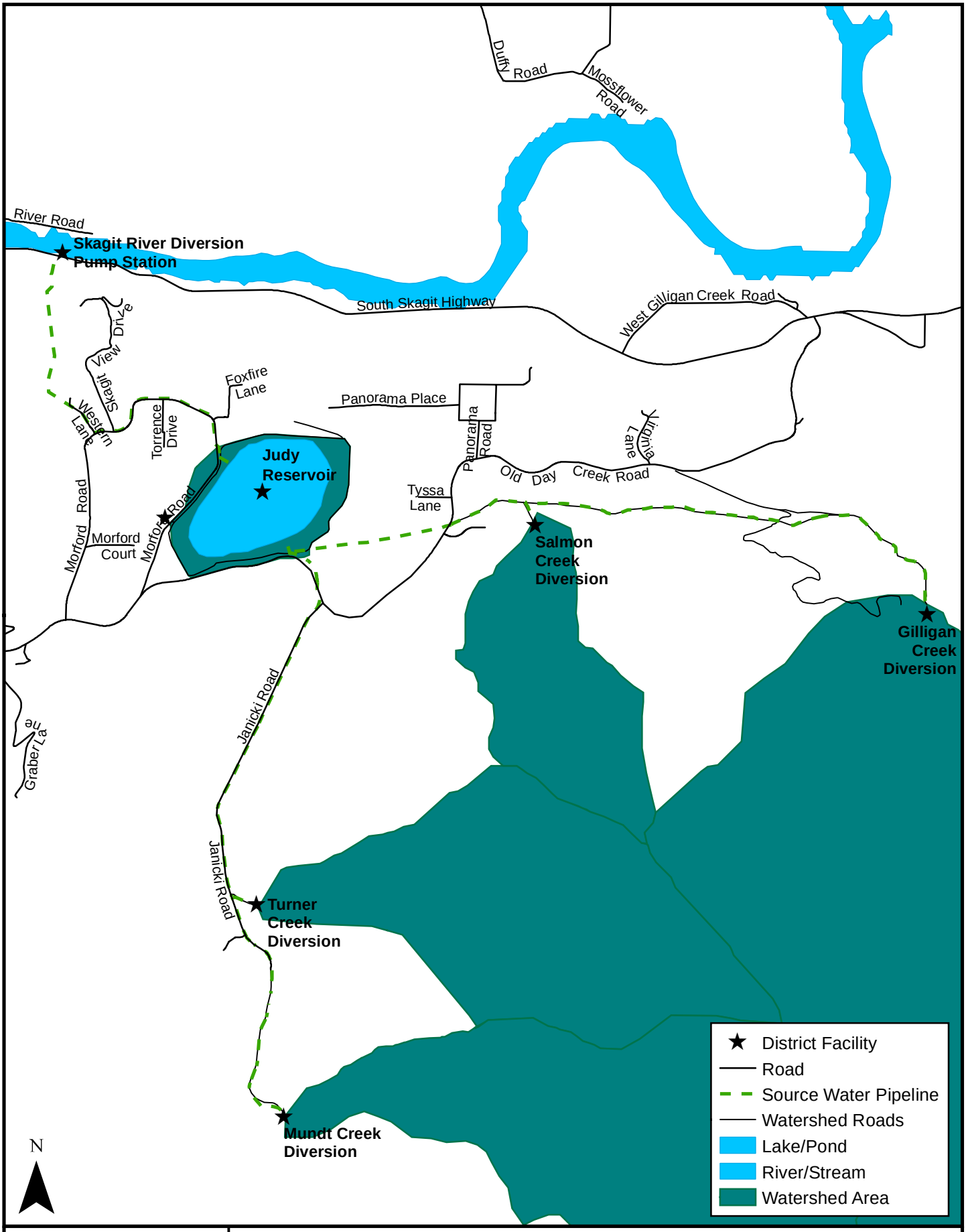
Location of the Cultus Mtn Watershed & Skagit River Diversion Pump Station

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1 2 Miles

Figure 2-9



District Facilities Related to the Cultus Mountain Watershed

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 2-10

2.6.2 Treatment Facilities

Until 1990, raw water impounded in Judy Reservoir was disinfected and delivered unfiltered, directly from Judy Reservoir to the distribution system through transmission pipelines. In March 1990, the District's new multi-media direct filtration WTP was placed in service adjacent to Judy Reservoir. Raw water from the Judy Reservoir impoundment is pumped to the WTP and disinfected and filtered to meet current Safe Drinking Water Act (SDWA) requirements. Water is then served by gravity through transmission lines to the District's customers. The WTP capacity was increased to 30 MGD in 2006–2008 through the addition of new filters and a third clearwell.

The raw water flowing from Judy Reservoir is disinfected with chlorine dioxide and pumped up to the control building; carbon dioxide and coagulant aids are also added at this stage. The water flows through an in-line static flash mixer to four 2-stage flocculation basins. Then the water flows to the filter basins. There are eight filter basins, 500 square feet each, utilizing a high-speed filtration process through coal and sand filter media. The filtered water is disinfected again with chlorine and flows by gravity to the three finished water reservoirs (clearwells) near the WTP; these include one steel 3-MG tank and two steel 1.22-MG tanks. Caustic soda and ammonia are added before the clearwells to adjust pH and form chloramine residual. Finished water from the clearwells flows by gravity down the transmission lines to the distribution system and the District's customers.

The WTP currently has a treatment capacity of 24 MGD and a hydraulic capacity of 30 MGD. The hydraulic capacity means that the water flowing through the plant would not be treated. Actual peak flow rates at the WTP from 2003 through 2012 are shown in Table 2-1. A schematic of the process at the WTP is provided in Figure 2-11.

Table 2-1. Water Treatment Plant Peak Flow

Year	Peak Flow (MGD)
2003	14.2
2004	11.8
2005	13.2
2006	12.8
2007	16.0
2008	12.0
2009	13.4
2010	12.6
2011	12.0
2012	11.9

Finished water from the WTP flows by gravity to three storage reservoirs adjacent to the WTP. The reservoirs, typically referred to as the District's "clearwells", have a combined capacity of 5.69 MG and a spill elevation of 459 feet AMSL.

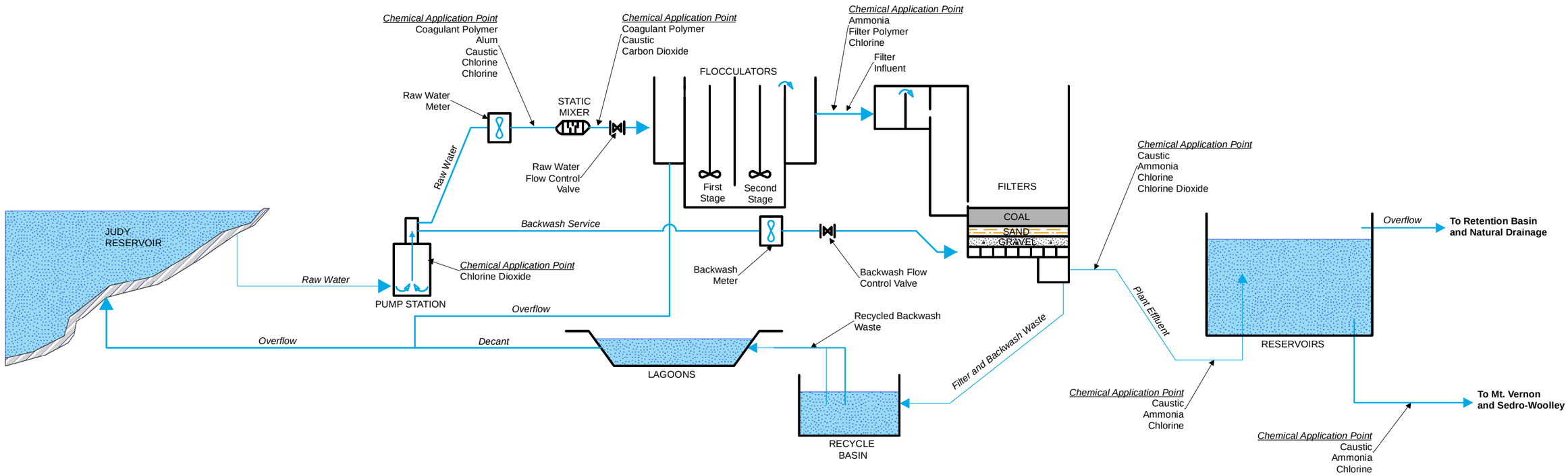
The water received through interties from the City of Anacortes is treated at the City's WTP, located adjacent to the Skagit River on Riverbend Road in Mount Vernon.

On May 15, 2007, the Skagit County Commissioners, acting as the Board of Health, passed resolution #R20070284 mandating that the District provide fluoridation at its Judy Reservoir WTP and at the east and west bank interties with Anacortes. This decision was put to a vote and did not pass. Therefore, fluoridation is not provided by the District at this time.

2.6.3 Transmission Facilities

Finished water from the clearwells at the Judy Reservoir WTP flows by gravity to District customers through a looped transmission pipeline system. The transmission pipelines leave the WTP at 459 feet Hydraulic Grade Line (HGL), so the typical working pressures are between 160 and 180 pounds per square inch (psi). However, in some areas, the pressure in the transmission pipeline is reduced to distribution pressure to serve customers. In those areas, the transmission pipelines act more as large-diameter distribution pipelines, but are still referred to as transmission pipelines because they are the backbone for the District's infrastructure. The transmission system is shown in Figure 2-12 and can be divided into four main components at this time:

- **Judy Reservoir to Sedro-Woolley Pipeline** – A 20-inch-diameter concrete cylinder pipeline that begins at the WTP and brings flow across the Skagit River to Sedro-Woolley.
- **Cook Road and Josh Wilson Road Pipelines** – Recently constructed 18-inch-diameter ductile iron pipelines that carry flow from Sedro-Woolley to the west to Burlington and Bay View.
- **Judy Reservoir to Mount Vernon Pipeline** – A 24-inch-diameter concrete cylinder pipeline that begins at the WTP and brings flow to the most populated area of the District's system in Mount Vernon.
- **Riverside Drive and Burlington Boulevard Pipelines** – A combination of 12-inch-diameter and 18-inch-diameter pipelines that are reduced in pressure and carry flow between Burlington and Mount Vernon.

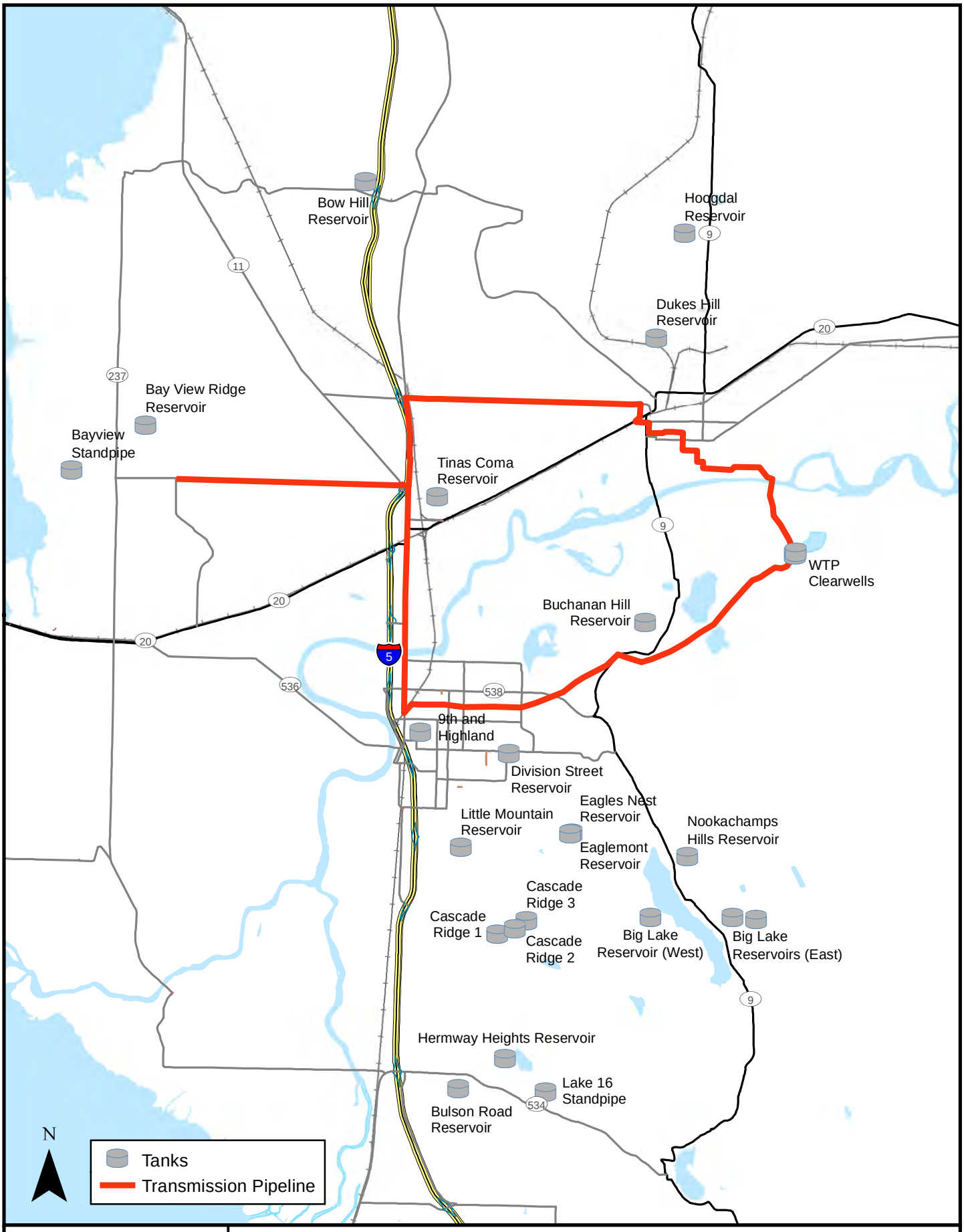


Skagit PUD
PUBLIC UTILITY DISTRICT

Water Treatment Plant Process Schematic

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83 | Not to Scale | **Figure 2-11**



Judy System - Transmission Pipeline Loop

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1 2 Miles

Figure 2-12

2.6.3.1 Judy Reservoir to Sedro-Woolley Pipeline

The transmission pipeline to the north that crosses the Skagit River into Sedro-Woolley is a 20-inch-diameter concrete cylinder pipe constructed in 1970. The pipeline leaves the WTP at 459 feet HGL and goes down a steep bank between the Skagit River and Judy Reservoir. The pipeline crosses the Skagit River on a small suspension bridge and heads to Sedro-Woolley for distribution. The pipe size, material, and installation date of the various sections of this pipeline are provided in Table 2-2.

Historically, the transmission line loop was reduced to 214 feet HGL in Sedro-Woolley, and the lower pressure transmission pipeline continued west along State Route (SR) 20 into Burlington. However, with the recent construction of the Cook Road and Josh Wilson Road transmission pipelines, the pressure zone at 459 feet HGL has been extended farther to the west and the older concrete cylinder pipe on SR 20 serves as a redundant piece of the transmission pipeline loop.

Table 2-2. Size, Material, and Installation Date of Judy Reservoir to Sedro-Woolley Pipeline

Section	Pipe Size (Diameter)	Material	Installation Date
WTP to top of hill	30-inch	Concrete cylinder	1970
Top of hill to south side of Skagit River	20-inch	Concrete cylinder	1970
Skagit River crossing	24-inch	Ductile iron	1958
North side of Skagit River to Nelson & Walley	24-inch	Ductile iron	1977
Nelson & Walley to SR 9 and West State Street	24-inch	Concrete cylinder	1977
SR 9 crossing	16-inch	Ductile iron	1977
SR 9 and West State Street to BNSF	24-inch	Concrete cylinder	1977
BNSF crossing	16-inch	Concrete cylinder	1977
SR 20 to Hodgin Street	24-inch	Concrete cylinder	1977

There has been no history of leaks or problems with this pipeline, although no specific condition assessment has been performed. This pipeline is nearing capacity for the current peak demands in the system and is expected to reach capacity in approximately 2025.

2.6.3.2 Cook Road and Josh Wilson Road Pipelines

Both the Cook Road and Josh Wilson Road transmission pipelines were recently constructed with the goal of providing gravity-fed water from Judy Reservoir to District customers in Bay View. By doing so, the District is now able to serve those customers without purchasing water from the City of Anacortes through existing interties. The Cook Road pipeline starts at Hodgin Street in Sedro-Woolley and travels west on the shoulder of Cook Road to Old Highway 99. It then crosses under the BNSF Railway and proceeds south on Old Highway 99 to the Chuckanut Interchange on Interstate 5 (I-5). At this point, the Josh Wilson Road pipeline begins by going under I-5 and the Chuckanut Interchange in a 30-inch-diameter steel casing pipe. The pipeline then continues west on Josh Wilson Road to Higgins Airport Way, where a pressure-reducing valve (PRV) provides water to the Bay View area. The pipe size, material, and installation date of the various sections of this pipeline are provided in Table 2-3.

Table 2-3. Size, Material, and Installation Date of Cook Road and Josh Wilson Road Pipelines

Section	Pipe Size (Diameter)	Material	Installation Date
SR 20 & Hodgin Street to Old Hwy 99 & Cook Road	18-inch	Ductile iron	2007
Old Hwy 99 & Cook Road to Old Hwy 99 and Gear Road	16-inch	Ductile iron	1995
Old Hwy 99 & Gear Road to Josh Wilson Road & Higgins Airport Way	18-inch	Ductile iron	2012

The majority of this pipeline has been installed in the last 6 years and is expected to be in very good condition.

2.6.3.3 Judy Reservoir to Mount Vernon Pipeline

The transmission pipeline to the southwest that extends to Mount Vernon is a 24-inch-diameter concrete cylinder pipeline constructed in 1961. This high-pressure pipeline leaves the WTP at 459 feet HGL and goes down the hillside toward Clear Lake in an easement. The pipeline then goes through the Clear Lake area, through the North Fork of Nookachamps Creek, across SR 538 (College Way), and along the Kulshan Trail through Mount Vernon to Laventure Road. In 2009, a new 36-inch-diameter ductile iron pipeline was constructed from Laventure Road to College Way to provide additional capacity and redundancy to the water supply to Mount Vernon. The new pipeline was constructed within the same easement as the 24-inch-diameter pipeline. The 36-inch-diameter pipeline is planned to continue from College Way to the Judy Reservoir WTP. The pipe size, material, and installation date of the various sections of this pipeline are provided in Table 2-4.

Table 2-4. Size, Material, and Installation Date of the Judy Reservoir to Mount Vernon Pipeline

Section	Pipe Size (Diameter)	Material	Installation Date
WTP to Kulshan & Laventure	24-inch	Concrete cylinder	1961
Kulshan & Laventure to Alder Lane & Riverside Drive	20-inch	Concrete cylinder	1961
College Way to Kulshan & Laventure	36-inch	Ductile iron	2009

The Judy Reservoir to Mount Vernon 24-inch-diameter concrete cylinder pipeline has reached its hydraulic capacity for current peak demands on the system in terms of maximum acceptable velocity, and there is a need for additional capacity. In 2009, the redundant 36-inch-diameter ductile iron pipeline was constructed from College Way to Kulshan and Laventure. However, the remainder of the pipeline from College Way to the WTP was deferred for financial reasons. The continuation of this pipeline is vital to the District's ability to provide water to Mount Vernon during peak day demands, and is therefore in the District's Capital Improvement Plan (see Chapter 10) for completion prior to 2020, subject to financing.

2.6.3.4 Riverside Drive and Burlington Boulevard Pipelines

The high-pressure transmission pipeline from Judy Reservoir to Mount Vernon ends in Mount Vernon, but a lower pressure pipeline continues to the north along Riverside Drive at a pressure of 214 feet HGL. It crosses the Skagit River on the Riverside Bridge and continues north along Burlington Boulevard to Old Highway 99 to connect to the transmission pipeline near Josh Wilson Road. This pipeline completes the loop of the transmission system, which is vital to the reliability of the District's infrastructure. The pipe size, material, and installation date of the various sections of this pipeline are provided in Table 2-5.

Table 2-5. Size, Material, and Installation Date of Riverside Drive and Burlington Boulevard Pipelines

Section	Pipe Size (Diameter)	Material	Installation Date
Alder Lane & Riverside Drive to Pacific & Riverside	18-inch	Concrete cylinder	1967
Pacific & Riverside to Burlington Blvd & George Hopper	24-inch	Ductile iron	2001
Burlington Blvd & George Hopper to Burlington Blvd & Victoria	18-inch	Concrete cylinder	1966/1967
Burlington Blvd & Victoria to Alder & Victoria	24-inch	Concrete cylinder	1977
Alder & Victoria to Old Hwy 99 and Gear Road	16-inch	Ductile iron	1990/1992

The majority of this pipeline is over 30 years old, but there are no reports of any leaks or other issues.

The District serves Burlington, Mount Vernon, and Sedro-Woolley, and the Town of Clear Lake from the transmission pipeline loop. Distribution lines are gridded through these areas to provide the necessary domestic and fire flows. Remaining areas in the Judy Reservoir service area—such as Big Lake, Conway, Avon, Bay View, Allen, Samish Island, Bow Hill, and the rural areas around them—are served by a system of long distribution lines. Distribution lines are normally smaller than transmission lines, ranging from 4 through 12 inches in diameter.

2.6.4 Storage Facilities

The District has 22 water storage reservoirs and 3 clearwells within the Judy System. Table 2-6 provides the details about the reservoirs, showing a total nominal capacity of 29,881,000 gallons, of which 2,921,576 gallons is operational storage; 22,131,184 gallons is standby/fire storage; 3,690,614 gallons is equalizing storage; and 1,170,000 gallons is additional fire storage. The names and locations of the reservoirs within the Judy System are shown in Figures 2-5 through 2-8.

Table 2-6 Distribution Reservoirs for Judy System

DESCRIPTION	HGL	NOMINAL CAPACITY (GAL)	EQUALIZ. STORAGE (GAL)	STANDBY STORAGE (GAL)	FIRE STORAGE (GAL)	UNUSABLE STORAGE (GAL)	WALL HEIGHT (FT)	DIAM (FT)	SPILL ELEV (FT)	BASE ELEV (FT)	PUMP CALL ELEVATION (FT)	OPERATIONAL STORAGE (GAL)	GAL/FT EACH	YEAR PLACED IN SVC	MATERIAL	C.O.#
9th and Highland Reservoir	214	5,000,000	635,000	3,980,385	INCL	0	39	147	214	175	PRV *	384,615	128,205	1975	Welded Steel	2448
Bay View Ridge Reservoir	290	2,930,000		2,632,754			69	84	290	221	283	297,246	42,464	1999	Welded Steel	3812
Bayview Standpipe	270	300,000	15,000	71,000	70,000	135,000	100	23	270.75	170.75	PRV *	9,000	3,000	1971	Welded Steel	2244
Big Lake Reservoir (West)	356	140,000	21,000	59,517	45,000	0	29	30	356.5	327.5	PRV *	14,483	4,828	1993	Cylindrical Concrete	3427
Big Lake Reservoirs (East) 1	356	70,000	21,000	32,846	INCL	0	13	30	356.5	343.5	PRV *	16,154	5,385	1993	Cylindrical Concrete	3427
Big Lake Reservoirs (East) 2	356	70,000	21,000	32,846	INCL	0	13	30	356.5	343.5	PRV *	16,154	5,385	1993	Cylindrical Concrete	3427
Bow Hill Reservoir	456	1,000,000		862,069			87	45	456	369	444	137,931	11,494	1996	Welded Steel	3660
Buchanan Hill Reservoir	365	1,000,000	89,000	129,826	409,000	320,000	57.5	55	365.5	308	PRV *	52,174	17,391	1994	Welded Steel	3560
Bulson Road Reservoir	195	100,000	50,000	12,500	INCL	0	8	46	195	187	PRV *	37,500	12,500	1962	Cyl.Concrete;Wd Roof	1625
Cascade Ridge Reservoir #1	322	75,000		55,147	INCL		34	20	322	288	313	19,853	2,206	1994	Bolted Steel (Porc.)	3364
Cascade Ridge Reservoir #2	592	23,000		18,071	INCL		14	17	592	578	589	4,929	1,643	1994	Bolted Steel (Porc.)	3364
Cascade Ridge Reservoir #3	858	33,000		24,750	INCL		14	20	858	844	854.5	8,250	2,357	1994	Bolted Steel (Porc.)	3364
Division Street Reservoir	322	1,000,000	97,000	374,250	435,000	0	32	74	322.5	290.5	PRV *	93,750	31,250	1977	Welded Steel	2629
Dukes Hill Reservoir	214	5,000,000	809,000	3,722,250	INCL	0	32	166	214	182	PRV *	468,750	156,250	1994	Welded Steel	3460
Eaglemont Reservoir	560	5,000,000	889,000	3,076,517	INCL	0	29	174	560	531	554	1,034,483	172,414	1994	Welded Steel	3460
Eagles Nest Reservoir	645	1,000,000	46,000	180,027	211,000	477,000	110.5	39.5	644.5	534	635	85,973	9,050	1994	Welded Steel	3570
Nookachamps Hills Reservoir	356/450	500,000	34,000	440,576	INCL	0	59	38	356	297	PRV *	25,424	8,475	1992	Welded Steel	3287
Hermway Heights Reservoir	412	60,000	16,000	7,077	INCL	0	26	26	412.5	386.5	396.5	36,923	2,308	1985	Cylindrical Concrete	3092
Hoogdal Reservoir	430	100,000	26,000	58,211	INCL	0	19	29.5	430	411	PRV *	15,789	5,263	1994	Welded Steel	3460
Lake 16 Standpipe	684	60,000	7,000	41,462	INCL	0	52	14	684	632	674	11,538	1,154	1993	Welded Steel	3437
Little Mountain Reservoir	463	500,000	95,000	295,625	INCL	0	32	52	463	431	456	109,375	15,625	1968	Welded Steel	2050
Tinas Coma Reservoir	506	230,000		188,718			39	32	506	467	499	41,282	5,897	2000	Welded Steel	4044
WTP Clearwells #1	459	1,220,000	265,000	955,000	INCL	0	23	95	459	436			53,043	1990	Welded Steel	3234
WTP Clearwells #2	459	1,220,000	265,000	955,000	INCL	0	23	95	459	436			53,043	1990	Welded Steel	3234
3rd Clearwell	459	3,250,000	289,614	2,754,760	INCL	205,626	24.1	157	464	439.93			135,023	2006	Welded Steel	3234
TOTALS		**29,881,000**	**3,690,614**	**20,961,184**	**1,170,000**	**1,137,626**						**2,921,576**				

PRV * = tank are kept full as possible - a 3' operational storage is assumed.

DOH requires the District to have at least 2 days of Average Day Demand (ADD) for each equivalent residential unit (ERU), with a minimum of 200 gallons per day (gpd) per ERU. An ERU is a method of representing water use by non-residential customers as an equivalent number of residential customers. An ERU is the amount of water used by a single-family household. A storage analysis was completed for the entire Judy System, and for each pressure zone within the system, as described in Chapter 6. Table 2-7 provides a summary of the standby storage available for each regional area within the Judy System based on the number of services that it supplies. As shown in the table, the District is far above the standard requirement set forth by DOH.

Table 2-7. Judy Sub-Area Reservoir Standby Storage for 2014

Service Sub-Area	Standby Storage (gal)	# of ERUs	Gallons per ERU
Bay View	2,703,754	3,747	722
Big Lake	565,786	935	605
Burlington*	3,040,980	9,805	310
Clear Lake	129,826	476	273
Conway	61,038	257	238
Mount Vernon*	6,014,580	23,385	257
Sedro-Woolley	3,780,461	6,565	576
Water Treatment Plant	4,664,760	All Areas	N/A
	20,961,184	45,217	464

* 9th and Highland reservoir allocated half to Burlington and half to Mount Vernon via a transmission line

The District has a goal of providing at least 2 days of Maximum Day Demand (MDD) in standby storage for each ERU. Based on the District's current MDD of approximately 278 gallons per day per ERU (gpd/ERU), the standby storage goal for the District is 300 gpd/ERU, for a total of 600 gallons per ERU. This goal and the status of the system in relation to the goal are discussed in Chapter 6.

The majority of the District's domestic and commercial demands in the Judy System are east of I-5, supported by all but two of the system's storage reservoirs. The majority of the District's customers to the west (principally the Bay View area) are supported by the two remaining distribution storage reservoirs, backed up by interties with the City of Anacortes. The minimum design standards for the District are discussed in Appendix G, Water Policy Manual.

All storage reservoirs in the District's service areas are constantly drawn down and refilled throughout the day by customer demands. Once reservoirs have drawn down to a preset elevation,

the reduced static pressure triggers the controls of the supervisory control and data acquisition (SCADA) system, PRV, or pump station(s) supplying that pressure zone to replenish the storage.

2.6.5 Pump Stations

The District has installed booster pump stations at various locations around the Judy System as required to raise water pressure from a lower to a higher hydraulic grade and/or to compensate for frictional pipeline losses. Table 2-8 provides the details for the pump stations. The names and locations of the pump stations are shown in Figures 2-5 through 2-8, and the configurations of the pump stations between pressure zones can be seen in the hydraulic profile in Figure 2-13.

With few exceptions, these booster pump stations are low capacity and provide only domestic service. The exceptions are the Bow Hill pump station, the Fir-Waugh pump station, and the WTP pumps which are high capacity pump stations that have the capacity to provide limited fire flow without storage assistance, although storage is available in all three cases.

The high-capacity pump stations all have at least two pumps to provide station reliability and redundancy in the case of a pump failure. However, the smaller low-capacity stations do not always have a dual pump setup. In those cases, the District makes every effort to ensure that the pumps are a model similar to the model in other single booster pump stations. The District then keeps at least one spare pump in stock at the warehouse in the event that a failure occurs at any booster pump station. So even though there is not the immediate redundancy of a dual pump booster station, the District has an additional pump that can be installed in the place of a failed pump within hours.

2.6.6 Pressure-Reducing Valves

PRVs are used to reduce the water pressure from a higher pressure gradient to a lower pressure gradient, serving from transmission to distribution systems and from higher to lower distribution pressure zones. PRVs that serve distribution grids from the transmission line loop are usually set based on the spill elevation of storage reservoirs in the receiving pressure zone, to refill storage that may have been diminished by daytime demands. PRVs that serve between distribution pressure zones are usually set slightly below the static pressure of the receiving pressure zone, intended to open only for high-demand conditions such as fire flow.

The District has established its pressure zones to maintain an average range of 40 to 80 psi at the customers' services. Pressures above 80 psi can damage a customer's plumbing and hot water heater. The District advises its customers of the plumbing code requirements for installation of an individual PRV on each customer's service that has pressure greater than 80 psi. The District's major PRV stations have dual PRVs in parallel: a small PRV for average flow conditions and a larger PRV for peak flow and fire flow conditions. See Table 2-9 for a complete list of current PRVs. The names and locations of PRVs are shown in Figures 2-5 through 2-8, and the configurations of the PRVs between pressure zones can be seen in the hydraulic profile in Figure 2-13.

Table 2-8 Water Booster Pump Stations

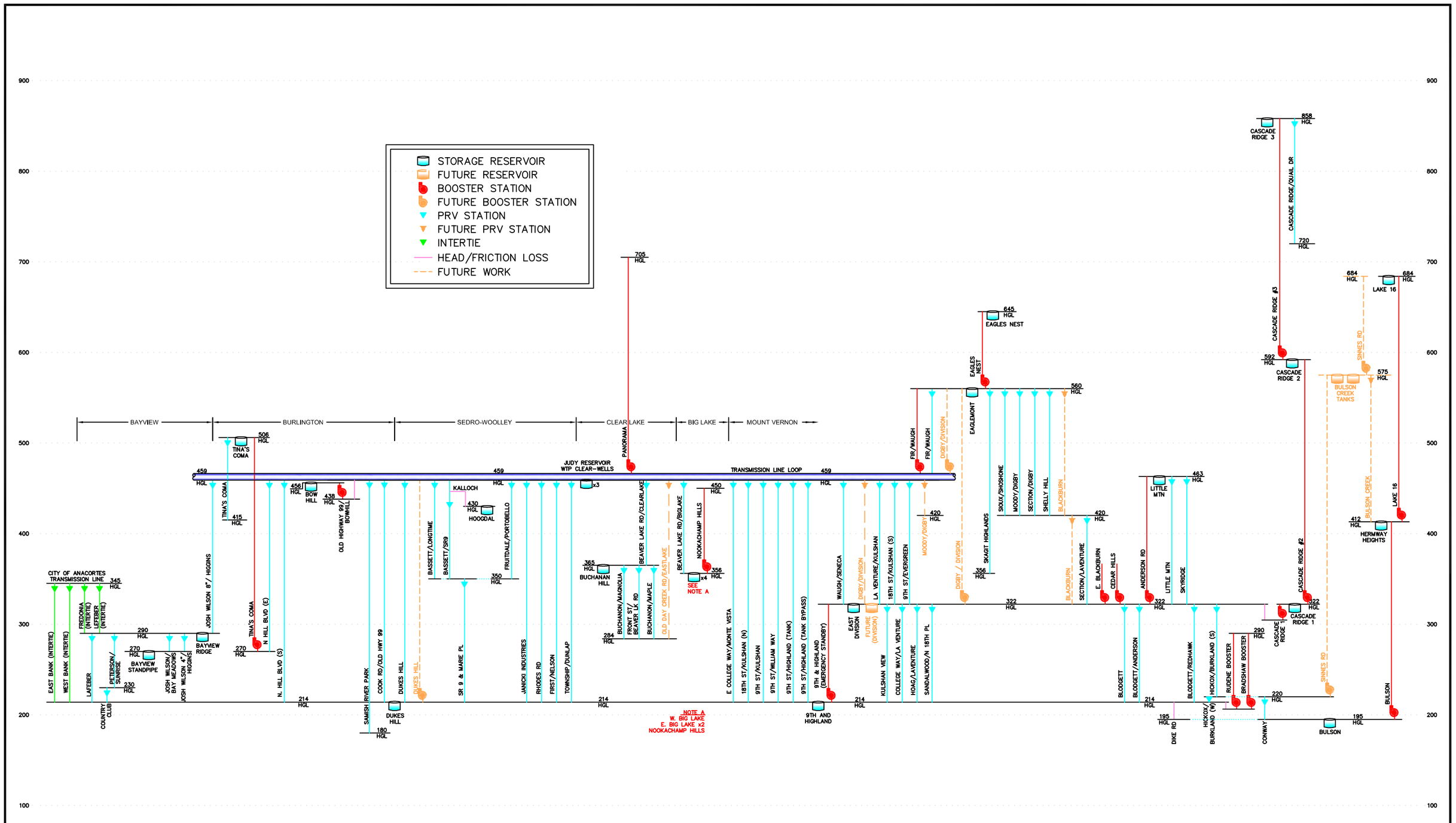
Pump Station	C.O. #	Install Year	Inlet Pressure Zone	Discharge Pressure Zone	Operation	Elevation (ft)	Pump Mfg	Pump Model	Inlet Pressure (psi)	Discharge Pressure (psi)	Flow (gpm)	TDH (ft)	Impeller Diameter	Impeller Trimmed	Suction Size	Discharge Size	Connection	Motor Mfg	VFD?	HP	Phase	Motor RPM
9TH and Highland Pump 1			214	322	Emergency		De Laval	I 5/4	20	80	1000	225	15	no	6	6	8 Bolt Flange	US Motors		75	3	3600
Anderson Road Pump 1			322	463	Continuous		Goulds	XVE215TCDR7012AP	60	133	200	180		no	3	2	4 Bolt Flange	U.S. Motors		15	3	3600
Blackburn Pump 1			322	423	Continuous		Berkeley	B1-1/2 ZPL	43	110			7.875	no	2	2	Threaded with Meter Flange	Marathon Electric		10	1	3465
Bow Hill Pump 1			214	459	Continuous		Goulds	3196 3X4-13	158	150	750		13	no	4	3	flange	US Motors	X	150	3	3450
Bow Hill Pump 2			214	520	Continuous		Goulds	3196 3X4-13	158	150	750		13	no	4	3	flange	US Motors	X	150	3	3450
Bulson Road Pump 1			220	412	Continuous		BURKS	150G9A- 1 1/2	15	100	60	300	8.37	no	1.5	1.25	Threaded	Emerson	X	15	3	3535
Cascade ridge #1 Pump 1			322	322	Continuous		Goulds	3A145	93.5	109			6	no	2"	1.5	Threaded	Baldor		5	3	3450
Cascade ridge #2 Pump 2			322	592	Continuous		Goulds	11A125	10.7	128			7.125	no	3	2	Flange	Baldor		30	3	3525
Cascade ridge #3 Pump 3			592	858	Continuous		Goulds	11A125	4.9	118			7.125	no	3	2	Flange	Baldor		30	3	3525
Cedar Hills Pump 1			322	392	Continuous		Goulds	3655 1.25X1.5	50	100	105		7.5	no	1.5	1.25	4 Bolt Flange	General Electric		5	3	3475
Eagles Nest Pump 1			560	645	Continuous		GOULDS	3196	8.5	42.2		660	11	yes	3	1 1/2	4 bolt flange	US Motors		10	3	1755
Eagles Nest Pump 2			560	645	Continuous		GOULDS	3196	8.5	42.2		660	11	yes	3	1 1/2	4 bolt flange	US Motors		10	3	1755
Lake 16 Pump 1			412	684	Continuous		Goulds 3196	Goulds 3196	45	160	100	300	8.9375	no	2	1	Flange	Leeson		25	3	3500
Lake 16 Pump 2			412	684	Continuous		Goulds 3196	Goulds 3196	45	160	100	300	8.9375	no	2	1	Flange	Leeson		25	3	3500
Nookachamps Hills Pump 1			356	450	Continuous		GOULDS SSV	5SVBK2	22	60	26	405	n/A	no	2	2	4 bolt flange	Baldor	X	10	3	3500
Nookachamps Hills Pump 2			356	450	Continuous		GOULDS SSV	5SVBK2	22	60	26	405	n/A	no	2	2	5 bolt flange	Baldor	X	10	3	3500
Peterson Road Pump 1			214	290	Continuous		Pacific Pumping Company	No tag			400	80		no	4	3	4 Bolt Flange	Century		10	3	1750
Rudene Road Pump 1			214	290	Backup		Goulds	3656	85	100	45		6	no	2	1.5	Threaded	Baldor	X	10	3	3450
Saratoga Pump 1			322				GOULDS	3656	40	170	60		8.125	no	2	1	THREADED	Baldor	X	10	3	3450
Bradshaw Pump 1			214		Continuous		GOULDS	VM3711T	80	110	150	225	n/A	no	2	2	4 bolt flange	Baldor	X	10	3	3450
Tinas Coma Pump 1			415	506	Continuous		GOULDS	3196	48	150	260		10	no	3	1.5	4 bolt flange	Leeson		40	3	3555
Tinas Coma Pump 2			415	506	Continuous		GOULDS	3196	48	150	260		10	no	3	1.5	5 bolt flange	Leeson		40	3	3555
Fir/Waugh Pump 1			459	560	Continuous		paco	11-60157-15822	110	150	1500	200	14.5	no	8	6	flange	Marathon Electric		125	3	1780
Fir Waugh Pump 2		2007	459	560	Continuous		Paco	11601571582xx	110	150	1500	200	14.5	no	8	6	flange	Baldor		150	3	1775

Table 2-9 Pressure Reducing and Control Valves

PWS	Area	Location	PRV Mfr	Control Valve Model	Size	HGL In	HGL Out	Pressure In	Pressure Static Out	Maximum gpm	Elevation (AMSL)	Normal Position	Date placed in service	C.O.#	Remarks
Judy	SW	Township / Dunlap at TL	Clayton	90	3	459	214	177	72	570	43	NO	1977	2609	
Judy	SW	Township / Dunlap at TL	Clayton	90	8	459	198	177	72	3900	43	NO	1977	2609	
Judy	SW	First / Nelson at TL	Clayton	90	6T	459	214	177	72	2250	49.2	NO	1977	2609	
Judy	SW	First / Nelson at TL	Clayton	90	12T	459	198	177	72	8600	49.2	NO	1977	2609	
Judy	SW	Rhodes Road	Clayton	90	6	459	214	168	72	2250	49	NO		4384	
Judy	SW	Rhodes Road	Clayton	90	12	459	198	168	72	8600	49	NO		4384	
Judy	SW	Janicki Industries	Clayton	90	6	459	214	170	67	2250	59	NC		4256	
Judy	SW	Janicki Industries	Clayton	50G-01B	4	237	0	170	80	1000	59	NC		4256	ReliefValve
Judy	SW	Fruitdale / Portabello	Clayton	90G-01	3	459	350	140	115	260	78	NO		4265	
Judy	SW	Fruitdale / Portabello	Clayton	90G-01	8	459	334	140	115	3900	78	NO		4265	
Judy	SW	Fruitdale / Portabello	Clayton	50G-01B	4	373	0	115	125	2250	78	NC		4265	ReliefValve
Judy	SW	Fruitdale / Portabello	Clayton		6	350	214				78	NC		4265	Checkvalve
Judy	SW	KallochRd / SR9 (Out of svc)	Clayton	90	8	459	430	O/S	pulled out	3900	240	-	1993	3555	Bypass open
Judy	SW	Hoogdal Reservoir	Clayton	210-3	6	430	430	9	9	2250	410	NO	1993	3555	Altitude Valve
Judy	SW	Bassett / SR9	Clayton	90	3	459	340	100	62	260	200	NO	1993	3555	
Judy	SW	Bassett / SR9	Clayton	90	8	459	334	100	62	3900	200	NC	1993	3555	
Judy	SW	Bassett / SR9	Clayton	50	3	373	0	59	69	570	200	NC	1993	3555	ReliefValve
Judy	SW	SR 9 / Marie Pl	Clayton	90	8	340	214	104	49	3900	100	NC	1994	3568	
Judy	SW	Bassett / Longtime	Clayton	90	1.5	459	340	96	46	160	200	NO		4137	
Judy	SW	Bassett / Longtime	Clayton	90	4	459	334	96	40	1000	200	NC	1993	4137	
Judy	SW	Bassett / Longtime	Clayton	50G-01B	2	373	0	46	56	260	200	NC		4137	ReliefValve
Judy	SW	DukesHill Reservoir	Clayton	210-G01ABS	6	214	214	65	10	2250	186	NO	1993	3555	Altitude Valve
Judy	SW	DukesHill Reservoir	Clayton	90-01	6	459	214	117	65	2250	186	NO	1993	3555	
Judy	R	Cook Rd / Collins Rd	Clayton	90	2	459	214	177	80	260				4384	
Judy	R	Cook Rd / Collins Rd	Clayton	90	6	459	230	177	80	2250				4384	
Judy	R	Cook Rd / District Line Rd	Clayton	90	2	459	214	175	80	260				4384	
Judy	R	Cook Rd / District Line Rd	Clayton	90	6	459	230	175	80	2250				4384	
Judy	R	Cook Rd / Gardner Rd	Clayton	90	2	459	214	175	80	260				4384	
Judy	R	Cook Rd / Gardner Rd	Clayton	90	6	459	230	175	80	2250				4384	
Judy	R	Samish River Park	Clayton	100-01	1.5	459	180	180	55	160	56	NO	2008	4595	
Judy	R	Samish River Park	Clayton	100G-01-83	4	459	171	180	50	1000	56	NC	2008	4595	
Judy	R	Samish River Park	Clayton	50A-01	2	206	0	55	65	260	56	NC	2008	4595	ReliefValve
Judy	Bur	Cook Rd. / Old Hwy 99	Clayton	90G-01	6	459	214	178	81	2250	26	NO		3671	
Judy	Bur	North Hill Blvd (S)	Clayton	90G-01	8	459	214	180	70	3900	26	Fireflow		4384	
Judy	Bur	North Hill Blvd (E)	Clayton	90G-01	2	459	270	180	100	260	26	Off		4384	Not Big Enough
Judy	Bur	North Hill Blvd (E)	Clayton	90G-01	6	459	254	180	105	2250	26	Flowing		4384	Not Big Enough
Judy	Bur	Tina's Coma / Hillcrest	Clayton	90-01ABS	2	506	415	100	50	260	282	Flowing		4044	
Judy	Bur	Tina's Coma / Hillcrest	Clayton	90-01	6	506	399	100	50	2250	282	Standby		4044	Fireflow/Standby
Judy	Bur	Tina's Coma / Hillcrest	Clayton	50-01B	4	438	0	100	120	1000	282	NC		4044	Relief Valve
Judy	Bur	Hillcrest			8	415	214				40	NC		4044	Checkvalve
Judy	BV	Josh Wilson / Higgins at TL	Clayton	90	8	459	290	126	62	3900	165	NC	2013	4636	
Judy	BV	Josh Wilson / Higgins at TL	Clayton	50-01	3	313	0	62	70	580	165	NC	2013	4636	ReliefValve
Judy	BV	Josh Wilson 4" / Higgins	Clayton	90-01	4	290	270	62	55	1000	160	NO	1992	3431	
Judy	R	Josh Wilson at old pump site	Wilkins		1	270	230	81	64	100	82	NO		1491	
Judy	BV	Josh Wilson / Bay Meadows	Clayton	90	4	290	270	56	48	1000	161	NO		4520	
Judy	BV	Peterson / Sunrise	Clayton	90-01AS	2T	290	230	72	58	260	111	NO	1994	3623	Moved in 2007
Judy	BV	Peterson / Sunrise	Clayton	90-01	6	290	214	72	60	2250	111	NO	1994	3623	Moved in 2007
Judy	BV	Peterson / Sunrise	Clayton	50G-01B	3	253	0	72	80	570	111	NC	1994	3623	ReliefValve
Judy	BU	Country Club	Clayton	90G-01	4	230	214	52	24	1000	59	NC		2010	
Judy	Bur	Lefeber PRV	Clayton	90G-02	4	290	214	115	79	1000	13	NO	2000	4346	
FI	R	LeFeber Intertie at ANA TL	Clayton	90G-01	6	345	290	140	122	2250	13	NC	2000	3812	Intertie
Judy	BV	Freedonia at ANA TL	Clayton	90	8	345	290	139	115	3900	10	NC	1983	3006	Intertie
Judy	BV	BayViewRidge Resrvr	Clayton	210-3	8	290	290	Alt		3900			1998		Altitude Valve
Judy	R	Bradshaw / Summer	Clayton	CKV		214	214	CKV		CKV	*18*	NC			Check Valve
Judy	CL	BeaverLakeRd / Clearlake	Clayton	90	2T	459	365	180	140	260	39	NO	1990	3560	
Judy	CL	BeaverLakeRd / Clearlake	Clayton	90	6T	459	349	180	140	2250	39	NO	1990	3560	
Judy	CL/BL	BeaverLakeRd / Biglake	Clayton	90	2T	459	356	180	150	260	39	NO	1990	3287	
Judy	CL/BL	BeaverLakeRd / Biglake	Clayton	90	6T	459	340	180	145	2250	39	NC	1990	3287	
Judy	CL	Buchanon / Maple St	Clayton	90	2	365	284	105	70	260	124.6	NC	2002	3560	
Judy	CL	Buchanan / Maple St	Clayton	CKV	6	284	284	105	70		124.6	NC	1995	3506	Check Valve
Judy	CL	Front St / Beaver LK Dr	Clayton	90	6	365	284	142	104	2250	49	NO		3560	
Judy	CL	Buchanan / Magnolia	Clayton	90	6	365	284	72	64	2250	195	NO		2620	
Judy	BL	BigLake Reservoir (W)	Clayton	CKV	8	356	356	13	13	3900	327	NO	1993	3427	Check Valve
Judy	BL	BigLake Reservoirs (E)	Clayton	CKV	8	356	356	5	5	3900		NO			Check Valve
Judy	BL	Nookachamps Creek Pump	Clayton	50G-01B	2	356	356	22	60	260					ReliefValve
Judy	MV	E CollegeWay / Monte Vista	Clayton	90	3	459	214	174	65	570	49	NO	1996	3746	
Judy	MV	E CollegeWay / Monte Vista	Clayton	90	8	459	198	168	60	3900	49	NO	1996	3746	
Judy	MV	E CollegeWay / Monte Vista	Clayton	50 g-01b	4	237	0	174	75	990	49	NO	1996	3746	ReliefValve
Judy	MV	18th St / Kulshan (N) at TL	Clayton	90	4	459	214	171	72	1000	55	NC	1979	2796	
Judy	MV	18th St / Kulshan (S) at TL	Clayton	90	4	459	322	171	110	1000	55	NC	1979	2796	
Judy	MV	9th / Kulshan	Clayton	90G-01	2	459	214	168	72	260	36	NO	2006	4383	
Judy	MV	9th / Kulshan	Clayton	90G-01	10	459	198	168	65	6150	36	NC	2006	4383	
Judy	MV	9th St / William Way	Clayton	90G-01	3	459	214	168	83	580	23	NO		3088	
Judy	MV	9th St / William Way	Clayton	90	6	459	198	168	83	2250	23	NC	1998	3088	
Judy	MV	9th St / Highland (Tank Bypass)	Clayton	90-01 AB	10	459	214	123	20	6150	164	NC	1975	2448	
Judy	MV	9th St / Highland (Tank)	Clayton	208	12	459	214	123	18	8720	164	NO	1975	2448	Qin=200gpmMAX
Judy	MV	Waugh / Seneca	Clayton	90	4	459	322	172	107	1000	65	NO	1979	2806	
Judy	MV	KulshanView	Clayton	90	8	322	214	106	55	3900	82	NC	1980	2894	
Judy	MV	LaVenture / Kulshan	Clayton	50-01B	4	345	0	109	109	580	75	NO	2000	4087	Relief Valve
Judy	MV	LaVenture / Kulshan	Clayton	90	8	459	322	165	109	3900	75	NO	2000	4087	
Judy	MV	College Way / LaVenture	Clayton	90	8	322	214	104	50	3900	85	NO	1996	3818	
Judy	MV	Hoag / LaVenture	Clayton	90	1.5T	322	214	99	78	190	95	NC	1978	2736	
Judy	MV	Hoag / LaVenture	Clayton	90	6	322	198	99	73	2250	95	NC	1978	2736	
Judy	MV	9th / Evergreen	Clayton	90	6	459	322	122	70	2250	157	NO	2001	2448	
Judy	MV	Sandalwood / N 18th Pl	Clayton	90	4	322	214	113	65	1000	62	NC	1978	2770	
Judy	MV	Skagit Highlands	Clayton	90G-01	2	560	356	134	35	260	259	NO	2007	4511	
Judy	MV	Skagit Highlands	Clayton	90G-01	6	560	340	134	40	2250	259	NO	2007	4511	
Judy	MV	Skagit Highlands	Clayton	50G-01B	3	379	0	40	45	570	259	NC	2007	4511	ReliefValve
Judy	MV	Fir / Waugh	Clayton	90G-01	8	560	459	170	120	3900	194	NC	2004	3320	
Judy	MV	Eagles Nest Pump	Clayton	81G-02	6	645	560	47.3	7.7	2250	534	NC	1995	3698	
Judy	MV	Eagles Nest Pump	Clayton	93EG-95	6	Pump	Ckv	11	47	2250	534	NC	1995	3698	Check Valve
Judy	MV	Sioux / Shoshone	Wilkins	90	1	560	420	140	65	68	270	NO	2002	4175	
Judy	MV	Sioux / Shoshone	Wilkins		1.5	560	404	135	65	160	270	NC	2002	4175	
Judy	MV	Sioux / Shoshone	Clayton		1	443	0	65	70	68	270	NC	2002	4175	Relief Valve
Judy	MV	Moody / Digby	Clayton	90G-02	2	560	420	120	56	260	285	NC		4097	
Judy	MV	Moody / Digby	Clayton	90G-01	6	560	400	120	48	2250	285	NC		4097	
Judy	MV	Moody / Digby	Clayton	50G-01B	3	443	0	56	66	570	285	NC		4097	Relief Valve
Judy	MV	Section / Digby	Clayton	90	3T	560	420	122	57	570	295	NO	1996	3714	
Judy	MV	Section / Digby	Clayton	90	8T	560	404	122	53	3900	295	NC	1996	3714	
Judy	MV	Section / Digby	Clayton	50	4	443	0	57	77	1000	295	NC	1996	3714	Relief Valve
Judy	MV	Shelly Hill	Clayton	PSV	4	560	420	64	32	1000	310	NC	1999	3909	
Judy	MV	Shelly Hill	Clow		8	560	420	32	64		310	NC	1996	3714	Check Valve
Judy	MV	Section / Laventure	Clayton	90	6	420	322	80	47	2250	206	NC	1996	3799	
Judy	MV	Blodgett	Clayton	90	1.5T	322	214	129	74	190	16	NO	1962	1641	
Judy	MV	Blodgett	Clayton	90	6T	322	198	129	74	2250	16	NO	1962	1641	
Judy	MV	Blodgett / Anderson	Clayton	90	6	322	214	127	74	2250	32.8	NO	1987	4728	Was Moved 3787

Table 2-9 Pressure Reducing and Control Valves

PWS	Area	Location	PRV Mfr	Control Valve Model	Size	HGL In	HGL Out	Pressure In	Pressure Static Out	Maximum gpm	Elevation (AMSL)	Normal Position	Date placed in service	C.O.#	Remarks
Judy	MV	LittleMountain	Clayton	90	8	463	322	130	74	2250	154	NC	1967	2079	
Judy	MV	LittleMountain	Clayton	50G-01B	2	463	463	140	130	260					Tank bypass
Judy	MV	Skyridge	Clayton	90	4	463	322	123	60	570	174	NC	1967	1969	
Judy	MV	Blodgett / RedHawk	Clayton	90	8	322	214	121	75	3900	39	NC	1998	3861	
Judy	MV	Hickox / Burkland (S)	Clayton	90	3	322	220	127	90	580	16	NO	1997	3828	
Judy	MV	Hickox / Burkland (S)	Clayton	90	8	322	198	127	85	3900	16	NO	1997	3828	Conway Svc
Judy	MV	Hickox / Burkland (W)	Clayton	90	6	220	214	138	78	2250	13	NC		4057	
Judy	CW	Conway and Hwy 534	Clayton	90G-01	2	220	195	88	80	260	6.5	NO	2003	1635	
Judy	CW	Conway and Hwy 534	Clayton	90G-01	6	220	179	88	80	2250	6.5	NC	2003	1635	
Judy	CW	Conway and Hwy 534	Clayton	50G-01B	4	218	0	80	85	1000	6.5	NC	2003	1635	Relief Valve
Judy	MV	CascadeRidge / Quail Dr	Clayton	90	6	858	720	121	61	2250	578	NO	1992	3364	
Judy	MV	CascadeRidge #1	Clayton	68	3	322	322	-	-	-	-	-	-	3364	Pump Control
Judy	MV	CascadeRidge #1	Clayton	68	3	322	592	-	-	-	-	-	-	3364	Pump Control
Judy	MV	CascadeRidge #2	Clayton	68	3	592	858	-	-	-	-	-	-	3364	Pump Control
Judy	MV	DraperValleyFarms	Clayton	90	6	459	-		PRIVATE	2250		NO	1985	3088	PRIVATE
Judy	MV	Lions park	Clayton	50G-01B	8	214	225	75	80	3900					ReliefValve
Judy	MV	Cedar Hills pump	Clayton	50G-01B	2	pump	bypass			260					Bypass
Judy	CW	Bulson Rd Tank	Clayton	90G-01	6	Alt	Valve	15	5	2250					Altitude Valve
Judy	CW	Bulson Rd Tank	Clayton	90G-02	4	412	220	120							Sustain valve
Judy	MV	East Bank Intertie	Clayton	90	2	345	214	150	On / Off	260	25	NC	1993	3463	Intertie
Judy	MV	East Bank Intertie	Clayton	90	10	345	214	150	On / Off	3250	25	NC	1993	3463	Intertie
Judy	MV	East Bank Intertie	Clayton	90	4	345	214	150	On / Off	1000	25	NC	1993	3463	Intertie
Judy	MV	West Bank Intertie	Clayton	90	8	345	233	139	90	3900	25	NO	1985	3135	Intertie
Judy	MV	17th St	Wilkins		1	322	290			100	80				



Skagit PUD
PUBLIC UTILITY DISTRICT

N

Judy Water System Hydraulic Profile

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83 | **Not to Scale** | **Figure 2-13**

2.6.7 Distribution Pipes and Related Components

The District's distribution pipes, generally 4 to 12 inches in diameter, provide for distribution of water to customers. The distribution system has grown over the years to serve the growing population base of the Judy System, both in terms of total numbers and in terms of geographical area. In addition, fire flow requirements for commercial and industrial buildings as well as increasing demands from residential customers have stressed the District's distribution system because of the need to provide adequate peak day water demands. Table 2-10 shows the growth of the District's overall piping for the Judy System.

Table 2-10. Growth of the District's Pipe Network

Year	Total Pipe (feet)	Total Pipe (miles)
2012	3,216,888	609.3
2010	3,184,165	603.1
2005	3,045,571	576.8
2000	2,793,749	529.1
1995	2,524,872	478.2
1990	2,450,519	464.1

Table 2-11 shows the total length of pipe, categorized by size and material, for the transmission and distribution systems. Service pipelines and abandoned pipelines are excluded from the table. The total current length of pipe in the system is 3,216,888 feet, or 609.3 miles.

Figures 2-15, 2-16, and 2-17 show the diameters of all of the piping in each city, and Figure 2-18 shows the pipe diameters in the rural areas.

Figures 2-19, 2-20, and 2-21 show the construction material of all of the piping in each city, and Figure 2-22 shows the pipe material in the rural areas. The District's current standard for pipe material is Class 50 ductile iron. Some of the pipelines that are asbestos cement or plastic are made such that their pressure class is limited, and thus allowable system pressures in those areas are limited to 100 psi.

Figure 2-14 shows the breakdown of the District's pipe network compared with the age of the pipe, and Table 2-12 provides this information in tabular form. Figures 2-23, 2-24, and 2-25 show the age of all of the piping in each city, and Figure 2-26 shows the pipe material in the rural areas.

Table 2-11. Pipe Inventory for Distribution and Transmission System

Diameter (inches)	Ductile Iron	PVC	Asbestos Cement	Plastic	Concrete	Cast Iron	Copper	ABS	Other	Total Length (feet)
2 and less	3,335	76,834	1,041	93,158		580	6,130	1,112	1,417	183,607
3	599	72,754	2,455	41,229				76	86	117,199
4	43,464	56,103	159,488	24,788		3,698		8	1,313	288,861
6	96,082	262,996	222,004	59,590		22,280		404	316	663,672
8	953,269	133,469	99,431	4,968		8,492	29	727		1,200,384
10	16,735	21,994	26,538	10,751		4,718			441	81,176
12	432,062	7,283	6,469	373	3,648	5,772		3,469	145	459,221
14	184		141							325
16	44,033				9,179	539				53,751
18	43,567				17,566					61,133
20			522		11,537	439				12,498
24	21,194				64,336					85,531
30	1,847				5,082					6,929
36	1,421									1,421
48	1,180									1,180
Total Length (feet)	1,658,975	631,432	518,088	234,855	111,348	46,518	6,159	5,796	3,718	3,216,888
Total Length (miles)	314.2	119.6	98.1	44.5	21.1	8.8	1.2	1.1	0.7	609.3
Percent	51.6%	19.6%	16.1%	7.3%	3.5%	1.4%	0.2%	0.2%	0.1%	100%

Table 2-12. Age of the District's Pipe Network

Year Installed	Total Pipe (feet)	Total Pipe (miles)
1920-1929	1,231	0.23
1930-1939	2,741	0.52
1940-1949	30,865	5.85
1950-1959	165,705	31.38
1960-1969	529,155	100.22
1970-1979	525,436	99.51
1980-1989	422,939	80.10
1990-1999	926,592	175.49
2000-2009	581,510	110.13
2010-Present	30,713	5.82

The District's transmission and distribution system is adequate for the majority of the District's service area during much of the year. The District began water service to customers in the cities and rural areas when population numbers were lower and less emphasis was placed on fire flow requirements. In recent years, city populations have increased, people have moved to areas of higher elevation, fire codes have increased the required fire flows, and rural demands have increased. This has resulted in many of the existing District water lines being undersized and incapable of providing adequate service. The District is endeavoring to establish a strong grid of arterial pipelines that is consistent with local land use projections and that will provide adequate domestic service and required fire flows into the future. These pipelines range in size from 8-inch diameter in rural areas to 24-inch diameter in urban areas, but they all serve to provide a strong network of pipelines to provide a redundant source of water to District customers.

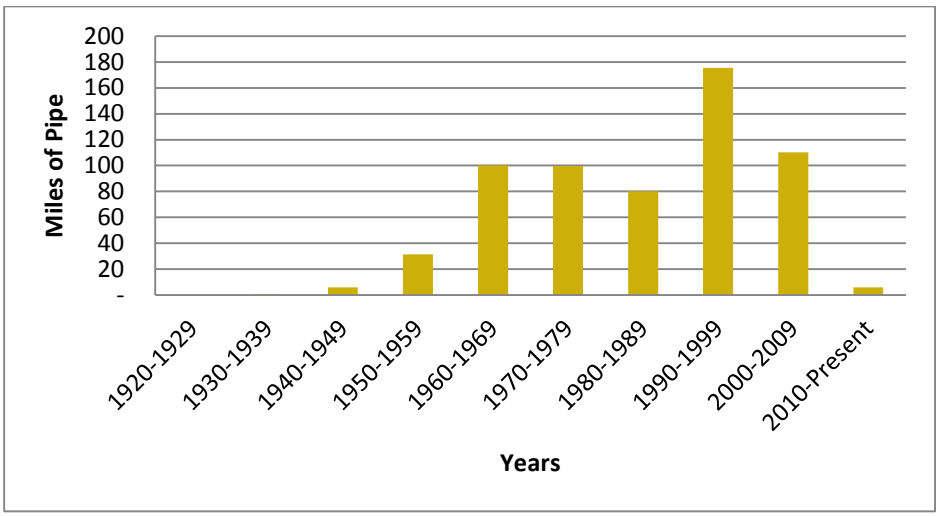


Figure 2-14. Age of District's Pipe Network

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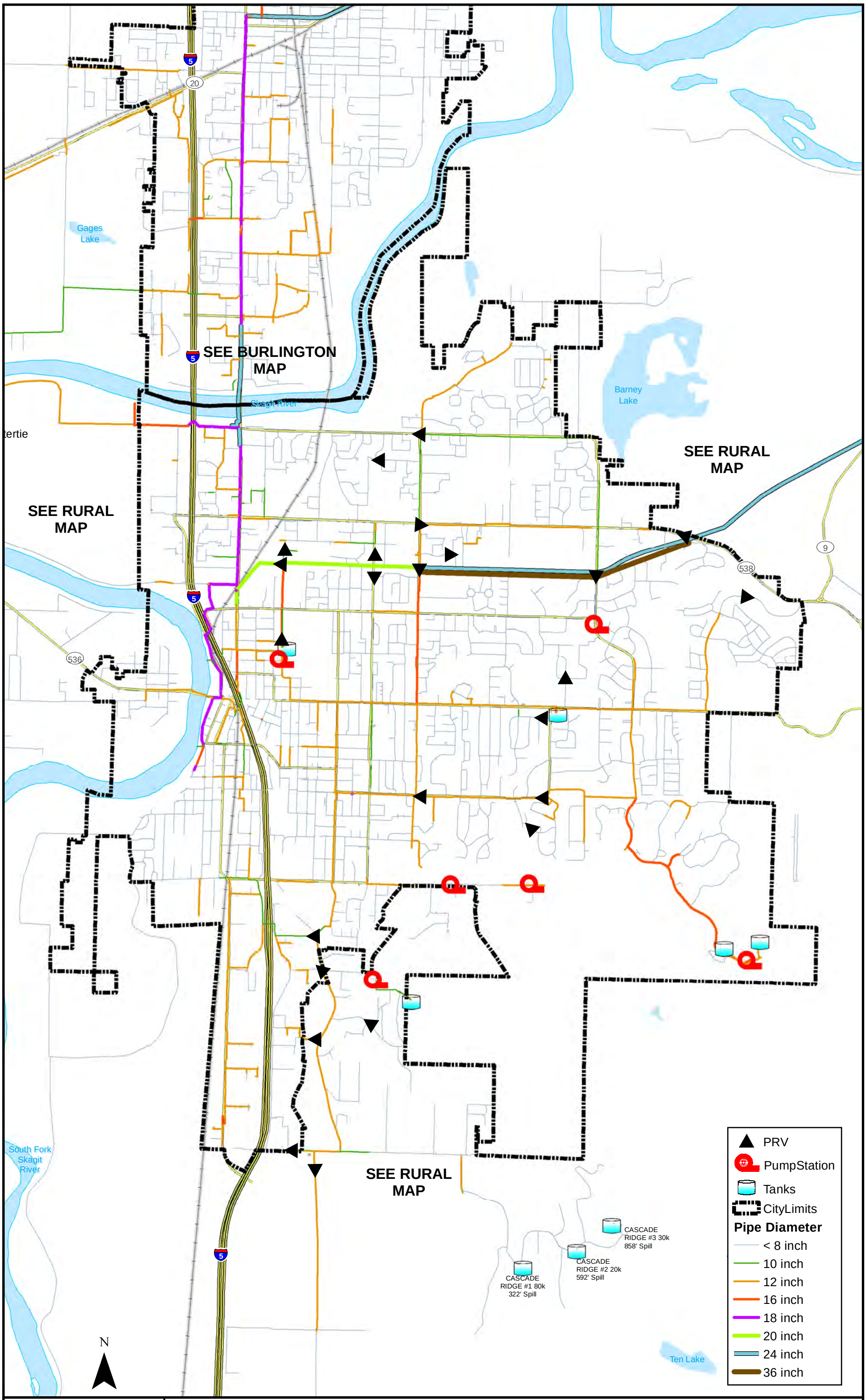


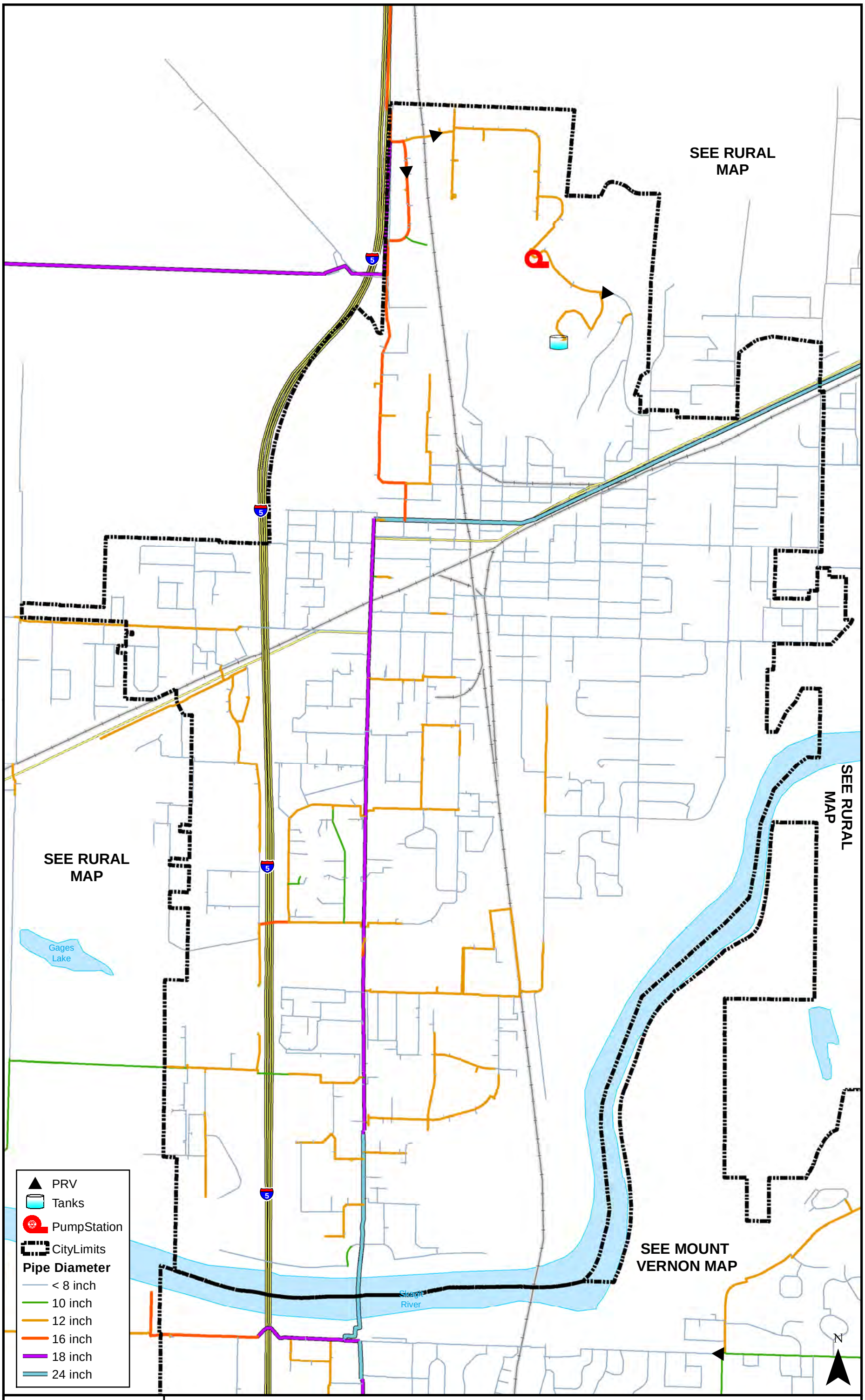
District Pipes Displayed By Diameter - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 2-15



Skagit PUD PUBLIC UTILITY DISTRICT

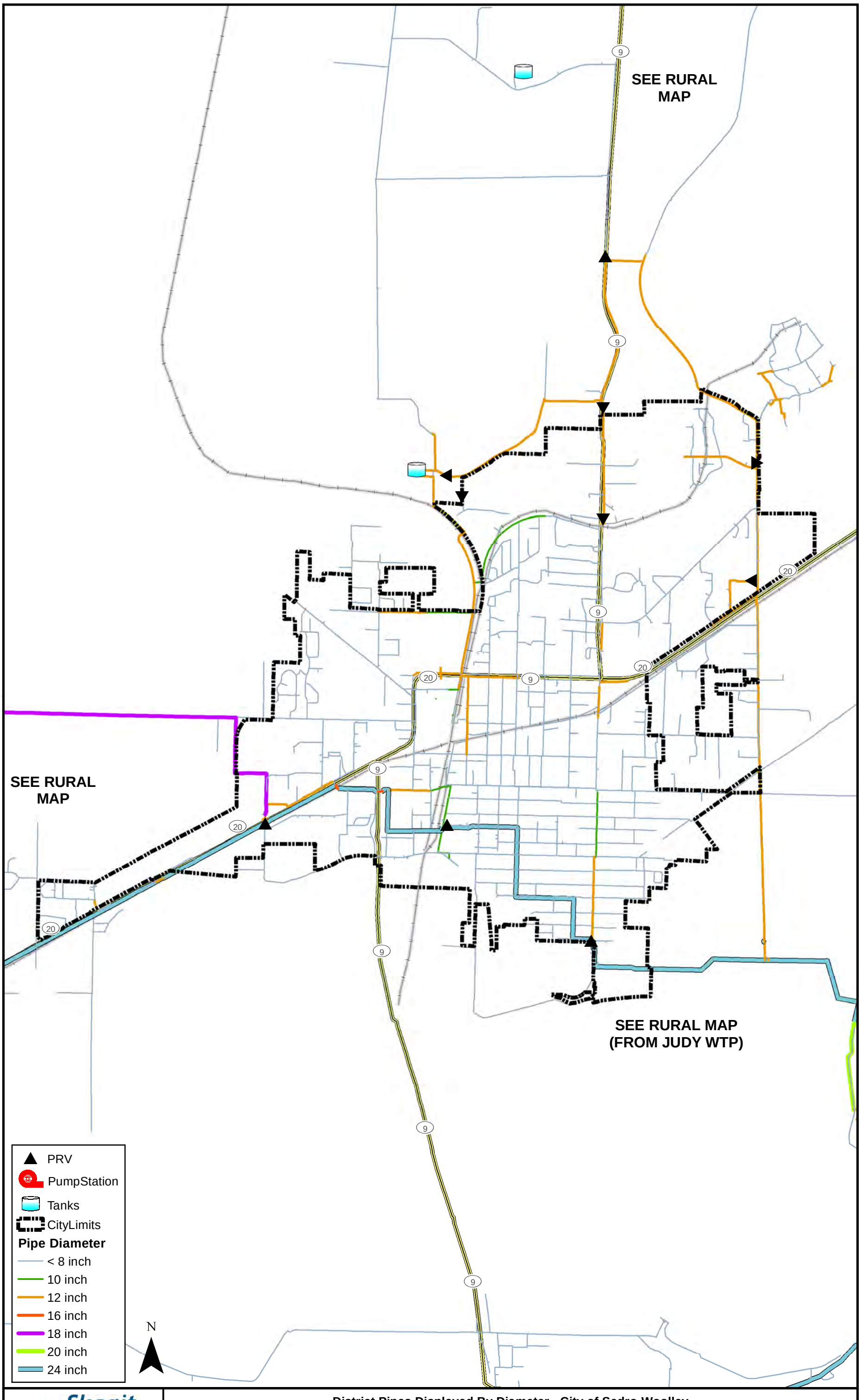
District Pipes Displayed By Diameter - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 2-16



District Pipes Displayed By Diameter - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 2-17

CITY OF SEDRO-WOOLLEY (SEE DETAIL)

CITY OF BURLINGTON (SEE DETAIL)

CITY OF MOUNT VERNON (SEE DETAIL)

CityLimits
PRV
Tanks
PumpStation

Pipe Diameter

- < 8 inch
- 10 inch
- 12 inch
- 16 inch
- 18 inch
- 20 inch
- 24 inch
- 30-48 inch

N

Skagit PUD
PUBLIC UTILITY DISTRICT

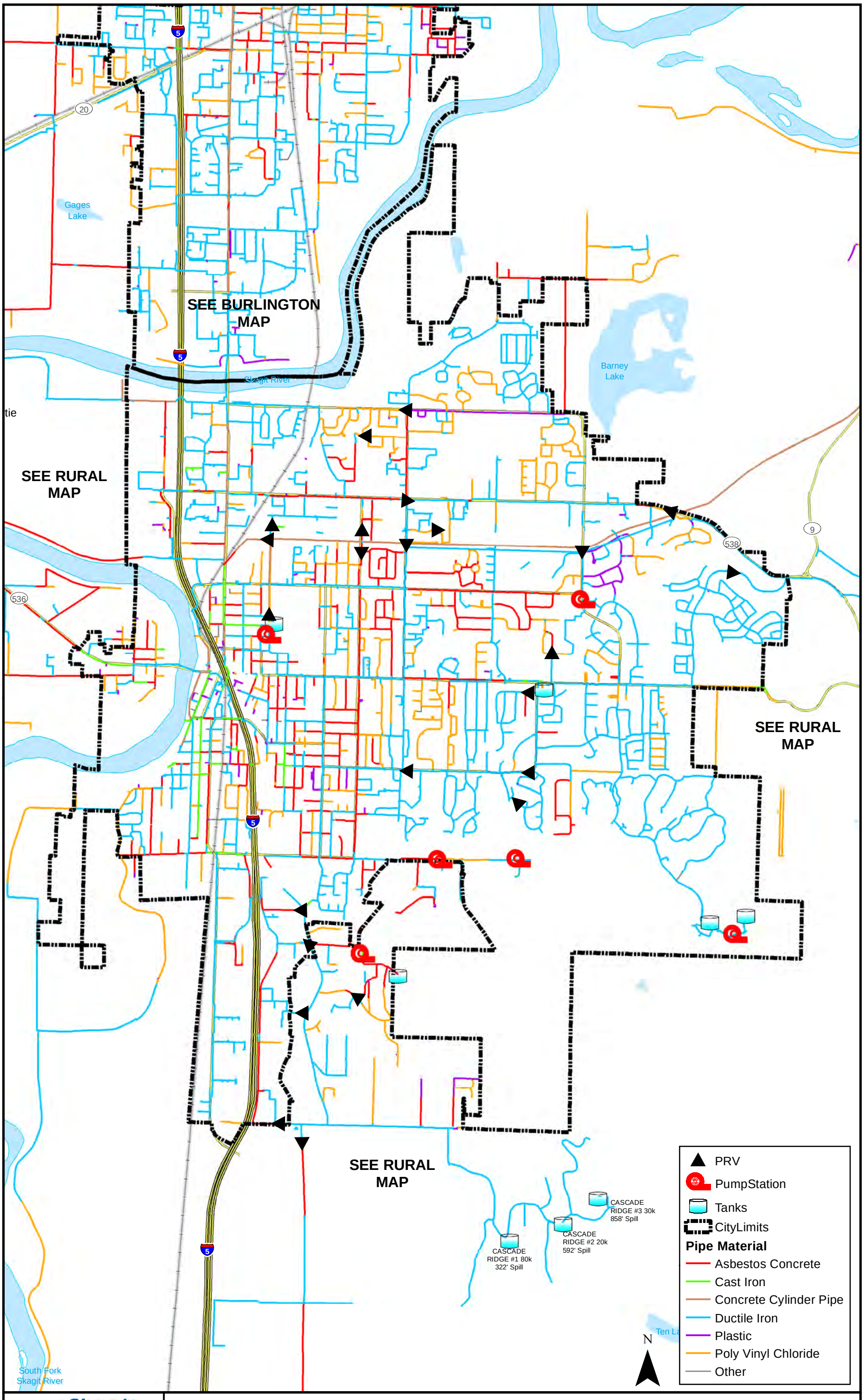
District Pipes Displayed By Diameter - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1.5 3 Miles

Figure 2-18



District Pipe Displayed By Material - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 2-19

SEE RURAL MAP

SEE RURAL MAP

SEE RURAL MAP

SEE RURAL MAP

SEE MOUNT VERNON MAP

Gages Lake

Skagit River

N

PRV
Tanks
PumpStation
CityLimits

Pipe Material

Asbestos Concrete
Cast Iron
Concrete Cylinder Pipe
Ductile Iron
Plastic
Poly Vinyl Chloride
Other

Skagit PUD
PUBLIC UTILITY DISTRICT

District Pipes Displayed By Material - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 2-20

SEE RURAL MAP

SEE RURAL MAP

SEE RURAL MAP
(FROM JUDY WTP)

PRV
PumpStation
Tanks
CityLimits

Pipe Material

- Asbestos Concrete
- Cast Iron
- Concrete Cylinder Pipe
- Ductile Iron
- Plastic
- Poly Vinyl Chloride
- Other

N

Skagit PUD
PUBLIC UTILITY DISTRICT

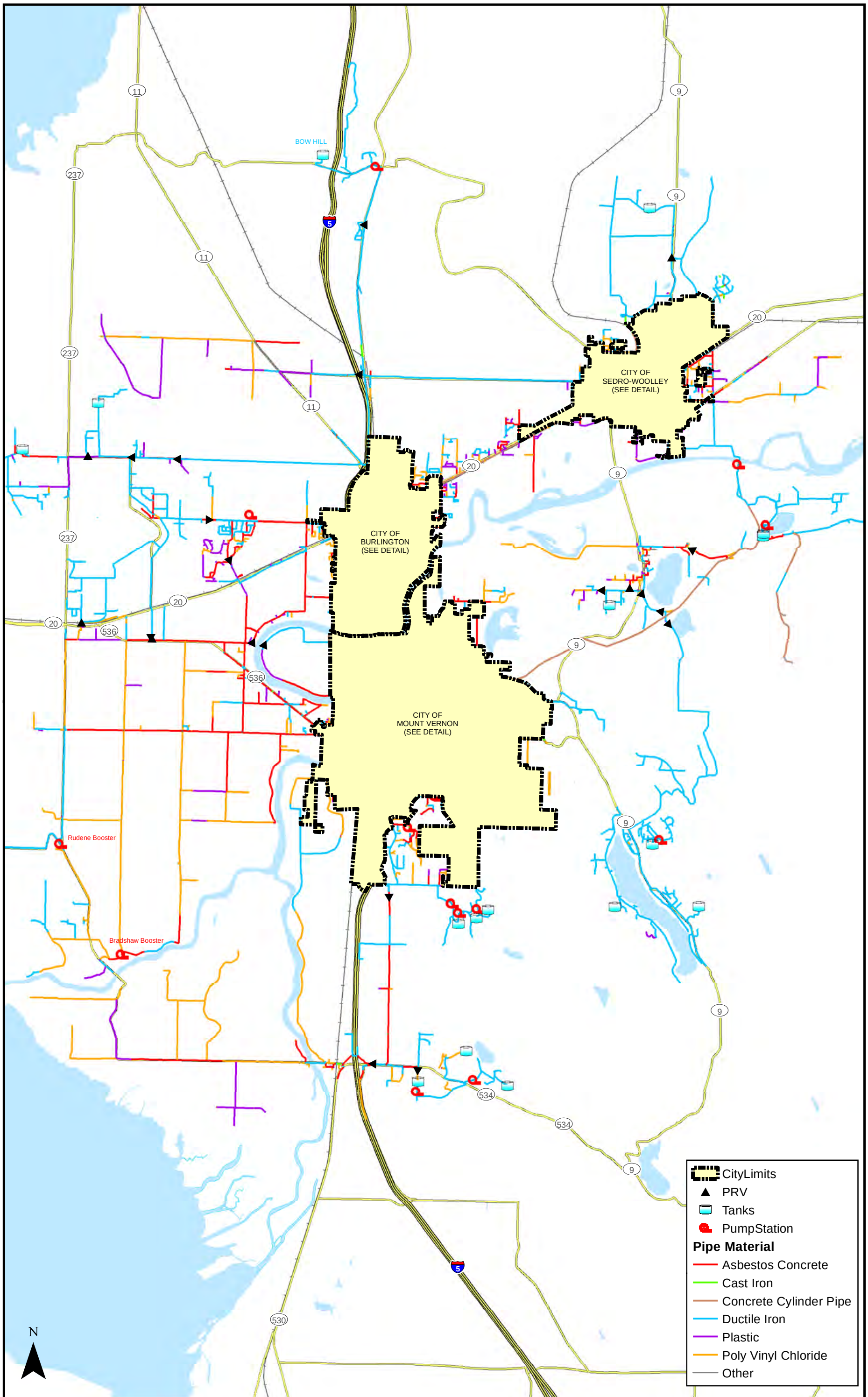
District Pipes Displayed By Material - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 2-21



Skagit PUD
PUBLIC UTILITY DISTRICT

District Pipes Displayed By Material - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1.5 3 Miles

Figure 2-22

TINAS COMA
230k
506' Spill

PRV 506'-402

Gages
Lake

SEE BURLINGTON
MAP

Barney
Lake

E. Bank Intertie

SEE RURAL
MAP

SEE RURAL
MAP

Skagit
River

SEE RURAL
MAP

South Fork
Skagit
River

CASCADE
RIDGE #3 30k
858' Spill

CASCADE
RIDGE #2 20k
592' Spill

CASCADE
RIDGE #1 80k
322' Spill

N

PRV
PumpStation
Tanks
CityLimits
Pipe Install Year
< 1950
'50's & '60's
'70's & '80's
'90's & 2000's
2010 - 2013
Unknown

Skagit PUD
PUBLIC UTILITY DISTRICT

District Pipes Displayed By Installation Year - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 2-23

PRV
Tanks
PumpStation
CityLimits
Pipe Install Year
< 1950
'50's & '60's
'70's & '80's
'90's & 2000's
2010 - 2013
Unknown

SEE RURAL MAP

SEE RURAL MAP

SEE RURAL MAP

Gages Lake

Skagit River

SEE MOUNT VERNON MAP

N

Skagit PUD
PUBLIC UTILITY DISTRICT

District Pipes Displayed By Installation Year - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 2-24

PRV
PumpStation
Tanks
CityLimits

Pipe Install Year

< 1950
'50's & '60's
'70's & '80's
'90's & 2000's
2010 - 2013
Unknown

SEE RURAL MAP

SEE RURAL MAP

SEE RURAL MAP
(FROM JUDY WTP)

9
20

N

Skagit PUD
PUBLIC UTILITY DISTRICT

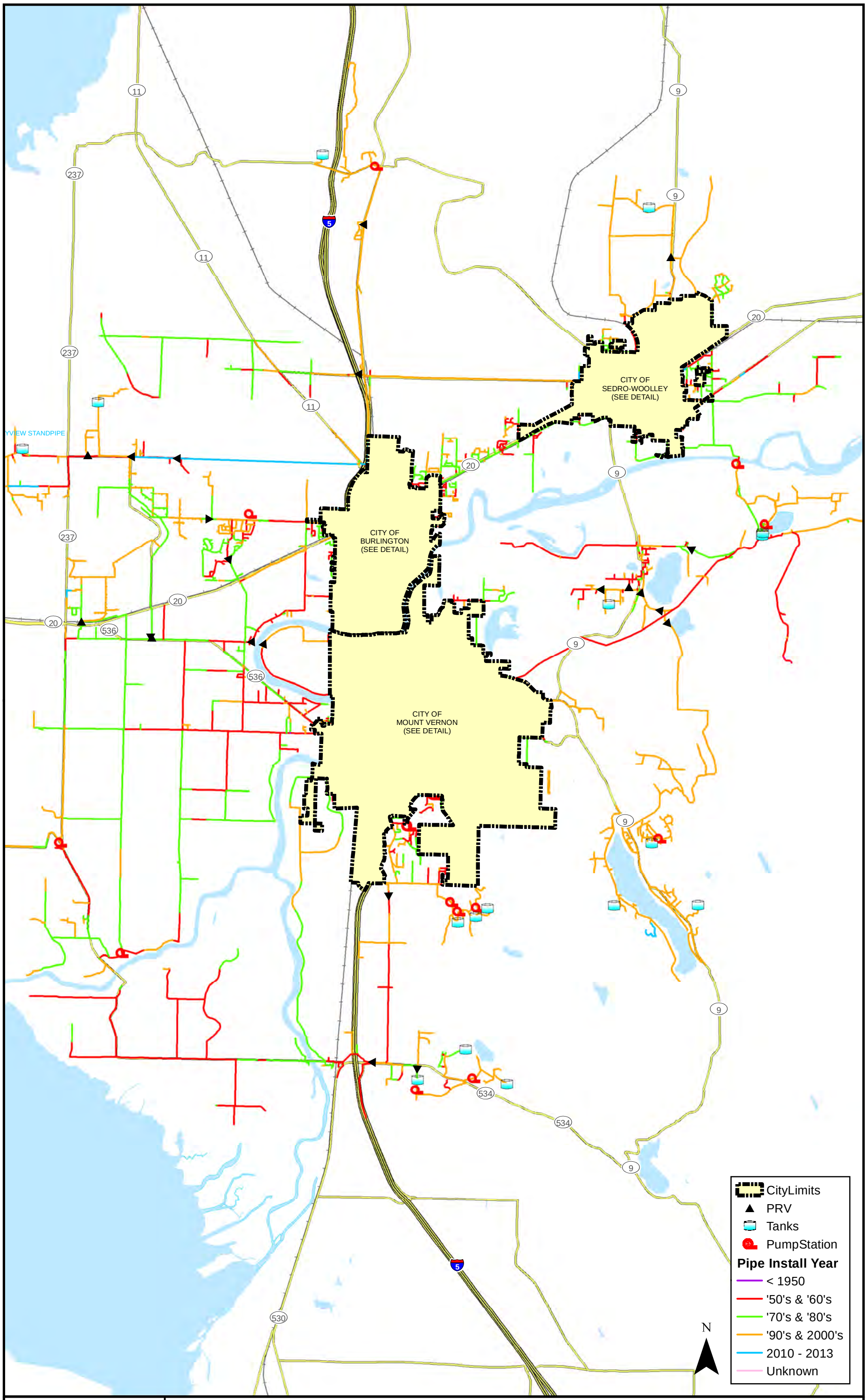
District Pipes Displayed By Installation Year - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 2-25



Skagit PUD
PUBLIC UTILITY DISTRICT

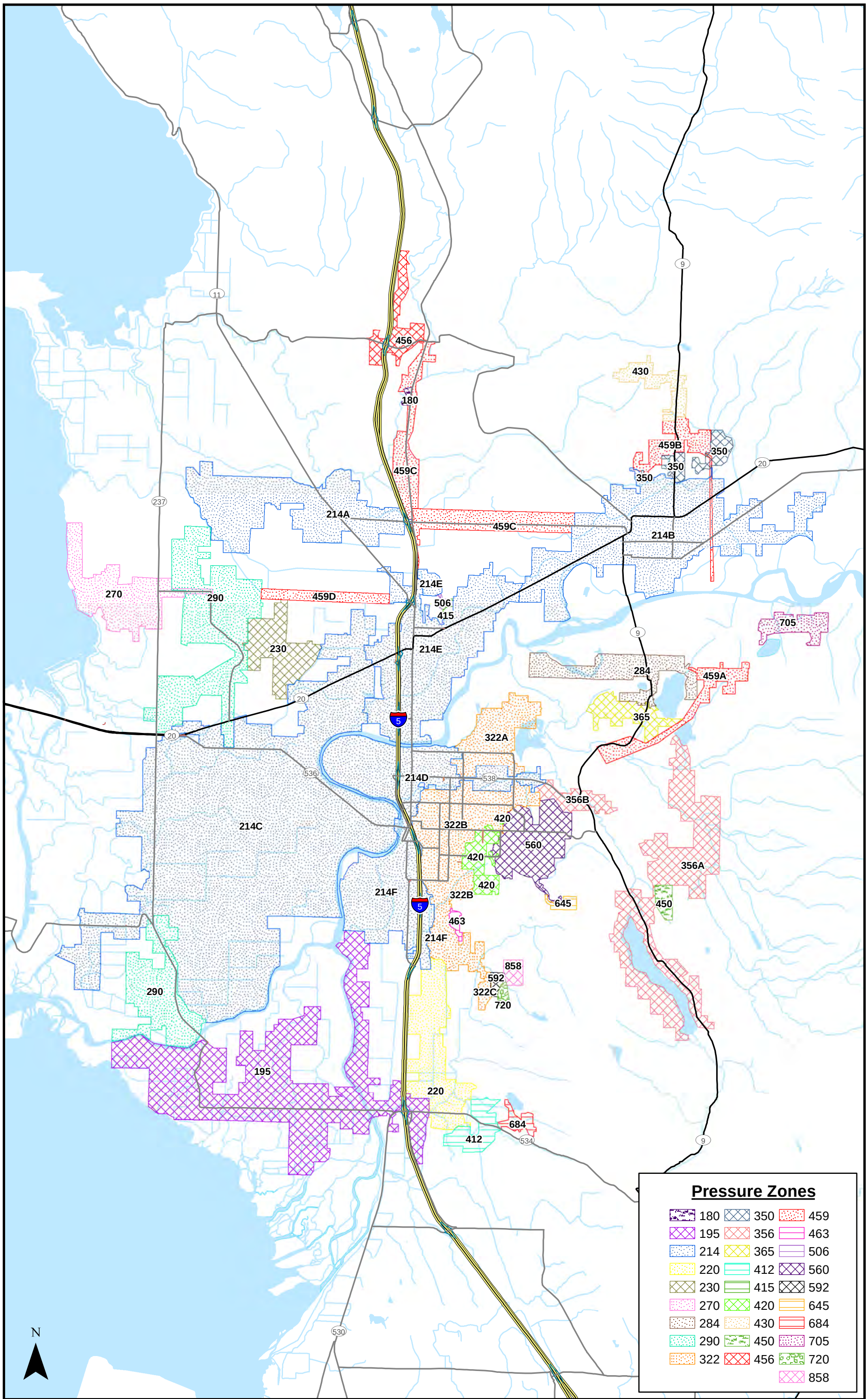
District Pipes Displayed By Installation Year - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1.5 3 Miles

Figure 2-26


456
180
459B
350
350
350
459C
214A
459C
214B
214E
506
415
459D
270
290
230
214E
705
284
459A
365
322A
214D
356B
214C
322B
420
560
420
356A
420
214F
322B
645
450
463
214F
858
592
322C
720
290
195
220
684
412
534
530
9
11
237
20
536
538
5
Pressure Zones
180
195
214
220
230
270
284
290
322
350
356
365
412
415
420
430
450
456
459
463
506
560
592
645
684
705
720
858
N
Skagit PUD
PUBLIC UTILITY DISTRICT
Judy System - Pressure Zones
2013 Skagit PUD Water System Plan
Coordinate System: WA State Plan North, NAD83
0
1.75
3.5
Miles
Figure 2-27

2.6.8 Pressure Zones

The District has 29 pressure zones in the Judy System, and the configuration of the zones is shown in the hydraulic profile in Figure 2-13. The hydraulic profile shows the relationship between the different pressure zones in terms of the reservoirs that provide storage for each zone, the PRV and/or the booster station that feeds each zone, and the hydraulic grade of each pressure zone.

A plan view of the Individual pressure zones (hydraulic grade) for the Judy Reservoir System is shown in Figure 2-27. This figure shows the relationship of each pressure zone in terms of the areas of the system that it serves. These pressure zones are described in greater detail in the sections below.

2.6.8.1 180-Foot HGL (Samish River Park)

The 180-foot HGL pressure zone is supplied by a PRV station from the 459-foot HGL transmission line located on Old Highway 99 between Cook Road and Bow Hill Road. The pressure zone was created for the Samish River Park Division 1 plat; therefore, the demands are solely residential and there is no storage within the pressure zone. The system is made up of 6-inch-diameter ductile iron pipe with fire hydrants to provide fire flow. The demands for this small zone are included within the 459-foot HGL pressure zone.

2.6.8.2 195-Foot HGL (Conway – Fir Island)

The 195-foot HGL pressure zone is supplied from the 214-foot HGL supply along Dike Road, which is 6-inch and 8-inch diameter plastic and ductile iron pipe. There is no PRV to reduce the pressure from the 214-foot HGL to the 195-foot HGL; instead, the pressure zone is created due to hydraulic head losses within the system. This feed is projected to supply about half the average demand to the Conway area but less than half of the peak months' demands due to system hydraulics. Additional feed comes from the 220-foot HGL zone by way of a PRV station on the east side of I-5 at Conway. Because of the area's flat topography, the 195-foot HGL zone does not have a reservoir within the zone. The standby and equalizing storage for the zone comes from the Bulson tank, a 100,000-gallon storage reservoir on Bulson Road east of Conway. This tank provides support only during fire flow events because the Hickox Road PRV is set to a 220-foot HGL. The Bulson tank is re-supplied from the 322-foot HGL pressure zone in Mount Vernon by way of the Hickox Road PRV station in south Mount Vernon. Standby storage to this zone is also provided by the 9th and Highland tank in Mount Vernon.

The 195-foot HGL pressure zone serves the agricultural area south of Mount Vernon bordering Dike Road and the rural village of Conway, as well as Fir Island and North Fir Island Water Association, all west of I-5. The area is predominantly flat alluvial plain, and pipelines are predominantly asbestos cement (AC) and plastic. Fir Island is currently the most remote point in the Judy Reservoir System; however, water quality monitoring consistently provides satisfactory results. Demands are predominantly residential and agricultural, and peak during the dry summer months due to irrigation requirements.

Improvements planned for this area of the system will ultimately eliminate this pressure zone. Pipe replacement projects on Mclean Road, Best Road, and Fir Island Road will increase the hydraulic capacity of the pipelines feeding this area, allowing the 214-foot HGL to be extended throughout Fir Island and Conway. In addition, a new storage reservoir on Pleasant Ridge is planned to provide standby storage and fire flow to the area. This will allow the District to abandon the Bulson tank. See Chapter 10 for a description of these improvements.

2.6.8.3 214-Foot HGL (Skagit Valley Floor)

The 214-foot HGL pressure zone serves the cities of Sedro-Woolley, Burlington, and Mount Vernon and the rural areas adjacent to them. The 214-foot HGL pressure zone is served principally through the 5-MG Dukes Hill Reservoir in Sedro-Woolley, and the 5-MG 9th and Highland Reservoir in Mount Vernon. Both reservoirs have a regulated inflow from the 459-foot HGL transmission pipeline system, though their outflow is based strictly on demand. The reservoirs draw down and refill throughout the day as demands exceed inflow. Both reservoirs have an operating range of less than 5 feet.

For system analysis and discussion purposes, the 214-foot HGL pressure zone is divided into six sub-zones:

1. 214A – Custer

The 214-foot HGL Custer sub-pressure zone is located east of I-5 along Cook Road (Bradley Road), Allen West Road, and Benson Road, serving the farming and agricultural areas of Custer. It is fed by a PRV located on Cook Road and Old Highway 99 that takes water from the 459-foot HGL Cook Road transmission pipeline. Another feed into this sub-pressure zone is planned by completing a pipeline extension along SR 11 (Chuckanut Drive) that will help connect it to the 214E – Burlington sub-pressure zone and provide redundancy. The distribution system in this area is a mix of plastic, PVC, and ductile iron pipe ranging in size from 2-inch-diameter through 12-inch-diameter installed between 1960 and 2003.

The general condition of the system is good, but there are hydraulic issues because of the small-diameter piping, lack of a redundant feed, and lack of a storage tank. Once the connection to the 214E sub-pressure zone is complete through the new pipeline on SR 11, this area will be stronger and will be able to utilize the future storage tank that is planned for Burlington.

2. 214B – Sedro-Woolley

The 214-foot HGL Sedro-Woolley sub-pressure zone is primarily fed by the 5-MG Dukes Hill Reservoir, which is filled through the Dukes Hill PRV located on the 459-foot HGL transmission line. The reservoir is remotely located and is fitted with high- and low-level alarms to alert District staff through SCADA. The feed into this sub-pressure zone is supplemented by two PRV stations on the transmission lines; the station located at 1st and Nelson Streets helps to supplement normal high

demands, and the station at Township and Dunlap Streets is set to respond to unusually high demands such as fire flows.

Due to construction of the Rhodes Road PRV, the Dukes Hill Reservoir is no longer able to provide water to the City of Burlington. The Rhodes Road PRV was constructed as part of the Cook Road transmission pipeline and now takes water directly from the 459-foot HGL pressure zone to feed the City of Burlington along the 24-inch-diameter concrete cylinder pipe (CCP) on SR 20. The water storage for customers on the 24-inch-diameter CCP is now provided by the 9th and Highland Reservoir in Mount Vernon.

The piping network in and out of the Dukes Hill Reservoir was designed to allow the 214-foot HGL water to return to the 459-foot HGL system for any emergency situation requiring shutdown of the 459-foot HGL supply; this would provide minimum pressures and flows to local residents for survival purposes. As shown in Chapter 10, the District proposes to construct a new emergency booster station at the Dukes Hill site to serve the 459-foot HGL pressure zone from the 214-foot HGL pressure zone, using the 5 million gallons of storage as a source.

The 214B sub-pressure zone can receive supplemental water from one of the interties with the City of Anacortes water system. The Avon intertie can augment the supply into this area in the case of an emergency.

The majority of the existing distribution system in this area is a mix of 8- through 12-inch-diameter ductile iron pipe installed after 1980 and 3- through 8-inch-diameter AC and plastic pipe installed between 1960 and 1980. The distribution system is well gridded and providing adequate fire flow is typically not a problem. Some areas have experienced leaks and breaks on a routine basis, and those pipes will be replaced as part of the annual pipe replacement program.

3. 214C – County

The 214C – County sub-pressure zone serves a very large area in the rural part of the District's system, and in the weaker part of the system in terms of hydraulics. This area covers everything west of the Skagit River and south of SR 536. The primary feeds into this sub-pressure zone are from the 12-inch-diameter ductile iron pipe across the West Side bridge in Mount Vernon from 214D, and from 214E at Avon Allen Road and Bradshaw Road, including the Avon intertie with the City of Anacortes.

Parts of this sub-pressure zone located in Pleasant Ridge have trouble maintaining adequate pressure during periods of high demand. As a result, booster pump stations were constructed at Rudene Road and at Bradshaw Road to boost pressure for the 290-foot HGL Pleasant Ridge pressure zone. Improving the distribution pressure in this area is one of the District's objectives as part of the CIP identified in Chapter 10. New pipelines on Mclean Road and Best Road will help maintain system

pressures and eliminate the long-term use of the booster pump stations that were intended for temporary use.

The storage for this sub-pressure zone comes from the 9th and Highland Reservoir in Mount Vernon via the 12-inch line on the West Side bridge. There are plans to construct a new 290-foot HGL reservoir in Pleasant Ridge to provide better distribution pressure, fire flow, and standby storage, as identified in Chapter 10.

The majority of the existing distribution system in this area is a mix of 8- through 12-inch-diameter ductile iron pipe installed after 1980 and 3- through 8-inch-diameter AC, PVC, and plastic pipe installed between 1960 and 1980. Some areas have experienced leaks and breaks on a routine basis, and those pipes will be replaced as part of the annual pipe replacement program.

4. 214D – Mount Vernon

The 214-foot HGL Mount Vernon sub-pressure zone serves the City of Mount Vernon along SR 538 (College Way), the commercial area around the intersection of SR 538 and Riverside Drive, and the Riverbend area west of I-5. Normal demands in this area are served by PRV stations on the 459-foot HGL transmission line at East College Way and William Way in Mount Vernon, and from the 322-foot HGL pressure zone from PRV stations at the intersection of Hoag and Laventure Roads and at Blodgett Road in Mount Vernon. Additional PRV stations are set to respond to unusually high demands, such as from fire flows. These PRV stations are near Riverside Drive, Kulshan View, the intersection of 18th Street and Kulshan, and the intersection of Sandlewood and North 18th Street in Mount Vernon.

The storage for this sub-pressure zone comes from the 5-MG 9th and Highland Reservoir. The reservoir also provides water storage to 214C – County, 214E – Burlington, 214F – South Mount Vernon. As an emergency standby, water from the 214-foot HGL pressure zone can be boosted at the 9th and Highland Reservoir site to serve the 322-foot HGL pressure zone in Mount Vernon. The storage analysis completed for this area indicates that a new water storage reservoir will be required in the future. This project is discussed in Chapter 10.

Like other 214-foot HGL sub-pressure zones, 214D can also receive supplemental water from the City of Anacortes through an intertie. For Mount Vernon, the Riverbend intertie can augment supply south and east of the Skagit River. This intertie has not been used in recent years.

The majority of the existing distribution system in this area is a mix of 8- through 12-inch-diameter ductile iron pipe installed after 1980 and 3- through 8-inch-diameter AC and plastic pipe installed between 1960 and 1980. The distribution system is well gridded and providing adequate fire flow is typically not a problem. Some areas have experienced leaks and breaks on a routine basis, and those pipes will be replaced as part of the annual pipe replacement program.

5. 214E – Burlington

The 214-foot HGL Burlington sub-pressure zone covers a wide area both north and south of SR 20 from Bayview to Sedro-Woolley, and north of the Skagit River. The primary feeds into this zone are from the Rhodes Road PRV in Sedro-Woolley, the 24-inch-diameter ductile iron line across the Riverside Bridge, and the 12-inch-diameter ductile iron line across the West Side Bridge in Mount Vernon. There is a standby feed at North Hill Boulevard that can be used in special circumstances, and the Avon intertie with the City of Anacortes can also supply this area on an emergency basis.

The 9th and Highland Reservoir in Mount Vernon provides the water storage for this sub-pressure zone primarily via the 24-inch-diameter line on the Riverside Bridge. There are plans to construct a new 214-foot HGL reservoir for this sub-pressure zone to provide additional fire flow and standby storage, as identified in Chapter 10.

As mentioned above, there are plans to construct piping on SR 11 to complete a connection to the 214A – Custer sub-pressure zone, which will provide for another feed into this zone from the Cook Road and Old Highway 99 PRV.

The majority of the existing distribution system in this area is a mix of 8- through 12-inch-diameter ductile iron pipe installed after 1980 and 3- through 8-inch diameter AC and plastic pipe installed between 1960 and 1980. The distribution system is well gridded and providing adequate fire flow is typically not a problem. Some areas have experienced leaks and breaks on a routine basis, and those pipes will be replaced as part of the annual pipe replacement program.

6. 214F – South Mount Vernon

The 214-foot HGL sub-pressure zone in south Mount Vernon is located approximately south of Division Street to Hickox Road, and between I-5 and the Skagit River. The primary feeds into this area are the 18-inch-diameter CCP on Freeway Drive, the 10-inch-diameter cast iron pipe near 4th Street, a 6-inch-diameter ductile iron pipe on Kincaid Street, a 6-inch-diameter cast iron pipe on Section Street, and a 10-inch-diameter steel pipe fed by a PRV station on Anderson Road. The piping leaving this sub-pressure zone on Dike Road feeds the 195-foot HGL Conway-Fir Island pressure zone.

The 9th and Highland Reservoir in Mount Vernon provides the water storage for this sub-pressure zone.

The majority of the existing distribution system in this area is a mix of 3/4-inch through 18-inch-diameter pipe made of cast iron, ductile iron, concrete cylinder, steel, AC, PVC, and plastic pipe. The age of the pipe in this area ranges from the 1950s to 2008. The general condition of the system is good, and it can generally meet fire flow requirements.

2.6.8.4 220-Foot HGL (Hickox South, East Conway)

The 220-foot HGL pressure zone is supplied from the Hickox Road PRV on the south side of the Mount Vernon 322-foot HGL zone. The growth in the Conway area, especially in the foothills around Lake Sixteen, has prompted future plans to change the pressure zones in the area. Future plans include replacing much of the arterial line to the Conway area with new pipe to allow for the extension of the 322-foot HGL pressure zone. The District plans to remove the Hickox Road PRV station and increase the pressure, allowing the 322-foot HGL pressure zone to extend to Conway and serve the area. The Hickox Road PRV is normally set at about 80 psi, but can be boosted to 90 psi or more in the summer to overcome frictional head loss in the 4 miles of 6-, 8-, and 12-inch-diameter pipe from Mount Vernon to Conway due to increased summer demand flows.

The distribution system can currently meet fire flow requirements, as outlined in Table 6-1 for a rural area.

Future development in the Conway area will result in construction of a new reservoir with a spill elevation of 575 feet AMSL. This new reservoir will have the ability to serve the 413-foot Hermway Heights pressure zone through a new PRV. Therefore, construction of this new reservoir will allow for the future removal of the Bulson tank and the Bulson booster station. In addition, a new reservoir is planned within the City of Mount Vernon with a 322-foot spill elevation, which will supplement the new, extended 322-foot HGL pressure zone that will extend into the Conway area east of I-5.

The new extended 322-foot HGL zone will supplement the supply to the 214-foot HGL pressure zone, which will be extended to Conway and Fir Island and across the bridge on the North Fork of the Skagit River. Capital projects reflecting some of these improvements are presented in Chapter 10.

2.6.8.5 Bay View Ridge – 230-Foot HGL, 270-Foot HGL, and 290-Foot HGL

The Bay View Ridge area of the District's Judy System has historically been served through the Lefeber and Fredonia interties with the City of Anacortes system. The District would typically purchase about 250–300 MG per year from the City to serve the Bay View Ridge area because the District did not have the ability to provide Judy Reservoir water at the required HGL. In 2007, the District constructed the Cook Road transmission pipeline to bring 459-foot HGL water from Sedro-Woolley to Old Highway 99 in Burlington. In 2012, the District constructed the Josh Wilson transmission pipeline to convey the 459-foot HGL water from Old Highway 99 to Higgins Airport Way near the Port of Skagit County. A PRV was constructed at the intersection of Higgins Airport Way and Josh Wilson Road to reduce the pressure from the 459-foot HGL to the 290-foot HGL. Therefore, the District can now provide water from Judy Reservoir to serve customers in the Bay View Ridge area, reducing the need for the Lefeber and Fredonia interties to emergency supplies as required.

As part of the Cook Road and Josh Wilson Road projects, high pressure was extended north on Old Highway 99 to Bow Hill Road and south toward Burlington to support the transmission pipeline loop.

The Bay View Ridge area currently has three distinct pressure zones:

1. 290-Foot HGL (Port of Skagit County)

The Port of Skagit County and Bay View Business and Industrial Park are served from the Josh Wilson Road transmission pipeline. The system currently receives water through a solenoid-controlled PRV station, controlled through the District's SCADA system based on the level of the 2.9-MG Bay View Ridge Reservoir. When the reservoir draws down to a pre-set level, the SCADA system opens the Higgins–Josh Wilson PRV and refills the reservoir; when the reservoir is full, the SCADA system shuts off the PRV. During a power outage, the PRV would fail to an open position, which would refill the reservoir and then close the altitude valve. The PRV setting would prevent over-pressuring the 290-foot HGL pressure zone.

The Lefeber and Fredonia interties with the City of Anacortes provide backup supply in case of distribution system isolation, closure/failure of the Higgins–Josh Wilson PRV station, or any other emergency situation.

2. 270-Foot HGL (Bay View)

The rural village of Bay View on Padilla Bay is served a moderate inflow by a PRV station from the Bay View Ridge 290-foot HGL pressure zone. The 300,000-gallon Bay View standpipe, operating at 270-foot HGL, draws down during the day as demands exceed inflow from the PRV station, and refills at night as demands relax and supply exceeds demands. A seismic vulnerability assessment indicated that the Bay View Standpipe is inadequately anchored and recommended repairs.

3. 230-Foot HGL (Country Club)

The Skagit Golf and Country Club is also served from the Bay View Ridge 290-foot HGL pressure zone through a PRV station, and operates at about the 234-foot HGL. Until early 1994, the Country Club was served by the 214-foot HGL pressure zone. A seismic vulnerability assessment indicated that the local 214-foot HGL storage reservoir did not meet current seismic design criteria. With the pressure upgrade to the 234-foot HGL, the reservoir was demolished and the local pump station at Peterson Road was fitted with a PRV. In a situation where the water is unavailable from the 290-foot HGL pressure zone, the Peterson Road pump station can support the demands of the Country Club pressure zone from the 214-foot HGL pressure zone.

These three subsystems were separate in 1994, and a stated objective of the 1994 Water System Plan was to connect them into a single distribution system with a single storage reservoir. The Bay View Ridge Reservoir was completed and the subsystems linked in 1999.

2.6.8.6 290-Foot HGL (Pleasant Ridge)

The 290-foot HGL pressure zone is served from the 214-foot HGL pressure zone by two booster stations at Rudene Road and at Bradshaw Road. Undersized distribution piping, along with residential growth on Pleasant Ridge and increased irrigation consumption in the 214-foot HGL pressure zone to the north have caused low pressure problems in the Pleasant Ridge area, mostly during peak summer demands. The static pressure is normally about 40 psi at the highest service on Pleasant Ridge, but drops to approximately 20 psi during periods of peak summer demands. The District responded in mid-1994 by re-establishing a booster pump system to serve this area. The relocated booster system at Rudene Road serves a small, rocky knoll that rises about 100 feet above the alluvial plain. In 2009, an additional booster station was constructed at the intersection of Summers Drive and Bradshaw Road to increase pressures in the southern area of Pleasant Ridge. The distribution system is predominantly plastic with some ductile iron water lines. System demands are predominantly residential.

There is currently no storage on Pleasant Ridge, though construction of a storage reservoir is tentatively scheduled for this planning period. However, the new storage reservoir will be constructed at a lower hydraulic grade than the current booster stations, and so the local residents will see a slight drop in pressure after the reservoir is constructed. The booster stations are considered a temporary measure until water line replacements indicated in Chapter 10 are complete, improving system flows and stabilizing system pressures throughout the year. The booster stations operate year-round, with higher operating pressures during the summer months when demands are higher. Previously, the District discussed a water system connection with the Town of LaConner, which could also provide increased flows and pressures to the Pleasant Ridge area.

2.6.8.7 284-Foot HGL (Clear Lake North)

The 284-foot HGL pressure zone used to be served from the 500,000-gallon Clear Lake Reservoir located on a bench on the hillside northeast of the community of Clear Lake; however, the reservoir was recently taken out of service due to maintenance concerns. There are plans to construct a new PRV to supply this pressure zone directly from the 459-foot HGL Judy Reservoir to Mount Vernon transmission pipeline. In the meantime, the 284-foot HGL is served through PRVs from the 365-foot HGL Southwest Clear Lake pressure zone and the 1.0-MG Buchanan Hill Reservoir.

After the new PRV is constructed, the 284-foot HGL pressure zone will be able to provide water to the adjacent 365-foot HGL pressure zone through a check valve on Maple Street if the 365-foot zone loses its source and drops in pressure. Demands in the 284-foot HGL pressure zone are predominantly domestic with a few commercial services in town and agricultural services in outlying areas. The 284-foot HGL pressure zone serves the northeast three-quarters of Clear Lake and along Francis Road up to Nookachamps Creek.

The distribution system is predominantly 6-inch-diameter plastic and AC mains, and is adequate to meet both peak hour domestic needs and appropriate fire flows. Demands are mostly residential with a few commercial services.

2.6.8.8 322-Foot HGL

The 322-foot HGL pressure zone is located primarily within the City of Mount Vernon, but there is a small isolated zone on Cascade Ridge with the same HGL. This zone requires a small booster station to maintain the 322-foot HGL because of pressure losses through the system before the water gets there.

1. 322A and 322B – Mount Vernon

The 322-foot HGL pressure zone is served by the 1-MG East Division Reservoir at the corner of Digby Road and Division Street in Mount Vernon. The pressure zone is large, and demands are supplemented to the west and north of the Division Street Reservoir by PRV stations at 9th Street, 18th Street, Laventure Road, and Waugh Road from the 459-foot HGL transmission pipeline. The reservoir draws down during the day as demands increase and refills in the evening as demands subside. Demands are primarily single-family and multi-family residential, with various commercial and public services dispersed throughout the pressure zone.

The 322-foot HGL pressure zone also can supply water to and receive water from adjacent pressure zones. It can receive water from the 420-foot HGL pressure zone to the southeast by a PRV station at the corner of Section Street and Laventure Road. The Sioux/Shoshone pressure sustaining valve station can provide supply back from the 560-foot HGL pressure zone to the 322-foot HGL pressure zone at peak demands, though it is currently valved closed. The Skyridge pump station on east Anderson Road in south Mount Vernon serves the 463-foot HGL Skyridge area; the PRV stations at east Anderson Road and Skyridge Drive provide supply back to the 322-foot HGL pressure zone from the 463-foot HGL zone at peak demands. The 322-foot HGL pressure zone is the source for the East Blackburn and Cedar Hills booster/pressure tank systems, serving small subdivisions on the north foot of Little Mountain in south Mount Vernon. Both are considered temporary systems and are expected to be removed when a new 12-inch-diameter water main is installed down Blackburn Road, providing increased pressure and storage from the 560-foot HGL pressure zone to these subdivisions and to the 322-foot HGL pressure zone through new PRV stations.

The distribution system in the 322-foot HGL pressure zone is generally good. It is strong in the center of the zone with 16-, 12-, and 10-inch-diameter distribution mains on Laventure Road and 12-inch-diameter mains on Section Street, Division Street, Fir Street, 15th Street, and Waugh Road. The remaining grid is a mixture of 12-, 10-, 8-, 6-, and 4-inch-diameter mains that are adequate for the peak hour domestic demands and have the capacity to provide the appropriate fire flows.

The 322-foot HGL pressure zone formerly served a gradual slope in the eastern end of Mount Vernon, which experienced low peak hour pressures (35± psi). The District has transitioned this area into a 420-foot HGL pressure zone between the 322-foot HGL and 560-foot HGL pressure zones. The East Blackburn pressure system discussed earlier will be absorbed into the 560-foot HGL pressure zone; the Cedar Hills pressure system will be absorbed into the 420-foot HGL pressure zone. The 420-foot HGL pressure zone is served by PRV stations from the 560-foot HGL pressure zone and

provides service as required to the 322-foot HGL pressure zone at Section Street through a PRV station.

The 1.0-MG Division Street tank mentioned above has inadequate standby storage to meet the demands of the 322-foot HGL pressure zone. Currently, the 560-foot HGL tank at Eaglemont or the emergency pump station at 9th and Highland must support this zone in the event of an emergency where the source is lost. The District is currently in the design phase for construction of a new 6.0-MG tank, in the same location as the existing tank, to provide adequate standby storage for the 322-foot HGL pressure zone. The current 1.0-MG tank will be decommissioned. The project will also include construction of a booster pump station to provide a redundant supply to the 560-foot HGL pressure zone. Currently, the only supply to the 560-foot HGL pressure zone is the Fir-Waugh booster station.

2. 322C – Cascade Ridge #1

The Cascade Ridge area, a large residential development completed in 1992 in south Mount Vernon on Stackpole Road, is supplied by the 322A and 322B sub-pressure zones in Mount Vernon. However, due to hydraulic losses through the system, the first part of the development served by the 322C sub-pressure zone requires a booster station. There is also a 75,000-gallon storage reservoir to serve this area, plus two other booster stations and two other reservoirs for higher zones.

2.6.8.9 350-Foot HGL (Sedro-Woolley – Portabello)

The 350-foot HGL pressure zone is a small zone located in Sedro-Woolley that is served by a single PRV station from the 459-foot HGL transmission line on Fruitdale Road. It serves an area just north of SR 20, primarily the Sauk Mountain View Estates development and Northern State Hospital.

It is a small localized zone that does not have any storage reservoirs. Storage for this pressure zone is provided by the clearwells at the WTP. There are no current plans to expand this zone or to construct a storage reservoir.

2.6.8.10 356-Foot HGL (Clear Lake South and Big Lake)

The 356-foot HGL pressure zone is divided into two separate areas. Both of these zones are fed directly from PRV stations from the 459-foot HGL transmission line, and both are predominantly single-family residential demands with a few commercial, multi-family, and public services scattered throughout.

1. 356A – Clear Lake South and Big Lake

The 356A sub-pressure zone is located between Clear Lake and Big Lake along Beaver Lake Road, Gunderson Road, and Otter Pond Drive, and on both the east side and west side of Big Lake. This sub-pressure zone is served by four storage reservoirs. The 500,000-gallon Nookachamps Hills Reservoir serves Beaver Lake and Gunderson Roads, Otter Pond Drive, all the area south of Clear

Lake, and the north end of Big Lake. The distribution system on the east side of Big Lake is served by two reservoirs totaling 140,000 gallons. The distribution system on the west side of Big Lake is served by the 140,000-gallon West Big Lake Reservoir. All four of the reservoirs are served by a PRV station from the 459-foot HGL transmission line on Beaver Lake Road in Clear Lake. The PRV station is quite remote from the demands on the system and the reservoirs are not very big, so the District monitors the pressures in this area very carefully through SCADA and consistently makes adjustments to the PRV settings in order to keep the system pressures adequate.

The distribution system in this sub-pressure zone is predominantly of 12- and 8-inch-diameter ductile iron and is quite adequate and able to meet the appropriate fire flows.

A booster pump station located adjacent to the Nookachamps Hills Reservoir currently serves a small 450-foot HGL pressure zone. Development may expand this zone, and a storage reservoir will be required.

2. 356B – Skagit Highlands

The 356B sub-pressure zone is located at the east end of College Way (SR 538) on both the north and south sides of the road, including east of the intersection of College Way and SR 9, along Knapp Road. This sub-pressure zone is fed by a PRV station in the Skagit Highlands subdivision from the 560-foot HGL pressure zone. This is a small zone that does not have any storage, and there are no current plans to expand the zone or to add storage.

2.6.8.11 365-Foot HGL (Southwest Clear Lake)

The 365-foot HGL pressure zone is served by the 1-MG Buchanan Hill Reservoir, serving the southwest quarter of Clear Lake. It is also the current supply to the adjacent 284-foot HGL pressure zone through PRV stations on Buchanan Street at Maple Avenue and at South Front Street and Beaver Lake Road due to the removal of the Clear Lake Reservoir. The Buchanan Hill Reservoir is served by a PRV station from the 459-foot HGL transmission pipeline on Beaver Lake Road in Clear Lake (separate from the PRV serving the 356-foot HGL pressure zone). The PRV station is remote from the demands on the system, so the reservoir acts as the primary supply, and it draws down during the day as demands increase and refills at night when demands are low. Demands in this pressure zone are predominantly residential. The distribution system in the 365-foot HGL pressure zone is predominantly of 8-inch-diameter ductile iron pipe and is able to meet the appropriate fire flows. The 365-foot HGL pressure zone may also at some future date support the adjacent 356-foot HGL pressure zone south of Clear Lake by closing the main valve to the 459-foot HGL transmission line and installing a bypass at the 365-foot HGL PRV station. Both systems would then effectively operate at the 356-foot HGL and serve off their storage only.

2.6.8.12 412-Foot HGL (Hermway Heights)

The 412-foot HGL pressure zone east of Conway is served by the 60,000-gallon Hermway Heights Reservoir. The Hermway Heights Reservoir is filled from the 220-foot HGL pressure zone by the Bulson pump station on Bulson Road, next to the Bulson Road Reservoir. The pump station operates on a pressure setting to refill the reservoir when the water level gets below the set point. District operators keep track of the reservoir levels and adjust for periods of high demand. Demands on the 412-foot HGL pressure zone are predominantly single-family residential. The distribution system is adequately sized for present domestic use, with newer lines being 8-inch-diameter ductile iron and the remaining lines being 2- and 3-inch-diameter plastic. A hydrant on the larger line from the Hermway Heights Reservoir is sized to allow for rural fire flows. The 412-foot HGL pressure zone also serves as supply for the adjacent 684-foot HGL pressure zone, supplying the Lake Sixteen pump station through an 8-inch-diameter ductile iron main along SR 534.

Development in this area at the Bulson Creek Subdivision will result in construction of two additional 132,000-gallon reservoirs at the 575-foot HGL. The District contributed to the upsizing of one of the reservoirs and fully paid for construction of the second reservoir. The 575-foot HGL will serve the majority of the new development and a booster pump station will serve the houses at a higher elevation with a newly created 684-foot HGL. The District has reviewed the system hydraulics in concert with land use in the Lake Sixteen area and proposes to construct a new PRV at Bulson Creek to supply the Hermway Heights pressure zone. After these improvements are made, the District will be able to abandon the Bulson tank. However, the hydraulic gradient will be increased from the current 412-foot HGL to approximately the 485-foot HGL. The proposed 485-foot HGL pressure zone works well with the existing 684-foot HGL pressure zone and the proposed increase of the 195-foot HGL pressure zone to the 322-foot HGL. This increase from the 412-foot HGL to the 485-foot HGL will increase the service area without adding another pressure zone.

2.6.8.13 420-Foot HGL (Central Mount Vernon)

The 322-foot HGL pressure zone formerly served a gradual slope in the eastern end of Mount Vernon, which experienced low peak hour pressures (35± psi). The District transitioned this area into a 420-foot HGL pressure zone between the 322-foot HGL and the 560-foot HGL pressure zones. The 420-foot HGL pressure zone is served by PRV stations from the 560-foot HGL pressure zone and provides service to the 322-foot HGL pressure zone at Section Street through a PRV station as required. The Cedar Hills pressure system currently in the 322-foot HGL pressure zone will be absorbed into the 420-foot HGL pressure zone after completion of the new pipeline on Blackburn Road, which is currently not planned and will likely be a requirement of any development projects in the Eaglemont area.

The 420-foot HGL pressure zone does not have its own storage; the 5-MG Eaglemont Reservoir has sufficient storage capacity to also serve the 420-foot HGL pressure zone. Demands in the 420-foot HGL pressure zone are predominantly residential. The distribution system is a grid of 12-inch and 8-inch-diameter ductile iron pipe. Strategically-placed PRVs support average, peak hour, and fire flow demands, served from the 560-foot HGL pressure to the 420-foot HGL zone, through to the 322-foot

HGL pressure zone as required. Check valves have been located off the 322-foot HGL pressure zone at Laventure Road and off the 420-foot HGL pressure zone at the Maddox Creek Plat to provide emergency service back to the 420-foot HGL and the 560-foot HGL pressure zones, respectively, in case of pressure loss in those upper zones.

2.6.8.14 430-Foot HGL (Hoogdal)

The 430-foot HGL pressure zone north of Sedro-Woolley is served by the 100,000-gallon Hoogdal Reservoir. The reservoir is filled from the 459-foot HGL pressure zone by a PRV station at the intersection of Kalloch Road and SR 9. The PRV station is quite remote from the reservoir, so the reservoir acts as the principal supply. Demands in this area are predominantly residential. The distribution system is of 8-inch-diameter ductile iron and is adequate for peak hour demands; it also has the capacity to meet the appropriate fire flow demands. The PRV station is on a bypass from the main, and a mainline valve can be opened to allow the 430-foot HGL water to serve the 459-foot HGL pressure zone in emergency situations.

2.6.8.15 450-Foot HGL (Nookachamp Hills)

The 450-foot HGL pressure zone is a small zone located in the Nookchamp Hills subdivision in Big Lake that is served by a booster pump station at the Nookachamp Hills Reservoir. The booster pump station serves a higher area of the development that the reservoir cannot serve.

It is a small localized zone that does not have any storage reservoirs. There are no current plans to expand this zone or to construct a storage reservoir.

2.6.8.16 456-Foot HGL (Bow Hill)

The 456-foot HGL pressure zone at Bow Hill north of Burlington is served by the 1-MG Bow Hill Reservoir. The 456-foot HGL pressure zone serves the residential and commercial areas near the Bow Hill Road intersection with I-5. The Bow Hill Reservoir is filled from the 459-foot HGL pressure zone served by the Cook Road transmission pipeline and the high-pressure line on Old Highway 99. However, due to head losses in the pipelines, the Bow Hill booster station is required to boost the water to the 456-foot HGL into the reservoir. The booster station is controlled by the District's SCADA system based on reservoir level. Demands on the pressure zone are predominantly commercial and public authority, but include single-family residential. The distribution system of the 456-foot HGL pressure zone is all of ductile iron, primarily 12-inch diameter, and is adequate for both peak hour demands and appropriate fire flows.

2.6.8.17 459-Foot HGL (Transmission Line)

The 459-foot HGL pressure zone is served by the clearwells at the Judy Reservoir WTP east of Clear Lake. The clearwells are filled by the WTP and have a normal operating range of about 5 feet. The entire Judy System is primarily supplied by this pressure zone, though storage reservoirs in lower pressure zones serve most of the daily demands in their distribution systems. There are also some direct services from the 459-foot HGL pressure zone. If these direct services were mapped, they

would form a narrow band along the 459-foot HGL transmission line, mostly at higher elevations. There are three main segments of the 459-foot HGL pressure zone, as described below.

1. 459A – Judy Reservoir to Mount Vernon Transmission Line

The 459A sub-pressure zone of the 459-foot HGL transmission line runs southwest from clearwells, serving several customers along Old Day Creek Road and Clear Lake Reservoir, continuing southwest past Clear Lake (serving demands of the 356-foot HGL and the 365-foot HGL pressure zones at the PRV stations on Beaver Lake Road) to Mount Vernon. The 459-foot HGL transmission line serves demands in Mount Vernon to Draper Valley Farms, a large commercial chicken processing facility that takes full 459-foot HGL water through its own PRV stations; to the 560-foot HGL pressure zone via the Fir-Waugh pump station; to the 322-foot HGL pressure zone through PRV stations at Waugh Road, Laventure Road, 18th Street, and 9th Street; and to the 214-foot HGL pressure zone through PRV stations at East College Way, 18th Street, and 9th Street. This sub-pressure zone drops from the 459-foot HGL to the 214-foot HGL at the mainline PRV stations near 9th Street, where it continues north along Riverside Drive to meet the north leg of the transmission line loop at the Skagit River Bridge.

The piping for the 459A sub-pressure zone is predominantly concrete cylinder pipe, except for the new section of ductile iron pipe constructed in 2009 parallel to the existing concrete cylinder line to provide redundancy and additional hydraulic capacity. This line will eventually be continued to the WTP.

As indicated above, the clearwells provide distribution storage for a small number of domestic services in upper elevations of the Judy System, plus one large commercial customer in Mount Vernon; they also provide supplemental supply to replenish storage in the 214-, 284-, 322-, 356-, 365-, 430-, and 560-foot HGL pressure zones. Under special circumstances, a PRV installed near the Fir–Waugh pump station may be opened to feed water into the 459-foot zone from the 560-foot tank.

2. 459B – Sedro-Woolley

The 459B sub-pressure zone follows the transmission line north from the clearwells, serving several homes off Morford Road, through an overhead pipeline crossing the Skagit River, to Sedro-Woolley. The transmission line tees at Fruitdale Road, sending a 12-inch-diameter line north on Fruitdale Road and continuing the 24-inch-diameter line through Sedro-Woolley to the PRV station at the intersection of 1st and Nelson Streets.

There is a PRV at Rhodes Road in Sedro-Woolley that reduces the pressure from the 459-foot HGL to the 214-foot HGL, and this lower-pressure transmission line continues west along SR 20 to Burlington, then south along Burlington Boulevard to meet the south leg of the transmission line loop at the Skagit River Bridge.

The Fruitdale Road transmission line in Sedro-Woolley also acts as a distribution line for elevations above 200 feet AMSL. It serves Northern State Multi-Service Center through a PRV station, continues north along Fruitdale Road, west along Kalloch Road to SR 9 (where it serves the 430-foot HGL pressure zone to the north), south on SR 9 to Bassett Road (serving domestic customers), and west on Bassett Road to the Dukes Hill Reservoir site (serving domestic customers near the reservoir site).

The 459B piping is a mix of concrete cylinder, ductile iron, and welded steel pipe. The Skagit River crossing is welded steel, but most of the line from the WTP to the Rhodes Road PRV is concrete cylinder pipe.

3. 459C – Cook Road and Old Highway 99

The 459C sub-pressure zone runs through Sedro-Woolley and up to Cook Road, where the recently-constructed transmission line extends the 459-foot HGL pressure zone along Cook Road to Old Highway 99, where it interties with 16-inch-diameter pipelines that run north and south along Old Highway 99. In 2012, the 459-foot HGL pressure zone was extended to Bay View Ridge through the construction of the Josh Wilson transmission line. This line connects to the 16-inch-diameter pipeline on Old Highway 99 and ends at Higgins Airport Way. The Cook Road pipeline was constructed with PRV stations at Collins, District Line, and Gardner roads and Old Highway 99 to allow for future service connections. There are no connections at the present time. The Josh Wilson pipeline was not set up with any PRVs except for the one at Higgins Airport Way. Services are not planned for this portion of the line.

The newly-constructed portions of the 459C piping along Cook Road and Josh Wilson Road are ductile iron. A seismic vulnerability assessment completed for the District noted that unrestrained-joint concrete cylinder pipe in unconfined alluvial material is moderately vulnerable to damage during a seismic event. When replacing such portions of transmission pipeline, the District will use ductile iron or other seismically-sound material. In other respects, the transmission pipeline loop appears to be sound and serviceable, though there have been some small failures.

As noted earlier in this chapter and in Chapter 6, growth projections, hydraulic analyses, and waning transmission line lifespans have an effect on future serviceability of the transmission pipelines. Based on this, the District plans to complete construction of the redundant south leg of the transmission line from Mount Vernon to the WTP. Also, replacement of the north leg of the transmission line is also planned in approximately 15 years.

2.6.8.18 463-Foot HGL (Skyridge)

The 463-foot HGL pressure zone serves a small residential area accessed by Skyridge Drive in south Mount Vernon and is served by the 500,000-gallon Little Mountain Reservoir. The Little Mountain Reservoir is filled from the 322-foot HGL pressure zone by the Skyridge pump station on Anderson Road. Water can also be returned from the 463-foot HGL pressure zone to the 322-foot HGL pressure zone during peak demands through PRV stations on Anderson Road (at the pump station)

and at Skyridge Drive. The distribution system in the 463-foot HGL pressure zone is predominantly ductile iron and plastic, and has adequate capacity for peak hour demands as well as appropriate fire flow demands.

2.6.8.19 506/415-Foot HGL (Tinas Coma)

The 506-foot HGL pressure zone on Burlington Hill in north Burlington is served by the 230,000-gallon Tinas Coma Reservoir and serves a small residential area on the hill accessed from the north on Hillcrest Drive. There is a PRV station that feeds a small 415-foot HGL pressure zone in this area as well. The Tinas Coma Reservoir is filled from the 290-foot HGL pressure zone by the Tinas Coma pump station on north Hillcrest Drive. The distribution system in the 506/415-foot HGL pressure zone is predominantly ductile iron, and has adequate capacity for peak hour demands as well as appropriate fire flow demands.

2.6.8.20 560-Foot HGL (Mount Vernon)

The 560-foot HGL pressure zone in southeast Mount Vernon is served by the 5-MG Eaglemont Reservoir. The Eaglemont Reservoir is filled from the 459-foot HGL transmission line by the Fir–Waugh pump station, which is controlled by the SCADA system coordinated with the Eaglemont tank level. The 560-foot HGL pressure zone can return water to the 322-foot HGL pressure zone through the pressure sustaining valve (PSV) station at the intersection of Sioux and Shoshone in east Mount Vernon; this PSV station is currently valved-off. The 560-foot HGL pressure zone can also feed into the 459-foot HGL zone through a bypass PRV near the Fir–Waugh pump station. The 560-foot HGL pressure zone supplies water to the adjacent 645-foot HGL pressure zone through a pump station adjacent to Eaglemont Reservoir. The distribution system in the 560-foot HGL pressure zone is predominantly ductile iron and plastic, with some AC and plastic in the older, lower areas by Digby Road and Division Street. The entire distribution system in this pressure zone is adequate for peak hour demands, and the ductile iron and plastic distribution piping is adequate for appropriate fire flows. The older AC and plastic distribution lines in critical hydraulic legs are scheduled for replacement, as indicated in Chapter 10. An extension of Waugh Road across the Eaglemont development down to Blackburn Road has not yet been constructed, but a new pipeline along this alignment will serve to strengthen the District's distribution system in this area. It will also provide increased storage, flows, and pressures to the east Blackburn Road area and allow the retirement of three small booster/pressure tank systems, one on Cedar Hills and two on East Blackburn, in conjunction with the planned expansion of the 420-foot HGL pressure zone (as stated above).

This pressure zone also serves the irrigation demands of the golf course at the Eaglemont development (protected from the potable water system by a cross-connection control assembly) and the clubhouse for the golf course. An irrigation meter fills an adjacent irrigation pond, which is then pumped to meet actual irrigation demands. The District's water contract with the Eaglemont development allows it to withdraw irrigation water only during the 10 off-peak hours of each day to avoid overburdening the District's distribution or supply systems.

2.6.8.21 592-, 720-, 858-Foot HGL (Cascade Ridge)

Cascade Ridge is a residential development on a significant hillside south of Mount Vernon. The lowest portion of Cascade Ridge is served by the 322-foot HGL, including a pump station and a 75,000-gallon reservoir. A second pump station boosts water from the 322-foot HGL zone up the hill to a 592-foot HGL pressure zone and its 23,000-gallon reservoir. A third pump station boosts water from the 592-foot HGL reservoir up the hill to an 858-foot HGL pressure zone and its 33,000-gallon reservoir. The 858-foot HGL serves a small 720-foot HGL pressure zone through a mainline PRV. The distribution system is all made of ductile iron and has sufficient capacity for both Maximum Day Demands and fire suppression flows. The pump systems are interconnected with their supported reservoirs by a telemetry system, responding based on reservoir drawdown. The Cascade Ridge pressure zone may have the potential to support even higher pressure zones, should there be further development up the hillside, or farther south.

2.6.8.22 645-Foot HGL (Mount Vernon)

The 645-foot HGL pressure zone in southeast Mount Vernon is served by the 1-MG Eagles Nest Reservoir, adjacent to the Eaglemont Reservoir. The Eagles Nest Reservoir is filled from the 560-foot HGL pressure zone by the Eagles Nest pump station. The Eagles Nest Reservoir is approximately 110 feet tall and is on one of the highest points in the pressure zone, allowing it to provide a minimum of 40 psi to any point in the pressure zone. There are currently no domestic demands in this pressure zone because this area of Eaglemont has not yet been developed. The primary demand is from the Eaglemont Golf Course clubhouse.

The demands of the zone, once developed, will be primarily residential and irrigation. The pump station will refill the reservoir once drawn down to a specified level and will have telemetry alarms for the pump system and for both Eagles Nest and Eaglemont reservoirs. A PRV station in the pump station will supply water from the 645-foot HGL pressure zone to the 560-foot HGL pressure zone should the Eaglemont Reservoir be out of service for any reason. The distribution system in the 645-foot HGL pressure zone is all to be of ductile iron and will be adequate to serve both peak hour demands and meet the appropriate fire flow requirements.

2.6.8.23 684-Foot HGL (Lake Sixteen)

The 684-foot HGL pressure zone east of Conway is served by the 60,000-gallon Lake Sixteen Reservoir and serves the residential areas to the south of Lake Sixteen; the areas to the north of the lake can also be served up to elevation 584 feet AMSL. The Lake Sixteen Reservoir is filled from the 413-foot HGL pressure zone by the Lake Sixteen pump station near SR 534, controlled by the reservoir pressure transducer. Demands on the pressure zone are predominantly single-family residential. The distribution system of the 684-foot HGL pressure zone is all of ductile iron, primarily 8-inch diameter, and is adequate for both peak hour demands and appropriate fire flows.

Future development in this area is planned with an upper pressure zone of the 684-foot HGL. This new zone will eventually connect to the Lake Sixteen pressure zone to provide redundancy and additional storage.

2.6.8.24 705-Foot HGL (Panorama)

The 705-foot HGL pressure zone north and east of the WTP is served by the finished water pumps at the WTP. These pumps also serve domestic water to the plant including water for chemical feeds and filter backwash. As a result, when there is a large demand in the Panorama zone like a fire flow, the service to the WTP is affected. A separate booster station for this zone is required.

There is no water storage in this pressure zone. Demands on the pressure zone are predominantly residential with agricultural and livestock components. The distribution system of the 705-foot HGL pressure zone is made up of 6-inch and 8-inch-diameter ductile iron pipe, and is adequate for both peak hour demands and appropriate fire flows.

2.6.9 Interties

The District currently has four interties between the Judy System and the City of Anacortes water system. Tables 2-13 and 2-14 detail the historical water purchases from Anacortes as well as the specific purchases from 2012. Until recently, two of the interties at Lefeber and Fredonia provided the daily water supply for the District's customers in the Bay View Ridge area. But with construction of the Josh Wilson Road transmission pipeline to bring Judy Reservoir water to Bay View, all four interties are now in the capacity of emergency and peak demand supplies.

Table 2-13. City of Anacortes Purchases

Year	Yearly Water Purchases (gallons)
2004	349,782,632
2005	213,894,955
2006	379,012,399
2007	336,000,000
2008	348,668,807
2009	295,068,227
2010	283,569,156
2011	274,289,827
2012	283,613,976

Table 2-14. Judy Reservoir System and City of Anacortes Interties

Intertie Location	2012 Average Monthly Volume (gallons)	2012 Total Yearly Volume (gallons)
Avon – 17098 Bennett Road, Mount Vernon	0	0
Riverbend – 14423 Riverbend Road, Mount Vernon	0	0
Lefeber – 15377 State Route 536, Mount Vernon	19,226,376	230,716,515
Fredonia – 14245 McFarland Road, Mount Vernon	208,714	2,504,573

The District and the City have a water supply agreement in place that designates a committed volume of water per year for use by the District. This agreement expired in 2012 and is currently under negotiation, primarily due to the fact that the demand from the Lefeber and Fredonia interties has reduced considerably.

2.6.10 Fire Flow

The District provides water service to fire sprinkler systems in commercial structures, as well as to the many fire hydrants connected to its water mains, throughout its service areas. The District works regularly with the county and city fire marshals as well as the city fire departments and rural fire districts to ensure that adequate flow and pressure are available at these services and hydrants to support the required fire flow demands (see Chapter 6). Fire flow is one of the principal criteria the District uses to evaluate the adequacy of existing water mains in urban areas. The District evaluates fire flow availability by either flow testing existing hydrants or through hydraulic analysis using its computer model, or a combination of both. Developers may be required to replace existing water main(s) if the main(s) will not provide the flow required by the fire marshal at the District's design criteria. The District's Design and Construction Standards are discussed in Chapter 9.

Recent legislation by the State of Washington has granted authority for responsibility for fire hydrants to the utility that supplies the water. Therefore, the District will become responsible for the operation and maintenance of all the fire hydrants within its service area.

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3 Related Plans, Agreements, and Policies

The District's process of water delivery to its customers has been developed over many years in the context of various agreements, plans, and policies that address water management in Skagit County. This chapter describes key agreements and plans that influence the District's water service policies, and provides information about the authority and responsibility of the District to provide water.

Table 3-1 lists the related plans and agreements that were reviewed for consistency with this Water System Plan. These plans and agreements, along with other policies, are discussed in the sections below.

Table 3-1. Related Plans and Agreements

Category	Document	Year
Local and Regional Utility Planning	Skagit County Coordinated Water System Plan – Regional Supplement	2000
	District Water Policy Manual	2005
	Skagit County Comprehensive Plan	2007
	City of Burlington Comprehensive Plan	2005
	City of Mount Vernon Comprehensive Plan	2005
	City of Sedro-Woolley Comprehensive Plan	2011
Water Supply	1996 Memorandum of Agreement	1996
	Cultus Mountain Watershed Management Plan	2013
	Skagit River Watershed Control Plan	2010
	Anacortes and District Joint Operating Agreement	1993
	Skagit County Franchise Agreement	1993
Customer Agreements	Samish Farms Water District Wholesale Agreement	1996
	North Fir Island Water Association Wholesale Agreement	1983 (expired)
	Sierra Pacific Retail Agreement	2008

3.1 Service Area Authority

This section describes the authority and responsibility of the District to provide water within the service area established as part of the Skagit County Coordinated Water System Plan (CWSP).

3.1.1 Existing Service Area Characteristics

The District is authorized by RCW 54.04.030 to operate water systems within and outside the boundaries of Skagit County, Washington. This gives the District county-wide service authority and sets the legal boundaries of the District at, but not limited to, the boundaries of the county. The District and other water utilities participating in the CWSP process have agreed on the designated service areas for each water system. The District's service area is essentially the entire county except for those areas already served by another public water system. These other existing systems have first priority for water service to adjacent new development proposals within one-half mile of their service areas. If service is declined, the District is responsible for providing new water service. The formal Service Area Agreement is included as Appendix D.

In accordance with RCW 40.20.260, the District defines its retail service area as concurrent with the service area boundaries defined in the 2000 CWSP. According to the municipal water law, the District has a duty to provide retail water service within its retail service area (established in RCW 43.20.260) if:

1. Its service can be available in a timely and reasonable manner;
2. The District has sufficient water rights to provide the service;
3. The District has sufficient capacity to serve the water in a safe and reliable manner as determined by the Department of Health; and
4. It is consistent with the requirements of any comprehensive plans or development regulations 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 service area and, for water service by the water utility of a city or town, with the utility service extension ordinances of the city or town.

As a general philosophy, the District considers this "duty to serve" as a protection of the rights of existing or future water service customers to be served water by the District if they desire. Water users within the District's service area may be served water from the District so long as they accept the District's service requirements. The District does not interpret the "duty to serve" as requiring all new water users within the District's service area to be required to obtain water from the District. However, the District does recognize that it has made commitments to reduce the proliferation of exempt wells in the 1996 MOA, and will strive to distribute piped water where possible.

The municipal water law does not provide clear definition for what constitutes "timely and reasonable." DOH guidance documents indicate that this definition is to be left to the local jurisdiction or water purveyor.

3.1.1.1 Timely and Reasonable

An individual or developer seeking public water system service is required to receive service from a designated utility (as indicated in the CWSP) but is entitled to appeal this requirement. For the District, this is any area of Skagit County not identified as the service area of another public water system. Other public water systems should be approached before the District when new customers are within one-half mile of their water system service boundaries.

The District considers service to be "timely and reasonable" if it can be provided within 120 calendar days of all fees being paid to the District, with the following provisions:

1. If the extent of water service requested requires construction of major facilities such as the replacement or installation of new storage tanks, wells, booster pumps, or transmission or distribution mains, the time associated with construction and permitting will be added to the 120 days. The time period will commence after the payment of fees.
2. Construction of water facilities is subject to design review and approval at state and local levels. The "construction time" includes state and local permitting, construction season considerations, and coordination with other planned infrastructure projects such as roads, sewers, lights, etc. "Construction time" activities are in addition to the 120-day period.
3. A letter of water-availability indicating the conditions for the provision of service will be drafted and sent to the new customer prior to the 120-day period. The District's water service policies are defined in the Water Policy Manual (Appendix G). A customer is responsible for paying for appropriate connections charges, and/or costs of extending or upgrading facilities.
4. If an appeal is requested it will be evaluated per the terms of the 2000 CWSP appeal procedure.

3.1.1.2 Water Rights

A summary of the District's water rights is provided in Chapter 7 of this Water System Plan.

3.1.1.3 Capacity

The physical capacity of the District's water systems is addressed in Chapter 6 of this Water System Plan.

3.1.1.4 Consistency

Consistency determinations are as provided by the local land use authorities. Copies of the consistency determinations for this Water System Plan are located in Appendix A.

3.1.1.5 Priority Service Areas

The District has been contacted regarding service to LaConner and many rural areas including Allen Island, Humphrey Hill, Lake McMurray, and Starbird Road; areas around Clear Lake, Big Lake, Pass Lake, Ten Lake, Lake Cavanaugh, Concrete, and Fonk Road; and several islands. These in-county

areas fall within the District's retail service area. The District will provide retail water service to those customers desiring water service so long as this meets the provisions of the District's water code and water can be provided in a timely and reasonable manner.

In coordination with Skagit County, the District has identified high-priority areas for the provision of water service. These priorities include the following:

1. Service to Urban Growth Areas; and
2. Service to areas with pre-existing higher rural density land use designations AND either of the following two types of flow constraints:
    a. Instream flow constraints due to limited access to on-site water supplies under state instream flow rules (Chapters 173-503 and 173-505 WAC); or
    b. Low-flow basins identified in Skagit County's Critical Areas Ordinance (Skagit County Code 14.24).

The pre-existing higher rural density land use designations have corresponding Skagit County Comprehensive Plan designations that recognize these areas (i.e., limited areas of more intensive rural development (LAMIRD), as authorized by RCW 36.70A.070(5)(d)(i)).

3.1.1.6 Low-Priority Areas for Public Water Service

The following two types of Skagit County Comprehensive Plan designated areas are low priority for public water because of their specific long-term purposes as forest resource or open space lands:

1. Industrial Forest Natural Resource Lands

    Water service is discouraged in commercial forest resource lands, per the following policies:

    Countywide Planning Policy 2.10:
    Establishment or expansion of local improvement districts and special purpose taxing districts except flood control, diking districts and other districts formed for the purpose of protecting water quality, in designated commercial forest resource lands shall be discouraged.

    Skagit County Comprehensive Plan Policy 4B-4.4:
    Discourage Tax Districts and LIDs (Local Improvement Districts)
    Special purpose taxing districts and local improvement districts that plan to expand into Industrial Forest Lands, allowing as a result new residential or commercial development, shall be required to provide an analysis of impacts and related mitigation of such new, non-resource development on established commercial forestry operations.

2. United States Forest Service and National Park Service lands with County designation of Open Space of Regional/Statewide Importance (OSRSI) and having no or limited facilities.

   The specific areas include North Cascades National Park, Noisy Diobsud Wilderness, Glacier Peak Wilderness, Ross Lake National Recreation Area, and the Mount Baker–Snoqualmie National Forest.

3.1.2 Future Service Area

As outlined in the District's Service Area Agreement (see Appendix D), the District has the potential of serving any area within the county not already a designated service area of another approved water utility. Furthermore, per RCW 54.16.030, the District has the authority to serve water to any persons including public and private corporations outside its designated service area, "including full and exclusive authority to sell and regulate and control the use, distribution, and price thereof."

The District has discussed extension of service with the Samish Water District around Lake Samish in Whatcom County, and has been approached by utilities in Island County and San Juan County regarding satellite service. Any potential customer(s) outside Skagit County has the opportunity to have its area annexed into the service territory of the District, provided its area is contiguous with the District's existing service boundary. The conditions and processes for annexation are outlined in RCW 54.04.035; annexation affords the customer(s) representation as a constituent(s) of a District Commissioner and allows the customer(s) to vote for District Commissioners. Any future expansion of water service area should also address Section IV. G. 2 of the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes (1996 MOA) (see Section 3.3.1), which states:

> (the parties agree) *To reach agreement prior to expanding service areas beyond those identified in the CWSP. Such agreement will be based on evaluations of additional needs existing at the time, and after considering additional needs that may exist after the 50-year term of this Agreement. If the Parties cannot agree, then they may not seek or approve any changes relating to water quantity associated with the expansions of service areas for a period of 50 years from the effective date of this Agreement.*

3.1.3 Service Area Agreements

The 2000 CWSP identified the District and the City of Anacortes as the responsible entities for serving growth in urban areas. Accordingly, the District and Anacortes implemented a Joint Operating Agreement (JOA) for development of shared regional water supply facilities. A copy of the JOA is included in Appendix D. Under the terms of the JOA, the District and Anacortes agreed to pursue joint use facilities for their mutual benefit, especially those that would provide a backup supply from one utility to the other during an emergency shutdown or catastrophic failure. Such facilities may include strategically-located interties (preferably two-way), distribution storage tanks, and new or improved water treatment facilities. The Riverbend Intertie was the first facility developed under the

JOA, and the 1996 MOA was an out-growth of the JOA. Additional or expanded interties must first consider and plan for in-county consumptive and non-consumptive needs, then consider demands outside the county.

The District also has water service agreements with two wholesale water purchasers: Samish Farms Water District and the North Fir Island Water Association. Those agreements are included in Appendix D.

3.1.4 Satellite Management Agencies

The District is the primary Satellite Management Agency for Skagit County (Satellite Management Agency #103) and, as identified in the CWSP, will work with any water system that is unable to provide service within or adjacent to its own designated service area, and will evaluate service to any new system in undesignated areas. The District will provide service whenever financially feasible, and may provide service either by line extension from an existing system or by establishment of a new remote system. The District currently owns and operated eight satellite systems that are discussed in greater detail in Chapter 12.

3.2 Local and Regional Utility Planning

3.2.1 Skagit County Coordinated Water System Plan – Regional Supplement

The Public Water System Coordination Act of 1977 (Chapter 70.116 RCW) requires coordinated planning among public water supply systems within critical water supply service areas. In 1982, the area known as Fidalgo Island was designated a critical water supply service area, and in 1984 the Skagit Board of County Commissioners adopted the first coordinated water system plan titled "Anacortes–Fidalgo Island Coordinated Water System Plan". After several years, it became apparent to resource managers that many of the water system issues being dealt with locally had implications outside the Fidalgo Island area. Subsequently, in July 1993, the Skagit Board of County Commissioners approved an updated CWSP that included all of Skagit County. The plan was updated in 2000.

The purpose of the CWSP is to provide for maximum integration and coordination of public water system facilities consistent with the protection and enhancement of the public health and well-being. The 2000 CWSP describes strategies intended to manage the county's potable water according to applicable statutes and ordinances. Topic areas covered in the plan include minimum design standards, water utility service areas, utility service review procedures, satellite system management, water demand forecasts, water supply system assessments, regional water supply strategies, and a joint use facilities plan. This Water System Plan is consistent with the policies, goals, and requirements set forth in the CWSP.

3.2.2 District Water Policy Manual

The District Water Policy Manual outlines the policies and procedures to be applied by District staff while providing utility services to individual properties. The policies guide how the District will manage extensions, make improvements to the District's water system, and provide service to satellite utility systems owned or operated by the District. Specifically, the manual provides information on the following:

- Terms, conditions, and policies for furnishing and receiving water
- Metering and billing procedures
- Schedules for water rates
- Fees and deposits
- Source water protection
- Environmental policies
- Management strategies for satellite systems
- System extensions policies
- Water system design criteria

The Water Policy Manual was originally drafted in January 2005 but is a living document. Content of the manual is continually updated as policies and procedures evolve and change. This is so the document can serve as a daily reference guide for staff and management. This Water System Plan is consistent with the policies and requirements set forth in the District Water Policy Manual, which is provided in Appendix G.

3.2.3 Local Government Comprehensive Plans

A comprehensive plan is a local government's codified strategy for managing future growth, land use, and development within its jurisdictional boundaries. These plans are long-range in nature, typically with 20-year planning horizons, and contain a broad set of goals, policies, and objectives that address land use, urban design, transportation, housing, economic development, parks and open space, community facilities (e.g., hospitals, schools), and utility services. Comprehensive plans are implemented through zoning, land division regulations, and other codes. The District's largest water system, Judy Reservoir, lies within and serves unincorporated Skagit County and the cities of Burlington, Mount Vernon, and Sedro-Woolley. All of these local governments have comprehensive plans and zoning ordinances that affect the development and future placement of District utility infrastructure. This Water System Plan and the policies it contains are consistent with these locally-adopted comprehensive plans and their implementing regulations.

3.2.4 SEPA Review Process

The District has prepared a State Environmental Policy Act (SEPA) Environmental Checklist in accordance with WAC 197-11. Based on the checklist, a Determination of Non-Significance (DNS) has been issued. Copies of the completed SEPA Environmental Checklist and DNS are included in Appendix A.

3.3 Water Supply

This section describes documents that shape the way the District's water supply is managed.

3.3.1 1996 Memorandum of Agreement

In 1996, representatives from several important stakeholder groups including the District, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, Washington State Department of Ecology (Ecology), and Washington Department of Fish and Wildlife signed the Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes (MOA). The agreement was intended to shape water use policy over a 50-year period. According to the MOA, its purpose was to do the following:

- Ensure the establishment of instream flows to protect fisheries resources, and the mitigation of any interference with such established flows.
- Provide a mechanism for the coordinated management of water resources and to meet the out-of-stream needs of the Swinomish Tribal Community, Upper Skagit River Tribe, Sauk-Suiattle Indian tribes, local governments, and public water purveyors in Skagit County.
- Avoid litigation or adjudication between parties to the agreement.
- Help expedite Ecology's water right decision-making within the CWSP service area.
- Modify the CWSP to conform to the agreement and incorporate the agreement into Anacortes' and the District's JOA.

In addition, specific water rights for Anacortes and the District were documented as part of the MOA. Chapter 7 of this Water System Plan includes a detailed discussion of the District's water rights related to the MOA. This Water System Plan acknowledges the agreements documented in the MOA and is consistent with the intent and arrangements made in that accord. The MOA is provided in Appendix H.

3.3.2 Skagit River Basin Instream Resources Protection Program Rule (WAC 173-503)

Enacted in 2001, the Skagit River Basin Instream Resources Protection Program Rule established instream flows for the Skagit River and the Cultus Mountain streams as envisioned in the 1996 MOA. This rule is discussed in greater detail in Chapter 7 of this Water System Plan.

3.3.3 Cultus Mountain Watershed Management Plan

The Cultus Mountain Watershed Management Plan serves as documentation of the watershed control program implemented by the District. This plan is used to control sources of potential contamination to supply sources for the Judy Reservoir water system. The Cultus Mountain Watershed Management Plan is discussed in greater detail in Chapter 7 of this Water System Plan and the plan's table of contents is provided in Appendix E.

3.3.4 Skagit River Watershed Control Plan

The District and the City of Anacortes developed a watershed control plan for the Skagit River to control sources of potential contamination to supply sources used by both purveyors. The Skagit River Watershed Control Plan is discussed in greater detail in Chapter 7 of this Water System Plan and is provided in Appendix F.

3.3.5 Anacortes and District Joint Operating Agreement

Anacortes and the District are the entities responsible for serving water to populations in Skagit County's urban areas. To this end, Anacortes and the District have entered into a Joint Operating Agreement (JOA) to coordinate the operation and maintenance of infrastructure, eliminate duplicate responsibilities, and develop shared regional water supply facilities. According to the JOA, the specific intent of the contract is to "make provisions for a standardized method to expand the Skagit Regional Water Supply System to meet the public water supply needs, and to establish a basis for agreement between Anacortes and the District for financing, ownership, construction and operation of new joint facilities required for the Skagit Regional Water Supply System."

Under terms of the agreement, several items are specified, such as connections to public water systems, supply of water, capacity rights, fees, administrative provisions, and other matters affecting the rights and responsibilities of both parties' water supply systems. This Water System Plan acknowledges the agreements documented in the JOA and is consistent with the intent and arrangements made in that accord. The JOA is provided in Appendix D.

3.3.6 Skagit County Franchise Agreement

The District holds a franchise agreement with Skagit County that allows the District to use county right-of-way for the purposes of operating, maintaining, and improving the District's utility infrastructure. The agreement spells out specific conditions to which both parties are legally bound. For example, the agreement obligates the District to repair, to a specific standard, roads disturbed by District construction activities; requires minimum interference with public travel during construction

and operation of District projects; and calls for District project approval by the County through either a permitting process or design review. The agreement states that the County shall coordinate and notify the District of road modifications or improvements, road vacations, and utility relocations. The agreement term is 50 years and the term will expire in 2043. This Water System Plan and the planned actions described within it are intended to comply with the terms of the franchise agreement with Skagit County. The District franchise agreement is contained in Appendix D.

3.4 Customer Agreements

The District has water service agreements with two wholesale water purchasers and one retail water purchaser. This section discusses the customer service agreements in which the District is currently involved.

3.4.1 Wholesale Customer Agreements and Plans

The District currently wholesales water to two customers: Samish Farms Water District and North Fir Island Water Association. This section briefly discusses the details of each agreement. More detailed information regarding quantity of water, points of delivery, water quality, rates and charges, and other subjects is listed in the wholesale agreements, which are provided in Appendix D.

3.4.1.1 Samish Farms Water District

The District has a water supply agreement with the Samish Farms Water District. The agreement took effect April 30, 1996. The contract is not to exceed 25 years from date of execution, but may be extended at the option of either party with the consent of the other for additional 3-year periods. The District agrees to provide no less than 810,000 cubic feet of water per calendar month and no more than 1,100,000 cubic feet of water per calendar month.

3.4.1.2 North Fir Island Water Association

The District has a water supply agreement with the North Fir Island Water Association. The agreement took effect July 5, 1983. The contract is not to exceed 25 years from date of execution, but may be extended at the option of either party with the consent of the other for additional 3-year periods. The District agrees to provide no more than 125 gallons per minute at the delivery point. This agreement expired on July 5, 2008; however, the District still provides North Fir Island Water Association with water under this expired contract. A new contract with North Fir Island Water Association is presently being negotiated.

3.4.2 Retail Customers

The District currently has a large number of retail commercial, industrial, and residential customers in Mount Vernon, Burlington, Sedro-Woolley, and the surrounding areas of Skagit County. One of the larger customers is briefly discussed in this section. More detailed information regarding quantity of water, points of delivery, water quality, rates and charges, and other subjects is listed in the retail agreements, which are provided in Appendix D.

3.4.2.1 Sierra Pacific Industries

The District has a water supply agreement with Sierra Pacific Industries. The agreement took effect September 11, 2008. The District and Sierra Pacific Industries agreed that the service would be continuous until the agreement was terminated. Sierra Pacific Industries estimated that it requires pressures of water at 80 to 100 psi and in amounts of a "maximum" continuous flow rate of 217–234 gallons per minute (gpm), an "average" continuous flow rate of 159–176 gpm, with an anticipated maximum quantity of water equal to 81,000,000 gallons per calendar year.

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4 PLANNING DATA AND WATER DEMAND FORECASTING

This chapter discusses the planning data and water demand forecast information used to assess the current and future capabilities of the District's water system. It summarizes historical and projected population trends in the District's water service area as well as water use characteristics, including production, consumption, and related factors used to develop the District's demand forecast for the 20-year planning period.

4.1 Population Data

Population data were used to understand the historical growth patterns of Skagit County, and as an indicator of the growth potential during this 20-year planning period. Population data from the U.S. Census Bureau and from the Washington State Office of Financial Management (OFM) were used to develop population growth projections for the customers within the Judy System. These growth projections were used as a reference, along with historical water consumption data and potential meter growth, in the development of the water demand forecasts. Other growth projection sources, such as the Skagit County Comprehensive Plan, were not used for this analysis due to the relatively outdated information compared to the newer information provided by the U.S. Census Bureau and OFM.

4.1.1 Historic

U.S. Census Bureau population data collected for 1990, 2000, and 2010 for Skagit County, incorporated cities and towns, as well as the unincorporated areas of the county are displayed in Table 4-1 below. For the county as a whole, and for each individual city and town, the rate of population growth slowed between 2000 and 2010 compared to the rate between 1990 and 2000. However, while the growth rate slowed, the percentage of new population that became District customers increased over the same period. During the 20-year period from 1990 to 2010, just over 37,000 people were added to the county's population. Of this total number, over 22,000, or nearly 60%, were added in the three cities of Burlington, Mount Vernon, and Sedro-Woolley. During the 10-year period from 2000 to 2010, of the approximately 14,000 residents added to the county's population, approximately 9,000, or nearly 65%, were residents of Burlington, Mount Vernon, and Sedro-Woolley.

Table 4-1. Census Data for Historic Population Growth in Skagit County

Locality	1990	2000	10-Year Growth Rate (1990–2000)	2010	10-Year Growth Rate (2000-2010)
Skagit County	79,545	102,979	29.5%	116,901	13.5%
Anacortes	11,451	14,707	28.4%	15,778	7.3%
Burlington	4,349	6,623	52.3%	8,388	26.6%
Concrete	735	832	13.2%	710	-14.7%
Hamilton	228	330	44.7%	301	-8.8%
La Conner	656	782	19.2%	891	13.9%
Lyman	275	384	39.6%	438	14.1%
Mount Vernon	17,647	26,297	49.0%	31,743	20.7%
Sedro-Woolley	6,333	8,698	37.3%	10,540	21.2%
Unincorporated Areas	37,871	44,326	17.0%	48,112	8.5%

Source: Adapted from Washington State Office of Financial Management (OFM 2012)

4.1.2 Future

As directed by state statute RCW 43.62.035, every 5 years OFM prepares a reasonable range of population growth forecasts for Washington counties required to comply with the Growth Management Act. The population forecasts are projected for a 20-year period and include a low, medium, and high estimate. The medium-level projection represents OFM's estimate of the most likely population projection for the county. Skagit County is required to plan under the Growth Management Act. The OFM low, medium, and high forecasts for Skagit County for 2020, 2030, and 2040 are presented in Table 4-2.

Table 4-2. OFM Population Projections for Skagit County Based on the 2010 Census

Census 2010	OFM Projection	2020	10-year Growth Rate (2010–2020)	2030	10-year Growth Rate (2020–2030)	2040	10-year Growth Rate (2030–2040)
116,901	Low	112,269	-4.0%	121,917	8.6%	132,559	8.7%
	Medium	128,249	9.7%	144,953	13.0%	162,738	12.3%
	High	150,199	28.5%	179,929	19.8%	210,827	17.2%

As a comparison, the District's 2007 Water System Plan provided population forecasts from OFM using the 2000 census data, and from the 2000 Coordinated Water System Plan. Table 4-3 shows the projections made by OFM and the CWSP for 2010.

Table 4-3. Previous OFM and CWSP Population Projections for Skagit County

Census 2000	Projection Rates	OFM 2010 Projection	2000 CWSP Projection	Census 2010
102,979	Low	113,902	118,853	116,901
	Medium	123,807	125,510	
	High	137,054	136,644	

As evidenced by Table 4-3, the actual census population for 2010 was between the low and medium growth rates for the OFM projections and below the low growth rate for the CWSP. As mentioned earlier, the actual population growth rates are considered, along with historical growth information of the District's customers, to determine the future meter growth rate and the water demand forecast.

4.2 Water Usage Characteristics

4.2.1 Production

Figure 4-1 shows a history of the District's water production including production from the District's water treatment plant and the water purchased from the City of Anacortes through interties. Total water production into the District's system has ranged from a low of 2,832 million gallons in 2005 to a high of 2,945 million gallons in 2007. The average annual production over the past 9 years has been 2,908 million gallons. The overall production is not expected to change, but it is expected that the amount of water purchased from Anacortes through the interties will decrease considerably because of the completion of the Josh Wilson Road pipeline, which brings the District's water to customers in Bay View.

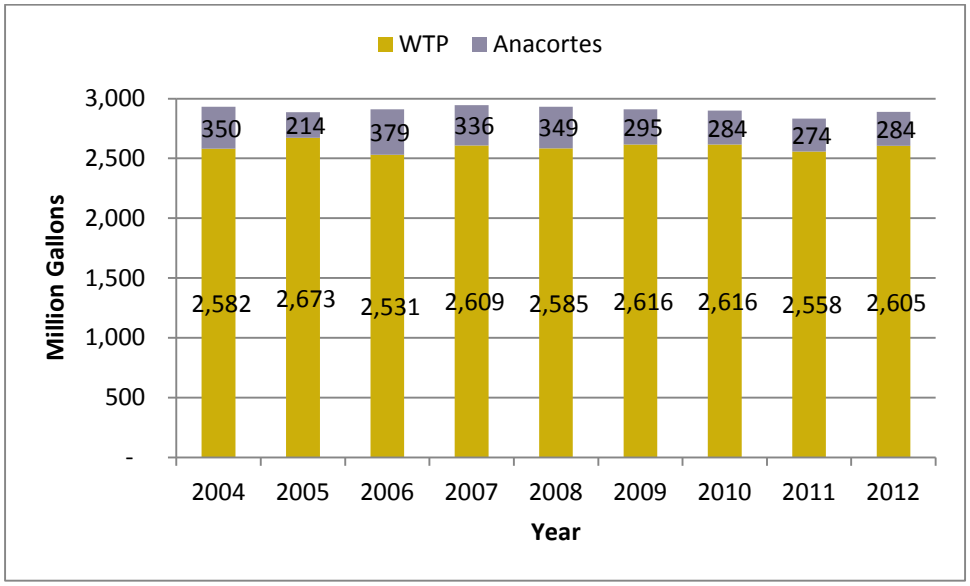

Figure 4-1. Annual Water Production (2004–2012)

Production typically increases in the summer months due to irrigation use. Figure 4-2 shows the average monthly distribution of water production from the District's water treatment plant for 2010-2012.

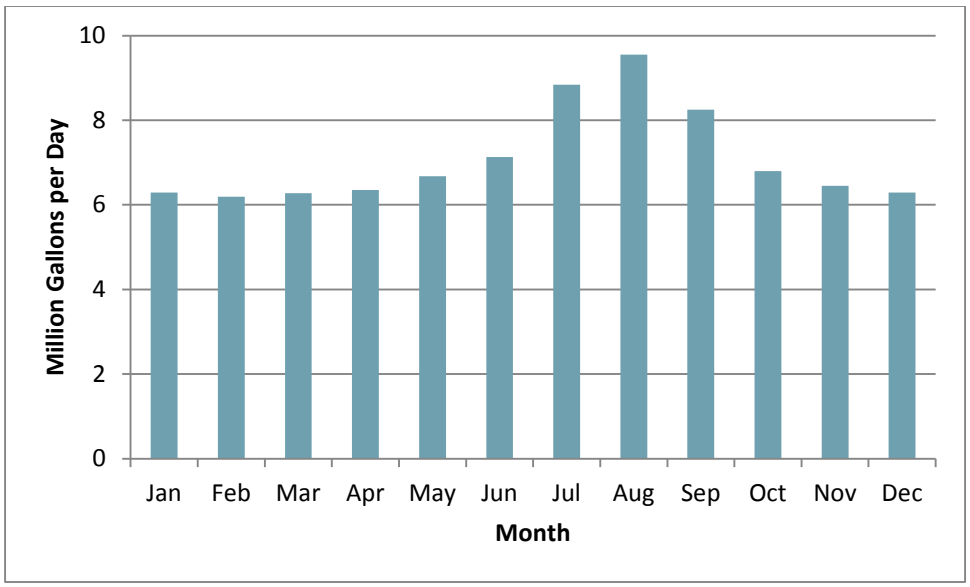

Figure 4-2. Monthly Distribution of Water Production (2010–2012 Average)

For 2012, the average day production for the system, including production from the water treatment plant and the water purchased from Anacortes, was 7.98 MGD. The peak production day for 2012 occurred on August 16 and was 12.68 MGD, resulting in a peaking factor of 1.59. Table 4-4 lists the average day and peak day production and the peaking factor for 2004–2012.

Table 4-4. Peaking Factor

Year	Average Day Production from WTP And Anacortes (MGD)	Peak Day Production from WTP and Anacortes		Peaking Factor
		(MGD)	Date	
2004	8.01	12.78	7/23	1.59
2005	7.89	13.75	7/26	1.74
2006	7.95	13.79	7/3	1.73
2007	8.05	16.88	7/12	2.10
2008	8.01	12.93	8/16	1.61
2009	7.95	14.16	7/28	1.78
2010	7.92	13.37	8/17	1.69

Year	Average Day Production from WTP And Anacortes (MGD)	Peak Day Production from WTP and Anacortes		Peaking Factor
		(MGD)	Date	
2011	7.74	12.79	9/22	1.65
2012	7.98	12.68	8/16	1.59

4.2.2 Consumption

The District's primary water customer category is residential; however, a variety of other customer types are served. The District's customer categories are grouped as follows:

Residential: The residential customers include single-family residences.

Multi-Family: Multi-family customers are defined as apartments, condominiums, and other structures where multiple dwellings are served from a single water meter.

Commercial and Industrial: This category includes retail consumers, churches, as well as manufacturing and processing consumers.

Government: Buildings or facilities that are owned by local government agencies, including schools.

Farms: Customers that own and operate farms.

Irrigation: Customers that provide irrigation water to their property, including golf courses.

Fire Protection: Water that is used by Fire Departments and Fire Districts throughout Skagit County for use in training staff in how to fight fires, and for actually fighting the fires.

Resale: Resale customers have a wholesale meter that provides water to a specific area. The District currently has two resale customers: North Fir Island Water Association and Samish Farms Water Association.

Other: This includes two small customer categories: Manifold (non-irrigation), which includes the residential meter on a manifold meter set up for both irrigation and consumption; and Statement No-Bill, which includes the water consumption by the District's facilities that is not billed. This includes things like the backwash water at the water treatment plant and the water used by the District office.

Table 4-5 shows the number of active service connections by customer category for 2012, along with the total water consumption for that category and the overall percentage of consumption compared to the yearly total.

Table 4-5. 2012 Service Connections by Category

Category	Number of Meters	Water Consumption (MG)	% of Total
Residential	19,469	1,084.05	42.8
Multi-Family	1,209	387.49	15.3
Commercial/Industrial	1,776	759.55	30.0
Government	186	65.45	2.6
Farms	124	115.46	4.6
Irrigation	182	81.24	3.2
Fire Protection	103	0.28	0.01
Resale	2	32.79	1.3
Other	12	7.90	0.3
TOTAL	23,063	2,534.21	100

Since 2007, there has been an increase in the number of new water meters within the District's system. However, the growth in the meter count does not correspond with the annual water production, as provided in Figure 4-1. Table 4-6 shows the growth in the number of meters compared to the overall water production.

Table 4-6. Service Connection Growth by Year

Year	Number of Meters	% Growth	Water Production (MG)	% Growth
2007	22,402		2,945	
2008	22,634	1.0%	2,940	-0.2%
2009	22,856	1.0%	3,020	2.7%
2010	22,895	0.2%	2,898	-4.0%
2011	22,938	0.2%	2,832	-2.3%
2012	23,063	0.5%	2,921	3.1%

The overall quantity of water produced, including the production at the WTP and the water purchased from Anacortes, decreased from 2007 to 2012. With the number of meters increasing during this same period, the average consumption per equivalent residential unit (ERU) has decreased. This is discussed in greater detail below.

Customers with large water demands are of interest because their demand can have a significant impact on the overall water demand for the District's system. The 10 largest District customers on the Judy System are listed in Table 4-7.

Table 4-7. District's Largest Customers in 2012

Customer	Service Type	2012 Volume Used (MG)
Draper Valley Farms	Commercial	121.1
Sierra Pacific	Industrial	117.4
Advanced Refreshment LLC	Commercial	82.2
Samish Farms Water Association	Re-Sale	30.0
Sakuma Bros.	Commercial	26.0
Skagit Gardens Nursery	Irrigation	23.2
Skagit Valley Mobile Manor	Multi-Family	16.1
Eaglemont Golf Course	Irrigation	12.2
Washington Bulb Company	Commercial	11.7
Cascade Ag Services	Commercial	11.2

4.2.3 Water Use Factors – Equivalent Residential Units

The residential water use factor for 2012 was found to be 152 gallons per day per residential account. This number was determined by taking the average daily water consumption for the entire Residential meter category and dividing it by the total number of meters.

Water Use Factor = 1,084,051,716 gallons per year / 366 days per year / 19,469 meters

Water Use Factor = 152.1 gallons per day per meter

This number was used to determine the ERU for each of the remaining customer categories to determine the overall number of ERUs in the system. Table 4-8 shows the results of those calculations.

Table 4-8. Water Use Factor and 2012 ERUs

Category	Number of Meters	2012 Water Consumption (MG)	ERUs
Residential	19,469	1,084.0	19,469
Multi-Family	1,209	387.5	6,959
Commercial/Industrial	1,776	759.6	13,641
Government	186	65.5	1,175
Farms	124	115.5	2,074
Irrigation	182	81.2	1,459
Fire Protection	103	0.3	5
Resale	2	32.8	589
Other	12	7.9	142
TOTAL	23,063	2,534.2	45,513

Note: ERUs calculated by dividing the 2012 water consumption by residential water use factor of 152.1.

ERUs are a method of representing water use by non-residential customers as an equivalent number of residential customers. An ERU is the amount of water used by a single-family household, and is used in the analysis of the system to determine the availability of source or reservoir storage adequacy. The District's water use factors numbers from 2007–2012 are presented in Table 4-9.

Table 4-9. Water Use Factors from 2007 through 2012

Year	Number of Residential Meters	Water Use Factor
2007	22,393	167.5
2008	22,625	159.6
2009	22,843	172.1
2010	22,889	160.5
2011	22,927	149.9
2012	23,050	152.1
	Average	160.3

As shown in Table 4-9, the ERU has been on a downward trend since 2007, indicating water conservation throughout the District. The average water use factor of 160.3 is what is used to determine the water use forecast.

4.2.4 Water Balance, Non-Revenue, and Leakage

The District embarked on a water meter replacement program in 2007 and 2008 that replaced all of the existing small-diameter water meters with new radio-read Badger meters. Other larger-diameter water meters are also systematically being replaced as budget allows. The new water meters have given staff more confidence in the readings, as well as being able to detect faulty meter reads based on historical usage and possible leaks on the customer side of the meter. In 2014 the District plans to replace two additional meters located at the WTP on each of the District's transmission lines. The replacement of these source meters will be a tremendous help in the tracking the revenue vs. non-revenue water.

A water balance is an accounting for all water that is produced and purchased. Table 4-10 shows the water balance for the District's Judy System for 2012. It is a slightly modified version of the format recommended for use by the American Water Works Association's Water Loss Committee.

Table 4-10. Water Balance (2012)

	Level 1	Level 2	Level 3	Million Gallons	% of Water Produced
Water Produced	Revenue Water	Billed Authorized Consumption	Billed Water Exported (1)	32.8	1.1%
			Billed Metered Consumption (2)	2,493.5	85.4%
			Billed Unmetered Consumption	0	0
	Non-Revenue Water	Unbilled Authorized Consumption	Unbilled Metered Consumption (3)	7.9	0.3%
			Unbilled Unmetered Consumption	0	0
		Apparent Losses	Unauthorized Consumption	0	0
			Customer Metering Inaccuracies	0	0
		Real Losses	Known Leakage	0	0
			Assumed Leakage (4)	387.1	13.3%
			Total	2,921.3	100%

1. Water sold to resale customers North Fir Island Water Association and Samish Farms Water Association.
2. Water sold to retail customers.
3. This represents consumption by District facilities that is metered but not billed, as well as a manifold non-irrigation meter.
4. This is the overall water production (District WTP production plus purchased water from Anacortes) minus all other categories. As mentioned in this chapter, the District will be replacing two of the large source meters at the WTP, which is expected to increase the reliability and accuracy of the overall system reads.

The water balance allocates the water production to different categories at three different levels:

Level 1 – allocates the water to either Revenue or Non-Revenue Water. As implied by the names, Revenue Water generates income while Non-Revenue Water does not. This is helpful in understanding what percent of water production generates income for the District. Additionally, Non-Revenue Water needs to be factored into the demand forecast.

Level 2 – splits Non-Revenue Water into the following three sub-categories, which are useful in identifying potential additional revenue sources and identifying the magnitude of leaks that could be fixed.

Unbilled Authorized Consumption: Includes uses such as water system flushing, firefighting, and water used for District facilities.

Apparent Losses: Includes unauthorized uses and customer meter inaccuracies, both of which are lost revenue opportunities.

Real Losses: Includes various types of system leaks and also includes inaccuracies in the meters themselves. A certain level of leakage is unavoidable; however, leakage beyond that level should be repaired as soon as practically possible to avoid damage to the natural resource and physical infrastructure. Any amount that cannot be assigned to another category is considered a Real Loss under the American Water Works Association's protocol, as well as per the formula for calculating distribution system leakage under Washington State's Water Use Efficiency Rule.

Level 3 – simply further splits the water into additional sub-categories.

Table 4-11 shows a history of the District's water balance elements, namely distribution system leakage and Non-Revenue Water.

Table 4-11. Distribution System Leakage and Non-Revenue Water

Year	Water Produced (MG) [1]	Authorized Consumption		Distribution System Leakage [4]		Non-Revenue Water [5]	
		Billed (MG) [2]	Unbilled [3]	Qty (MG)	% of Production	Qty (MG)	% of Billed Consumption
2007	2,945	2,643	8.4	294	10.0%	302	11.4%
2008	2,933	2,686	7.0	240	8.1%	247	9.2%
2009	2,911	2,729	7.7	174	6.0%	182	6.7%
2010	2,900	2,598	5.7	296	10.2%	302	11.6%
2011	2,832	2,470	82.4	280	9.9%	362	14.7%
2012	2,921	2,527	7.9	387	13.3%	394	15.6%
AVG	2,907	2,609	19.8	278	9.6%	298	11.4%

1. This is the overall water production for the year, including the production from the District's WTP and water purchased from the City of Anacortes.
2. Water sold to District customers.
3. This represents consumption by District facilities that is metered but not billed, as well as a manifold non-irrigation meter.
4. As defined by the Water Efficiency Rule, Distribution System Leakage is the water production minus authorized consumption.
5. Calculated as water production minus billed consumption.

4.3 Water Demand Forecast

4.3.1 Customer Demand Forecast

The development of the District's water demand forecast is based on an estimation of the meter growth rate, using OFM population data and historical District customer growth information as a reference, and then calculating the total Maximum Day Demand of the system for each year in the reporting period using the average water use factor from 2007 through 2012 of 160.3 gpd/ERU.

Based on the historical customer growth rate at the District over the past 4 to 5 years, which was affected by a recessionary economy and poor job growth, the customer growth rate was estimated for each of the District's meter categories. Table 4-12 shows the estimated meter growth for each of the different customer categories and the total anticipated growth for the Judy System.

Starting in 2014, the three main customer categories (residential, multi-family, and commercial/industrial) are forecasted to increase approximately 0.8% per year until 2019, and then at 1.0% per year until 2033. This coincides with the recent meter growth that the District has experienced. The other customer categories are forecasted to increase at different rates, with the Resale and Other categories forecasted to have zero growth. The overall meter growth rate calculates as 0.8% per year from 2014 to 2019, and as 1.0% per year from 2020 to 2033.

Each of the customer categories also has its own consumption pattern and specific water use per meter. As a result, the historical annual water usage from 2007 through 2012 was used to determine a water use per meter for each different customer category. The average annual water use per meter for each category from 2007 through 2012 was used as the projected annual water use per meter going forward from 2014 to 2033 for each customer category. Therefore, the projected meter growth per year for each customer category can be translated into the annual water usage per year for each category. Adding up the annual water usage for each customer category provides the total yearly water demand of the customers for each year.

Table 4-13 shows a summary of the meter growth and annual water demand for each customer category for this planning period, including the years 2007 through 2012 to provide a reference point. Table 4-13 also uses the water use factor of 160.3 gpd/ERU to determine the ERU growth for each year for each customer category from 2014 to 2033. The summary total of the meter growth, the annual usage, and the ERU growth is shown totaled on the right side of the table.

4.3.2 System Demand Forecast

The calculation of the overall water demand for the Judy System is more a calculation of the demand of the system, instead of the demand of the customers. The difference between the system demand and the customer demand is the amount of water produced by the WTP and purchased from the City of Anacortes that cannot be accounted for. That water can be allocated to system leakage, inaccurate meter readings, etc. But regardless of where the water eventually goes, the District is required to produce that water at the WTP or purchase it from the City of Anacortes in order to serve the system demand. Therefore, the water demand for the Judy System is calculated based on the system demand and not the customer demand.

The distribution system leakage calculated for 2012 was found to be 13.3%. It is the District's goal to reduce that number to at least 10% in 2014 and to at least 9% for each year after that. The volume of water calculated in the distribution system leakage is added to the customer demand to determine the overall system demand.

Table 4-13 shows the metered demand (customer demand) of the Judy System for each year, as well as the production requirements, which is the overall water demand. For 2012, the overall metered customer demand was 6.92 MGD, whereas the actual water demand and production requirement was determined to be 7.98 MGD. Going forward from 2014, the process of calculating the water demand for a given year was based on the following steps:

1. Add up the annual demand from each customer category to determine the total metered demand for each year. Divide that number by 366 to determine the average daily customer demand.

2. Take the total annual metered demand from the customer categories and add the percentage of distribution system leakage to get the production requirements from the District WTP for each year. Divide that number by 366 to determine the average daily water demand of the District WTP.

Adding the values from steps 1 and 2 above gives the overall production requirements of the Judy System for any given year.

The average yearly peaking factor for the Judy System from 2007 through 2012 was found to be 1.73. This peaking factor is applied to steps 1 and 2 above to determine the peak day customer demand and the overall Maximum Day Demand of the Judy System.

4.3.3 System Demand with Conservation

The total Maximum Day Demand and the residential water use factor of the system are affected by the extent of the water efficiency measures that are adopted (see Chapter 5). After considering the water efficiency measures that are proposed as a part of this plan, and adjusting the residential water use factor as a result of those savings, it is projected that these measures will not significantly reduce the residential water use factor. The District plans to continue the water efficiency measures beyond 2019, but the average water use factor of 160.3 gpd calculated from 2007 through 2012 was used for the water demand forecast.

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Table 4-12 Meter Growth Forecast

	Year	Residential		Multi-Family		Commercial and Industrial		Government		Farms		Irrigation		Fire Protection		Resale		Other		Total	
		Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)
Actual	2007	18,792	2.6%	1,223	1.2%	1,752	1.4%	175	0.0%	124	2.5%	174	5.5%	150	20.0%	2	0.0%	10		22,402	2.6%
	2008	19,048	1.4%	1,220	-0.2%	1,764	0.7%	182	4.0%	123	-0.8%	179	2.9%	106	-29.3%	2	0.0%	10		22,634	1.0%
	2009	19,232	1.0%	1,222	0.2%	1,770	0.3%	182	0.0%	125	1.6%	183	2.2%	130	22.6%	2	0.0%	10		22,856	1.0%
	2010	19,324	0.5%	1,222	0.0%	1,763	-0.4%	187	2.7%	124	-0.8%	184	0.5%	80	-38.5%	2	0.0%	9		22,895	0.2%
	2011	19,363	0.2%	1,217	-0.4%	1,760	-0.2%	186	-0.5%	126	1.6%	181	-1.6%	93	16.3%	2	0.0%	10		22,938	0.2%
	2012	19,469	0.5%	1,209	-0.7%	1,776	0.9%	186	0.0%	124	-1.6%	182	0.6%	103	10.8%	2	0.0%	12		23,063	0.5%
Current	2013	19,566	0.5%	1,215	0.5%	1,785	0.5%	188	1.0%	124	0.3%	183	0.5%	104	0.5%	2	0.0%	12	0.0%	23,179	0.5%
Forecast	2014	19,723	0.8%	1,225	0.8%	1,799	0.8%	190	1.0%	125	0.3%	186	1.5%	105	1.5%	2	0.0%	12	0.0%	23,366	0.8%
	2015	19,881	0.8%	1,235	0.8%	1,814	0.8%	192	1.0%	125	0.3%	188	1.5%	107	1.5%	2	0.0%	12	0.0%	23,554	0.8%
	2016	20,040	0.8%	1,244	0.8%	1,828	0.8%	194	1.0%	125	0.3%	191	1.5%	108	1.5%	2	0.0%	12	0.0%	23,745	0.8%
	2017	20,200	0.8%	1,254	0.8%	1,843	0.8%	195	1.0%	126	0.3%	194	1.5%	110	1.5%	2	0.0%	12	0.0%	23,936	0.8%
	2018	20,362	0.8%	1,264	0.8%	1,857	0.8%	197	1.0%	126	0.3%	197	1.5%	112	1.5%	2	0.0%	12	0.0%	24,129	0.8%
	2019	20,525	0.8%	1,275	0.8%	1,872	0.8%	199	1.0%	126	0.3%	200	1.5%	113	1.5%	2	0.0%	12	0.0%	24,324	0.8%
	2020	20,730	1.0%	1,287	1.0%	1,891	1.0%	201	1.0%	127	0.3%	203	1.5%	115	1.5%	2	0.0%	12	0.0%	24,568	1.0%
	2021	20,937	1.0%	1,300	1.0%	1,910	1.0%	203	1.0%	127	0.3%	206	1.5%	117	1.5%	2	0.0%	12	0.0%	24,814	1.0%
	2022	21,146	1.0%	1,313	1.0%	1,929	1.0%	205	1.0%	127	0.3%	209	1.5%	118	1.5%	2	0.0%	12	0.0%	25,063	1.0%
	2023	21,358	1.0%	1,326	1.0%	1,948	1.0%	208	1.0%	127	0.3%	212	1.5%	120	1.5%	2	0.0%	12	0.0%	25,314	1.0%
	2024	21,571	1.0%	1,340	1.0%	1,968	1.0%	210	1.0%	128	0.3%	215	1.5%	122	1.5%	2	0.0%	12	0.0%	25,568	1.0%
	2025	21,787	1.0%	1,353	1.0%	1,987	1.0%	212	1.0%	128	0.3%	219	1.5%	124	1.5%	2	0.0%	12	0.0%	25,824	1.0%
	2026	22,005	1.0%	1,366	1.0%	2,007	1.0%	214	1.0%	128	0.3%	222	1.5%	126	1.5%	2	0.0%	12	0.0%	26,083	1.0%
	2027	22,225	1.0%	1,380	1.0%	2,027	1.0%	216	1.0%	129	0.3%	225	1.5%	128	1.5%	2	0.0%	12	0.0%	26,344	1.0%
	2028	22,447	1.0%	1,394	1.0%	2,048	1.0%	218	1.0%	129	0.3%	229	1.5%	129	1.5%	2	0.0%	12	0.0%	26,608	1.0%
	2029	22,672	1.0%	1,408	1.0%	2,068	1.0%	220	1.0%	129	0.3%	232	1.5%	131	1.5%	2	0.0%	12	0.0%	26,875	1.0%
	2030	22,899	1.0%	1,422	1.0%	2,089	1.0%	222	1.0%	130	0.3%	236	1.5%	133	1.5%	2	0.0%	12	0.0%	27,144	1.0%
	2031	23,128	1.0%	1,436	1.0%	2,110	1.0%	225	1.0%	130	0.3%	239	1.5%	135	1.5%	2	0.0%	12	0.0%	27,417	1.0%
	2032	23,359	1.0%	1,451	1.0%	2,131	1.0%	227	1.0%	130	0.3%	243	1.5%	137	1.5%	2	0.0%	12	0.0%	27,692	1.0%
	2033	23,592	1.0%	1,465	1.0%	2,152	1.0%	229	1.0%	131	0.3%	246	1.5%	139	1.5%	2	0.0%	12	0.0%	27,969	1.0%

Table 4-13 Water Demand Growth Forecast with Conservation

	Year	Residential			Multi-Family			Commercial and Industrial			Government			Farms			Irrigation			Fire Protection			Resale			Other			Total			Metered Demand		Production Requirements	
		Meter Quantity	Annual Usage (MG)	GPD/M (ERU value)	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Average Day Demand (ADD)	Maximum Day Demand (MDD)	Average Day Demand (ADD)	Maximum Day Demand (MDD)
Actual	2007	18,792	1152.01	167	1,223	415.30	6,774	1,752	702.03	11,452	175	72.56	1,184	124	119.37	1,947	174	141.84	2,314	150	0.78	13	2	38.50	628	10	8.38	137	22,402	2,650.77	43,240	7.24	15.19	8.05	16.88
	2008	19,048	1112.84	160	1,220	408.38	6,990	1,764	733.55	12,556	182	68.65	1,175	123	127.85	2,188	179	107.10	1,833	106	97.59	1,670	2	32.00	548	10	6.99	120	22,634	2,694.95	46,128	7.36	11.88	8.01	12.93
	2009	19,232	1211.59	172	1,222	421.17	6,685	1,770	736.79	11,695	182	74.36	1,180	125	125.58	1,993	183	118.12	1,875	130	0.41	7	2	40.76	647	10	7.68	122	22,856	2,736.47	43,437	7.48	13.31	7.95	14.16
	2010	19,324	1135.45	161	1,222	403.20	6,862	1,763	746.47	12,704	187	74.98	1,276	124	119.78	2,039	184	81.16	1,381	80	0.49	8	2	35.76	609	9	5.70	97	22,895	2,602.98	44,300	7.11	12.01	7.92	13.37
	2011	19,363	1062.23	150	1,217	388.35	7,079	1,760	731.97	13,343	186	60.07	1,095	126	118.18	2,154	181	74.45	1,357	93	0.47	9	2	33.43	609	10	82.42	1,502	22,938	2,551.55	46,511	6.97	11.52	7.74	12.79
	2012	19,469	1084.05	152	1,209	387.49	6,959	1,776	759.55	13,641	186	65.45	1,175	124	115.46	2,074	182	81.24	1,459	103	0.28	5	2	32.79	589	12	7.90	142	23,063	2,534.21	45,513	6.92	11.00	7.98	12.68
		2007-2012 Average:		160.302																															
Current	2013	19,566	1147.58	160.3	1,215	402.73	6,864	1,785	743.69	12,676	188	71.18	1,213	124	121.01	2,063	183	101.99	1,738	104	0.46	8	2	35.54	606	12	7.43	127	23,179	2,631.61	44,861	7.19	12.44	8.08	13.98
Forecast	2014	19,723	1156.76	160.3	1,225	405.95	6,919	1,799	749.64	12,777	190	71.90	1,225	125	121.32	2,068	186	103.52	1,765	105	0.46	8	2	35.54	606	12	7.43	127	23,366	2,652.51	45,217	7.25	12.54	8.05	13.93
	2015	19,881	1166.01	160.3	1,235	409.19	6,974	1,814	755.64	12,879	192	72.62	1,238	125	121.62	2,073	188	105.08	1,791	107	0.47	8	2	35.54	606	12	7.43	127	23,554	2,673.59	45,576	7.30	12.64	8.03	13.89
	2016	20,040	1175.34	160.3	1,244	412.47	7,030	1,828	761.68	12,982	194	73.34	1,250	125	121.92	2,078	191	106.65	1,818	108	0.48	8	2	35.54	606	12	7.43	127	23,745	2,694.85	45,939	7.36	12.74	8.09	14.00
	2017	20,200	1184.74	160.3	1,254	415.77	7,086	1,843	767.78	13,086	195	74.07	1,263	126	122.23	2,083	194	108.25	1,845	110	0.49	8	2	35.54	606	12	7.43	127	23,936	2,716.29	46,304	7.42	12.84	8.16	14.11
	2018	20,362	1194.22	160.3	1,264	419.09	7,143	1,857	773.92	13,191	197	74.82	1,275	126	122.54	2,089	197	109.88	1,873	112	0.49	8	2	35.54	606	12	7.43	127	24,129	2,737.92	46,673	7.48	12.94	8.22	14.22
	2019	20,525	1203.77	160.3	1,275	422.45	7,200	1,872	780.11	13,296	199	75.56	1,288	126	122.84	2,094	200	111.53	1,901	113	0.50	9	2	35.54	606	12	7.43	127	24,324	2,759.72	47,045	7.54	13.04	8.29	14.33
	2020	20,730	1215.81	160.3	1,287	426.67	7,272	1,891	787.91	13,429	201	76.32	1,301	127	123.15	2,099	203	113.20	1,929	115	0.51	9	2	35.54	606	12	7.43	127	24,568	2,786.53	47,502	7.61	13.17	8.37	14.47
	2021	20,937	1227.97	160.3	1,300	430.94	7,345	1,910	795.79	13,564	203	77.08	1,314	127	123.46	2,104	206	114.90	1,958	117	0.52	9	2	35.54	606	12	7.43	127	24,814	2,813.61	47,963	7.69	13.30	8.45	14.61
	2022	21,146	1240.25	160.3	1,313	435.25	7,419	1,929	803.75	13,699	205	77.85	1,327	127	123.77	2,109	209	116.62	1,988	118	0.52	9	2	35.54	606	12	7.43	127	25,063	2,840.97	48,430	7.76	13.43	8.53	14.76
	2023	21,358	1252.65	160.3	1,326	439.60	7,493	1,948	811.79	13,836	208	78.63	1,340	127	124.07	2,115	212	118.37	2,018	120	0.53	9	2	35.54	606	12	7.43	127	25,314	2,868.61	48,901	7.84	13.56	8.61	14.90
	2024	21,571	1265.18	160.3	1,340	444.00	7,568	1,968	819.90	13,975	210	79.42	1,354	128	124.38	2,120	215	120.14	2,048	122	0.54	9	2	35.54	606	12	7.43	127	25,568	2,896.53	49,377	7.91	13.69	8.70	15.05
	2025	21,787	1277.83	160.3	1,353	448.44	7,643	1,987	828.10	14,114	212	80.21	1,367	128	124.70	2,125	219	121.95	2,079	124	0.55	9	2	35.54	606	12	7.43	127	25,824	2,924.73	49,858	7.99	13.82	8.78	15.19
	2026	22,005	1290.61	160.3	1,366	452.92	7,720	2,007	836.38	14,256	214	81.01	1,381	128	125.01	2,131	222	123.78	2,110	126	0.55	9	2	35.54	606	12	7.43	127	26,083	2,953.23	50,343	8.07	13.96	8.87	15.34
	2027	22,225	1303.51	160.3	1,380	457.45	7,797	2,027	844.75	14,398	216	81.82	1,395	129	125.32	2,136	225	125.63	2,141	128	0.56	10	2	35.54	606	12	7.43	127	26,344	2,982.01	50,834	8.15	14.10	8.95	15.49
	2028	22,447	1316.55	160.3	1,394	462.02	7,875	2,048	853.19	14,542	218	82.64	1,409	129	125.63	2,141	229	127.52	2,173	129	0.57	10	2	35.54	606	12	7.43	127	26,608	3,011.10	51,330	8.23	14.23	9.04	15.64
	2029	22,672	1329.71	160.3	1,408	466.64	7,954	2,068	861.73	14,688	220	83.47	1,423	129	125.95	2,147	232	129.43	2,206	131	0.58	10	2	35.54	606	12	7.43	127	26,875	3,040.48	51,831	8.31	14.37	9.13	15.79
	2030	22,899	1343.01	160.3	1,422	471.31	8,033	2,089	870.34	14,834	222	84.30	1,437	130	126.26	2,152	236	131.37	2,239	133	0.59	10	2	35.54	606	12	7.43	127	27,144	3,070.16	52,337	8.39	14.51	9.22	15.95
	2031	23,128	1356.44	160.3	1,436	476.02	8,114	2,110	879.05	14,983	225	85.15	1,451	130	126.58	2,157	239	133.34	2,273	135	0.60	10	2	35.54	606	12	7.43	127	27,417	3,100.14	52,848	8.47	14.65	9.31	16.10
	2032	23,359	1370.01	160.3	1,451	480.78	8,195	2,131	887.84	15,133	227	86.00	1,466	130	126.89	2,163	243	135.34	2,307	137	0.61	10	2	35.54	606	12	7.43	127	27,692	3,130.43	53,364	8.55	14.80	9.40	16.26
	2033	23,592	1383.71	160.3	1,465	485.59	8,277	2,152	896.72	15,284	229	86.86	1,480	131	127.21	2,168	246	137.37	2,341	139	0.62	10	2	35.54	606	12	7.43	127	27,969	3,161.04	53,886	8.64	14.94	9.49	16.42

4.3.4 System Demand Summary

Table 4-14 shows the water demand forecast based on the data discussed in this chapter and accounting for water use efficiency measures. Results from Tables 4-12 and 4-13 for the first year and last year during this Water Use Efficiency Plan period are as follows:

Table 4-14. Water Demand Summary

Year	Period	Demand without Conservation (MGD)	Demand with Conservation (MGD)
2014	Avg Day Demand	8.05	8.05
2019	Avg Day Demand	8.29	8.28

The efficiency measures that can be quantified do not make a significant impact on the overall Average Day Demand. However, there are a number of other measures that will be implemented that are not quantifiable that will help reduce the overall Average Day Demand; because those efficiency measures cannot be quantified, they are not included in the calculations for the water demand summary.

Figure 4-3 shows the projected Average Day Demand and Maximum Day Demand of the Judy System during the next 20-year reporting period.

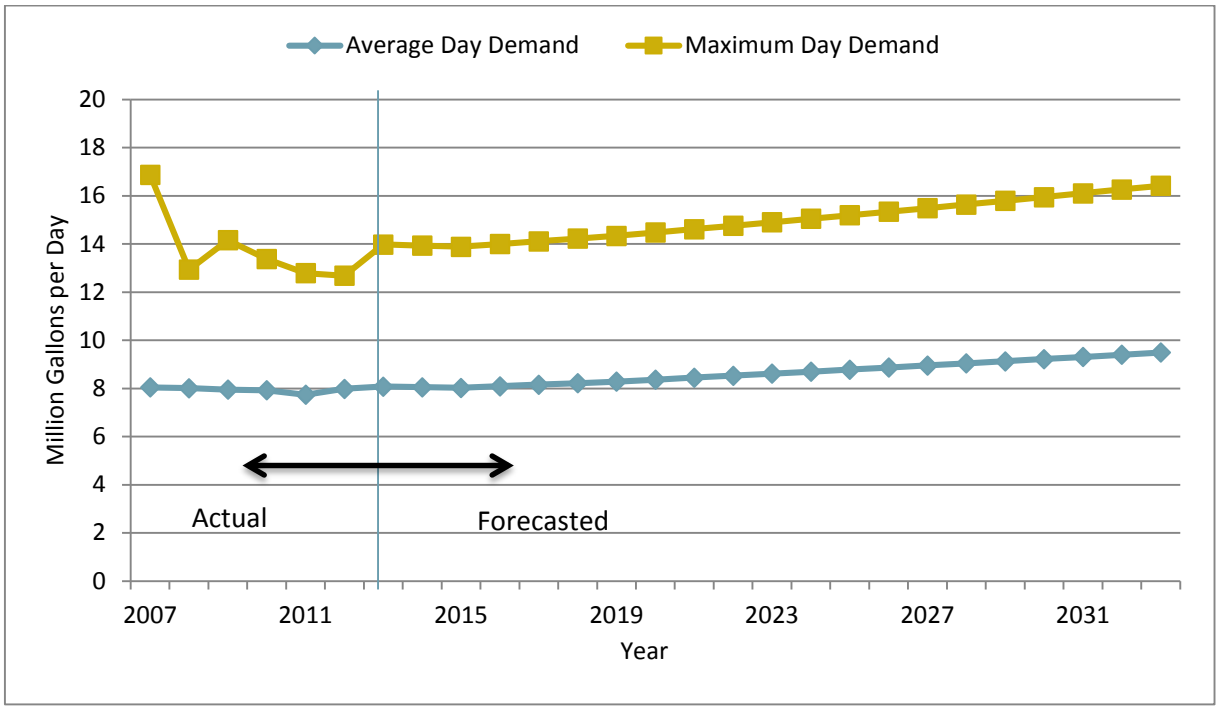

Figure 4-3. Demand Forecast Summary (With Conservation)

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5 WATER USE EFFICIENCY

Water is a precious, limited resource. How we use water affects all of us—our neighbors, businesses, farms, and the environment. In Washington state and elsewhere, growth in residential development, business, agriculture, and recreation has increased demand, and thus competition for water. In addition, dwindling salmon stocks and their listing under the Endangered Species Act have heightened concern about excessive water use and compliance with water resource laws. As the potential to develop new sources of water diminishes, efficient use of water is necessary to meet future demand.

The purpose of this chapter is to provide information on state-mandated conservation requirements for municipal water suppliers, the District's level of compliance with those requirements, the current water use efficiency program adopted by the District, and the water use efficiency program the District will implement from 2014 through 2019.

5.1 Regulatory Requirements and District Compliance

The following section discusses the regulatory requirements that the District must follow in relation to the Washington State Municipal Water Law, and the status of the District's compliance with each of the requirements.

5.1.1 Regulatory Background

To address increasing demand on the state's water resources, the Washington State Legislature passed the Municipal Water Law (Second Engrossed Second Substitute House Bill 1338) in 2003. An elemental function of the law is to provide incentives for efficient use of water by municipal water suppliers and provide greater water right certainty and flexibility. Specifically, the law does the following:

- Clarifies where municipal water utilities can use existing water rights.
- Defines which water systems and suppliers are exempt from Washington's relinquishment statute.
- Establishes new water conservation standards for municipal utilities and those who use their water, and imposes a fee to fund those conservation activities.
- Requires consistency with land use plans and sets forth a duty to provide retail water service.
- Establishes criteria for changing or transferring municipal water rights.
- Allows use of water for environmental goals and pilot watershed agreements.

As part of implementing this bill, the Washington State Department of Health (DOH) was directed by the Legislature to adopt and administer an enforceable Water Use Efficiency Rule (WUER). The rule became effective in 2007 and established water use efficiency requirements that water suppliers must fulfill. Prior to the 2007 WUER requirements, the Office of Drinking Water, a division of DOH, used the 1994 publication *Conservation Planning Requirements* to convey to water purveyors how they should incorporate water use efficiency into their planning process. The *Water Use Efficiency Guidebook* (DOH 2011), now in its third edition, has replaced the 1994 document and describes the requirements outlined in the WUER. This Water System Plan and the conservation planning that preceded it comply with the WUER and the guidelines outlined in the 2011 *Water Use Efficiency Guidebook*.

5.1.2 Requirements and District Compliance Status

Potable water suppliers, their water system plans, and the conservation strategies contained therein are required to comply with the State of Washington WUER and the *Water Use Efficiency Guidebook*. The requirements involve both water system planning and operation. The Water Use Efficiency (WUE) requirements and associated compliance deadlines for Group A municipal water suppliers are listed in order by due date in Table 5-1.

Table 5-1. Summary of Water Use Efficiency Requirements for Group A Municipal Water Suppliers

Requirement	Compliance Deadline	WAC Section Reference	Compliance Status	Notes
Include WUE program in planning documents	January 22, 2008	246-290-810	Yes	—
Submit first annual WUE report	July 1, 2008	246-290-840	Yes	—
Submit service meter installation schedule	July 1, 2008	246-290-496	Yes	System fully metered
Set WUE goals	July 1, 2009	246-290-830	Yes	Adopted new 2014-2019 WUE Goals June 2013
Meet distribution leakage standard	July 1, 2010, or 3 years after installing all service meters	246-290-820	No	Expect compliance by 2014. Action plan in place.
Complete installation of all service meters	January 22, 2017	246-290-496	Yes	—

5.1.2.1 Water Use Efficiency Program

As part of the planning requirements of the WUER, water purveyors must develop a Water Use Efficiency Program and include it in water system plans submitted to DOH after January 22, 2008. Per WAC 246-290-810, purveyors must describe the following elements in their Water Use Efficiency Program:

- The existing conservation program and how much water was saved over the last 6 years due to that program.
- Future program for the next 6 years (including an implementation schedule, budget, and funding mechanism).
- Projected water savings from selected conservation measures.
- Demand forecast that includes both a conservation implementation scenario and a no-conservation implementation scenario.
- Estimated leakage.
- How the purveyor will educate customers about efficiency practices.
- How the program will be evaluated for effectiveness.

5.1.2.2 Goal Setting and Performance Reporting

As mentioned above, the WUER requires municipal water suppliers to establish WUE goals. These goals must be established through a public process and reported on annually to customers and DOH by July 1 of each year. The WUE goals established through a public process are for a 6-year period, and should be re-evaluated each cycle. Goals must be measurable, address water supply and demand forecasting, and include an implementation schedule for each goal.

Performance reports are required to be made available to the public on an annual basis and should include the purveyor's WUE goals, goal achievement status, total annual production, annual leakage volume and percent, and for systems not fully metered, status of meter installation and action taken to minimize leakage. Many purveyors fulfilled this requirement by including the performance report information in their annual Consumer Confidence Report.

5.1.2.3 Distribution Leakage Standard

Prior to adoption of the Municipal Water Law, DOH did not have a set distribution leakage standard, but encouraged a figure of 20% or less. Under the WUER, municipal water suppliers must now meet a distribution system leakage rate of 10% or less of total production. Leakage must be presented both as a percentage and as leakage volume calculated using the mathematical formula defined in the WUER. Leakage is to be based on a rolling 3-year average. Compliance with the distribution leakage standard must be achieved by July 1, 2010; if unable to meet this standard, the supplier must

develop and implement a Water Loss Control Action Plan that outlines the steps and timelines to achieve the desired leakage rate.

5.2 Existing Water Use Efficiency Program

In January 2008, the District established measurable water saving goals for the 6-year period from 2008 through 2013 for both the supply- and demand-side of the District's distribution system. These goals were established through a public process as required by the Municipal Water Law. The goals provide a benchmark for achievement and play a significant role in defining the success of the District's Water Use Efficiency Program. To remain in synch with the update to the Water System Plan, the District re-established its 6-year WUE goals in 2013 for the 6-year period from 2014 through 2019.

The District's WUE goals and the measures taken to help meet those goals are described below.

5.2.1 Goals

The District's 2008–2013 Water Use Efficiency Program contained three goals, which included two demand-side goals and one supply-side goal. These three goals were as follows:

1. **Reduce consumption per Equivalent Residential Units from 178 gallons per service per day to 175 gallons per service per day.**

   Outcome: Equivalent Residential Units are 160 gallons per service per day.

2. **Reduce the summer peak flows from 1.7 times Average Daily Demand to 1.6 times Average Daily Demand.**

   Outcome: Summer peak flows are 1.7 times Average Daily Demand.

3. **Reduce distribution system leakage by 1%, from 7% to 6%.**

   Outcome: After adjusting the method by which the distribution system leakage (DSL) was calculated, the DSL 3-year rolling average is 11.1%.

The District's Water Use Efficiency Program consists of the WUE measures listed in Table 5-2.

Table 5-2. Existing Water Use Efficiency Measures

Measure	Sectors*			Implementation Year					
	SF	MF	NR	2008	2009	2010	2011	2012	2013
Public Outreach	x	x	x	x	x	x	x	x	x
Indoor Retrofit Kits	x	x	x	x					x
Shower Timers	x	x	n/a	x	x	x	x	x	x
School Outreach	x	x	x	x	x	x	x	x	x
Toilet Leak Kits	x	x	x	x	x	x	x	x	x
Soil Moisture Meters	x	x	x					x	x
Rain Barrel Program	x	x	x			x	x	x	x
System Leak Detection & Repair	x	x	x	x	x	x	x	x	x
Bill Showing Consumption History	x	x	x	x	x	x	x	x	x
Large Meter Testing	n/a	x	x	x	x	x	x	x	x

*SF = Single-Family, MF = Multi-Family, NR = Non-Residential, n/a = Not Applicable

5.2.1.1 Public Outreach Program

Water conservation is the "beneficial reduction in water use, waste, and loss" and is proven to be the most economical and environmentally protective means of meeting the challenges of water supply management. Water conservation activities can help save water, save time, and save money year-round, not just in the summer. The main focus of the District's public outreach program is to provide customers with simple behaviors they can adopt to reduce the amount of water they use. The District's public outreach activities include staffed informational booths at local community events, workshops, school fairs, etc. At the events, District staff share ideas on how to identify and stop common leaks, conserve water, and use water more efficiently.

The District provides water saving tips in each issue of its bi-monthly *Pipeline* newsletter. Depending on the season, articles focus on indoor or outdoor aspects of the District's Water Use Efficiency Program such as education programs, water saving devices, and gardening tips. The District also utilizes special publication advertising, the District's website, and social media tools (Facebook and Twitter) to encourage customers to be water-wise.

As part of its community outreach and education strategy, the District also utilizes sponsorships as a way to create awareness and visibility around water use efficiency, conservation, and resource protection. These activities include the following:

- Organizer and major sponsor of the Skagit River Salmon Festival, which brings together other community agencies and organizations to create greater awareness of the need for protecting our watershed and conserving its resources.
- Community sponsoring partner for *Built Green®* workshops targeted to building professionals and homeowners focused on building sustainability issues, including water use efficiency.
- Skagit Watershed Letterbox Trail, a cross between geocaching and a scavenger hunt, is an activity targeted at families using hidden letterboxes to explore the natural wonders of Skagit County while learning how to help protect our watershed.
- Skagit Community Energy Challenge community partner programs that provide interested homeowners with a home energy assessment plus free assessments in water conservation, waste reduction, and creation of wildlife habitat.

5.2.1.2 Indoor Retrofit Kits

The District is a conservation partner with the U.S. Environmental Protection Agency's (EPA's) WaterSense program to help customers decrease indoor and outdoor water use through water-efficient products and simple water saving practices. The program encourages customers to look for WaterSense labeled products, which have been independently certified for efficiency and performance, and promotes water saving techniques that reduce stress on water systems and the environment. The kits were first available through the District in 2008, but were not heavily marketed. New kits were developed in 2012 and include one 1.5-gpm low-flow showerhead, plus a kitchen and bathroom aerator, which are available for sale at the main office for $10.

5.2.1.3 Shower Timers

Standard showerheads use 2-1/2 gallons of water per minute; low-flow showerheads use less than 2 gallons. So, an average 8-minute shower uses 16 to 20 gallons of water. For every moment shaved off shower time, customers are saving water. By setting the timer to 5 minutes, customers can save 6 to 7-1/2 gallons of water per shower, which can significantly add up. The shower timer is one of the District's most popular give-away items at events. Since 2008, the District has handed out 2,250 5-minute shower timers.

5.2.1.4 School Outreach

Over the years, the District has offered school groups free tours of Judy Reservoir and the water treatment plant. In 2012, the District began piloting to elementary classrooms a program called *The Story of Drinking Water*—an exploration of water's role in our environment and society, with an emphasis on the importance of ensuring a safe and reliable water supply.

As part of the program, the District offers free to teachers *The Story of Drinking Water Teacher and Activity Guide*—a complete grade school curriculum on water. The teacher's guide provides 33 activities covering the hydrologic cycle, forms of water, water supply, water treatment, water distribution, conservation, weather, ecosystems, waterborne diseases, and more. The activities are aligned with national Science Process Standards and Bloom's revised (2001) *Cognitive Taxonomy of Educational Objectives*. All activities adhere to science curriculum, and many include math, social studies, and language arts.

For classrooms choosing to utilize the curriculum, every student receives a colorfully illustrated booklet of *The Story of Drinking Water.* Additionally, the District includes a classroom copy of *The Story of Drinking Water DVD.* The DVD makes learning about water fun and brings to life the materials contained in *The Story of Drinking Water* and *The Story of Drinking Water Teacher and Activity Guide.*

To enhance student learning, the District offers classroom field trip opportunities that include a tour of the following:

- Water Treatment Plant—which can process up to 25 million gallons of drinking water per day.
- Judy Reservoir—a 1.45-billion-gallon reservoir located above the town of Clear Lake.
- A stream within the watershed that is a supply source of the District's water.

The District continues to work with Northwest Educational Service District 189 to partner on grant opportunities and to develop teacher workshops on water resources and conservation.

District staff members also participate in school science fairs. Staff hand out water saving items at the education booths, initiating a dialogue about water use efficiency and encouraging conservation. As an interactive educational tool, the District also has a spin wheel with related questions about simple water saving ideas to engage students and parents.

5.2.1.5 Toilet Leak Kits

Toilet leaks are caused by worn or damaged parts in the toilet flush tank and account for more than 95% of all water waste. Some of these leaks empty directly into the sewer line without leaving any evidence that a leak path is present. The District provides free toilet leak detection dye tablets for customers to determine if their toilets leak and also provides detailed information on how to fix leaks.

5.2.1.6 Soil Moisture Meters

According to the EPA, homeowners use between 30 and 70% of their water outdoors. Experts estimate that 50% of the water used outdoors goes to waste due to evaporation, wind, or runoff caused by overwatering. In 2012, the District began offering customers the Soil Moisture Meter,

which promotes healthier lawns, gardens, and shrubs and helps save water by eliminating improper watering. The meters accurately measure the moisture in the soil at the root level where it counts. By simply inserting the probe into the soil at root level, customers can read the meter and know instantly if too much or not enough watering has occurred. This takes the guess work out of watering.

5.2.1.7 Rain Barrel Program

In October 2010, the District introduced its Rain Barrel Program to single-family and commercial customers in order to create awareness and visibility around water use practices. As part of the program, District staff conducts small group workshops that teach customers how to build, set up, and maintain their rain barrels. The act of collecting rainwater can be an inspiration to find other ways to conserve water around the home. Due to the popularity of the program, the District is frequently invited to speak to various gardening clubs and schools about the benefits of harvesting rainwater. Rain barrels are also used for non-profit auction events to help market the program and raise awareness for the need to be good water stewards.

5.2.1.8 System Leak Detection and Repair

The District has meters on all its service connections. The 23,000-plus service meters are a critical piece in providing accurate information for WUE planning.

Between 2010 and 2012, the District's distribution system leakage 3-year rolling average was 11.1% of production. This number is a result of a recalculation of the DSL numbers from 2010 and 2011, due to a revision in the data that was used to determine the DSL. This result is greater than the 10% or less requirement of the Water Use Efficiency Rule and therefore requires a Water Loss Control Action Plan to reduce the DSL below 10%. The District identified a number of meter inaccuracies in 2011 that have been resolved, and is currently in the process of planning for the replacement of finished water meters on the transmission lines to Sedro-Woolley and Mount Vernon as they leave the WTP. These meter replacements are in addition to numerous other system meters that were replaced in 2012 and 2013 because of their age and limited ability to be incorporated into the District's telemetry system.

By comparison, the District's recorded distribution system leakage (fire flows, hydrant testing, water system flushing, unmetered consumption, and leaks) averaged around 25% for the period 1984 through 1990, peaking at 26.6% at the end of 1990.

On the supply-side, all services within the District's water systems are metered. Service meters range in size from 5/8-inch positive displacement water meters (the standard residential service) to 8-inch fire line meters with detector check assemblies. All new service meters, other than for single-family residential water services, are sized based on the International Association of Plumbing and Mechanical Officials Uniform Plumbing Code. The District tracks high-use meters to check on their

accuracy, and meter technicians routinely replace service meters that show signs of inaccuracy or failure.

The District's demand-side leak detection program is proactive, and consists of being aware of probable customer leaks, notifying customers, following-up with customers, and maintaining a leak adjustment policy that encourages prompt repair. The District began transitioning to the Badger ORION Automated Meter Reading (AMR) system starting in the fall of 2005. During the reading process, the AMR system alerts meter technicians, via a radio signal, of possible leaks if a water meter has not stopped moving for at least 1 hour over a 24-hour period. Likewise, during bill preparation, the billing system identifies customers with abnormally high consumption. Customer notification and follow-up occurs through various means, including door hangers, e-mail, mailings, and phone calls. The District's leak adjustment policy for adjusted water bills is 1.5 times the average of the last 2 years' billings for the same period, thus encouraging prompt repair.

A number of customers also participated in the District's Water Meter Monitor Program. Customers previously had the option to buy or borrow a water meter monitor to calculate their water use and receive an alert if a leak occurred. Unfortunately, due to technical issues with the water meter monitors, this program has been suspended until the manufacturer releases an upgraded model that is more user-friendly.

5.2.1.9 Consumption History on Customer Bill Statements

The District provides historical consumption data on bills to assist customers in understanding how their use varies throughout the year and from year to year. This information helps customers make informed choices about how they manage their water use, including implementing conservation efforts. Additionally, unexpected increases in use can alert customers to possible leaks. The District's customer bills have included historical use data since 1991. The bills include a bar graph showing water use for the previous 24 months, which can be helpful in showing customers the difference between their summer and winter water use.

5.2.1.10 Large Meter Testing

Due to the mechanical nature of a water meter, accuracy decreases as the meter ages. Since 2005, the District has worked with a meter repair contractor to perform testing, recalibration, and repair work on 2-inch and larger meters and fire hydrant meters within the distribution system. The meters are flow-tested for high, medium, and low accuracy rates. Meters that are under-reading or leaking are repaired or replaced. Approximately one-third of all large meters within the system are tested each year. In the spring, hydrant meters are tested and calibrated in advance of the upswing in use by customers for summer construction projects, crop irrigation, and livestock watering.

5.2.2 Estimated Savings

The estimated WUE savings the District achieved from 2008 to 2013 are shown in Table 5-3. It is estimated that the program will have saved approximately 1.8 million gallons by the end of 2013.

Table 5-3. Estimated Savings Achieved by 2008–2013 WUE Program

Measure	Estimated Average Annual Savings					
	2008	2009	2010	2011	2012	2013
Public Outreach	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Indoor Retrofit Kits	159,012	159,012	159,012	159,012	159,012	424,032
Shower Timers	--	N/Q	N/Q	N/Q	N/Q	N/Q
School Outreach	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Toilet Leak Kits	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Soil Moisture Meters	--	--	--	--	N/Q	N/Q
Rain Barrel Program	--	--	60,000	120,000	180,000	210,000
System Leak Detection & Repair	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Bill Showing Consumption History	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Large Meter Testing	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Annual Total	159,012	159,012	219,012	279,012	339,012	634,032
Cumulative Total	--	--	--	--	--	1,789,092

*N/Q = Not Quantifiable

2008–2013 WUE Program Measure Assumptions

The numbers listed in Table 5-3 are based on the following assumptions:

- 80 indoor retrofit kits were distributed free in Year 1
- 15% implementation rate
- Household use based on 2.52 people/household
- Shower times based on national average of 8.2 minutes/shower
- Showerhead/faucet flow rates multiplied by 0.675 to obtain average actual flow rates
- Showerheads/faucets, post-1994 rated at 2.5 gallons/minute
- Rain barrel turnover rate at 11 times per year

5.2.3 Water Loss Control Action Plan

As a result of the 3-year rolling average for DSL being 11.1%, the District is required to complete a Water Loss Control Action Plan (WLCAP) according to WAC 246-290-820(1)(b)(iv) and 246-290-820(4). The District has a goal of reducing the DSL to less than 10% by 2015. Items of the WLCAP are discussed in this chapter, and are summarized below:

- The total water production, consumption, and DSL will be tracked and calculated on a monthly basis instead of a yearly basis to better track the DSL throughout the year, and to determine which WLCAP activities are having the biggest effect on the overall DSL. More frequent analysis of the data will help provide greater accuracy and confidence in the data being collected.
- The District has a program for large meter testing where one-third of all large meters are tested each year. In addition, all of the fire hydrant meters are tested and calibrated each spring in advance of the summer construction projects, crop irrigation, and livestock watering. This activity is funded through an operations budget and is routinely scheduled by District staff.
- The District will be replacing the water meter for the raw water that enters the WTP, as well as the two finished water meters on the transmission lines to Sedro-Woolley and Mount Vernon as they leave the WTP. This will be completed in early 2015 with an approximate cost of $50,000.
- The District will be replacing some of the large Metron water meters that are considered inaccurate based on their age. This will be completed in early 2015 with an approximate cost of $20,000.
- The District has an aggressive program of replacing aging and leaking water lines, as discussed in Chapter 10. Replacement of these lines is funded by the District's capital budget.
- As part of the District's new Asset Management program, a program will be implemented for inspecting system valves on a routine basis and repairing leaking valves as they are discovered. This activity will be funded through an operations budget.
- The District has a goal of repairing leaks as soon as they are found or when the District is notified.
- The District provides historical consumption data on each customer bill to track water usage. Any unexpected increases in use can alert customers to possible leaks and help the District repair those leaks.

All of these items in the WLCAP will be funded through a specific line item created in the 2014 budget to fund the WLCAP. In addition, the District will consider completing the International Water Association's (IWA) water audit to better ensure that the DSL is reduced to a manageable level. The District is very concerned with the amount of DSL and is committed to finding, repairing, and meeting the established DSL by 2015.

5.3 2014–2019 Water Use Efficiency Program

5.3.1 Goals

1. **Save a cumulative total of 6 million gallons of water by 2019.**

2. **Reduce distribution system leakage to 10% or less of total water produced per year.**

5.3.2 Measures

The District's conservation program for 2014–2019 consists of the 10 measures listed in Table 5-4. Descriptions of each measure are provided below. All measures will be implemented during Years 1-6 of the plan. The program reflects a continuation and/or enhancement of many of the measures in the District's 2008–2013 program.

Table 5-4. 2014–2019 Water Use Efficiency Measures

Measure Number	Measure	New/ Existing
1	Public Outreach	Existing
2	Indoor Retrofit Kits	Existing
3	Shower Timers	Existing
4	School Outreach	Existing
5	Toilet Leak Kits	Existing
6	Soil Moisture Meters	Existing
7	Rain Barrel Program	Existing
8	System Leak Detection & Repair	Existing
9	Bill Showing Consumption History	Existing
10	Large Meter Testing	Existing

5.3.2.1 Public Outreach

The District will continue its various public outreach activities, as previously described in Section 5.2.1.1. In addition, the District will explore workshop opportunities and partnerships that address such topics as drip irrigation systems, use of pre-rinse spray valves in commercial and institutional kitchens, low water use landscaping, and toilet and urinal retrofits. Evaluation will consist of tracking the number of programs conducted and the number of program participants reached annually by District public outreach programs.

5.3.2.2 Indoor Retrofit Kits

The District will continue providing customers with showerheads and faucet aerators to replace their less efficient fixtures, as previously described in Section 5.2.1.2. Evaluation will consist of annually tracking the number of showerheads and aerators provided. This value will then be multiplied by the per unit reduction in consumption for each efficient showerhead and aerator installed to determine the water savings achieved.

5.3.2.3 Shower Timers

The District will continue offering free 5-minute shower timers to customers, as previously described in Section 5.2.1.3. The timers provide a visual reminder to people that they can easily reduce household water consumption by shortening time spent in the shower, even by 1 minute. Evaluation will consist of tracking the number of timers distributed.

5.3.2.4 School Outreach

The District will continue providing school-based education programs, as previously described in Section 5.2.1.4. Evaluation will consist of tracking the number of programs conducted and the number of teachers and students reached annually by District education programs.

5.3.2.5 Toilet Leak Kits

The District will continue providing free toilet leak detection kits to customers, as previously described in Section 5.2.1.5. Messaging will include detailed information focused on the reasons why toilet tanks typically leak and how to fix leaks. Evaluation will consist of annually tracking the number of leak detection kits provided to customers.

5.3.2.6 Soil Moisture Meters

The District will continue providing customers soil moisture meters, as previously described in Section 5.2.1.6. Evaluation will consist of annually tracking the number of soil moisture meters provided to customers.

5.3.2.7 Rain Barrel Program

The District will continue offering workshops and selling customers rain barrels, as previously described in Section 5.2.1.7. Evaluation will consist of annually tracking the number of rain barrels sold and distributed. This value will then be multiplied by the estimated gallons saved per barrel during the growing season to determine the total water savings achieved. The District will also seek out partnerships with outside organizations to market and creatively promote the rain barrel program.

5.3.2.8 System Leak Detection and Repair

The District will continue with its leak detection and repair, as previously described in Section 5.2.1.8. Evaluation will consist of tracking the number of water leak adjustments processed annually.

5.3.2.9 Bills Showing Consumption History

The District will continue providing bills that show consumption history, as previously described in Section 5.2.1.9.

5.3.2.10 Large Meter Testing

The District will continue with its large meter testing and calibration program, as previously described in Section 5.2.1.10. Evaluation will consist of tracking the number of meter repairs performed annually.

5.3.3 Estimated Savings

The estimated savings and costs of the conservation program are shown in Table 5-5. At full program implementation at the end of 2019, it is estimated that the program will have saved approximately 6 million gallons.

The program will be funded through rate increases and is included in the budget discussed in Chapter 11. The savings achieved by the program, and the corresponding progress toward reaching the District's savings goal, will be estimated by tracking the number of devices distributed and multiplying them by their per-unit savings.

Table 5-5. Estimated Savings Achieved by 2014–2019 WUE Program

Measure	Estimated Average Annual Savings					
	2014	2015	2016	2017	2018	2019
Public Outreach	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Indoor Retrofit Kits	265,020	530,040	795,060	1,060,080	1,325,100	1,590,120
Shower Timers	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
School Outreach	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Toilet Leak Kits	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Soil Moisture Meters	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Rain Barrel Program	21,000	42,000	63,000	84,000	105,000	126,000
System Leak Detection & Repair	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Bill Showing Consumption History	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Large Meter Testing	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
Annual Total	286,020	572,040	858,060	1,144,080	1,430,100	1,716,120
Cumulative Total	--	--	--	--	--	6,006,420

*N/Q = Not Quantifiable

2014–2019 WUE Program Measure Assumptions

The numbers listed in Table 5-5 are based on the following assumptions:

- 25 indoor retrofit kits sold per year
- 80% implementation rate
- Household use based on 2.52 people/household
- Shower times based on national average of 8.2 minutes/shower
- Showerhead/faucet flows rates multiplied by 0.675 to obtain average actual flow rates
- Showerheads/faucets, post-1994 rated at 2.5 gallons/minute
- 35 rain barrels sold/distributed per year
- Rain barrel turnover rate at 11 times per year

5.3.4 Effect on Demand

It is anticipated that the conservation program will be implemented evenly over the 6-year planning period; that is, one-sixth of the devices will be sold each year and one-sixth of the rebates will be distributed each year, with savings accumulating over time. The cumulative annual savings, as well as its relationship to the demand forecast, is provided in Table 5-6.

Table 5-6. Savings Schedule and Impact on Average Demand

Year	Projected Demand Without Conservation (ADD gpd)	Cumulative Annual Savings (gal. per year)	Projected Demand With Conservation (ADD gpd)	Demand Reduction (Percent)
2014	8,052,552	286,020	8,051,770	0.009%
2015	8,027,357	572,040	8,025,794	0.019%
2016	8,091,189	858,060	8,088,844	0.029%
2017	8,155,566	1,144,080	8,152,440	0.039%
2018	8,220,490	1,430,100	8,216,583	0.048%
2019	8,285,967	1,716,120	8,281,278	0.057%

ADD=Average Day Demand; gpd=gallons per day

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6 System Analysis

This chapter provides an evaluation of the District's water system components from source to customer taps, and the ability to meet current and projected water supply needs. Hydraulic modeling was performed to identify system deficiencies and to generate recommended system upgrades for inclusion in the Capital Improvement Plan (CIP).

6.1 Distribution System Design Standards

The District has established design standards for all water system improvement projects, whether designed by the District or by an outside engineering firm. The intent is that all projects be designed to the same standard to ensure uniformity of the final product and of cost to the financier. The design and construction standards are discussed in Chapter 9. Standard material and construction specifications are outlined in the District's Water Policy Manual. The design standards and material/construction specifications are the minimum allowed by the District, with the potential for more stringent requirements based on the relationship of the project to overall District water plan development.

6.1.1 Fire Protection

Although already addressed in the Water Policy Manual, fire protection requires a specific discussion because of its tie to the CWSP Regional Supplement. Fire protection by fire hydrants and/or by other means shall be as required by the fire marshal for Skagit County or the respective city. Spacing of fire hydrants shall be as determined by the fire marshal, using the values in Table 6-1 as a minimum standard. The cost of each hydrant installation required by the fire marshal for a customer project shall be borne totally by that customer. The cost for each new hydrant installation required by the fire marshal for a District-sponsored water line replacement project shall be borne by the District. The cost of each additional fire hydrant requested by another party outside of the fire marshal requirements shall be borne by that party.

Table 6-1. Minimum Fire Flow and Hydrant Spacing

Minimum Fire Flow Design Standards For New And Expanding Water Systems[1]			
Land Use Designations Or Densities	**Minimum Fire Flow (Gallons Per Minute)**	**Minimum Duration (Minutes)**	**Maximum Hydrant Spacing (Feet)**
Urban Growth Areas [2]			
Industrial	1500	60	[3]
Commercial	1500	60	[3]
Multi-Family Residential	1500	60	500
Single-Family & Duplex Residential	1000	60	500
Non-Urban Growth Areas			
Commercial / Industrial	1500 [4]	60 [4]	[4]
1 Dwelling Unit Per Lot Less Than 2.5 Acres	500 [5]	30 [5]	900 [5]
1 Dwelling Unit Per Lot 2.5 Acres Or Larger	NONE [5]	NONE [5]	NONE [5], [6]
Natural Resource Lands	NONE [5]	NONE [5]	[5], [6]

(1) The design standards may be amended to reflect changes to Comprehensive Plan land use designations and/or their densities. Proposed amendments will be presented to the Skagit County CWSP WUCC for approval.

(2) These criteria establish a minimum water system design standard. Each water system in an urban growth area must comply with the standards of the local government with jurisdiction. When there are different or conflicting standards, the most stringent standard shall apply. Prior to the issuance of a development permit, the approving authority shall establish fire flow, duration and hydrant spacing requirements.

(3) As determined by the appropriate fire official.

(4) Fire flow for individual buildings or groups of buildings is to be determined by the Skagit County Fire Marshal per Uniform Fire Code Appendix IIIA and the Skagit County Fire Marshal policy on fire flow. The application of lesser or alternative standards shall be in accordance with Section 4.3.5 (Interpretation of Standards).

(5) Fire flow will be required for a Conservation and Reserve Development (CaRD) land division as follows.

CaRD Characteristics	Fire Flow Requirement
5 or more lots	Option 1: Fire flow of 500 gpm for 30 minutes with hydrant spacing of 900 ft. or, Option 2: Fire Marshal approved fire prevention water system that provides adequate pressure and flow to support NFPA 13D sprinkler systems is required for all residential dwellings. In addition, if the property is located in an Industrial Forest, Secondary Forest, or Rural Resource designated land the fire protection requirements as listed in Skagit County Code 14.04.190(14)(b)(iii)(b-e) also apply.
4 or fewer lots	None required, unless the property is located in an Industrial Forest, Secondary Forest, or Rural Resource designated land. If the property is located in such designated land the fire protection requirements as listed in Skagit County Code 14.04.190(14)(b)(iii)(b-e) apply. However, NFPA 13D sprinklers are only applicable to residential dwellings.

As of the effective date of the CWSP, where in-fill development or extension of an existing water system occurs to serve an existing platted lot, the Skagit County Fire Marshal may limit the requirement for fire flow or fire suppression in accordance with Table 4-1 to the newly developed lot only. Group B public systems may choose to separate the fire flow from water flow. Separate tank and hydrant(s) location is subject to Skagit County Fire Marshal approval.

(6) Hydrants shall be installed when water lines are installed or replaced and are capable of supplying a tanker truck with a minimum of 500 gallons per minute at a minimum residual pressure of 20 psi. Tanker truck filling hydrants are to be located at major roadway intersections and along roads at a spacing not to exceed one mile to assist in fire protection.

6.1.2 Distribution System

The following water distribution system design standards are from the District's Water Policy Manual. They are an overview of the design and construction standards, with more detail available in Chapter 9.

Pressure

The District has a desirable and allowable pressure range for all new construction (see Table 6-2). The pressure is measured at the water meter. If the pressure is greater than 80 psi at the water meter, individual pressure reducing valves are required on each service connection.

Table 6-2. Pressure Standards

	Allowable	Desirable
Minimum (psi)	30	40
Maximum (psi)	125	80

Minimum Pipe Diameter

- 8-inch diameter minimum as a general rule
- 6-inch diameter is allowable if there is no likelihood of a future water line extension. Use of any pipe with a diameter smaller than 8 inches must be approved by the District's Engineering Department.

Refer to the Water Policy Manual for specific issues related to water line construction as it pertains to new development.

Fire Flow Requirements

A minimum of 20 psi must be maintained at the nearest fire hydrant and also throughout the entire system. The fire flow requirements are as set out in Table 6-1.

Valve and Hydrant Spacing

- Water valves are usually placed on each leg of a tee or a cross, depending on the location of nearby valves.
- Air vacuum /relief valves shall be placed at local high points in the water line and at the direction of the District.
- Fire hydrant locations are as provided in Table 6-1.

Other specific valve location requirements are provided in the District's Water Policy Manual.

6.2 Water Rights Analysis

As described in Chapter 4, the existing (2012) Average Day Demand (ADD) is 7.98 MGD, which equates to 8,963 acre-feet per year (afy), with a Maximum Day Demand (MDD) of 12.68 MGD, which equates to 19.6 cubic feet per second (cfs) on a continuous basis. The 20-year (2033) forecast indicates an ADD of 9.49 MGD, which equates to 10,659 afy, and an MDD of 16.42 MGD, which equates to 25.41 cfs on a continuous basis. The forecast at the expiration of the MOA (2046) indicates an ADD of 10.77 MGD, which equates to 12,097 afy, and an MDD of 18.64 MGD, which equates to 28.84 cfs on a continuous basis.

By comparing the District's water rights to the existing and projected demands for the 6-year and 20-year planning periods, it can be seen that the District has adequate water rights to meet these projected demands. The District also has adequate water rights to meet projected demands at the expiration of the MOA in 2046. Chapter 7 includes a detailed description of water rights and a water rights self-assessment is included in Appendix A. Table 6-3 provides a summary of the comparison of water rights to existing and forecasted demands.

Table 6-3. Comparison of Water Rights to Existing and Future Demand

	Existing Water Rights		Existing and Projected Demands			
	Partially Subject to Instream Flow Rules	Exempt from Instream Flow Rules	2012 (Actual)	2019 (Forecast)	2033 (Forecast)	2046 (Forecast)
Average Day Demand-ADD (MGD)	35.80	27.52	7.98	8.29	9.49	10.77
Maximum Day Demand-MDD (MGD)	35.80	27.52	12.68	14.33	16.42	18.64
Continuous use based on MDD (cfs)	55.39	42.59	19.62	22.17	25.41	28.84
Annual Withdrawal-Qa (afy)	18,755	18,755	8,963	9,311	10,659	12,097

6.3 Source Capacity Analysis

6.3.1 Design Criteria

According to DOH planning requirements, sources of supply must be sufficient to meet MDD. This requirement applies to each pressure zone within a system, as well as for the entire system. The source capacity analysis presented below examines the ability of the existing sources of supply to meet this requirement. The analysis is done by comparing the District's water demand forecast, presented in Chapter 4, with current source capacities. All evaluations assume 18 hours per day source operation, unless otherwise noted.

6.3.2 Source Capacity Evaluation

Two levels of source capacity evaluation were conducted:

- The first level is for the entire Judy System, using the District's water treatment plant (WTP) as the source. This analysis includes the demands from all customers in the Judy System.
- The second level of source capacity evaluation is for all the different pressure zones and pressure zone combinations within the Judy System. A separate evaluation was completed for each pressure zone or pressure zone combination that has a dedicated source involving a pump station. Zones that are fed by a pump station or a pressure-reducing valve (PRV) station were included in a source analysis when they exclusively provide water to another zone. For example, the Fir–Waugh booster station provides water to the 560-foot HGL pressure zone, which then serves the 420-foot HGL pressure zone through PRVs. The source analysis for the 560-foot HGL zone includes the demand for the 420-foot HGL zone.

Table 6-4 shows the source analysis for the entire Judy System. It shows that there is a surplus of water source available for the entire system up to 2033 based on the capacity of the WTP, and that utilization of the maximum water rights available allows for a maximum of over 129,000 equivalent residential units (ERUs).

Table 6-4. Evaluation of Source Adequacy for the Judy System

	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERUs)	45,210	47,038	53,878	129,092
Average Day Demand (gpd)	7,247,297	7,540,230	8,636,710	20,693,642[5]
Maximum Day Demand (gpd)	12,537,823	13,044,598	14,941,508	35,800,000
Available Existing Source				
Skagit PUD Water Treatment Plant[2] (gpd)	24,000,000	24,000,000	24,000,000	35,800,000
Source Surplus/(Deficiency) (gpd)[3]	11,462,177	10,955,402	9,058,492	0

Notes:

1. Projected demands as presented in Chapter 4. This includes all of the District's service area, including industrial and wholesale customers. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The current treatment capacity of the WTP is 24 MGD. The maximum water right is equal to 35.8 MGD and is used for the maximum case.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with existing sources, based on maximum production rate.
5. A peaking factor of 1.73 was used to back-calculate the Average Day Demand based on the Maximum Day Demand.

Table 6-5 summarizes the source analysis for each of the individual pressure zones. The individual pressure zone analysis includes the projected number of ERUs for the given planning year and the

associated surplus or deficiency in the amount of source for that year. Details of each pressure zone analysis are included in Appendix I.

Table 6-5. Source Analysis Summary

	2014		2019		2033		Maximum
Pressure Zone	ERUs	Surplus/ (Deficiency) (gal)	ERUs	Surplus/ (Deficiency) (gal)	ERUs	Surplus/ (Deficiency) (gal)	ERUs
180/214A,E (Burl-Custer)	9,218	18,683,556	9,591	18,580,226	10,986	18,193,448	76,590
195/214C,D,F (MTV-County)/290	12,931	68,053,907	13,454	67,908,958	15,410	67,366,400	258,327
214B (SW)	5,431	28,589,734	5,651	28,528,851	6,473	28,300,961	108,523
220/322A,B	7,350	16,998,572	7,647	16,916,187	8,759	16,607,814	68,645
230/270/290	3,747	4,576,969	3,898	4,534,971	4,465	4,377,771	20,251
284	300	6,771,086	313	6,767,719	358	6,755,114	24,716
322C (Cascade 1)	31	45,498	32	45,154	37	43,868	195
350	580	12,511,218	603	12,504,719	691	12,480,394	45,694
356A	817	3,013,533	850	3,004,380	973	2,970,116	11,683
365	176	3,191,252	183	3,189,281	209	3,181,906	11,683
412	91	39,684	94	38,669	108	34,869	234
430	80	2,569,835	83	2,568,939	95	2,565,586	9,347
450	118	(4,567)	122	(5,886)	140	(10,825)	101
456	48	796,792	50	796,259	57	794,260	2,921
459A,B,C	947	6,937,498	985	6,926,888	1,128	6,887,173	25,963
463	76	195,036	79	194,189	90	191,017	779
506/415	66	262,536	69	261,798	78	259,034	1,013
560/420/356B	3,028	780,225	3,151	746,281	3,609	619,227	5,842
592	37	205,620	39	205,200	45	203,630	779
645	193	16,000	218	6,000	250	(14,000)	209
684	57	92,168	59	91,529	68	89,133	389
705	42	9,902	44	9,429	50	7,659	78
858/720	41	204,602	43	204,142	49	202,417	779

Based on the evaluation of each individual pressure zone, only the 450-foot HGL and 645-foot HGL zones have a source deficiency that will limit the growth of that particular zone within this planning period. Both of these pressure zones are small areas with a limited amount of demand and are supplied by a small booster station. There are no current plans to increase the source of supply for these zones.

6.4 Storage Capacity Analysis

6.4.1 Design Criteria

Water storage is required for the District's water distribution system to provide equalizing capacity for diurnal peak demands during high-demand periods and to provide emergency supply for fire protection and other purposes. According to DOH requirements, water system storage volume is comprised of five separate components:

- Operating storage volume
- Equalizing storage volume
- Fire flow storage volume
- Standby storage volume
- Dead storage volume

These required volume components are illustrated in Figure 6-1. All storage components are described in more detail below.

The demands on a reservoir are used to calculate the equalizing and standby storage volume requirements. These demands are defined as any volume that could be required from the reservoir, even if the demands are not served by gravity. The criteria for storage volume requirements are to include demands that may be required out of the reservoir by any means, including pump stations.

Operating and Dead Storage Volumes

Operating volume is the water that lies between low and high water storage levels set by District operations staff to control system pumps and flow control valves. The operating volumes for the District reservoirs are typically about 5 feet high. The dead volume is the volume at the bottom of the tank that cannot be used because it is physically too low to provide sufficient pressures. Operating and dead storage volumes are subtracted from total storage to determine the effective storage available for equalizing, standby, and fire flow.

Equalizing Storage Volume

Equalizing volume is the total volume needed to moderate daily fluctuations in diurnal demands during periods when the demand exceeds the capacity of the supply system. Equalizing volume requirements are greatest on the day of peak demand. Operation of a properly balanced system results in (1) replenishment of storage facilities during times of day when the demand curve is below the capacity of the supply system, and (2) depletion of storage facilities when the demand exceeds the supply capacity. The equalizing volume of a storage tank must be located at an elevation that provides a minimum pressure of 30 psi to all customers served by the tank.

Equalizing storage volume is calculated based on the peak hour demand (PHD) as defined by the DOH *Water System Design Manual* (WSDM) (December 2009). This storage is the greater of either (a) [(PHD - Total Available Source) * 150 minutes], or (b) 5% of MDD. PHD is also defined in the WSDM. For the storage analysis conducted as part of this Water System Plan, the formula is also documented in the footnotes of each storage table included in Appendix I for the complete storage analysis.

The total available source is defined as the total of all active source capacities into the interested zone except emergency sources (such as a fire pump). The total available source is documented in the footnotes of each storage table included in Appendix I for the complete storage analysis.

The 5% of MDD is not an equalizing requirement, but is included so that equalizing storage is never zero.

Fire Flow Storage Volume

The required fire flow volume for a given pressure zone or zone combination is calculated as the required fire flow multiplied by the required duration, as established by the local fire authority. Required fire flows and durations vary across the service area, depending on the zoning and land use. The maximum fire flow requirement considered in this analysis is 1,500 gpm for 1 hour, which applies to portions of the District where commercial and industrial development exists. Single-family residential fire flow requirements are 1,000 gpm for 1 hour. The detail of the fire flow requirement for each storage analysis is documented in the footnotes of each storage table included in Appendix I for the complete storage analysis.

The fire flow volume of a storage tank must be located at an elevation that provides a minimum pressure of 20 psi to all customers served by the tank.

DOH allows for optional “nesting” of the fire flow and standby storage volumes. Nesting is when only the larger of the two components is used, rather than the sum of both components. While there are reservoirs that have nesting included in the design, the District does not typically allow nesting, resulting in a more conservative analysis.

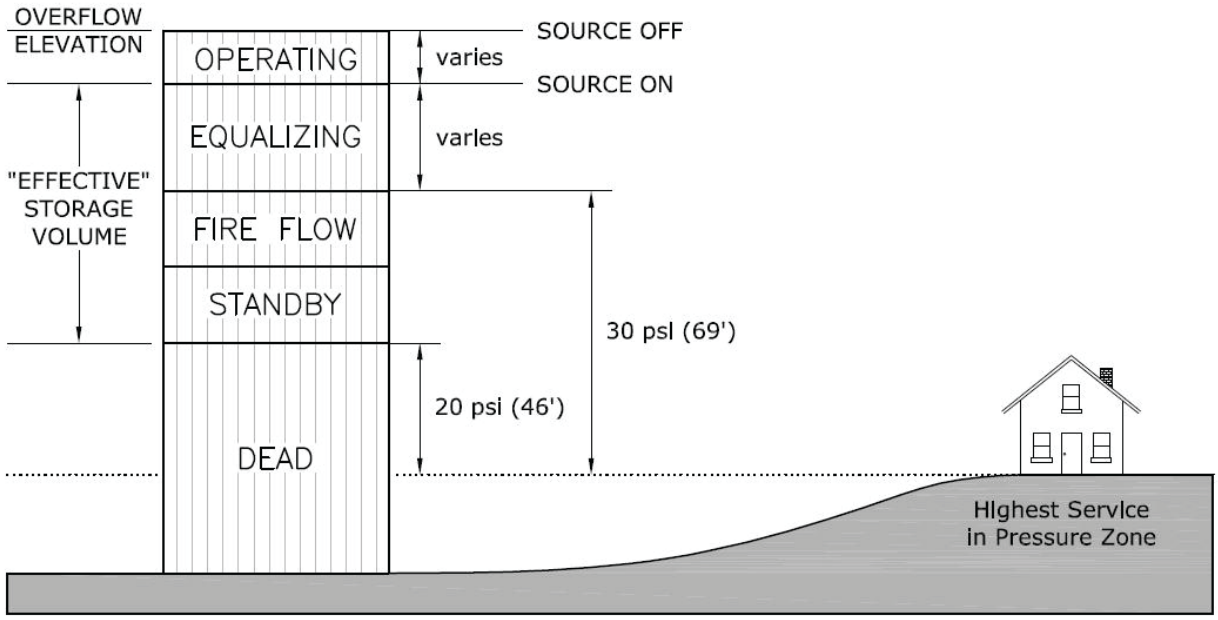


Figure 6-1. Reservoir Storage Components

STANDBY STORAGE VOLUME

Standby volume is required to supply reasonable system demands during a foreseeable system emergency or outage. A key concept in establishing standby volume is distinguishing between reasonable system outages and major system emergencies, as follows:

1. **Reasonable System Outages:** These are addressed by standby storage. These are outages that can be expected to occur under normal operating conditions, such as a pipeline failure, power outage, or valve failure.

2. **Major System Emergencies:** These are not addressed by standby storage. These are intended to be covered by emergency system operations planning, because construction of sufficient reserve volume to accommodate sustained system demands under emergency conditions is not economically feasible. Examples include outages due to an earthquake or problems at the water treatment plant resulting in a longer-term plant shutdown.

DOH has established guidelines for determining minimum required standby volume. This component is calculated as the greater of (1) two times the Average Day Demand (ADD), less multi-source credit; or (2) 200 gallons per day times the number of ERUs served by the storage facility. The multi-source credit is applicable only for pressure zones that have multiple sources of supply, and allows the required standby storage volume in such instances to be reduced. The credit assumes the largest source of supply is out of service; thus, it is calculated as the total source available to a particular pressure zone, or zone combination, less the capacity of the largest source. No credit is allowed for zones having only one source of supply.

The District has a goal of providing at least 2 days of MDD in standby storage for each ERU. Based on the District's current MDD of approximately 278 gallons per day per ERU (gpd/ERU), the standby storage goal for the District is 300 gpd/ERU, for a total of 600 gallons per ERU.

6.4.2 Storage Capacity Evaluation

The storage capacity evaluation is based on two primary calculations:

1. Comparison of available versus required storage located at an elevation that provides at least 30 psi to the highest customer in the zone during typical situations. This evaluates the ability of existing storage facilities to provide required operational and equalizing storage volumes under current and future conditions.

2. Comparison of available versus required storage located at an elevation that provides at least 20 psi to the highest customer in the zone during emergency situations. This evaluates the ability of existing storage facilities to provide required operational, equalizing, standby, and fire flow storage volumes under current and future conditions.

These two calculations are conducted for each pressure zone, or combination of pressure zones. The pressure requirement must be met at the highest service area in the zone or zones that are served by gravity by the system's reservoirs. Based on the locations of District reservoirs, and the interconnectedness of the various pressure zones via PRVs, multiple pressure zone combinations were considered in this analysis.

The storage analysis was conducted for the District's entire service area. Per the water supply agreements with its wholesale customers, the District will provide uninterrupted water service if possible, but is not committed to storing water for these users in case of circumstances beyond the District's control. Such circumstances could include, but are not limited to, Acts of God, sabotage, war, fires, floods, earthquakes, power failure or other catastrophes, strikes, or failure or breakdown of the water transmission lines or water treatment plant. However, to be conservative in the storage analysis, the wholesale customers were included in the calculations.

Table 6-6 includes the storage analysis for the entire Judy System. Based on the current storage available in the Judy System, including the new 6-MG Division Street Reservoir replacing the existing 1-MG reservoir, there is surplus storage available throughout the planning period according to DOH requirements.

Another item to note in the storage analysis is that the District has nearly 6 MG of storage at the clearwells located at the WTP. This storage was distributed to various pressure zones within the system that did not already have storage, primarily the 214-foot HGL pressure zones and the 459-foot HGL pressure zones. Each individual storage evaluation indicates the amount of storage distributed to that particular zone.

Table 6-7 summarizes the storage analysis for each of the individual pressure zones. The individual pressure zone analysis includes the projected number of ERUs for the given planning year and the associated surplus or deficiency in the amount of source for that year. Details of each pressure zone analysis are included in Appendix I.

Table 6-6. Evaluation of Storage Adequacy for Judy System

	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERUs)[2]	45,210	47,038	53,878	76,812
Average Day Demand (gpd)	7,247,297	7,540,20	8,636,710	12,313,053
Maximum Day Demand (gpd)	12,537,823	13,044,598	14,941,508	21,301,582
Available Source (gpd)				
Water Treatment Plant Source[3]	24,000,000	24,000,000	24,000,000	35,800,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	3,001,281	3,001,281	3,001,281	3,001,281
Equalizing Storage (gal)[6]	626,891	652,230	747,075	1,065,079
Standby Storage (gal)[7]	18,084,107	18,815,062	21,551,096	30,724,640
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	3,628,172	3,653,511	3,748,356	4,066,360
Greater than 20 psi at highest meter (gal)[10]	21,802,280	22,558,573	25,389,453	34,881,000
Existing Storage Greater Than 30 psi (gal)[11]				
TOTAL	29,881,000	34,881,000	34,881,000	34,881,000
Storage Surplus/(Deficiency) at 30 psi (gal)	26,252,828	31,227,489	31,132,644	30,814,640
Existing Storage Greater Than 20 psi (gal)[11]				
TOTAL	29,881,000	34,881,000	34,881,000	34,881,000
Storage Surplus/(Deficiency) at 20 psi (gal)	8,078,720	12,322,427	9,491,547	0

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs is based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the current treatment capacity of the water treatment plant of 24 MGD. The maximum water right is equal to 35.8 MGD and is used for the maximum case.
4. No multi-source credit is used.
5. Required operational storage is based on storage tank level when pump turns on. The volume indicated is the total operational volume in the system.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hour for commercial, industrial, and multi-family construction in the Urban Growth Area (UGA).
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The 20 psi and 30 psi requirement is based on the highest service within any given pressure zone, and total storage available within the system.
12. Maximum ERUs supported by available storage.

Table 6-7. Storage Analysis Summary

	2014		2019		2033		Maximum
Pressure Zone	ERUs	Surplus/ (Deficiency)	ERUs	Surplus/ (Deficiency)	ERUs	Surplus/ (Deficiency)	ERUs
180/214A,E (Burl-Custer)	9,218	869,087	9,591	714,880	10,986	137,668	11,318
195/214C,D,F (MTV-County)/290	12,931	1,695,197	13,454	1,461,969	15,410	588,977	16,730
214B (SW)	5,431	2,193,353	5,651	2,102,493	6,473	1,762,398	10,731
220/322A,B	7,350	(2,387,022)	7,647	1,980,419	8,759	1,484,236	12,085
230/270/290	3,747	537,525	3,898	302,961	4,465	68,361	4,630
284	300	808,492	313	803,466	358	784,655	2,157
322 (Cascade 1)	31	30,583	32	30,016	37	27,892	97
350	580	(300,945)	603	(310,643)	691	(346,946)	0
356A	817	109,919	850	96,258	973	45,125	1,082
365	176	495,443	183	492,503	209	481,496	1,373
412	91	(2,075)	94	(3,751)	108	(10,023)	86
430	80	36,133	83	34,796	95	29,791	167
450	118	(90,831)	122	(93,010)	140	(101,163)	0
456	48	752,358	50	751,562	57	748,580	1,866
459A,B,C	947	(283,702)	985	(300,774)	1,128	(364,677)	311
463	76	299,340	79	298,075	90	293,342	741
506/415	66	101,461	69	100,359	78	96,236	311
560/420/356B	3,028	2,622,266	3,151	2,571,610	3,609	2,382,000	9,043
592	37	(14,777)	39	(15,403)	45	(17,747)	2
645	193	224,273	218	213,792	250	200,315	728
684	57	9,836	59	8,881	68	5,306	81
705	42	(47,630)	44	(48,435)	50	(51,448)	0
858/720	41	(9,510)	43	(10,197)	49	(12,771)	18

Looking at the results of Table 6-7, there are a few zones that show a deficiency in the amount of storage required. Each of the deficient zones is addressed below.

180/214-foot HGL (214A, E) – This pressure zone is located in Burlington and the northern part of Skagit County. While there will not be a storage deficiency during the planning period, the total storage will be greatly reduced by 2033. Because this is the District's second-largest pressure zone in terms of overall demand and total ERUs, adding storage would be prudent to achieve the District's goal of 600 gallons per ERU of standby storage. Therefore, a new reservoir is planned for this area as part of the CIP program; see Chapter 10 for details.

195-foot and 214-foot HGL (214C, D, F)/290 – This pressure zone is located in Mount Vernon, the southern part of Skagit County, and Pleasant Ridge. For the 214 and 195 portions of this pressure zone there will not be a storage deficiency during the planning period, but the total storage will be greatly reduced by 2033. Because this is the District's largest pressure zone in terms of overall demand and total ERUs, adding storage would be prudent to achieve the District's goal of 600 gallons per ERU of standby storage. For the 290 Pleasant Ridge portion of the pressure zone, there is no current storage and a new reservoir is required. Therefore, a new reservoir is planned for Pleasant Ridge and a new reservoir is planned for the south Mount Vernon/County area as part of the CIP program; see Chapter 10 for details.

220/322A, B – This pressure zone is located in Mount Vernon, and there will be a new 6-MG reservoir constructed in 2015 to address the current storage deficiency. See Chapter 10 for details on the project.

350-foot HGL – This pressure zone is located in Sedro-Woolley and currently does not have any storage. A new reservoir is planned for this area as part of the CIP program; see Chapter 10 for details.

412-foot HGL – This is the Hermway Heights pressure zone located in Conway and it currently has a 60,000-gallon reservoir that is now too small to provide adequate storage for this area. As part of construction of the nearby Bulson Creek Subdivision, a new reservoir will be put into service that will replace the Hermway Heights Reservoir to increase the storage and solve the deficiency. The completion date for the Bulson Creek Subdivision is not known at this time.

450-foot HGL – This pressure zone is located in Big Lake near the Nookachamps development and does not have any storage. A regional reservoir has been planned for this area for quite some time, but it is dependent on development and growth of the population in this area. As planned developments start to be initiated, the regional reservoir can be constructed to support them.

459-foot HGL – This is the pressure zone for the main transmission lines that go from the WTP to Sedro-Woolley and also to Mount Vernon. The clearwells at the WTP provide storage for this

pressure zone, but they also provide storage to other areas in the Judy System, primarily the 214-foot HGL pressure zone. So when additional storage is constructed in the 214-foot HGL zone, then more of the storage from the clearwells can be allocated to the 459-foot HGL zone.

592/720/858 foot-HGL – These pressure zones are located on the upper portions of Cascade Ridge and they currently have about 55,000 gallons of storage in two reservoirs that are now unable to provide adequate storage and growth allowances. The reservoir for the 592-foot HGL zone is too small and services have been constructed at an elevation in the 858-foot HGL zone that render the 858 reservoir too short. A new reservoir is being planned for Cascade Ridge as part of the CIP to address the lack of storage and to address increasing maintenance issues with the existing reservoirs. See Chapter 10 for details on the project.

705-foot HGL – This is the Panorama pressure zone and it is located near the WTP. There is currently no storage in this zone and there are no plans to construct a reservoir at this time.

As mentioned earlier, based on the District's goal of providing 2 days of MDD for a total of 600 gallons per ERU, the District is looking at each of the following pressure zones to add additional storage by the end of the planning period in 2033:

195-foot and 214-foot HGL (214C, D, F) – A new reservoir is planned for this area as part of the CIP program; see Chapter 10 for details.

214-foot HGL (214A, E) – A new reservoir is planned for this area as part of the CIP program; see Chapter 10 for details.

220/322A, B – This pressure zone is located in Mount Vernon and there will be a new 6-MG reservoir constructed in 2015 to address the current storage deficiency. See Chapter 10 for details on the project.

230/270/290 – This pressure zone is located in Bay View and is a potential location for new residential and industrial growth within Skagit County. When growth plans are developed for this area and the future water demand can be estimated, additional storage projects will be considered in conjunction with developer required storage projects.

350-foot HGL – This pressure zone is located in Sedro-Woolley and currently does not have any storage. A new reservoir is planned for this area as part of the CIP program; see Chapter 10 for details.

356A – This pressure zone is located in Big Lake at the Nookachamps development. As mentioned earlier for the 450-foot HGL zone, a regional reservoir has been planned for this area for quite some

time, and as the planned developments start to be initiated, the regional reservoir can be constructed to support them.

412-foot HGL – A new reservoir is planned to be put into service that will replace the Hermway Heights Reservoir to increase the storage. The completion date for the Bulson Creek Subdivision and the new reservoir is not known at this time.

450-foot HGL – There is a regional reservoir that has been planned for this area for quite some time, but it is dependent on development and growth of the population in this area. As planned developments start to be initiated, the regional reservoir can be constructed to support them.

459-foot HGL – When additional storage is constructed in the 214-foot HGL zone, then more of the storage from the clearwells can be allocated to the 459-foot HGL zone.

592/720/858-foot HGL – A new reservoir is being planned for Cascade Ridge as part of the CIP to address the lack of storage and to address increasing maintenance issues with the existing reservoirs. See Chapter 10 for details on the project.

684 – This pressure zone is located in southern Skagit County near Lake Sixteen. Similar to the storage deficiency at the 412-foot HGL zone (Hermway Heights), the construction of nearby developments like Bulson Creek and Swan Ridge Estates will provide additional storage that will solve the deficiency. The completion dates for the two developments is not known at this time.

705-foot HGL – This is the Panorama pressure zone and it is located near the WTP. There is currently no storage in this zone and there are no plans to construct a reservoir at this time.

6.5 Hydraulic Analysis

A hydraulic model of the District's water distribution system was used to perform the following two types of analysis:

Peak Hour Analysis: A minimum pressure of 30 psi must be maintained at all customer connections under peak hour demand (PHD) conditions, with equalizing storage depleted in the reservoirs.

Fire Flow Analysis: A minimum of 20 psi must be maintained for fire flows under MDD conditions, with equalizing and fire flow storage depleted in the reservoirs.

Aging infrastructure, inadequately sized or dead-end pipes, and increasing demands all contribute to areas of low pressure during peak hour demands and substandard fire flows such that the existing system cannot provide adequate service during existing and future MDD conditions.

For areas that did not meet the pressure criteria, the model was used to develop improvements using an iterative process until the pressure criteria were satisfied with a minimum of total pipe and facility additions.

6.5.1 Hydraulic Model

The hydraulic model of the District's water distribution system was originally built using WaterGems software, but was updated recently to Innovyze, which is a Geographic Information System (GIS) based water modeling program. The District is transitioning into a GIS-based data management and mapping system, so the Innovyze product works well with other new software products at the District.

The model includes the following water system components:

- Pipes
- PRVs
- Reservoirs
- Pump stations
- Fire hydrants (and their associated service lines)
- Source information

Information regarding the water system components was imported from the previous WaterGems hydraulic model. The pipe and valve information (including diameter, material, and age) was provided from the District's AutoCAD Map software system. The reservoirs, pump stations, and

source information was based on design information, record drawings, maintenance records, and SCADA information. Facility controls, pump curves, and PRV settings were set based on discussions with District water distribution staff. Fire hydrants were included in the model so that available fire flow could be modeled within the system.

Elevation information for the hydraulic model was also imported from the WaterGems model, but investigation is currently being performed into the accuracy of that information. While most of the information is believed to be accurate, a GIS shapefile will be used to check the ground elevations of certain infrastructure.

The hydraulic model is continually being checked for network errors consisting of overlapping nodes, disconnected nodes, and closed valves and pipes. District water distribution staff will be enlisted to help troubleshoot the model.

6.5.2 Calibration

Calibration, a critical step in the development of a hydraulic model, is required prior to using the model as a tool to analyze system performance. Calibration consists of measuring pressure and flows in the field and comparing them with the same pressures and flows simulated in the model. Over the past 2 years, a total of 24 hydrant tests were conducted by District staff to assist with calibration of the steady-state model. The test locations were focused heavily on the District's biggest pressure zones: the 214-foot HGL and the 322-foot HGL zones.

It is acknowledged that the number and spacing of the tests throughout the pressure zones were inadequate considering the size of the Judy System. The District will be embarking on a more thorough program of hydrant testing to help provide information for calibration of the hydraulic model. This program will begin in 2015 and will be structured so that at least two hydrant tests are performed in each pressure zone, with additional tests depending on the size of the pressure zone.

Figures 6-2 through 6-5 show the locations of the hydrant tests in Mount Vernon, Burlington, Sedro-Woolley, and the rural areas. Table 6-8 shows the results of the hydrant flow tests.

For the hydrant tests that were conducted, a pressure gage was placed on the fire hydrant and the pressure was measured under normal operating or "static" conditions (i.e., no hydrant flowing). Once the pressure was recorded, the hydrant was opened and the flow was measured using a pitot gage. The residual pressure was measured at a second hydrant as the first hydrant was flowing for only some of the tests. The new hydrant flow tests that will be conducted will use two different hydrants so that the static pressure and the residual pressure can be monitored when the hydrant is flowing.

Table 6-8 shows that all the observed static pressures in the field were measured within 4 psi of the simulated hydraulic model pressures. Any discrepancies between the measured and simulated

pressures were addressed by adjustments of model demands, controls, and friction factors (based on pipe age and material) to achieve steady-state calibration.

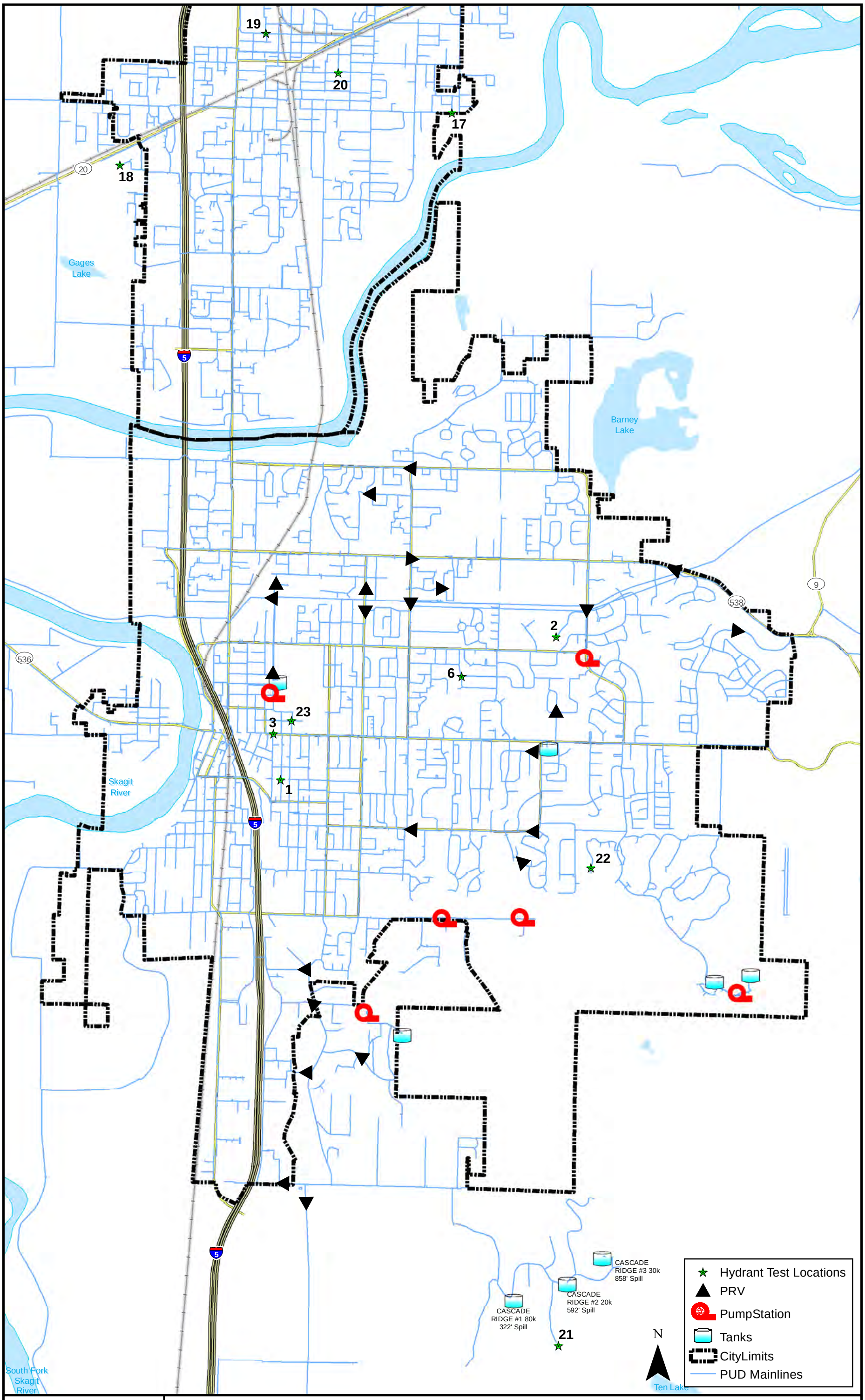
For the purposes of comprehensive planning, the District model is considered to be reasonably calibrated for steady-state conditions. This assessment was made based on two comparisons between the model and field measurements:

- The first comparison is between the modeled results and the field measurements for static pressures. This comparison assessed the overall accuracy of the model node elevations, tank elevations, and PRV settings under normal demand conditions. The comparison of the modeled static pressure to the measured static pressure is important because there is less reason for variability in the static condition calculation and measurement than in the dynamic condition. In addition, if the static pressures do not correlate, the residual pressure will be skewed. This comparison is found to be good.
- The second comparison was between the modeled results and the field measurements for the drop in pressure between static conditions and those when a hydrant is flowing. This comparison is only able to be done for five of the tests, so it is not a big enough sample size to determine the quality of the results. This comparison is found to be below average.

Even though additional information would help to further calibrate the model, the District feels confident in the results that were obtained.

Table 6-8. Hydrant Test Results

Test	Location	Area	Pressure Zone	Field Measured Static Pressure (psi)	Modeled Static Pressure (psi)	Static Pressure Difference (psi)	Field Measured Residual Pressure (psi)	Modeled Residual Pressure (psi)	Residual Pressure Difference (psi)
1	10th & Kincaid	MV	322	62	63	1	61	59.28	1.72
2	Seneca Drive	MV	322	104	103.8	0.2	90	92.91	2.91
3	S. 9th & Division	MV	322	56	60	4	n/a	59	
4	Wayward Way	Rural	284	76	76	0			
5	Upland & Comanche	MV	322	105	101	4			
6	Bradshaw	Rural	214	84	81	3			
7	Dodge Valley/Pickle Plant	Rural	214	76	72.5	3.5	10	14	4
8	Valentine Road	Rural	214	36	35.2	0.8	16	17.3	1.3
9	Rudene Road	Rural	214	97	99.7	2.7	91	91.5	0.5
10	Spruce & Greenfield	Conway	195	81	81.5	0.5			
11	Nookachamp Hills	Big Lake	356	42	40.8	1.2			
12	Portobello	SW	350	63	63.3	0.3			
13	Railroad Avenue	SW	214	74	73.6	0.4			
14	Morris Street	SW	214	75	75.3	0.3			
15	Bayview Edison Road	Rural	270	113	111	2			
16	Rector Road	Rural	270	37	35.9	1.1			
17	E. Rio Vista & Vine Street	Burl	214	75	76.1	1.1			
18	Andis Place	Burl	214	83	80.3	2.7			
19	Spruce & Avon	Burl	214	80	78.9	1.1			
20	E. Fairhaven & Holly	Burl	214	77	77.5	0.5			
21	Quail Drive	Rural	592	35	35.1	0.1			
22	Laurel Court & Eaglemont Dr	MV	560	45	45	0			
23	Warren & 11th	MV	322	59	58.1	0.9			
24	Talcott & 11th	SW	214	71	70.8	0.2			



Skagit PUD
PUBLIC UTILITY DISTRICT

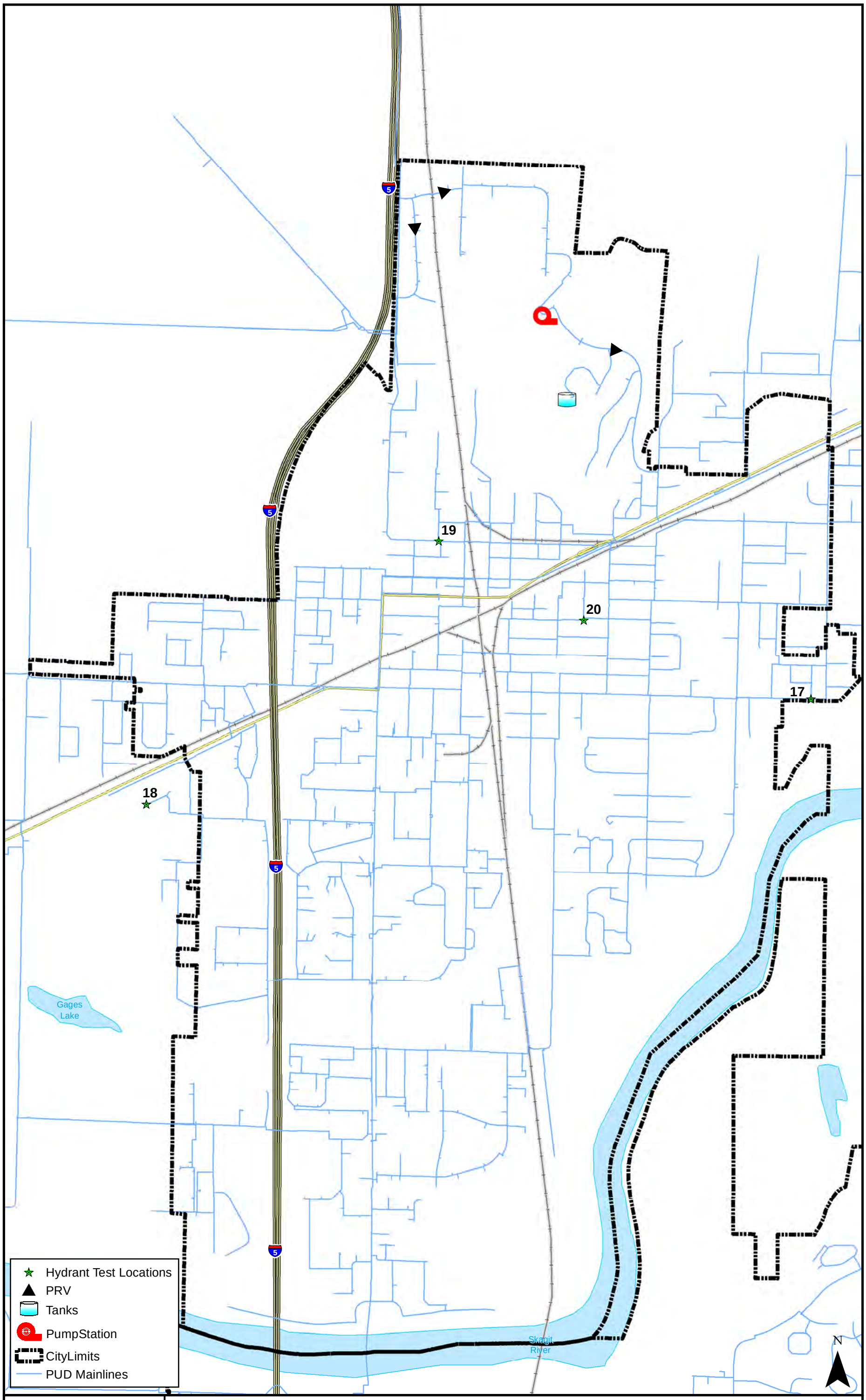
Hydrant Test Locations - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 6-2



Skagit PUD
PUBLIC UTILITY DISTRICT

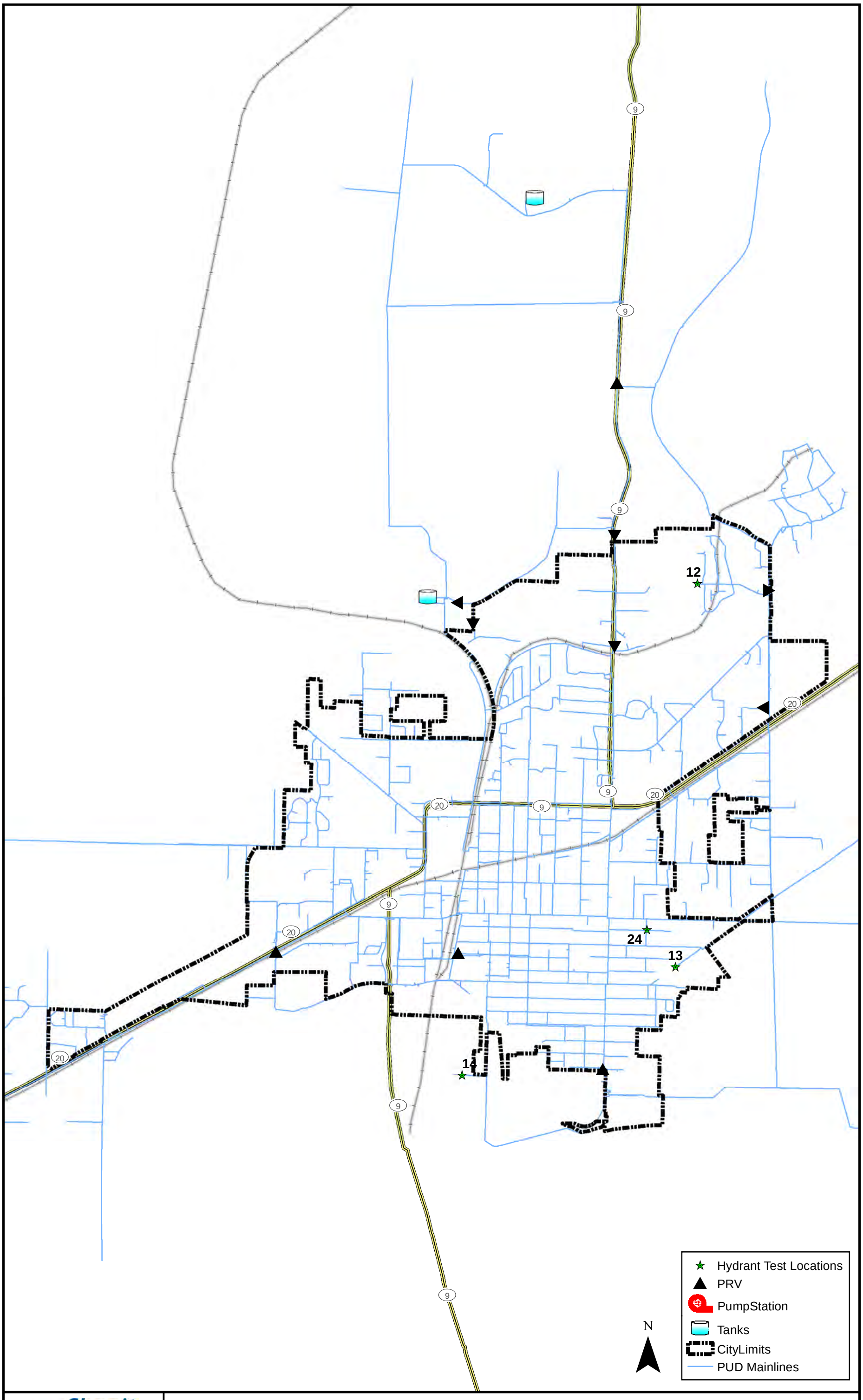
Hydrant Test Locations - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 6-3



Skagit PUD
PUBLIC UTILITY DISTRICT

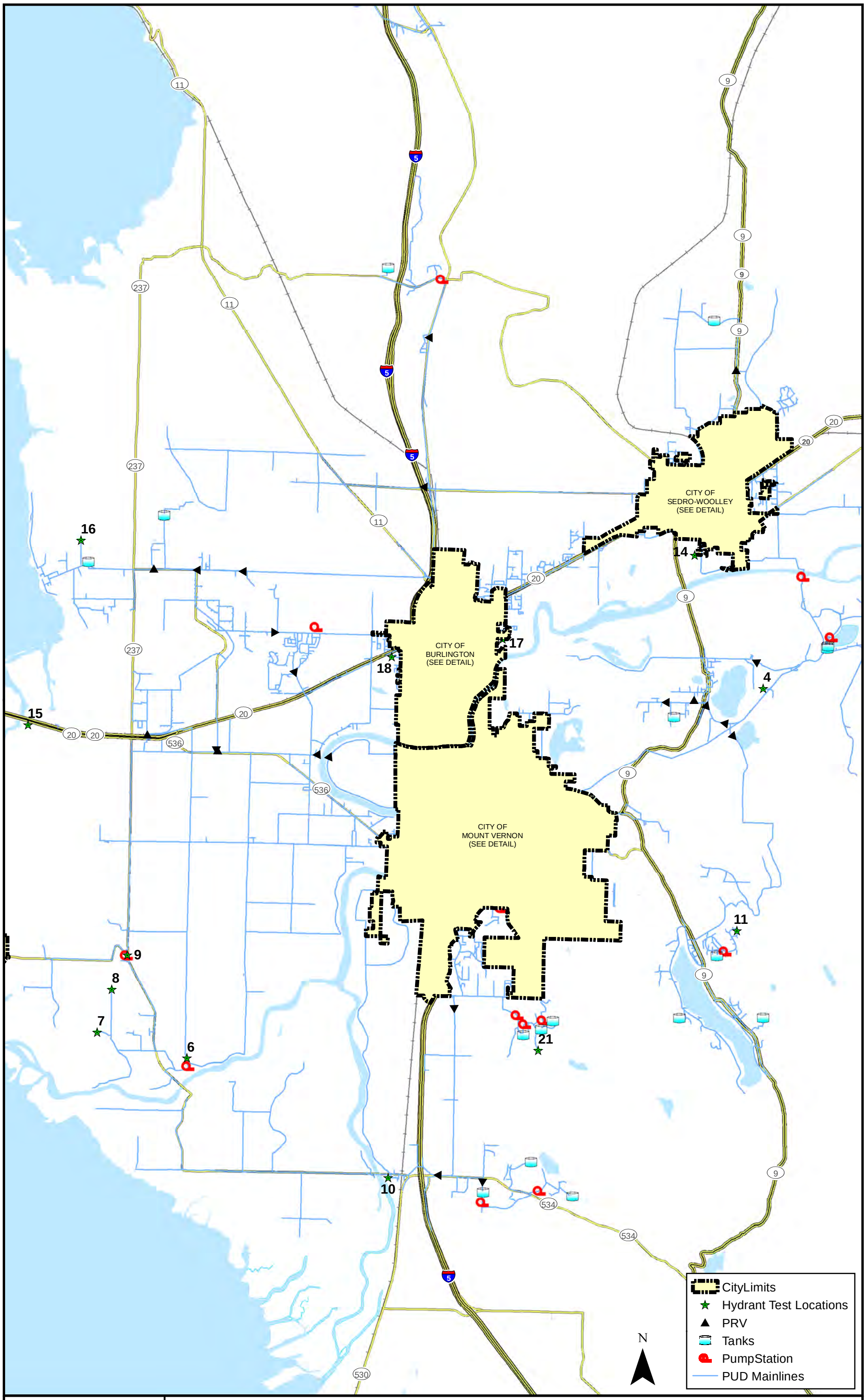
Hydrant Test Locations - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 6-4



Hydrant Test Locations - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 1 2 Miles

Figure 6-5

6.5.3 Modeling Scenarios

Four steady-state hydraulic analyses were completed for each pressure zone for 6-year (2019) and 20-year (2033) demand conditions. It was found that the demand did not increase significantly between the existing and 6-year demands, so an analysis for the existing demands was not done. The increases in demand for the 6-year and 20-year scenarios were allocated spatially based on available parcels and the District's knowledge of projected growth locations. The analyses considered peak hour demand and fire flow demand (MDD plus fire flow) conditions. Table 6-9 describes the modeling scenarios; the scenarios are listed in the sequence in which they were performed.

Table 6-9. Modeling Scenarios

Description	Demand
Plan Year 6 (2019) Peak Hour	Plan Year 6 Peak Hour Demand
Plan Year 6 (2019) Fire Flow	Plan Year 6 Maximum Day Demand plus fire flow
Plan Year 20 (2033) Peak Hour	Plan Year 20 Peak Hour Demand
Plan Year 20 (2033) Fire Flow	Plan Year 20 Maximum Day Demand plus fire flow

6.5.4 Peak Hour Analysis

Peak hour analyses were run for 6-year and 20-year demands. Peak hour analyses are run as steady-state evaluations, which evaluate system conditions at a single point in time. Initial tank levels for all reservoirs were set at such a level that the equalizing and operating portions of the storage were depleted.

For the most part, the Judy System performs very well during 6-year and 20-year peak hour demands. The areas with low pressures and pipelines that are exceeding velocity criteria are spread out between various locations in Mount Vernon, a few locations in Sedro-Woolley, and some locations in the rural areas. After the analysis, projects were identified for locations that did not meet the 20-psi minimum pressure criteria, as well as for pipelines that exceeded District velocity criteria of a maximum of 8 feet per second. However, projects were also identified if locations were nearing the pressure and velocity criteria.

The locations for the resultant projects are shown on Figures 6-6 through 6-9 for the 6-year demands, and Figures 6-10 through 6-13 for 20-year demands. Brief descriptions for each of the projects listed on the figures are described below.

Mount Vernon 6-Year Projects

PH6-1, 9th and Highland

- The 6-inch-diameter ductile iron pipe connection to the 24-inch-diameter CCP transmission main that is feeding the 322 pressure zone (9th & Highland PRV) is approaching District velocity criteria.
- The fire hydrant at the intersection of North 8th Street and E. Highland Avenue is approaching minimum pressure requirements.

PH6-2, Laventure / Kulshan PRV

- The 12-inch-diameter ductile iron piping network that feeds the Laventure/Kulshan PRV is approaching District velocity criteria.

PH6-3, Fir-Waugh Booster Station

- The 8-inch-diameter PVC and ductile iron pipe on Waugh Road beginning from the 24/36-inch-diameter transmission main near Seneca Drive, south of the Fir-Waugh pump station, is approaching District velocity criteria.

PH6-4, Lilac Drive

- The fire hydrant at the intersection of Lilac Drive and Honeysuckle Drive is approaching the minimum pressure requirements.

PH6-5, East Blackburn

- The blow-off serving a few residential houses on the east end of East Blackburn Road is approaching the minimum pressure requirements. The houses are located on a dead-end line and their elevation is higher than the water main located on East Blackburn Road.

Burlington 6-Year Projects

There were no projects identified in Burlington for the 6-year analysis.

Sedro-Woolley 6-Year Projects

There were no projects identified in Sedro-Woolley for the 6-year analysis.

Rural Areas 6-Year Projects

PH6-6, Bay View Ridge

- A blow-off at the end of the 8-inch-diameter ductile iron main on Rector Road in Bay View Ridge is approaching the minimum pressure requirements.

PH6-7, Hoogdal

- A blow-off at the end of the 6-inch-diameter ductile iron main on Dennis Lane, near the Hoogdal Tank, is below the minimum 20-psi limit. This is due to the line being a dead-end and at a substantially higher elevation than the main water line.

PH6-8, Old Day Creek Road

- A blow-off at the end of the 6-inch-diameter PVC main on Old Day Creek Road is approaching the minimum pressure requirements.

PH6-9, Teak Lane

- A blow-off at the end of the 8-inch-diameter ductile iron main on Teak Lane, near the Buchanan Hill Reservoir, is approaching the minimum pressure requirements.

PH6-10, Amick Road

- The fire hydrant near the end of the 8-inch-diameter ductile iron main on Amick Road, on the west side of Big Lake, is approaching the minimum pressure requirements.

PH6-11, Big Lake

- The fire hydrant near the end of the 8-inch-diameter ductile iron main on Stonewood Drive, on the east side of Big Lake south of the reservoirs, is approaching the minimum pressure requirements.

Mount Vernon 20-Year Projects

PH20-1, 9th and Highland (Same as PH6-1)

- The 6-inch-diameter ductile iron pipe connection to the 24-inch-diameter CCP transmission main that is feeding the 322 pressure zone (9th & Highland PRV) is approaching District velocity criteria.
- The fire hydrant at the intersection of North 8th Street and E. Highland Avenue is approaching minimum pressure requirements.

PH20-2, Kulshan PRV

- The District velocity criterion through the 2-inch 9th & Kulshan PRV is exceeded.
- The District velocity criterion through the 3-inch 9th & Williams Way PRV is exceeded.

PH20-3, LaVenture / Kulshan PRV (Same as PH6-2)

- The 12-inch-diameter ductile iron piping network that feeds the Laventure/Kulshan PRV is approaching District velocity criteria.

PH20-4, Fir-Waugh Booster Station (Same as PH6-3)

- The 8-inch-diameter PVC and ductile iron pipe on Waugh Road beginning from the 24/36-inch-diameter transmission main near Seneca Drive, south of the Fir-Waugh pump station, is approaching District velocity criteria.

PH20-5, College Way / Monte Vista PRV

- The velocity through the 3-inch-diameter pipe serving the College Way/Monte Vista PRV is exceeding District criteria.

PH20-6, Lilac Drive (Same as PH6-4)

- The fire hydrant at the intersection of Lilac Drive and Honeysuckle Drive is approaching the minimum pressure requirements.

PH20-7, East Blackburn (Same as PH6-5)

- The blow-off serving a few residential houses on the east end of East Blackburn Road is approaching the minimum pressure requirements. The houses are located on a dead-end line and their elevation is higher than the water main located on East Blackburn Road.

Burlington 20-Year Projects

There were no projects identified in Burlington for the 20-year analysis.

Sedro-Woolley 20-Year Projects

PH20-8, Rhodes Road

- The velocity criterion for the 6-inch-diameter pipe serving the Rhodes Road PRV is being exceeded.

- The 12-inch-diameter ductile iron pipe at the Rhodes Road PRV, connected to the transmission main and running north to serve Cook Road, is approaching the District's velocity criterion.

PH20-9, SR 9 and State Street

- At the intersection of West State Street and SR 9, there is a section of 16-inch-diameter ductile iron pipe that runs east/west under SR 9 in steel casing that is approaching District velocity criteria.

PH20-10, 1st and Nelson

- At the intersection of 1st and Nelson, there is a section of 16-inch-diameter pipe that is approaching District velocity criteria.

Rural Areas 20-Year Projects

PH20-11, Bay View (Same as PH6-6)

- A blow-off at the end of the 8-inch-diameter ductile iron main on Rector Road in Bay View Ridge is approaching the minimum pressure requirements.

PH20-12, Fredonia PRV

- The 6-inch-diameter pipe at the 8-inch Fredonia PRV is exceeding District velocity criteria.

PH20-13, Valentine Road

- A blow-off at the end of the 8-inch-diameter ductile iron main on Valentine Road is approaching minimum pressure requirements.

PH20-14, Lesord Lane

- A blow-off at the end of the 8-inch-diameter ductile iron main on Lesord Lane is approaching minimum pressure requirements.

PH20-15 Hoogdal (Same as PH6-7)

- A blow-off at the end of the 6-inch-diameter ductile iron main on Dennis Lane, near the Hoogdal Tank, is below the minimum 20 psi limit. This is due to the line being a dead-end and at a substantially higher elevation than the main water line.

PH20-16, SR 9 and Bassett Road PRV

- The velocity through the 3-inch-diameter steel pipe at the SR 9/Bassett Road PRV is exceeding District velocity criteria.

PH20-17, Judy to Sedro-Woolley Transmission Main

- The section of 20-inch-diameter CCP transmission main, south of the Skagit River, is exceeding District velocity criteria.

PH20-18, Old Day Creek Road

- A blow-off at the end of the 6-inch-diameter PVC main on Old Day Creek Road is approaching the minimum pressure requirements.
- The section of the 24-inch-diameter CCP transmission main that runs from the WTP to Beaver Lake Road is exceeding District velocity criteria.
- The 2-inch-diameter piping and PRV at Beaver Lake and Fox Road that serves the Clear Lake area exceeds District velocity criteria.

PH20-19, Judy Reservoir to Mount Vernon Transmission Main

- The section of the 24-inch-diameter CCP transmission main that runs from Beaver Lake Road to College Way is approaching District velocity criteria.

PH20-20, Teak Lane (Same as PH6-9)

- A blow-off at the end of the 8-inch-diameter ductile iron main on Teak Lane, near the Buchanan Hill Reservoir, is approaching the minimum pressure requirements.

PH20-21 Amick Road (Same as PH6-10)

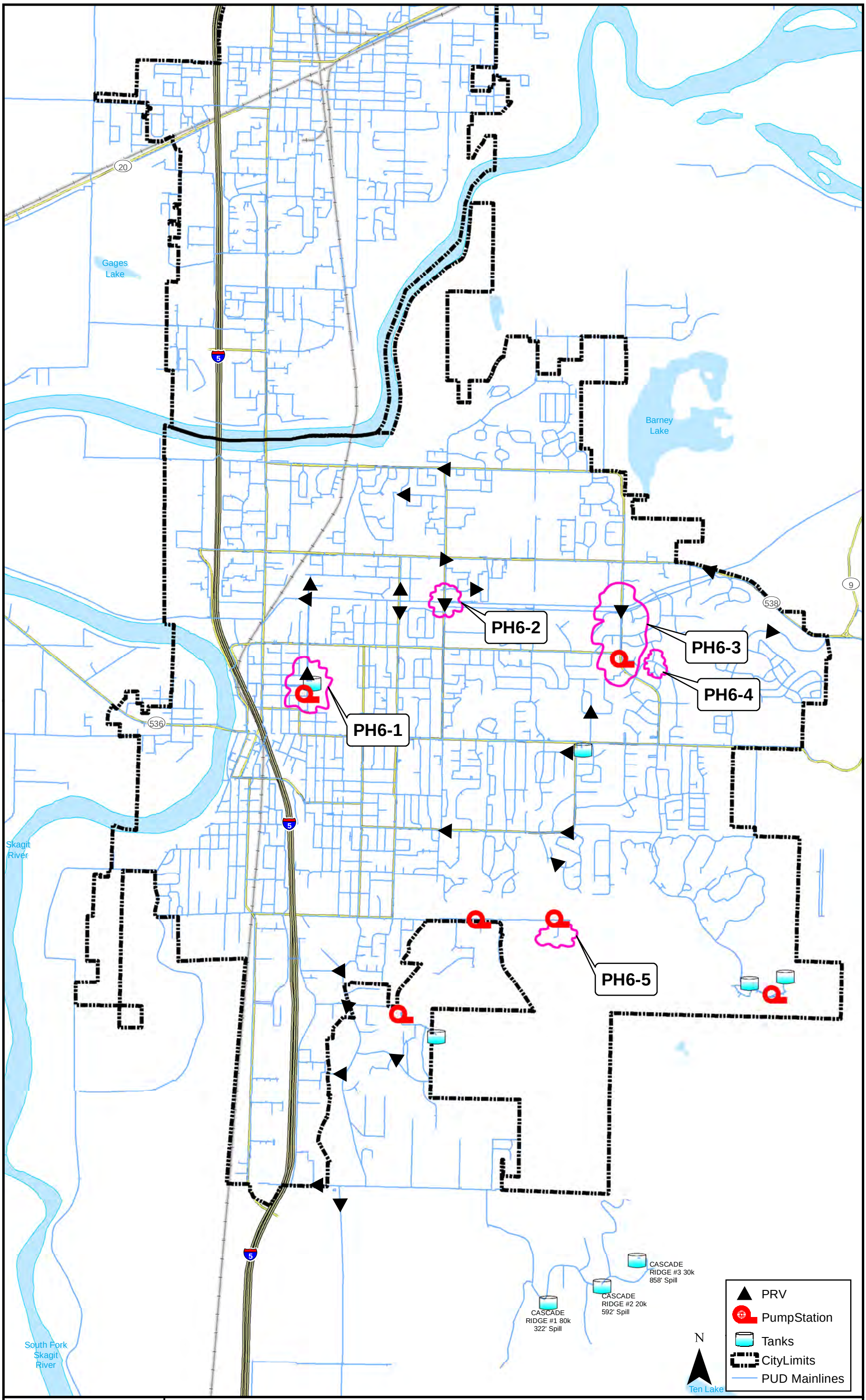
- The fire hydrant near the end of the 8-inch-diameter ductile iron main on Amick Road, on the west side of Big Lake, is approaching the minimum pressure requirements.

PH20-22 Big Lake (Same as PH6-11)

- The fire hydrant near the end of the 8-inch-diameter ductile iron main on Stonewood Drive, on the east side of Big Lake south of the reservoirs, is approaching the minimum pressure requirements.

PH20-23, Conway PRV

- The 2-inch-diameter piping and PRV on SR 534 serving the Conway area exceeds District velocity criteria.



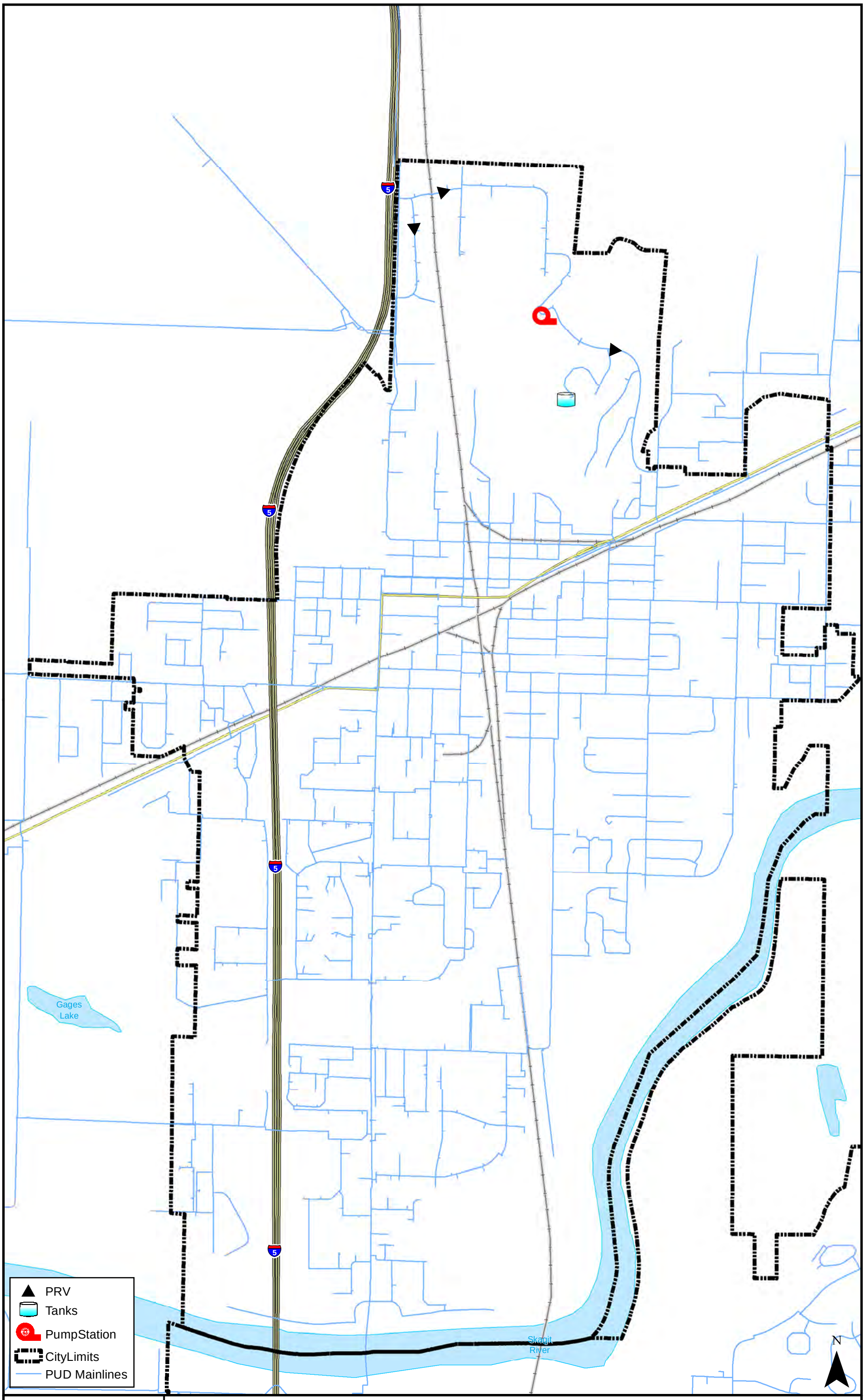
Skagit PUD PUBLIC UTILITY DISTRICT

Peak Hour Analysis For Current & 6-Year Demands - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

Figure 6-6



Skagit PUD
PUBLIC UTILITY DISTRICT

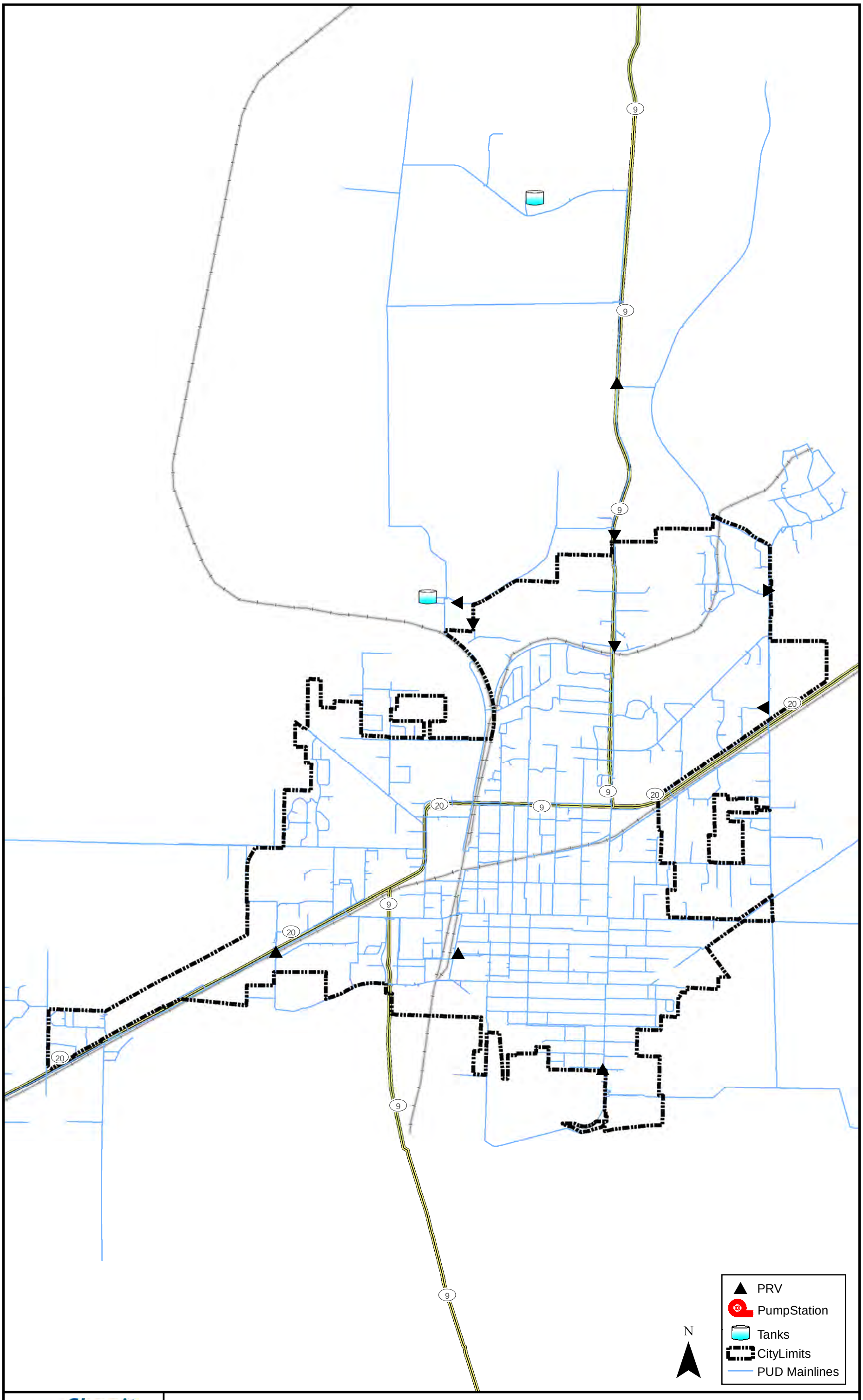
Peak Hour Analysis for Current & 6-Year Demands - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 6-7

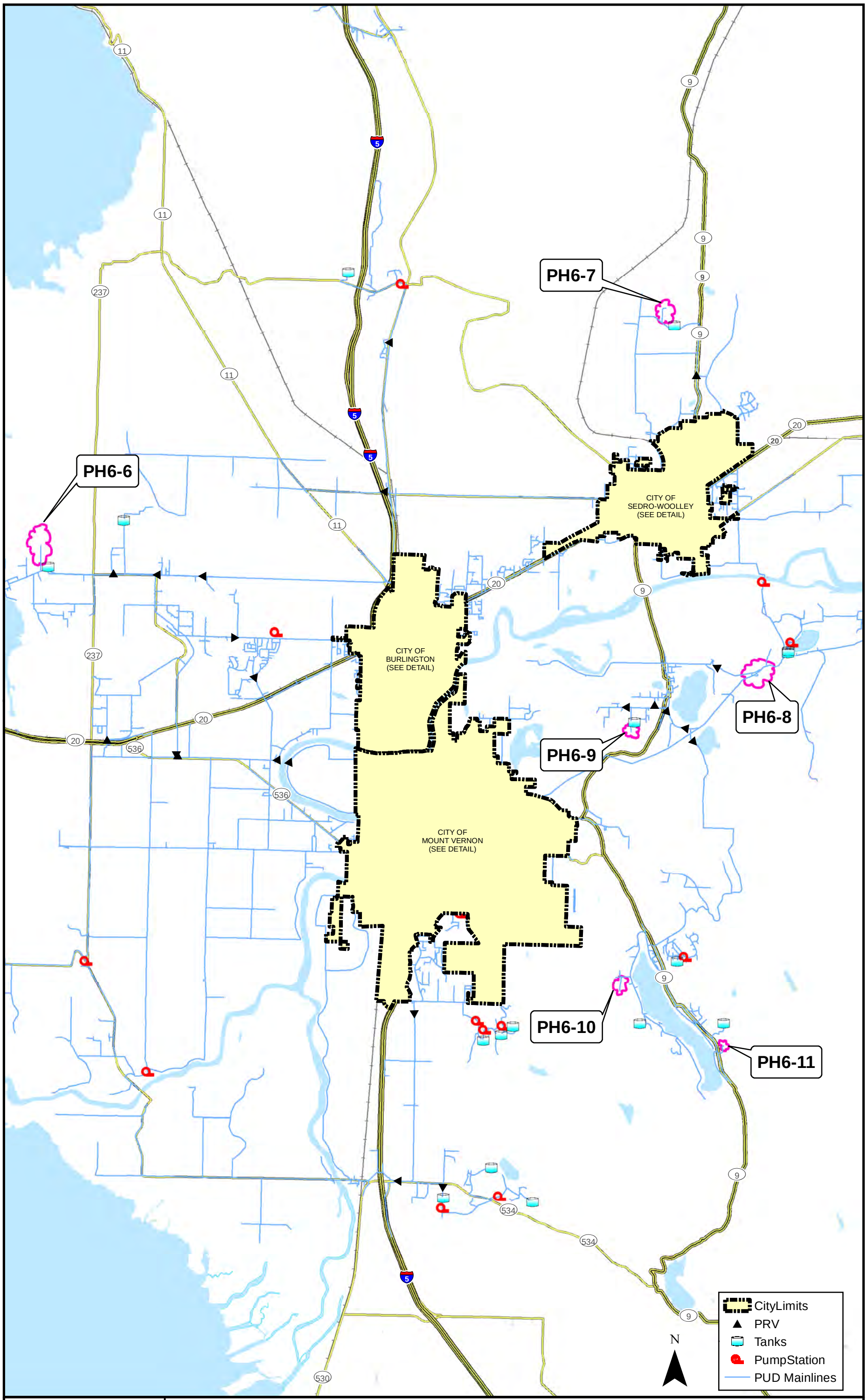


Peak Hour Analysis for Current & 6-year Demands - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

Figure 6-8



Peak Hour Analysis For Current & 6-Year Demands - Rural Areas

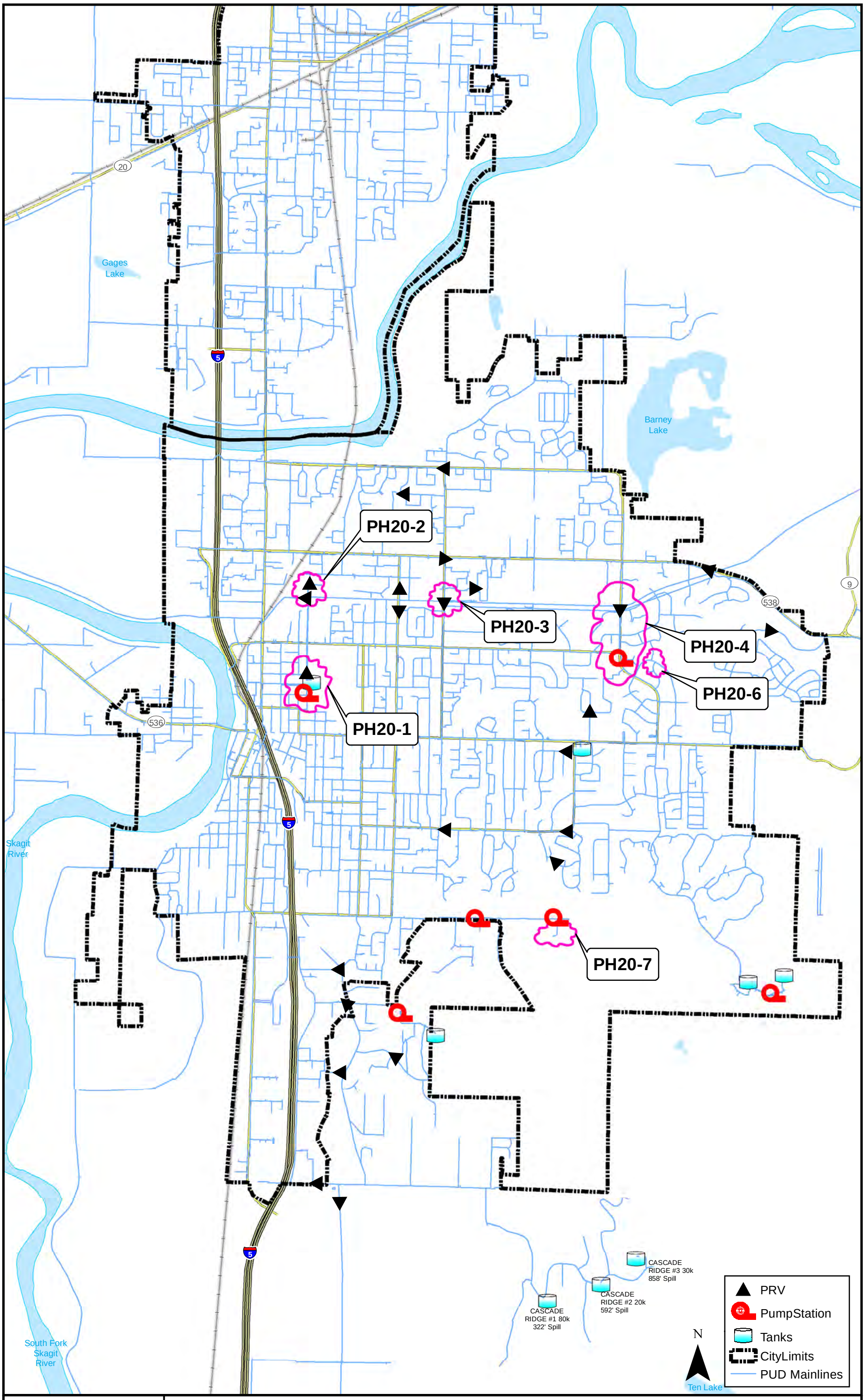
2013 Skagit PUD Water System Plan

Skagit PUD
PUBLIC UTILITY DISTRICT

Coordinate System: WA State Plan North, NAD83

0 1 2 Miles

Figure 6-9



Skagit PUD PUBLIC UTILITY DISTRICT

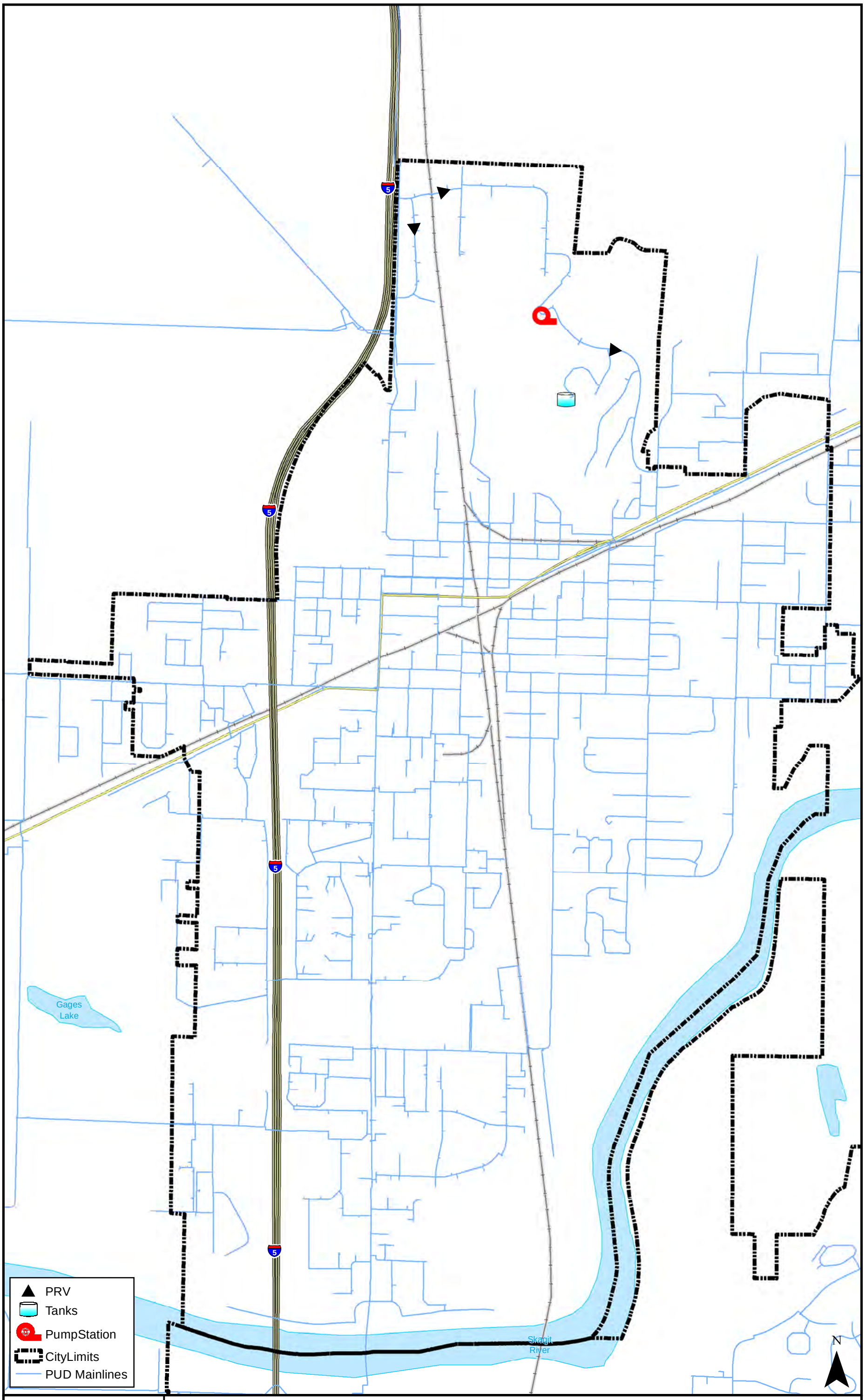
Peak Hour Analysis For 20-Year Demands - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 6-10



Skagit PUD
PUBLIC UTILITY DISTRICT

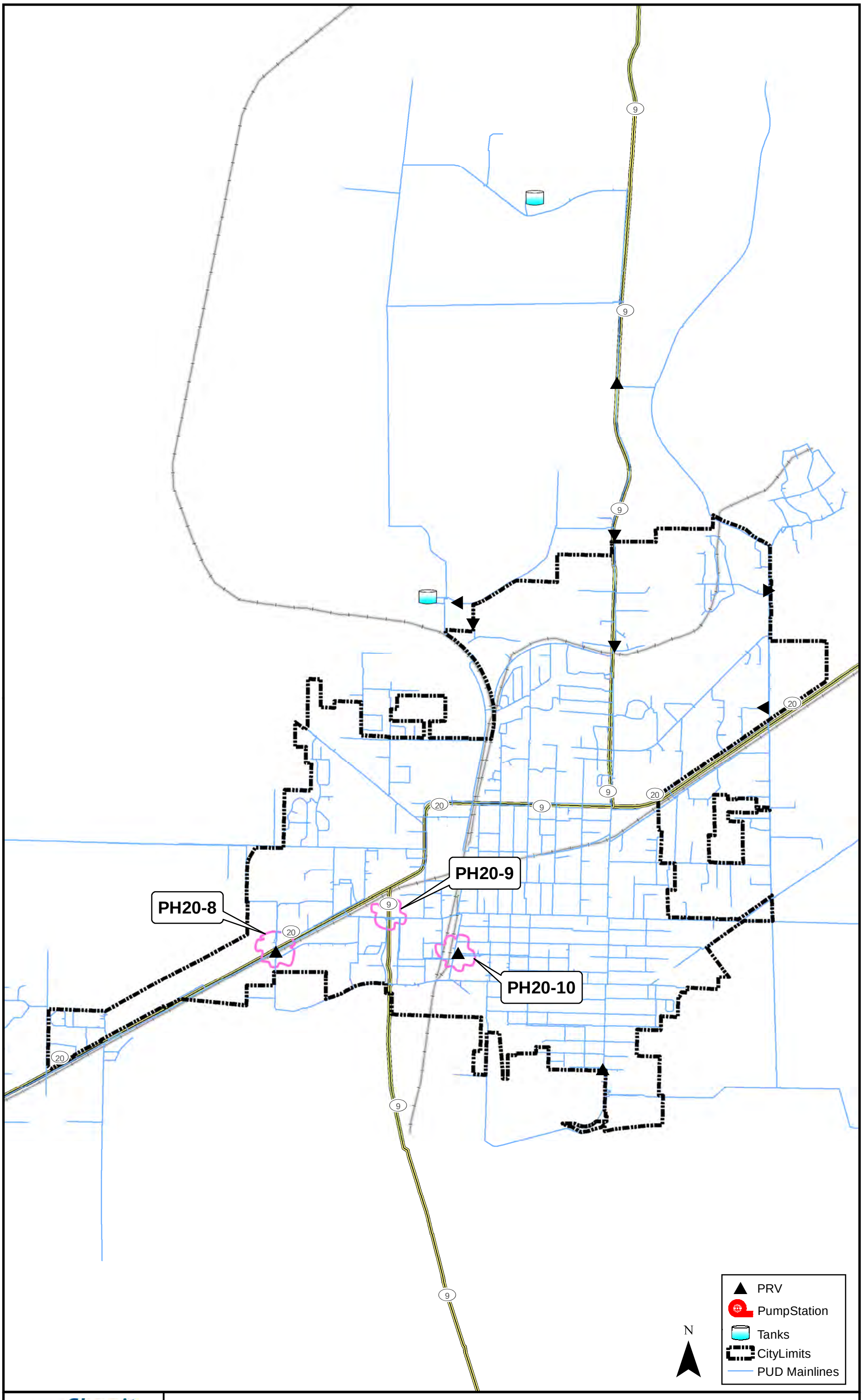
Peak Hour Analysis For 20-Year Demands - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 6-11



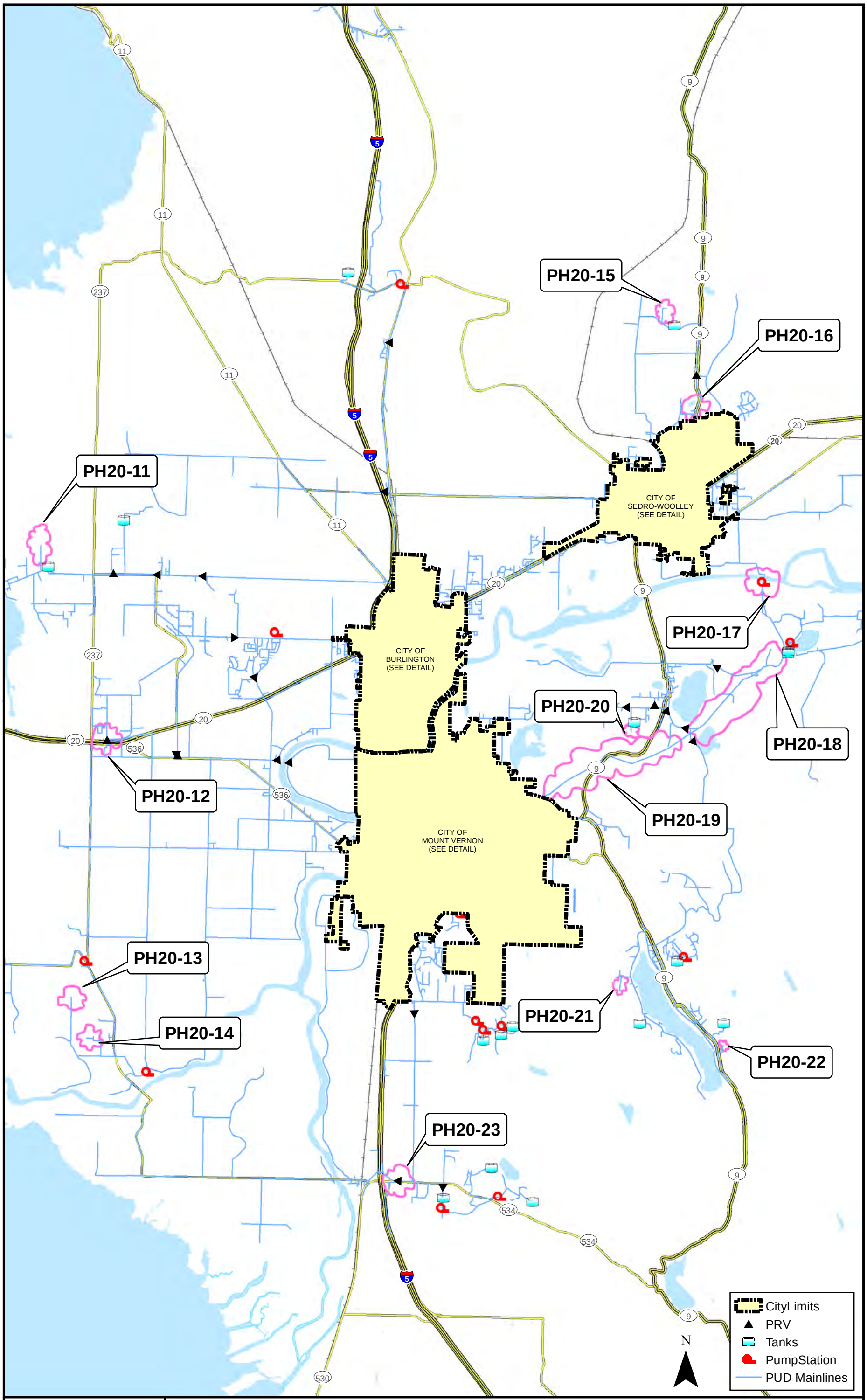
Peak Hour Analysis For 20-year Demands - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 6-12



Skagit PUD
PUBLIC UTILITY DISTRICT

Peak Hour Analysis For 20-Year Demands - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

Figure 6-13

6.5.5 Fire Flow Analysis

Fire flow analyses were run for the 6-year and 20-year demands. Fire flow analyses are run as steady-state evaluations, which evaluate system conditions at a single point in time. For the District system, a batch fire flow analysis was run within each pressure zone using a requirement of 500 gpm for all hydrants located within residential zoned areas and 1,500 gpm for all hydrants located within commercial zoned areas.

Available fire flow is the amount of water that can be withdrawn from a single fire hydrant without dropping the pressure at the hydrant or throughout the zone to less than 20 psi. Thus, a pressure somewhat remote from the flowing hydrant could limit the available fire flow. Fire flow simulations assume that water levels in the storage reservoir are set with equalizing, operating, and fire flow storage completely depleted.

Fire flow analyses for the 20-year demand identified a number of areas that were unable to meet fire flow requirements. In all cases, the deficiencies were due to dead-end lines or small areas of the system that consist of 2-, 3-, or 4-inch-diameter water lines that were installed when fire flow requirements were not the primary factor in sizing the pipes. Recommendations to resolve the deficiencies include replacing the undersized pipelines and trying to loop the system where possible to eliminate the dead-end lines. Many projects were developed to replace the undersized pipelines, and most of these were combined with other projects that were developed as part of the minor capital project list (see Chapter 10) to make the projects cost effective. Projects to loop the system where possible were also developed, and these were also combined with other projects to make them cost effective.

In general, most of the fire flow deficient areas will be remedied through the District's minor capital projects. However, there are a number of areas that have long, undersized dead-end lines that are on the list of projects that need to be completed, but will take some time to complete because of the large number of other projects that are also a priority. The Judy System is very large and the District has many other projects to complete in order to ensure that aging and leaking pipes are replaced. This is the reason for the District's asset management approach to project selection, which is described in detail in Section 10.2. This approach helps the District score and rank each potential project using a number of evaluation criteria so that the projects can be prioritized. Fire flow availability is one of the evaluation criteria, and it is weighted very high in terms of importance.

The 6-year fire flow analysis was also completed, but did not add any additional projects over and above the 20-year analysis.

Figures were not developed to show the location of the fire flow deficient areas because of the size and scale of the Judy System with respect to the number of undersized and dead-end pipelines.

6.5.6 Model Improvements

Based on the modeling results of the peak hour and fire flow analyses that were completed in conjunction with the asset management approach in the selection of other projects, the major and minor CIP projects were developed and are presented in Chapter 10. The projects were grouped together where possible to provide cost efficiencies.

In the process of performing the analyses and documenting other activities related to the hydraulic model, the District identified some tasks that will be performed to improve the accuracy and reliability of the hydraulic model, as listed below:

- During the conversion of the hydraulic model from WaterGEMS to Innovyze, some pipeline information was not associated with nodes and some asset information was not filled in, such as year, material, etc. The model will be examined for pipeline inconsistencies, disconnected nodes, duplicate pipelines, and asset information related to pipelines, PRVs, pump stations, and reservoirs.
- The hydrant flow tests that were performed and documented as described earlier in this chapter show that the hydraulic model is reasonably accurate when compared to static conditions in the field. However, there were not enough hydrant flow tests considering the number of pressure zones in the Judy System, and residual pressures were not taken when the hydrant was flowing. The District will embark on a more thorough and expansive calibration program to perform more hydrant flow tests in order to calibrate the hydraulic model.
- The District was able to perform extended period simulations for each individual pressure zone, but had difficulty performing the simulation for the entire Judy System because of the number of reservoirs, PRVs, and pump stations. The District will continue to work with the developer of the hydraulic model to improve the performance of the model when working with the Judy System.

7 System Reliability, Water Rights, and Source Water Protection

This chapter provides information about water system reliability, including water rights, water supply, and protection of source water for the District's water system.

7.1 System Reliability

This Water System Plan summarizes efforts the District has made to ensure that a safe and reliable supply of water can be provided to its customers at all times. Below is a list of provisions and policies the District has undertaken to achieve this goal.

- **Provide access to a sufficient quantity of water to meet customer demands.** These efforts are described below in Sections 7.2 and 7.3.

- **Maintain a reliable supply of water during adverse events such as drought or an emergency.** Section 7.4 below, as well as Chapter 9 (Operations and Maintenance) of this Water System Plan, include information on the District's drought and emergency response planning efforts.

- **Implement adequate planning for and development of facilities.** Facility and system development is described in Chapter 2 (System Description) of this Water System Plan. Chapter 6 (System Analysis) details the District's facility needs in order to meet criteria for fire flows and increasing customer demands during the time this Water System Plan is in effect. In addition, as part of future planning and facilities development, the District and the City of Anacortes have entered into a Joint Operating Agreement that "provides for the cooperation" of the District and City of Anacortes "in development of regional solutions for long range water supply needs". The specifics of this agreement are discussed in Chapter 3 (Related Plans, Agreements, and Policies) and a copy of the agreement is contained in Appendix D.

- **Sustain a water supply that meets water quality requirements.** The District provides a safe drinking water supply by managing and protecting its sources and drinking water treatment processes, and by meeting federal and state drinking water requirements. The efforts the District has undertaken to protect and manage drinking water sources are summarized in Section 7.5 below. The District's compliance with drinking water requirements is described in Chapter 8 (Water Quality).

7.2 Source of Supply Analysis

A source of supply analysis is only required for water systems that will be pursuing water rights within 20 years to meet the demand forecast. Based on review of the District's water rights and projected demands, the District has adequate water supply to meet water demand for the next 20 years (see detailed discussion in Section 7.3, Water Rights Evaluation, below). Therefore, the District is not required to complete this section of the Water System Plan. However, the District is pro-actively providing the following information with respect to source of supply and water system facilities:

- **Water Source.** The District's water supply sources for the Judy System are the Skagit River and four Cultus Mountain streams (Gilligan Creek, Mundt Creek, Turner Creek, and Salmon Creek). Treatment and transmission of the water is described in Chapter 2 (System Description). Chapter 3 (Related Plans, Agreements, and Policies) describes important agreements such as the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes (1996 MOA) and the Joint Operating Agreement between the District and other key parties that affect water use and water rights associated with these sources. Section 7.3 below discusses water rights as they relate to water demand, emergency planning, and protection of source water.
- **Water Conservation Program.** The District's water conservation program is described in Chapter 5 (Water Use Efficiency) of this Water System Plan. Chapter 5 contains a review of the District's compliance with state conservation planning requirements, a description of the District's recent conservation program, and an overview of the conservation program that the District will implement from 2014 through 2019.
- **Interties.** The District's interties are listed and described in Chapter 2 (System Description) of this Water System Plan.
- **Facility Analysis.** Chapter 6 (System Analysis) of this Water System Plan provides information regarding the ability of the water system facilities to perform under various operating conditions. Recommended improvements related to system deficiencies are covered in Chapter 10 (Capital Improvement Plan).

7.3 Water Rights Evaluation

One of the primary purposes of a water system plan is to ensure that the water system will have sufficient water to meet needs in the foreseeable future. Through development of a water demand forecast and by comparing it with existing water rights, resource planners can evaluate whether the presently allotted quantity of water will adequately meet expected future growth and demand. This section describes the water rights held by the District and shows that the currently allotted supply of water is sufficient to meet the forecasted demand described in Chapter 4 (Planning Data and Water Demand Forecasting).

7.3.1 Description of Water Rights

The waters of Washington State collectively belong to the public and cannot be owned by any one individual or group. Instead, individuals or groups may be granted rights to use them. A water right is a legal authorization to use a predefined quantity of public water for a designated purpose. This purpose must qualify as a beneficial use. Beneficial use involves the application of a reasonable quantity of water to a non-wasteful use such as irrigation, domestic water supply, or power generation.

The District currently holds 11 water right certificates and 5 water right applications for the Judy System, as shown in Table 7-1. These water right certificates and applications were documented as part of the 1996 MOA, which is discussed in Chapter 3 (Related Plans, Agreements, and Policies). An additional 7 claims and applications are currently inactive. The signatories of the 1996 MOA agreed not to challenge the water rights captured in the agreement for a 50-year period from the date of signing. The 1996 MOA also resulted in the establishment of the Skagit River Basin Instream Resources Protection Program Rule in 2001. This rule established instream flows[1] for the Skagit River and the Cultus Mountain streams (Gilligan Creek, Mundt Creek, Salmon Creek, and Turner Creek).

The river and stream water rights captured in the 1996 MOA total a maximum instantaneous quantity[2] of 35.8 million gallons per day (MGD). Withdrawals from the streams are subject to instream flow rules. Withdrawals from the river above an instantaneous quantity of 27.52 MGD are subject to the Skagit River instream flow rules. The 1996 MOA in its entirety is provided in Appendix H and the cumulative water rights for the Judy System are detailed in Table 7-2.

Water rights related to storage allow for the impoundment of up to 5,750 acre-feet of water in Judy Reservoir. Additional information related to the District's water rights is provided in Appendix J, including copies of the specific documents issued by the Washington State Department of Ecology (Ecology).

[1] The term "instream flow" is used to identify a specific stream flow needed to protect and preserve instream resources and values such as fish, wildlife, and recreation. An instream flow rule is, in essence, a water right for fish and other instream resources. While an instream flow rule does not affect existing water rights, water rights issued after the rule adoption are junior to the instream flow, and can only be exercised when the instream flow is being met.

[2] The term "instantaneous quantity", or "Qi", is used to describe the continuous use of water delivered from a source through a diversion. Qi is measured as a rate of flow over some period, usually quantified in terms of cubic feet per second. Qi values related to this discussion have been converted to million gallons per day (MGD) by multiplying the cubic feet per second value by the number of seconds in a 24-hour period.

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Table 7-1. Judy System Water Rights

Certificates and Claims-MOA Related*							
Source	Status	Document	Priority Date	Qi (cfs)	Qi (MGD)	Qa (afy)	Comments
Gilligan Creek	Certificated	Vol 1, PG 411	10/10/1929	1.5	0.97	1,086	From Puget Sound Pulp and Timber Co. River added as source.
Gilligan Creek	Certificated	S1-00724C	10/30/1963	8.89	5.75	3,700	Supplemental to certificate 411. River added as source.
Mundt Creek	Certificated	Vol 1, PG 26	9/28/1917	2.5	1.62	1,810	Qa is calculated based on continuous use. River added as source.
Mundt Creek	Certificated	S1-00737C	10/30/1963	8	5.17	3,886	Qa is supplemental to SWC 26 (2,076 primary and 1,810 supplemental) River added as source.
Turner Creek	Certificated	Claim 9333	Pre-1917	4.3	2.78	2,300	Vested right transferred to District. River added as source.
Turner Creek	Certificated	S1-00739C	10/30/1963	6.2	4.01	3,022	Qa is supplemental to claim 009333 (722 primary, 2,300 supplemental). River added as source.
Salmon Creek	Certificated	Claim 9332	Pre-1917	1.8	1.16	307	Vested right transferred to District. River added as source.
Skagit River Ranney Well	Permitted	GWP 3350; Vol 5, PG 2107-A	5/12/1954	8.9	5.75	6,400	Point of withdrawal changed to Skagit River.
Sedro-Woolley Well	Permitted	GWP 2911; Vol 4, PG 1904-A	3/26/1954	2	1.29	1,440	Point of withdrawal changed to Skagit River.
Applications-MOA Related*							
Source	Status	Document	Priority Date	Qi (cfs)	Qi (MGD)	Qa (afy)	Comments
Gilligan Creek	Permitted	S1-25129P	11/16/1987	13.15	8.50	3,700	Qa is supplemental to SWC 411 and S1-00724C. River added as source.
Mundt Creek	Application	S1-27861	10/22/1997	16.06	10.38		River added as source.
Turner Creek	Permitted	S1-27862P	10/22/1997	6.6	4.27	3,022	Qa is supplemental to Claim 009333 and S1-00739C. River added as source.
Salmon Creek	Permitted	S1-18219P	10/30/1963	4	2.59	307	Qa is supplemental to Claim 009332. River added as source.
Skagit River	Application	S1-27860	10/22/1997	12.8	8.27		
Certificates and Claims-Storage							
Source	Status	Document	Priority Date	Qi (cfs)	Qi (MGD)	Qa (afy)	Comments
Judy Reservoir	Certificated	Vol 18, 8738	1/16/1946	n/a	n/a	1,500	Permit R-142.
Judy Reservoir	Certificated	R1-00673C	4/24/1963	n/a	n/a	4,250	Permit R-293. Amended cert. issued 8-19-2004.
Other Certificates and Claims-Inactive							
Source	Status	Document	Priority Date	Qi (cfs)	Qi (MGD)	Qa (afy)	Comments
Rock Springs Creek	Claim	Claim 009334	pre-1917	0.2	0.13	40	Vested right transferred to District.
Pigeon Creek	Claim	Claim 009335	pre-1917	0.2	0.13	40	Vested right transferred to District.
Unnamed creek	Claim	Claim 009336	pre-1917	0.1	0.06	20	Vested right transferred to District.
Cold Springs Creek	Claim	Claim 009337	pre-1917	0.2	0.13	40	Vested right transferred to District.
East Fork Nookachamps Creek	Claim	Claim 009338	pre-1917	1.1	0.71	110	Vested right transferred to District.
Samish River Park	Certificated	G1-00128C	7/26/1971	0.33	0.22	30	Well
Other Applications-Inactive							
Name	Status	Document	Priority Date	Qi (cfs)	Qi (MGD)	Qa (afy)	Comments
Starbird	Application	G1-26742	9/29/1992	1.11	0.72		Wells.
Starbird	Application	G1-27030	3/31/1993	0.78	0.50		Wells.

afy = acre-feet per year; cfs = cubic feet per second; MGD = million gallons per day; Qa = annual quantity; Qi = instantaneous quantity.

*1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes (MOA). Total combined water right available from the river, streams, or a combination of both is 55.39 cfs (35.8 MGD). The total water right not subject to Lower Skagit River Instream Flows is 42.59 cfs (27.52 MGD). Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon creeks) are subject to Cultus Mountain instream flow rules.

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Table 7-2. Cumulative Active Water Rights for the Judy System

Source (not including storage)*	Document	Qi (cfs)	Qi (MGD)	Qa (afy)
Gilligan Creek	Vol 1, PG 411	1.5	0.97	1,086
	S1-00724C	8.89	5.75	3,700
	S1-25129P	13.15	8.50	3,700
Gilligan Creek Subtotal**		22.04	14.24	3,700
Mundt Creek	Vol 1, PG 26	2.5	1.62	1,810
	S1-00737C	8	5.17	3,886
	S1-27861	16.06	10.38	
Mundt Creek Subtotal**		26.56	17.17	3,886
Turner Creek	Claim 9333	4.3	2.78	2,300
	S1-00739C	6.2	4.01	3,022
	S1-27862P	6.6	4.27	3,022
Turner Creek Subtotal**		17.1	11.05	3,022
Salmon Creek	Claim 9332	1.8	1.16	307
	S1-18219P	4	2.59	307
Salmon Creek Subtotal**		5.8	3.75	307
Skagit River Ranney Well	GWP 3350; Vol 5, PG 2107-A	8.9	5.75	6,400
Sedro-Woolley Well	GWP 2911; Vol 4, PG 1904-A	2	1.29	1,440
Skagit River	S1-27860	12.8	8.27	
Skagit River Subtotal**		55.39	35.80	18,755
Total Water Rights (partially subject to instream flow rules)		55.39	35.80	18,755
Total Water Rights (exempt from instream flow rules)		42.59	27.52	18,755

afy = acre-feet per year; cfs = cubic feet per second; MGD = million gallons per day;
Qa = annual quantity; Qi = instantaneous quantity.

*Subject to the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes (MOA). Total combined water right available from the river, streams, or a combination of both is 55.39 cfs (35.8 MGD). The total water right not subject to Lower Skagit River Instream Flows is 42.59 cfs (27.52 MGD). Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon Creeks) are subject to Cultus Mountain instream flow rules.

**The Skagit River has been added as an additional source for water rights associated with the Cultus Mountain streams.

7.3.2 Comparison of Water Rights with Water Demand

A detailed discussion of the comparison of water rights with water demand is provided in Section 6.2. In summary, the District has adequate water rights to meet the projected demands for the 6-year and 20-year planning periods. The District also has adequate water rights to meet projected demands at the expiration of the MOA in 2046.

7.4 Emergency and Water Shortage Planning

7.4.1 Emergency Response Plan

Emergency response planning is an essential element of managing a water supply system to ensure public health and safety. The District has an Emergency Response Plan (ERP) that acts as a guide for operators and management in an emergency. The ERP lists the procedures these individuals should employ so that disruption of normal services to the District's water customers is minimized and public health and safety are preserved during an emergency.

The ERP provides the steps to be taken during various water system emergency situations. The District has established immediate actions, notifications, and follow-up actions. A copy of the ERP's Table of Contents is included for reference in Appendix K. The contents of the ERP are also discussed in Chapter 9 (Operations and Maintenance).

7.4.2 Water Shortage Response Plan

The 1996 MOA includes a water shortage response plan that outlines a plan of action by the District and the City of Anacortes to reduce the possible impact that diversions could have on the recommended instream flows for the lower Skagit River. The District will monitor the height and flow of the Skagit River utilizing U.S. Geological Survey Gaging Station No. 12200500 near Mount Vernon as a reference. If the flow in the Skagit River is projected to fall below the instream flow levels, the District will implement certain actions set forth in the plan. The actions are based on the level and duration of the reduced flows in the Skagit River. Actions range from raising public awareness, calling for voluntary water use reductions, limiting water withdrawals to quantities exempt from lower Skagit River instream flow rules, maximizing storage in Judy Reservoir, and requesting upstream Skagit River dam operators to commence additional releases. The 1996 MOA in its entirety is provided in Appendix H.

The three sources of water supply to the Judy System (Skagit River, Cultus Mountain streams, and interties with the City of Anacortes system) enable the District to continue operating the Judy System if one of the sources experiences a water shortage. The ability to store approximately 1.45 billion gallons of raw water in Judy Reservoir provides the District with a significant level of additional protection from the effects of water shortages. Depending on actual demand and the quantity of stored water during a water shortage, the District's water treatment plant is able to maintain the supply of finished drinking water to the distribution system for a period of up to 5 months.

Additional information related to the District's planned responses to water shortages is included in the ERP.

7.5 Source Water Protection

As an owner and operator of drinking water sources of supply, the District is responsible for meeting requirements for source water protection. Source water for the Judy System is obtained from the Skagit River and the Cultus Mountain Watershed. The general location of the Cultus Mountain Watershed and the point of withdrawal on the Skagit River are shown in Figure 7-1. The District protects these sources of water through two watershed control plans.

Under the Public Water System Coordination Act of 1977, purveyors of public drinking water systems that utilize surface water are required to develop and implement a watershed control plan. The purpose of a watershed control plan is to control sources of potential contamination to the supply of a public drinking water system. These plans and their general strategies are discussed below.

7.5.1 Cultus Mountain Watershed

The Cultus Mountain Watershed has been the District's primary source of water since 1939. A Watershed Control Plan for the Judy System was developed by the District in 1994. This document addressed protection of source water from the Cultus Mountain Watershed only, because the ability to withdraw water from the Skagit River was not established until 2009. The Cultus Mountain Watershed Management Plan, updated in 2013 and referenced in Appendix E, has been developed to update and expand on the District's efforts to control potential sources of contamination to water obtained from this area. The updated plan includes the following components:

- Description of the watershed and water system components
- Identification of watershed activities and land uses detrimental to water quality
- Watershed control measures
- System operation and emergency provisions
- Water quality trends
- Recent changes in the watershed
- Opportunities for improved watershed control

This plan describes significant improvements in the District's watershed control efforts, especially related to communication with watershed landowners and monitoring of their activities. The District will continue to build on these improvements by addressing the opportunities for improved watershed control listed in the updated plan.

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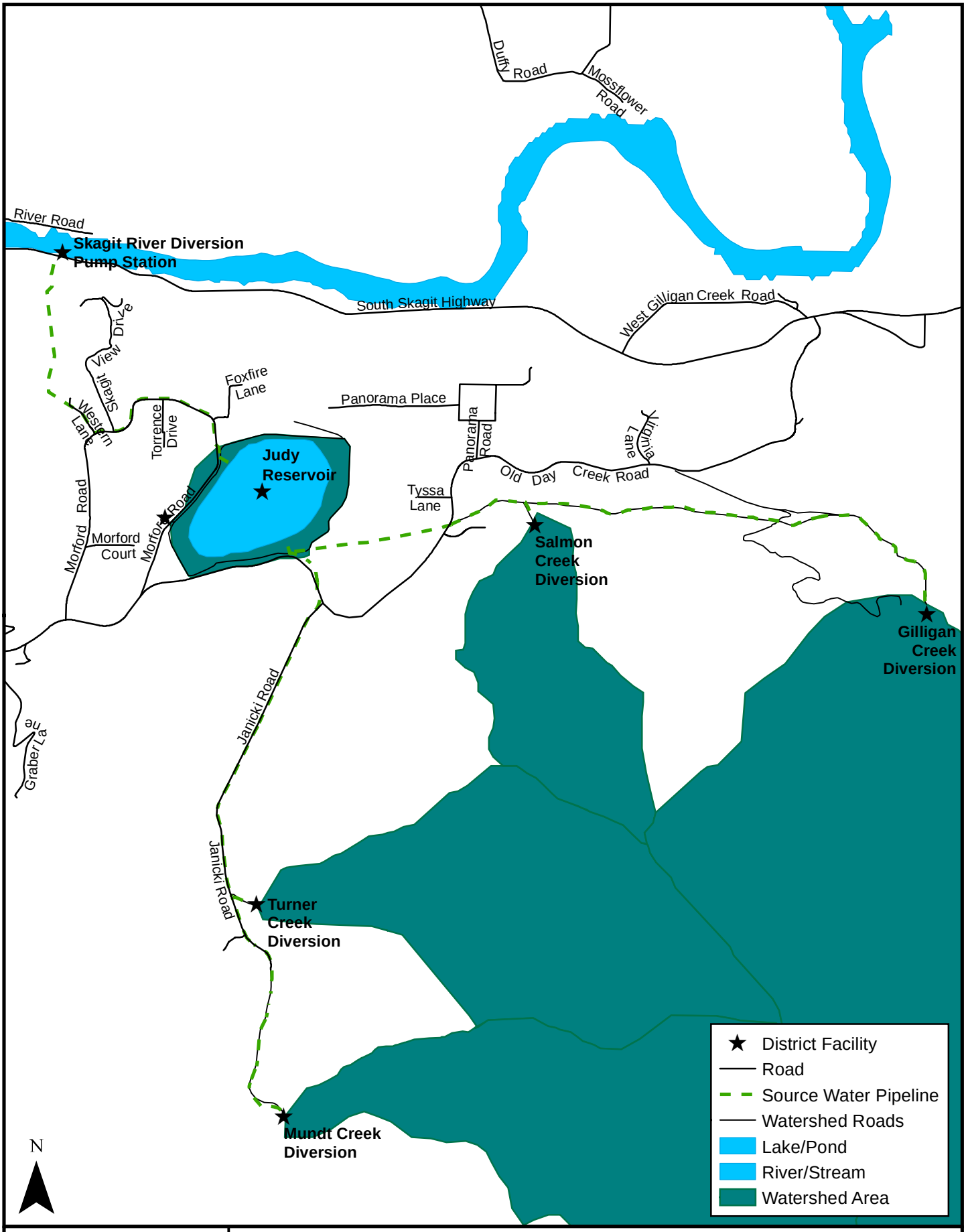

District Facilities Related to the Cultus Mountain Watershed

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 7-1

7.5.2 Skagit River

In 2004, the District and the City of Anacortes developed a watershed control plan for the Skagit River. The program area for this plan focused on the 43-mile length of river in the vicinity of water withdrawal points used or planned by the District and the City of Anacortes. An update to the plan was developed in 2010 by the City of Anacortes and is referenced in Appendix F, along with the table of contents from the original 2004 watershed control plan.

The 2004 Skagit River Watershed Control Plan and the 2010 update prepared by the City of Anacortes include a list of program strategies intended to minimize the risk of potential contamination to each organization's public drinking water supplies. The District intends to coordinate with the City of Anacortes to address implementation goals related to each of the categories listed below:

- Public education
- Emergency notification
- Ecology permit holder notification
- Interlocal agreements
- Cooperation

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8 WATER QUALITY

This chapter reviews current federal and state drinking water regulations in accordance with the Safe Drinking Water Act (SDWA) and evaluates the District's compliance for the 6-year period from 2007 through 2012. This chapter also discusses upcoming regulations and their impact on the District.

8.1 State and Regulatory Framework

8.1.1 Safe Drinking Water Act

The SDWA, passed in 1974, is the main federal law that ensures the quality of drinking water in the United States. The U.S. Environmental Protection Agency (EPA) sets the standards for water quality and oversees the implementation of these standards by every state. Originally, the main focus of the SDWA was on treatment; that is, providing safe drinking water at the tap. EPA subsequently issued two amendments in 1986 and 1996 that include protection of the water source, operator training, and funding for water system improvements and for providing information to the public regarding water quality. With these amendments, SDWA provides protection of water quality from source to tap.

8.1.2 Washington Administrative Code

The Washington State law that incorporates the SDWA and its amendments is Chapter 246-290 of the Washington Administrative Code (WAC 246-290). The Washington State Department of Health (DOH) is the primacy agency responsible for implementing and enforcing state and federal drinking water laws.

The District's Judy Reservoir System is a Group A public water system (PWS) (# 79500E) serving a population of 65,000 as of 2012. The District is responsible for maintaining compliance with all applicable state and federal regulations for Group A public water systems that pertain to source water protection, treatment, monitoring, and water quality. The Judy System serves the cities of Burlington, Mount Vernon, and Sedro-Woolley and the surrounding rural and suburban areas. The District also operates remote water systems including Fidalgo Island, Alger, Cedargrove, Marblemount, Mountain View, Potlach Beach, Rockport, and Skagit View Village.

8.2 Treatment Overview

JUDY RESERVOIR WATER TREATMENT PLANT (ID # 79500 E)

The District operates a multi-media direct filtration water treatment plant (WTP). Raw water flows by gravity into Judy Reservoir from four creeks—Gilligan, Salmon, Mundt, and Turner creeks—or alternatively, the water can be pumped from the Skagit River. The raw water is disinfected with chlorine dioxide and pumped up to the control building; carbon dioxide and coagulant aids are also added at this stage. The water flows through an in-line static flash mixer to four 2-stage flocculation basins. Then the water flows to the filter basins. There are eight filter basins, 500 square feet each, utilizing a high-speed filtration process through coal and sand filter media. The filtered water is disinfected again with chlorine and flows by gravity to the three finished water reservoirs (clearwells) near the WTP; these include one steel 3-million-gallon (MG) tank and two steel 1.22-MG tanks. Caustic soda and ammonia are added before the clearwells to adjust pH and form chloramine residual. Finished water from the clearwells flows by gravity down the transmission lines to the distribution system and the District's customers.

The WTP filters are alternated to maintain finished water production, and backwashed regularly to remove suspended solids, including microorganisms, which are trapped by the filter media. The filter backwash water is diverted to the backwash water recycle basin; filter-to-waste water is also diverted to the recycle basin. Two recycle pumps send the backwash and filter-to-waste from the recycle basin to one of two 19,000-square-foot settling lagoons. The majority of the water from the lagoons is decanted back to Judy Reservoir and the backwash solids remain. The District contracts for the solids to be removed and disposed of off-site.

The District maintains a variety of on-line analyzers at discrete stages of the treatment process to monitor water quality and treatment performance, and for process control and optimization. These include a streaming current monitor for raw water and coagulant dose charge, turbidimeters for raw water from Judy Reservoir and filter effluent, particle counters for raw water and effluent, free and total chlorine analyzers, and finished water pH analyzer. Along with the continuous on-line monitoring, grab samples are taken during the day for total and free chlorine, pH, temperature, turbidity, chlorite, color, and alkalinity.

8.3 Current Water Quality Regulations

Table 8-1 lists all drinking water quality regulations applicable to the District for the period of 2006 through 2012. These regulations are separated into three categories: source water and treatment, distribution system, and other. Each regulation and how it applies to the District is discussed below.

Table 8-1. Applicable Safe Drinking Water Act Regulations

Water Regulation	Contaminants Affected	Date Rule Took Effect	District Status
Current Source Water and Treatment Regulations			
Surface Water Treatment Rule	Turbidity, *Giardia lamblia*, heterotrophic bacteria, *Legionella*, enteric viruses, disinfectant residual	December 1990	Monitoring
Interim Enhanced Surface Water Treatment Rule	Turbidity, *Cryptosporidium*	January 2002	Monitoring
Long Term 2 Enhanced Surface Water Treatment Rule	*Cryptosporidium*	March 2006	Started monitoring in 2013
Phase I Rules	Volatile Organic Compounds	January 1989	Monitoring
Phase II and V Rules	Inorganic and Synthetic Organic Compounds	January 1993	Monitoring
Arsenic Rule	Arsenic	January 2006	Monitoring
Radionuclides Rule	Combined radium, gross alpha, beta and photon emitters, and uranium	December 2003	Monitoring
Unregulated Contaminant Monitoring Rule 2	25 parameters	January 2007	Monitoring
Unregulated Contaminant Monitoring Rule 3	30 parameters	April 2012	Start monitoring in 2014
Filter Backwash Recycling Rule	Recycle flow	May 2001	Not applicable
Current Distribution System Regulations			
Total Coliform Rule	Total and fecal coliform, *E. coli*	December 1990	Monitoring
Lead and Copper Rule and revisions	Lead and copper, water quality parameters	December 1992 December 2007	Monitoring
Stage 1 Disinfectants and Disinfection By-products Rule	Trihalomethanes, haloacetic acids, disinfectant, total organic carbon	February 1999	Completed
Stage 2 Disinfectants and Disinfection By-products Rule	Chlorite, trihalomethanes, haloacetic acids	March 2006	Monitoring
Ground Water Rule*	Total/ Fecal coliform	November 2006	Monitoring
Other Current Regulations			
Consumer Confidence Reports	Annual report addressing drinking water quality	September 1998	Reporting annually
Operator Certification	Minimum standards for operator certification	February 2001	Up-to-date

*Not applicable for Judy Reservoir

8.3.1 Surface Water Treatment Rule

8.3.1.1 Regulatory Elements

Public water systems (PWSs) using surface or groundwater under the direct influence of surface water as supply are prone to microbial contamination of their source. Pathogenic microorganisms can be removed or inactivated by water treatment through sedimentation, filtration, and disinfection. EPA issued the Surface Water Treatment Rule (SWTR), which sets maximum contaminant level goals (MCLGs) for pathogens like *Legionella*, *Giardia lamblia*, and viruses at zero, because any exposure to these contaminants is considered a health risk.

The SWTR took effect in 1990 and requires that PWSs have sufficient treatment to reduce source water concentrations of *Giardia lamblia* and viruses by at least 99.9% (3.0 log) and 99.99% (4.0 log), respectively. Subpart B of Part 6 of Chapter 246-290 WAC details specific requirements to achieve sufficient treatment by (a) filtration (WAC 246-290-660); (b) disinfection to ensure that pre-treatment, filtration, and disinfection in combination achieve at least 3.0 log reduction of *Giardia lamblia* cysts and at least 4.0 log reduction for viruses (WAC 246-290-662); (c) monitoring of source water coliform and source and filtered water turbidity; (d) monitoring to determine inactivation levels for *Giardia lamblia* cysts and viruses; and (e) monitoring of disinfectant residual concentrations entering and within the distribution system (WAC 246-290-664). The SWTR also includes requirements for reporting by filtered systems (WAC 246-290-666) and watershed control (WAC 246-290-668).

The SWTR requires after-treatment disinfection residuals of at least 0.2 milligrams per liter (mg/L) at the entry point and continuous disinfectant residual monitoring for water systems serving more than 3,300 people. If the residual level drops below 0.2 mg/L for more than 4 hours, the system is considered in treatment violation. Under the rule, systems are also required to maintain detectable disinfectant residual for at least 95% of the monthly distribution system water samples (taken concurrently with routine and repeat total coliform samples). Alternatively, samples may be analyzed for heterotrophic bacteria using a plate count method. A heterotrophic plate count (HPC) level of 500 colony forming units (cfu) per millimeter or less is considered equivalent to a detectable disinfectant residual.

8.3.1.2 District's Status

Based on the direct filtration treatment and effluent turbidity levels achieved at the WTP, Judy Reservoir receives the following physical treatment/removal credits:

- 2.0 log (99.0%) for *Giardia lamblia* removal
- 1.0 log (90.0%) for viruses

The credits for *Giardia lamblia* are achieved based on the direct filtration system (no sedimentation) listed in WAC 256-290-660 (2). To achieve 3.0-log removal of *Giardia*, the WTP is required to provide

1.0-log inactivation of *Giardia lamblia* by disinfection. Chlorine dioxide is injected at the raw water pump station into the raw water line that comes to the WTP. This is considered Stage 1. Chlorine also can be added at three discrete points (stages), which are as follows: (1) Stage 2 – prior to in-line static mixer (currently not in use), (2) Stage 3 – flocculation basin effluent, (3) Stage 4 – filter effluent line. At Stage 5, ammonia is injected just before the finished water tanks (clearwells) and it forms chloramines, which result in a reaction between the ammonia and chlorine solution.

The credits for *Giardia lamblia* and virus inactivation are based on pre- and post-chlorination and filtration. WTP personnel on a daily basis determine the level of inactivation achieved and then determine whether this level is sufficient to meet the required level of inactivation. For the years 2007 through 2012, the WTP has maintained inactivation ratios (IR) well above 1; below this value would be considered a treatment technique violation. The highest IR value achieved was 8. The WTP does not get extra credits for maintaining higher IR values.

In 1993, the District conducted a tracer study (at flow rates ranging from 4,800 gallons per minute [gpm] up to 8,200 gpm) to determine the T_{10}/T for each disinfection stage to assist with the development of daily disinfection contact time (CT) profiles. Using the results of this tracer study, a disinfection contacting model for the WTP was developed that allows assessments of the levels of disinfection under the ranges of water temperatures and flow rates that normally occur at the WTP. As a requirement of the SWTR, CT values are calculated daily on each stage of disinfection. Figures 8-1 through 8-6 show minimum, average, and maximum CT values for each year from 2007 through 2012.

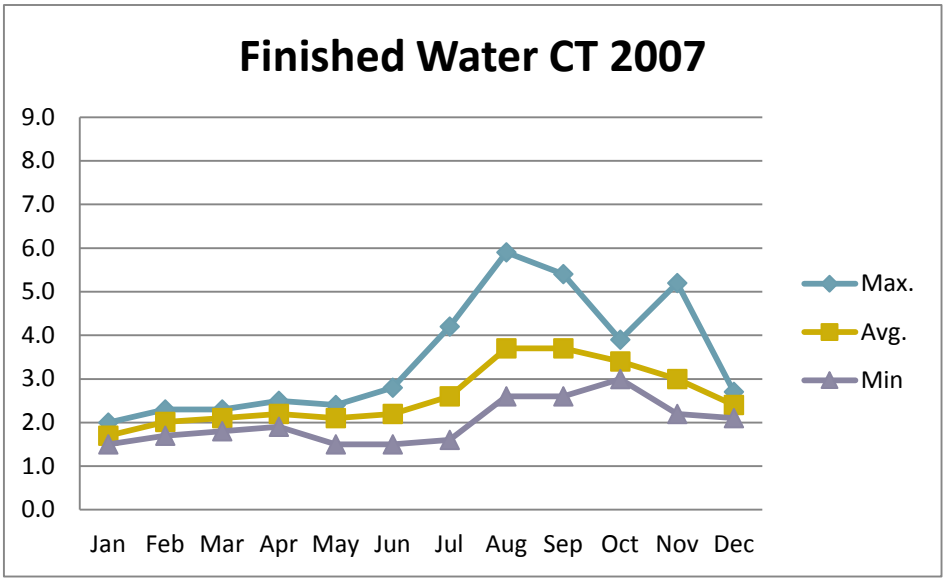

Figure 8-1. 2007 Minimum, Average, and Maximum CT Values

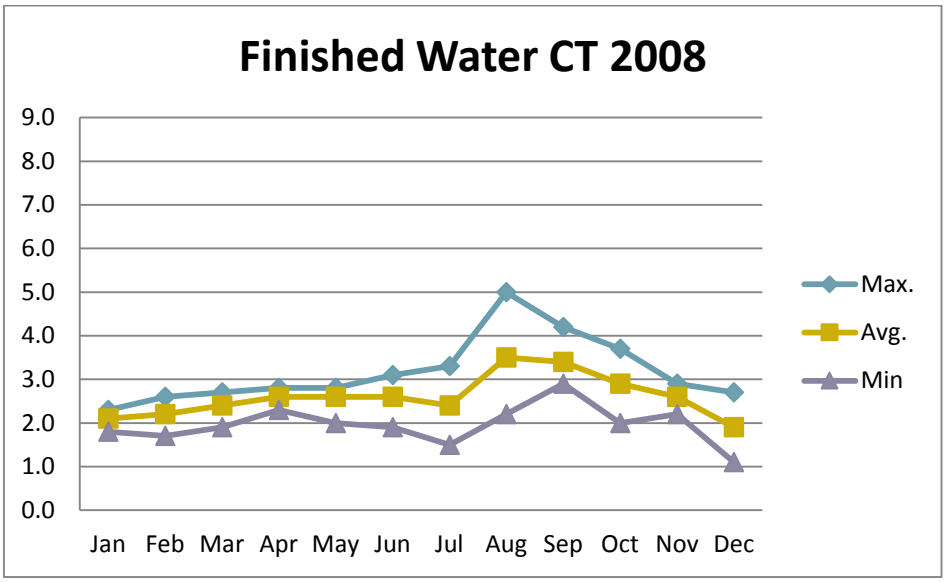

Figure 8-2. 2008 Minimum, Average, and Maximum CT Values

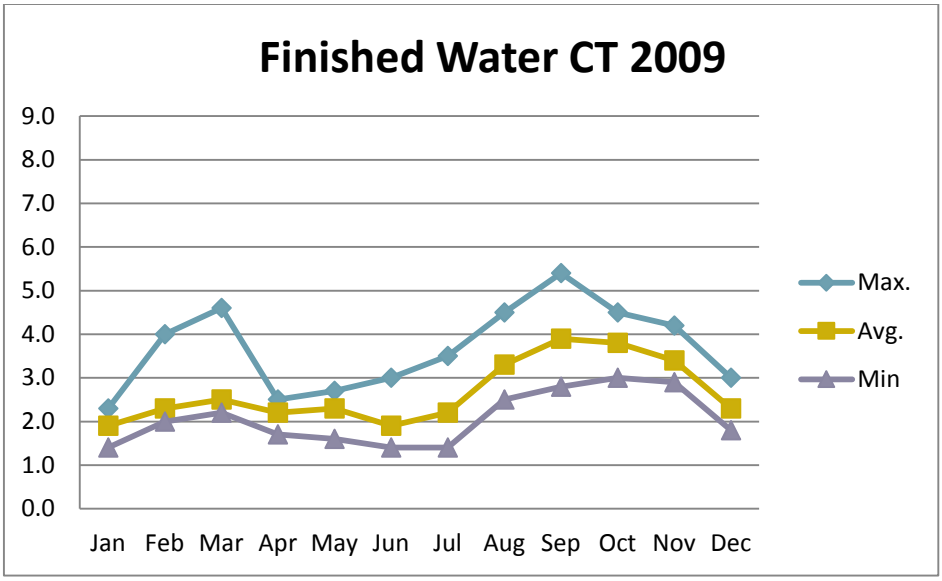

Figure 8-3. 2009 Minimum, Average, and Maximum CT Values

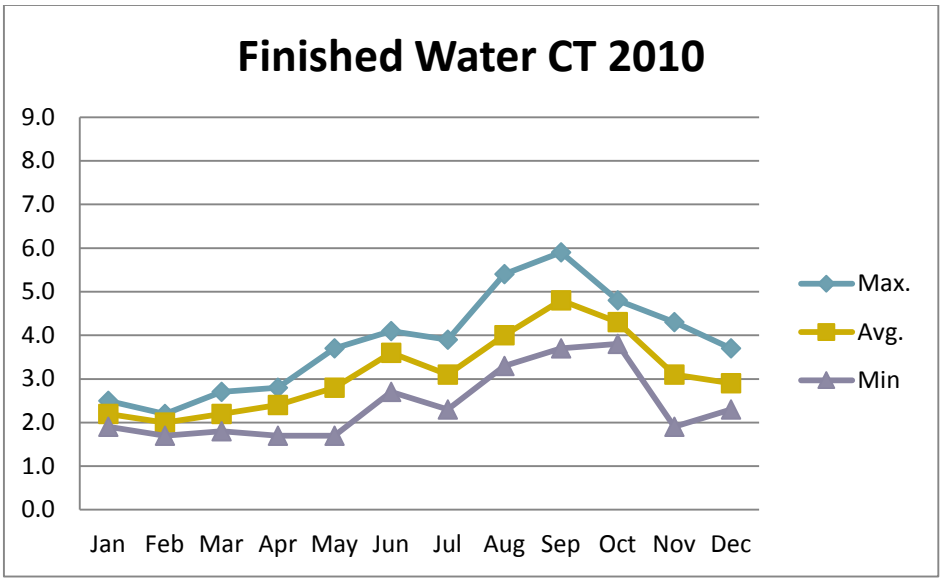

Figure 8-4. 2010 Minimum, Average, and Maximum CT Values

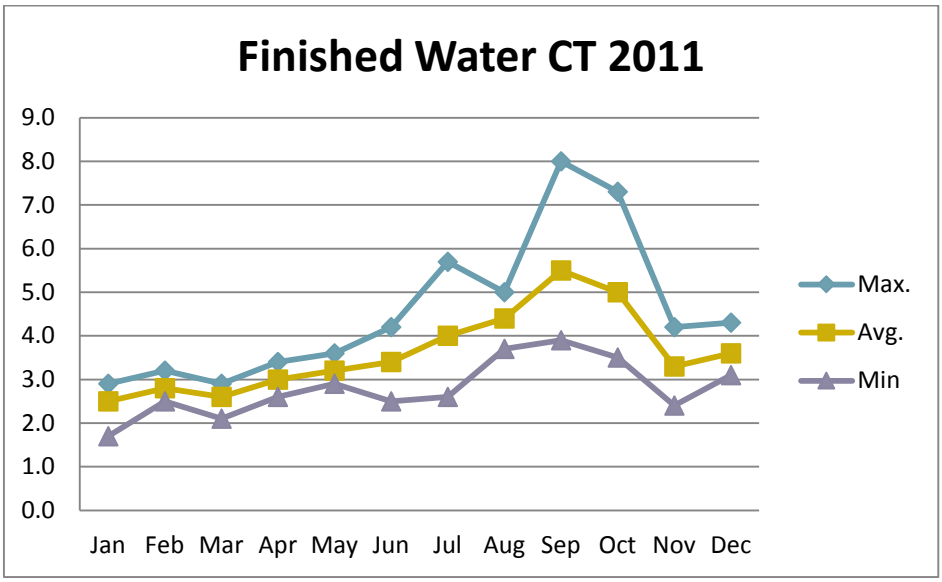

Figure 8-5. 2011 Minimum, Average, and Maximum CT Values

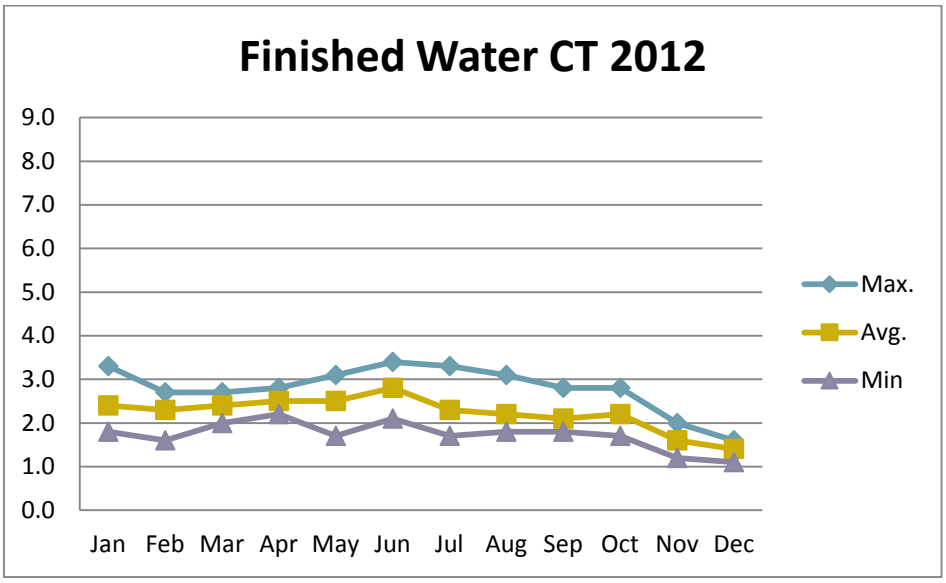

Figure 8-6. 2012 Minimum, Average, and Maximum CT Values

The WTP currently targets a total chlorine residual level of at least 1.2 mg/L at the CT determination point for Stage 5 (at the clearwells), which is also the entry point to the distribution system. The WTP provides continuous on-line chlorine residual monitoring at this location for process control and reporting purposes. Since 2007, the entry-point total chlorine residual has not fallen under 0.2 mg/L. The total chlorine residual is typically maintained in the range 1.2 to 1.5 mg/L. There have been no treatment technique violations based on this requirement. Figures 8-7 through 8-12 represent Stage 5 total chlorine residuals from 2007 through 2012.

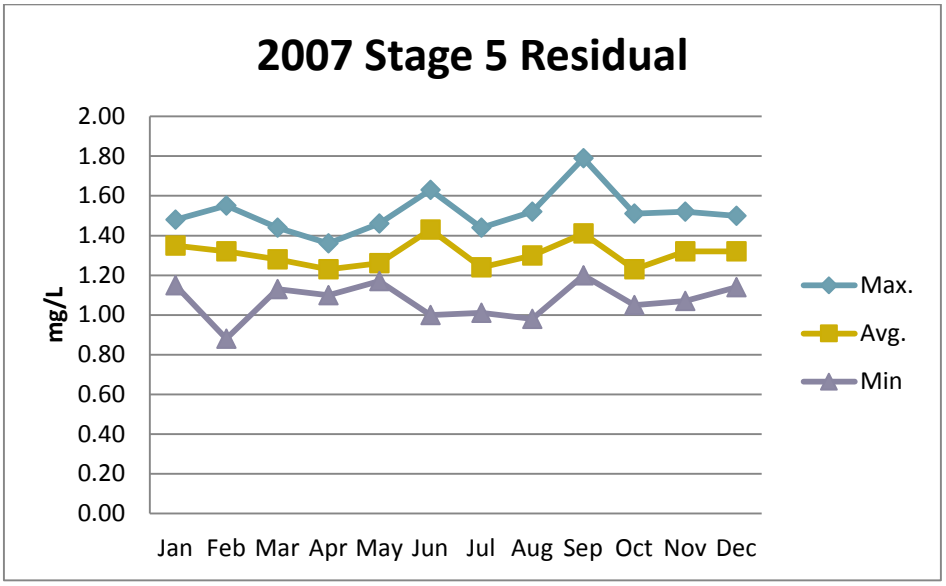

Figure 8-7. 2007 Stage 5 Total Chlorine Residual

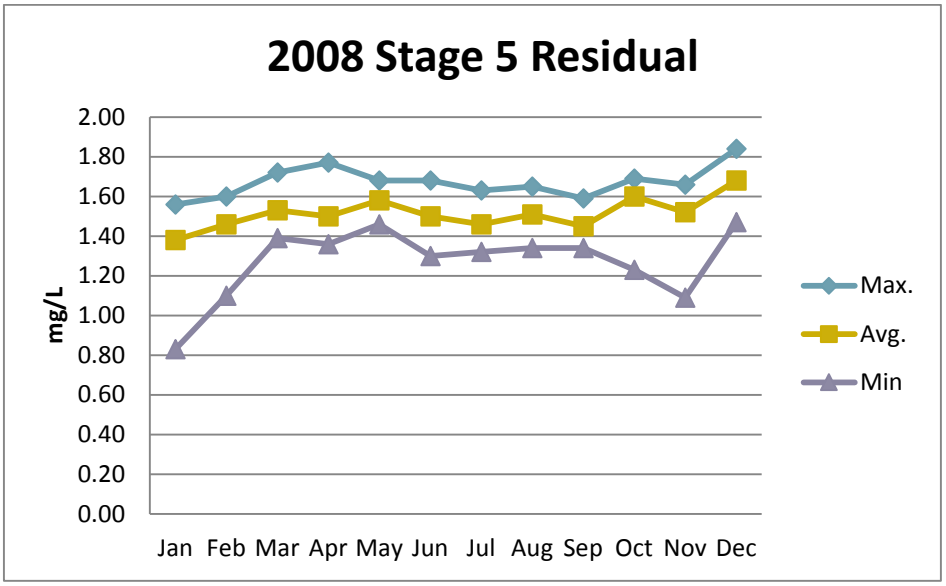

Figure 8-8. 2008 Stage 5 Total Chlorine Residual

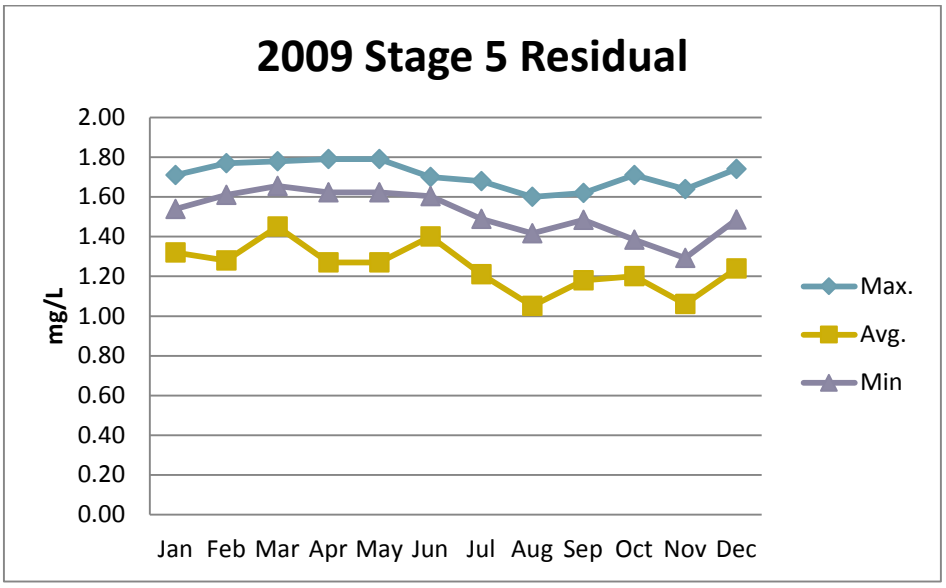

Figure 8-9. 2009 Stage 5 Total Chlorine Residual

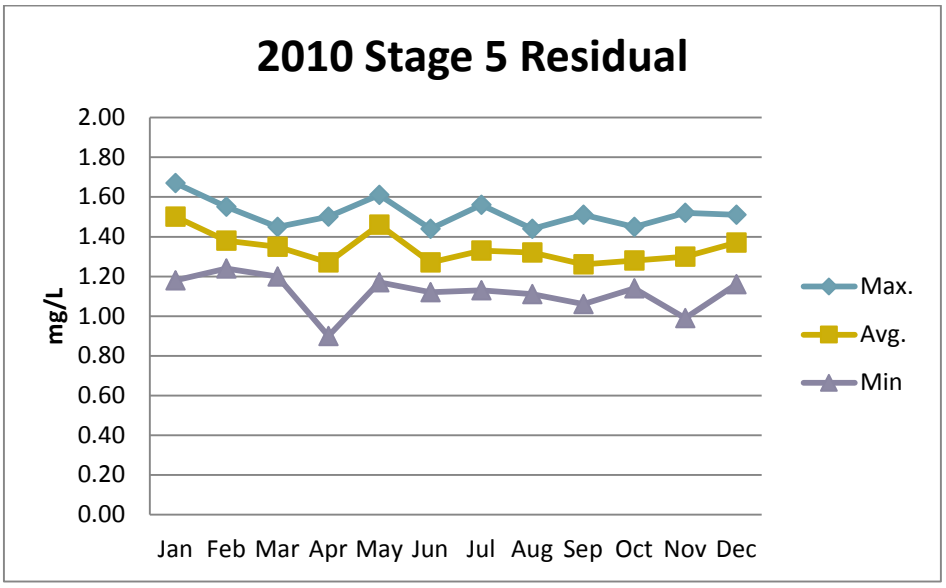

Figure 8-10. 2010 Stage 5 Total Chlorine Residual

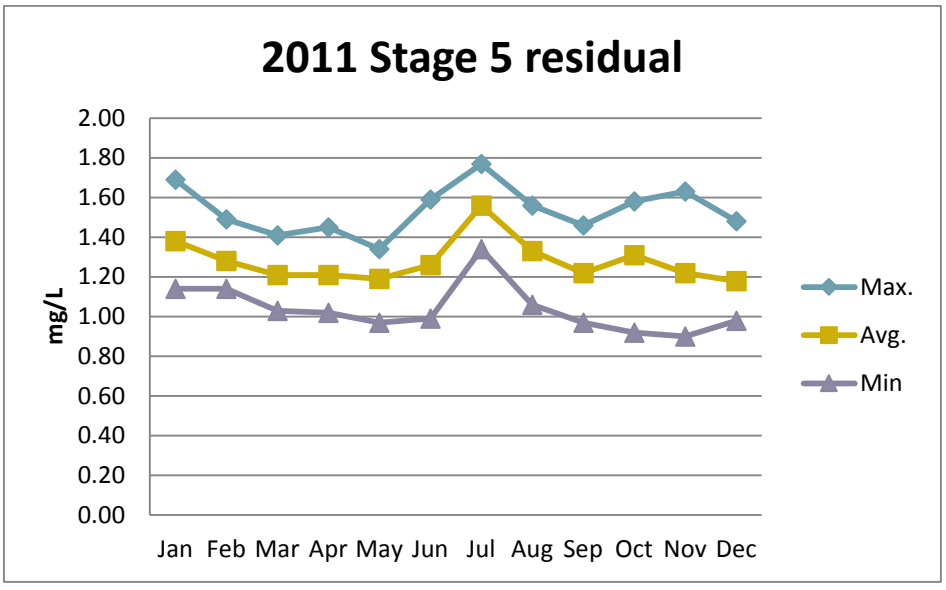

Figure 8-11. 2011 Stage 5 Total Chlorine Residual

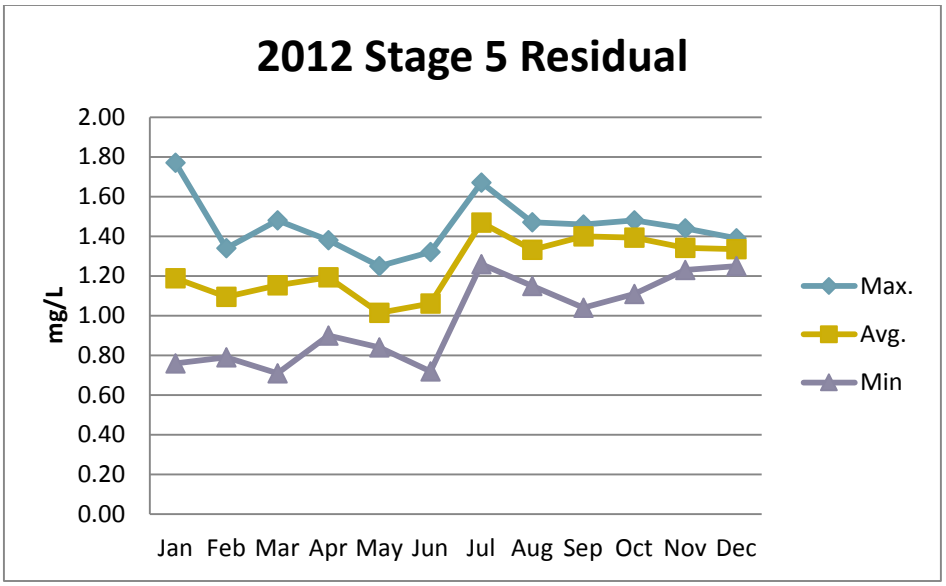

Figure 8-12. 2012 Stage 5 Total Chlorine Residual

The District monitors chlorine residuals with each coliform sample, about 70 samples per month. Figures 8-13 through 8-16 illustrate the minimum, average, and maximum monthly total chlorine residual levels for the period 2009 through 2012.

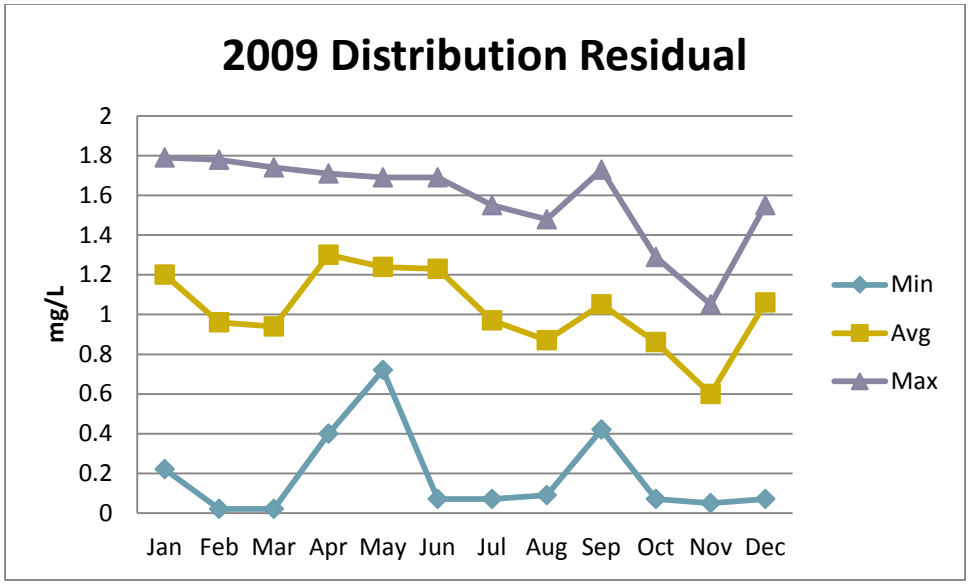

Figure 8-13. 2009 Minimum, Average, and Maximum Monthly Total Chlorine Residual

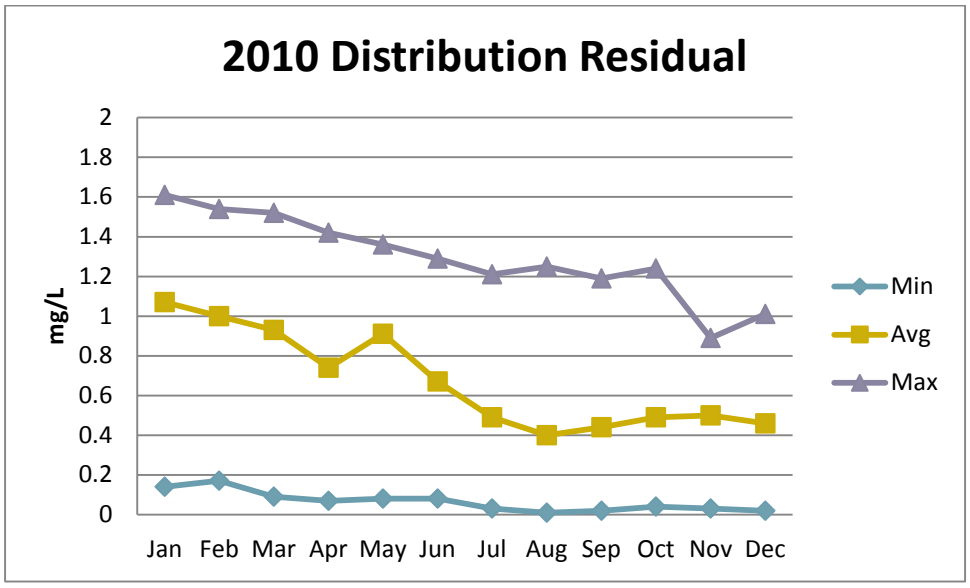

Figure 8-14. 2010 Minimum, Average, and Maximum Monthly Total Chlorine Residual

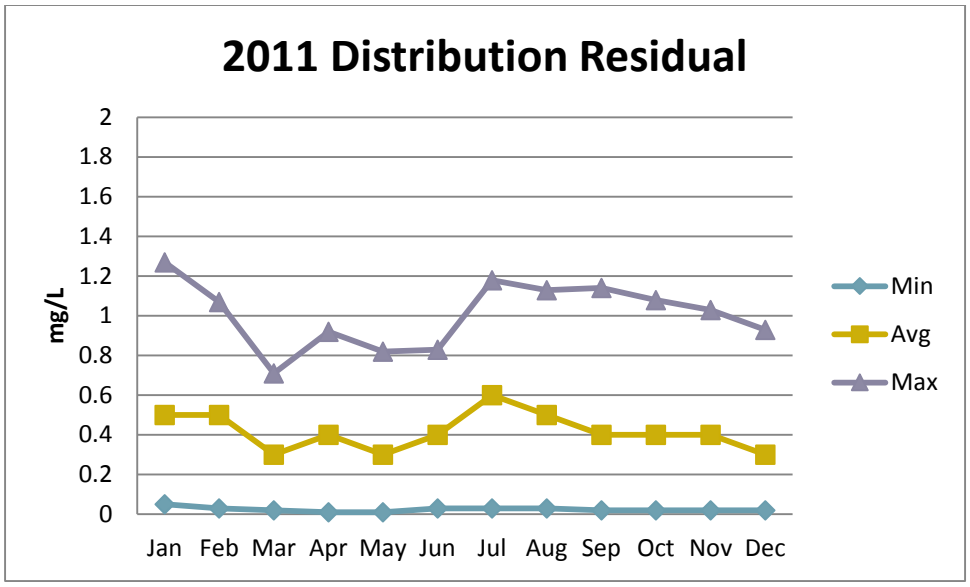

Figure 8-15. 2011 Minimum, Average, and Maximum Monthly Total Chlorine Residual

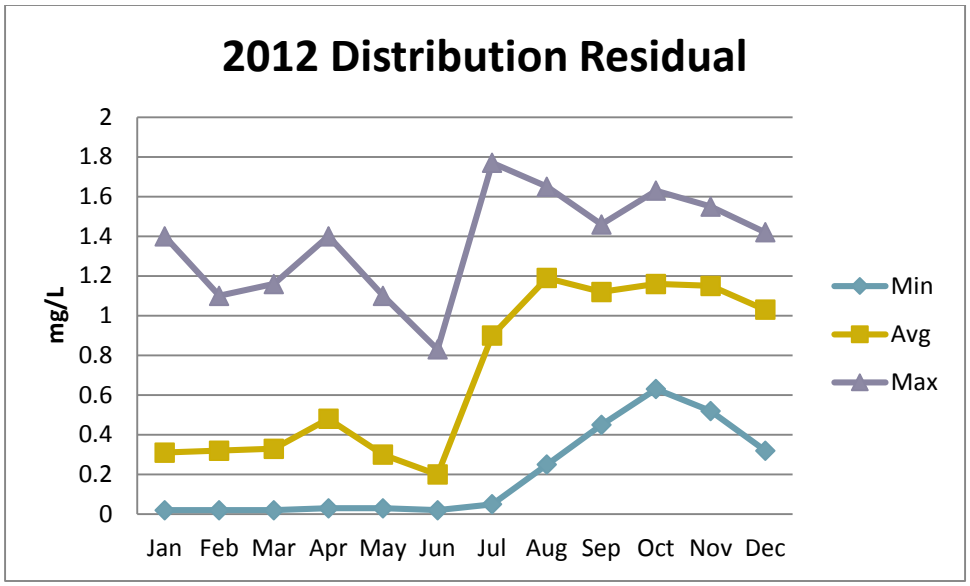

Figure 8-16. 2012 Minimum, Average, and Maximum Monthly Total Chlorine Residual

These results show fairly inconsistent chlorine residuals over the examined period. These changes can be attributed to chlorine demand changes, areas with low water use, seasonal fluctuations, plant optimizations, etc. These figures do not show the free residual chlorine measures at the sample stations of Bayview Edison Road, Peterson Road, and Airport Drive, which were measured by the City of Anacortes. With the completion of the Josh Wilson Road pipeline project, this area is now supplied by water from the Judy Reservoir and the total chlorine residual will be measured.

None of the monthly samples for the 6-year period from 2007 through 2012 have had non-detectable chlorine residual. The District has maintained detectable chlorine in at least 95% of the monthly samples for the entire period from 2007 through 2012. The District has established a procedure to test for HPCs if the sample has non-detectable chlorine residual.

Under the SWTR, the District performs monthly testing of the raw water from Judy Reservoir for fecal coliform (seven samples per month). In the months when Skagit River water is taken, the District is required to analyze one sample for fecal coliform per week.

8.3.2 Interim Enhanced Surface Water Treatment Rule

8.3.2.1 Regulatory Elements

The Interim Enhanced Surface Water Treatment Rule (IESWTR) builds on the SWTR by adding protection from *Cryptosporidium*. The IESWTR requires filtered systems to meet new turbidity standards for combined filter effluent (CFE) and individual filter effluent (IFE). Under the IESWTR, the CFE turbidity must be ≤0.3 Nephelometric Turbity Units (NTU) (for 95% sample in 4-hour intervals) and the maximum turbidity 1.0 NTU for filtered water. Additionally, the rule requires unfiltered systems to include control of *Cryptosporidium* in their watershed control plans. The IESWTR applies

to systems that serve more than 10,000 people. The IESWTR builds on the Total Coliform Rule by requiring sanitary surveys for all PWSs using surface water, regardless of their size. The rule also requires covers for all new finished water storage facilities and includes disinfection profiling and benchmarking provisions to ensure that systems provide continued levels of pathogen protection while taking the necessary steps to comply with the disinfection byproducts standards.

8.3.2.2 District's Status

The District has established continuous turbidity monitoring of the source water and filtered water (from each individual filter) for the purposes of process control, performance assessment, and compliance reporting.

Judy Reservoir raw water turbidity is affected by seasonal changes and events affecting the Cultus Mountain Watershed and the Skagit River. These changes include wind storms, algae blooms, and rain runoff, and turbidity can fluctuate significantly over a short period of time. When individual stream turbidities exceed 5 NTU or color exceeds 35 color units, water from that stream is typically not diverted into Judy Reservoir. A description of the strategy on when the water is diverted into Judy Reservoir can be found in Chapter 9. A maximum turbidity criterion of 10 NTU is used when deciding whether to divert Skagit River water into Judy Reservoir. Figures 8-17 and 8-18 represent minimum and maximum turbidity levels (NTU) of the raw water from Judy Reservoir.

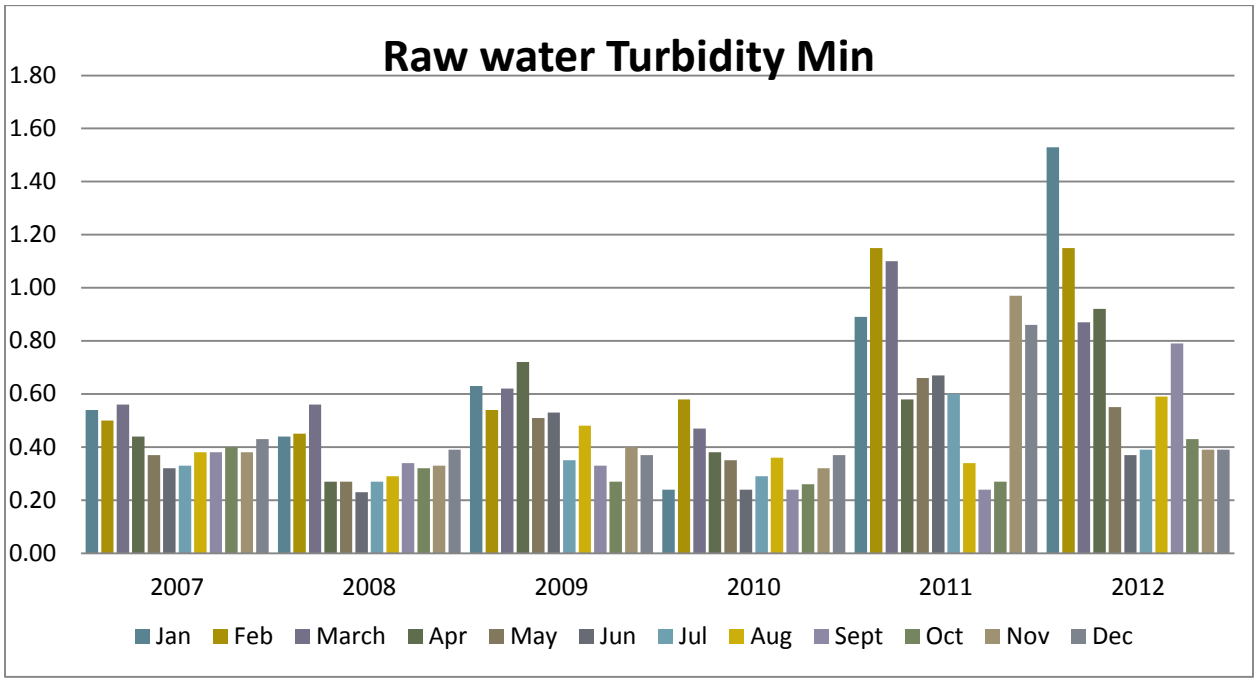

Figure 8-17. Minimum Monthly Raw Water Turbidity (NTU), 2007–2012

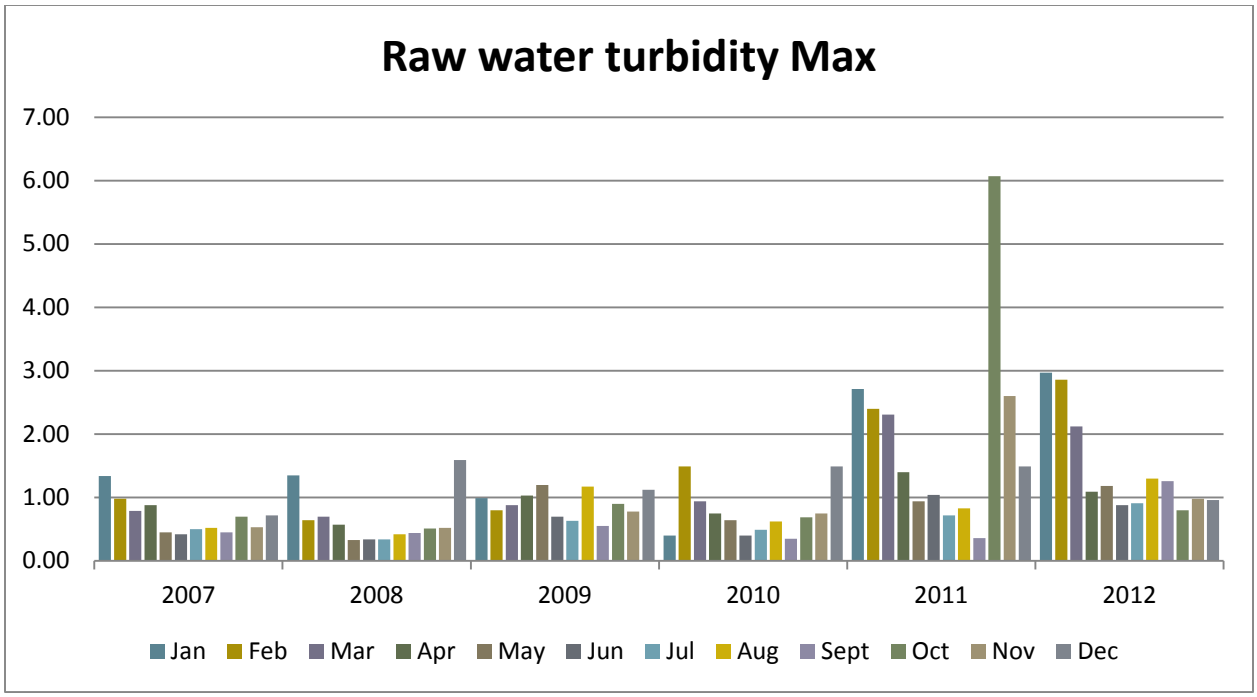

Figure 8-18. Maximum Monthly Raw Water Turbidity (NTU), 2007–2012

Turbidity levels shown on Figures 8-17 and 8-18 represent the relatively low turbidity of the source water and some seasonal fluctuations. High levels of turbidity in the source water can protect microorganisms from the effect of disinfection and may indicate that *Cryptosporidium* can break through the filters and enter the water supply. In addition to disinfection, to reduce turbidity levels the WTP employs flocculation and coagulations prior to filtration.

Inorganic and organic liquid coagulants are used for flocculation and coagulation. All coagulants are NSF- or UL-approved. Combined dosage of these chemicals is rarely above 7.0 mg/L. Coagulant dosage is reported in the Monthly Surface Water Treatment Report and annually in the DOH certification form.

With regard to IESWTR compliance, the District conducts continuous turbidity monitoring of each IFE and CFE, with recordings taken at 15-minute intervals. As required per WAC 246-290-664, the CFE data recorded at 4-hour intervals are reported for IESWTR compliance purposes. The WTP consistently achieves over 99.5% removal of source water turbidity, well above the 80% removal requirement specified in WAC 246-290-654.

Figures 8-19 and 8-20 show monthly effluent turbidity (minimum and maximum) for the 2007 through 2012 period. It is evident from these figures that finished water turbidity is significantly below the established maximum level of 1.0 NTU for treated water under the IEWSTR. Based on these low turbidity (below 0.1 NTU) results, the District consistently meets turbidity limits established under the SWTR. In addition, the District meets optimized treatment goals established by

EPA. In 2009, the District's WTP ranked in the top three treatment plants in Washington based on turbidity performance.

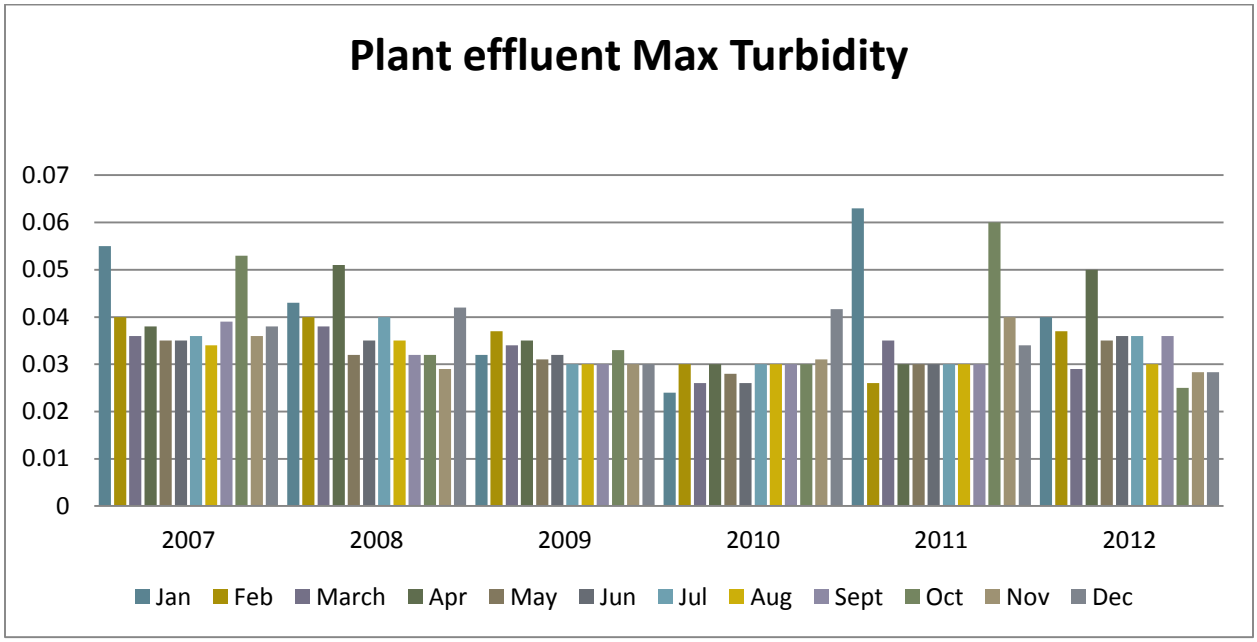

Figure 8-19. Maximum Monthly Plant Effluent Turbidity (NTU), 2007–2012

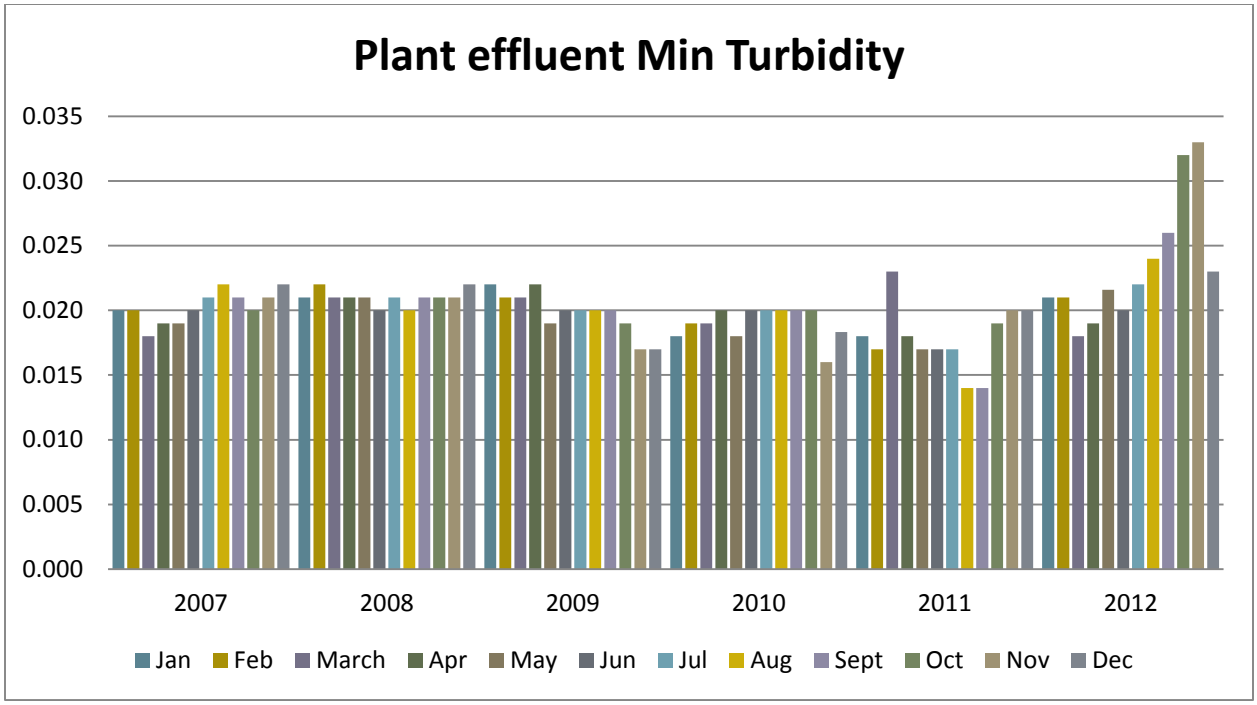

Figure 8-20. Minimum Monthly Plant Effluent Turbidity (NTU), 2007–2012

8.3.3 Long Term 2 Enhanced Surface Water Treatment Rule

8.3.3.1 Regulatory Elements

The Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) builds upon the SWTR and IESWTR by supplementing existing microbial treatment requirements for systems where additional public health protection is needed against *Cryptosporidium*. The rule was developed in conjunction with the Stage 2 Disinfectants/Disinfection Byproducts Rule (D/DBPR) requiring systems to provide microbial protection while trying to minimize the health effects from disinfection byproducts. This rule took effect in March 2006 and applies to water systems using surface water or groundwater under direct influence (GWUDI) as the source. Based on system size and filtration type, systems need to monitor for *Cryptosporidium*, *E. coli*, and turbidity.

The LT2ESWTR requires systems to monitor their water sources for *Cryptosporidium* to determine treatment requirements, ensuring less than 1 oocyst per 10,000 liters of finished water. This approach involves identification of source water vulnerability to *Cryptosporidium* and strategies minimalizing occurrence risk of *Cryptosporidium*. The LT2ESWTR establishes the following types of requirements:

- Two distinct rounds of source water monitoring for *Cryptosporidium*
- Determination of risk bin classification based on initial monitoring
- Microbial toolbox for meeting additional treatment requirements
- Profiling and benchmarking requirements
- Covering finished water storage facilities
- Sanitary surveys

The source water monitoring requirements of the LT2ESWTR apply to all Subpart H PWSs. Filtered and unfiltered systems must conduct 24 months of source water monitoring for *Cryptosporidium*. Filtered systems must also record source water *E. coli* and turbidity levels. Filtered systems are classified into one of the four "bins" based on the results of their source water monitoring (Table 8-2). Unfiltered systems calculate a mean *Cryptosporidium* level to determine treatment requirements. Systems may also use previously collected data (i.e., grandfathered data).

Table 8-2. Bin Classification

For systems that are:	Mean *Cryptosporidium* Concentration[1]	Bin Classification
Required to monitor for *Cryptosporidium*	< 0.075 oocysts/ L	Bin 1
	From 0.075 to < 1.0 oocysts/ L	Bin 2
	From 1.0 to < 3.0 oocysts/L	Bin 3
	≥ 3.0 oocysts/ L	Bin 4

[1] Samples analyzed by an approved laboratory and EPA method 1622 or 1623.

For filter plants classified in Bin 1, no additional *Cryptosporidium* treatment is required under the LT2ESWTR. Plants classified in Bins 2 through 4 need to provide the additional treatment for *Cryptosporidium* outlined in the EPA Microbial Toolbox. Filter plants classified in Bins 3 and 4 must achieve at least 1.0 log (90%) of additional *Cryptosporidium* treatment using one or more of the following, as specified in the Microbial Toolbox: bag filters, bank filtration, cartridge filters, membrane filtration, chlorine dioxide, ozone, and/or ultraviolet disinfection. The deadline for meeting the treatment requirements was October 2012 (Schedule 2).

Water systems are required to conduct a second round of source water monitoring 6 years after the initial bin classification to confirm or revise the initial assessment. For Schedule 2 (between 50,000 and 99,000 people), that will be October 2015.

Under the LT2ESWTR, water systems that propose changes to their disinfection strategy must develop *Giardia lamblia* and virus disinfection profiles. The profiling requirements for large systems include daily measurements of operational data for periods of 12 months in order to calculate inactivation ratios. This builds upon the requirements for disinfection profiling under the IESWTR, which were triggered based on distribution system disinfection byproduct levels.

8.3.3.2 District's Status

The District belongs to Schedule 2 systems (service population between 50,000 and 99,999), which involves the following:

- Begin initial source water monitoring (ISWM) or submit intent to grandfather historical data by April 1, 2007.
- Submit source water occurrence bin classification to DOH by October 1, 2009.
- Install treatment as needed to ensure compliance by October 1, 2012.
- Submit a sampling plan for follow-up source water monitoring (FSWM) by July 1, 2015.
- Begin FSWM by October 1, 2015.

In order to comply with the LT2ESWTR, in April 2007 the District submitted a report to EPA with the test results of 26 samples for *Cryptosporidium* collected between January 2004 and December 2005. In a letter dated July 2, 2007, DOH indicated its approval of the submitted data for grandfathering based on CFR 141. 707. This approval letter is provided in Appendix L.

The mean *Cryptosporidium* concentration of the 26 grandfathered samples in Judy Reservoir source was 0 oocysts/L. Based on these results, the District was approved for Bin 1 classification, and under this classification, no additional treatment for *Cryptosporidium* is required. This bin classification satisfies the requirements under CFR 141.710.

A second round of source water monitoring is required as part of the LT2ESWTR. The sampling plan for Round 2 is due by July 1, 2015, and sampling must start by October 1, 2015. Based on the future results, the District might change its bin classification.

Regarding disinfection profiling and microbial benchmarking, the District has developed daily pre- and post-filter chlorine contacting disinfection profiles for *Giardia lamblia* (all five stages).

8.3.4 Additional Source Monitoring

This section describes some of the preventive tests the District performs to monitor source/drinking water quality.

8.3.4.1 Algae

In 2003, Judy Reservoir experienced serious taste and odor issues, resulting in consumer complaints and media attention. Since then the District has been more closely monitoring algal communities in Judy Reservoir and trying to prevent similar events. Since October 2006, the District has had a contract with Western Washington University for identifying and counting phytoplankton, measuring chlorophyll, and determining total nitrogen and total phosphorus levels in the raw water from Judy Reservoir. Weekly raw water samples are collected from the pump station and submitted for analysis. Western Washington University has provided the District with annual reports for 2007, 2008, 2010, 2011, and 2012. These reports include descriptions of the water quality and algal data collected since October 2006. The data are described in a series of annotated figures regarding biovolumes, counts, and nutrients, as well as photographs of the most common phytoplankton in Judy Reservoir.

Figure 8-21 shows algal density for the 7 year period of 2006 through 2012. From the data it is obvious that the highest algal count is in late summer to late fall. This gives the District information on seasonal trends and changes in algal species, which could be used as a tool for treatment changes in case of algal blooms.

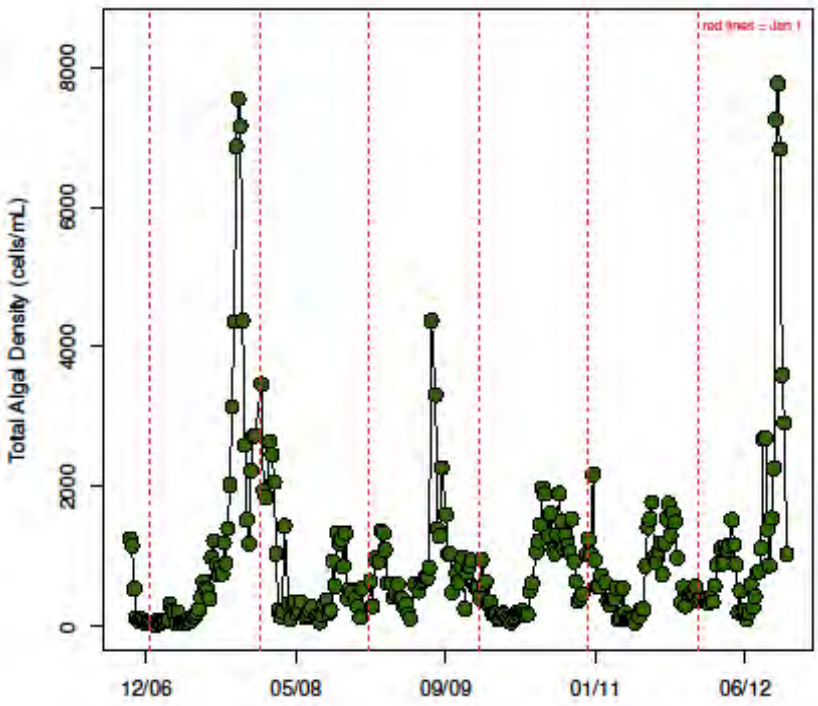

Figure 6: Algal density is determined by settling a known volume of water, then counting and identifying the settled algae. The highest algal counts usually occurred from summer to late fall, which is typical for lakes in our region, or in the winter. High winter counts are unusual for most lakes, but consistent with occasional high winter chlorophyll concentrations in Judy Reservoir (Figures 1 and 2). Although the 2011 algal densities lacked extreme peaks, the median density was higher than 2007–2010. The data from 2012 are incomplete; the 2012 median will probably be lower after the November/December counts are added to the data set.

	All Data	2007	2008	2009	2010	2011	2012†
Median density (cells/mL)	571	416	354	670	506	570	888

†partial year – 2012 does not include November/December

Figure 8-21. Algal Density from 2006 to 2012

8.3.4.2 Total Organic Carbon

As result of total trihalomethane (TTHM) exceedances in 2012, the District started to monitor on a monthly basis total organic carbon (TOC) from Judy Reservoir raw water and Skagit River raw water. Over the years, sporadic TOC tests have been done on source water that shows high organic presence. The Skagit River is known to have low TOC levels, which helps lower overall TOC levels when blended with Judy Reservoir water. Based on collected data, Judy Reservoir TOC levels vary from 1.5 mg/L to 2.5 mg/L; Skagit River (when in use) levels are usually below 1.0 mg/L; and Cultus Mountain Creek levels are between 5.0 and 6.0 mg/L.

8.3.4.3 Free Residual Chlorine

Free residual chlorine is tested on an as-needed basis in the distribution system, except in locations using Anacortes water. As result of the TTHM exceedances of the maximum contaminant level (MCL) values in 2012, and replacement of the chlorine dioxide generator, the District started to monitor its free residual chlorine in the distribution system between August and November. In August the distribution system had some higher than trace amount free chlorine residuals, which could explain why the TTHMs exceeded the MCL limits.

8.3.5 Phase I, II, and V Rules

8.3.5.1 Regulatory Elements

Phase I, II, and V rules, also known as Chemical Phase Rules, define regulations regarding contaminants in three different groups: inorganic chemicals (IOCs), synthetic organic chemicals (SOCs), and volatile organic chemicals (VOCs), a total of 65 contaminants. EPA sets the MCL for each contaminant as well as the standardized monitoring framework where monitoring cycles are established for each contaminant group. EPA has established 9-year cycles divided into 3-year compliance periods, which could be further subdivided to annual and quarterly periods.

As part of the Phase II Rule, systems with a significant amount of asbestos-cement (AC) pipe must conduct periodic asbestos monitoring in the distribution system. In Washington state, DOH requires systems that contain more than 10% AC pipe in their distribution system to comply with this monitoring requirement. These systems must collect one sample in the distribution system at locations served by AC pipe and under conditions where asbestos contamination is most likely to occur.

8.3.5.2 District's Status

The District performs routine finished water monitoring for VOCs, SOCs, and IOCs based on the annual DOH-issued water quality monitoring reports.

During the 6-year period from 2007 through 2012, none of these compounds exceeded the MCL levels. IOC monitoring is performed on an annual basis, and the only parameter close to MCL (15 color units [CU]) is color, with 15 CU.

DOH requires testing for asbestos once every 9 years. The District performed asbestos monitoring in 2009 and 2010. The values for both samples were with 1.4 million fibers per liter (MFL), and the MCL for asbestos is 7.0 MFL.

8.3.6 Arsenic Rule

8.3.6.1 Regulatory Elements

Arsenic is either a naturally occurring element or is introduced via agricultural or industrial practices into the drinking water supply. Arsenic is known to cause a number of organ failures. EPA sets the MCL of arsenic at 0.010 mg/L and it is based on the running annual average of results collected for each entry point to the distribution system. Systems could be eligible for reduced monitoring if their results are below the MCL; however, if arsenic is detected above the MCL in any individual sample, the monitoring frequency will be increased to quarterly.

8.3.6.2 District's Status

Arsenic is monitored annually as part of the suite of 16 primary IOCs. Over the period of 2007 through 2012, arsenic was 0.0030 mg/L, which is below the MCL limit of 0.010 mg/L. Based on these results, the District is in compliance with the Arsenic Rule.

8.3.7 Radionuclides Rule

8.3.7.1 Regulatory Elements

The original Radionuclides Rule was in effect in 1977 and in 2000 was revised and finalized. This rule includes requirements for uranium (30 picoCuries per liter [pCi/L]), combined radium-226 and radium-228 (5 pCi/L), gross alpha particle radioactivity (15 pCi/L), and beta particle and photon radioactivity (4 millirem per year [mrem/year]).

This rule establishes monitoring for radionuclides at each entry point of the distribution system. Systems were required to conduct an initial round of monitoring between 2003 and 2007, unless earlier radionuclide data were accepted for use in grandfathering by DOH. Systems were eligible for reduced monitoring (once every 9 years) if the average of the initial monitoring results for all contaminants was below detection limits.

8.3.7.2 District's Status

The District tested for radionuclides in 2009. No violation was found and none of the following contaminants were detected: gross beta, gross alpha, or radium 228.

8.3.8 Unregulated Contaminant Monitoring Rule 2

8.3.8.1 Regulatory Elements

The Unregulated Contaminant Monitoring Rule 2 (UCMR2) was proposed in August 2005 and requires systems to monitor for 25 contaminants for a 12-month period between 2008 and 2010. EPA divided the 25 contaminants into two lists. Based on the population served, systems monitor for List 1 (10 contaminants) or List 2 (15 contaminants). List 1 (Assessment Monitoring) contaminants are monitored using testing methods that are widely used. The List 1 contaminants include flame

retardants, chemicals used in explosives, and insecticides. List 2 (Screening Survey) contaminants are monitored using testing methods that are relatively new (EPA methods 527 and 529). The List 2 contaminants include nitrosamines and herbicides. Systems serving more than 100,000 people are required to conduct screening monitoring for 15 contaminants on the Screening Survey List (i.e., List 2).

8.3.8.2 District's Status

Between 2009 and 2010, the District performed entry-point sampling for the 10 contaminants on the Assessment Monitoring List (List 1). The analyses (based on EPA methods 527 and 529) were performed in the EPA-certified laboratory Edge Analytical in Burlington, Washington. None of the contaminants were detected in the samples.

8.3.9 Unregulated Contaminant Monitoring Rule 3

8.3.9.1 Regulatory Elements

The Unregulated Contaminant Monitoring Rule 3 (UCMR3) was signed in April 2012 and systems will start monitoring from 2013 to 2015 depending on their schedules. The monitoring for UCMR3 includes 30 contaminants (28 chemicals and 2 viruses). UCMR3 builds on the established structure of UCMR 1 and 2, and makes minor changes to improve the rule design. Per the cyclical nature of the UCMR, a new list of contaminants and analytical methods are defined. Some of the changes in UCMR3 are as follows:

- Redefines applicability to include PWSs that purchase all of their water
- Clarifies the terms of representative groundwater sampling
- Updates the reporting elements (including adding a data element for zip codes for the customers served by PWSs)

UCMR3 established three lists under which PWSs will be monitoring:

- Assessment Monitoring (List 1 contaminants) monitors for 21 contaminants
- Screening Survey (List 2 contaminants) monitors for 7 contaminants
- Pre-screen Testing (List 3 contaminants) monitors for 2 viruses

8.3.9.2 District's Status

The District is scheduled to start monitoring in 2014.

8.3.10 Filter Backwash Recycling Rule

8.3.10.1 Regulatory Elements

The federal Filter Backwash Recycling Rule (FBRR) was published in the Federal Register on June 8, 2001. This rule is intended to reduce the opportunity for recycling practices to adversely affect the performance of drinking water treatment plants and help prevent microbes, particularly *Cryptosporidium*, from passing through treatment systems and into finished water. The FBRR requires systems that recycle to return specific recycle flow (spent filter backwash water, thickener supernatant, or liquids from dewatering processes) through all processes of the system's existing conventional or direct filtration system or at an alternative location approved by the state.

8.3.10.2 District's Status

The filter backwash water at the WTP is diverted to the recycle basin, then sent to the two settling lagoons, where the decanted water is sent back to Judy Reservoir. Even though the WTP recycles its filter backwash water, this practice does not fall under this rule because the distance between the intake and recycle location is more than 800 feet (approximately 1,000 feet).

8.3.11 Total Coliform Rule

8.3.11.1 Regulatory Elements

The Total Coliform Rule (TCR) applies to all PWSs. Coliforms are easily detected in water and are used to assess a water system's vulnerability to pathogens. It requires systems to sample for coliform bacteria, which are used as an indicator of contamination. In the TCR, EPA set an MCLG of zero for total coliforms. EPA also set an MCL for total coliforms and required testing of total coliform-positive cultures for the presence of *E. coli* or fecal coliforms, which indicate more immediate health risks from sewage or fecal contamination. If more than 5% of the monthly samples (for systems with at least 40 samples per month) contain total coliform, PWSs must report this to the state and to the public. The TCR requires the use of a sample monitoring plan and sanitary surveys for systems collecting less than 5 samples per month.

Community water systems with service populations between 59,001 and 70,000 are required to collect 70 representative samples monthly from locations throughout the distribution system. All samples testing positive for total coliform must be followed by repeat sampling and additional testing to determine if *E. coli* is present.

Under the TCR, there are two types of violations: acute and non-acute. An acute MCL violation for coliform is based on the presence of either fecal coliform or *E. coli* in a repeat sample, or coliform presence in a repeat sample collected as a follow-up to a sample indicating the presence of fecal coliform or *E. coli*. A non-acute MCL violation for coliform occurs under the following conditions: a water system that collects ≥40 routine coliform samples per month (corresponding to a service population of at least 33,001) has more than 5% of the samples test positive for the presence of total

coliform; or, a system that collects fewer than 40 routine coliform samples per month has more than one positive total coliform detection.

8.3.11.2 District's Status

The District performs monitoring as outlined in its Coliform Monitoring Plan (updated July 2014), which is included in Appendix M. This includes collection of at least 70 routine coliform samples per month from 29 dedicated sample sites located throughout its retail distribution system. These sample sites and their associated typical monitoring frequency are summarized in Table 8-3.

Table 8-3. Routine Sampling Sites for Coliform Bacteria

Location	Address	Sample Frequency
Lake Sixteen Pump Station	21193 Lake 16 Rd	3/Month
Rawlins Road Sample Station	S of 14937 Rawlins Rd.	3/Month
Dodge Valley Road Sample Station	13459 Rawlins Rd.	3/Month
Bradshaw Road Pump Station	15011 Bradshaw Rd/ Summers Dr.	3/Month
Mclean Rd. and Penn Rd. N Side Sample Station	15621 Penn Rd. (Christmas tree farm)	2/Month
City Hall and Cleveland St. W Side Sample Station	1019 Cleveland St. (S of City Hall)	3/Month
Hillcrest Park W Side Sample Station	W of 1624 13th St.	3/Month
Cedardale Fire Department S Side Sample Station	19746 E Hickox Rd.	2/Month
Eaglemont Golf Course/Grille Sample Station	4129 Eaglemont Dr.	3/Month
Old Hwy 99 South W Side	Across from 3228 Old Hwy 99 S.	2/Month
Big Lake Blvd. and Big Lake Grocery E Side Sample Station	16818 W Big Lake Blvd.	3/Month
Cascade Ridge Pump Station #1	20463 Cascade Ridge Dr.	3/Month
Cascade Ridge Pump Station #2	20690 Cascade Ridge Dr.	2/Month
Cascade Ridge Pump Station #3	20962 Cascade Ridge Dr.	2/Month
Swan Rd. and Sherman Ln. Sample Station	21254 Sherman Ln.	2/Month
Conway Church	18101 Fir Island Rd.	2/Month
Northern State E Side - Fruitdale Rd. Entry Sample Station	E of 1704 Wildflower Way	2/Month
Bow Hill Rd. Sample Station	18994 Bow Hill Rd.	3/Month
Holiday Inn Express W Parking Lot Sample Station	900/1000 Andis Rd	3/Month
Airport Dr./Bayview Airport Sample Station	15290 Airport Dr.	2/Month

Location	Address	Sample Frequency
Bayview Edison Rd. N Side	10901 Bayview Edison	3/Month
Allen West Church	16775 Allen West Rd.	3/Month
Grip Road and Bridgewater Road	22958 Grip Rd.	2/Month
25th Street N of Section	SW Corner Baseball Field	3/Month
Burlington Hill Pump Station	963 Hillcrest Dr.	2/Month
Peterson Road/Sunrise Lane Sample Station	Peterson/Sunrise Intersection	2/Month
Otter Pond Dr. and Gunderson Rd.	15784 Otter pond Dr.	2/Month
Teak Lane Sample Station	13247 Teak Ln.	3/Month
Clear Lake School Sample Station	23631 Lake St.	2/Month

Of the 5,040 coliform samples collected over the period from 2007 through 2012, only 3 tested positive for total coliform (July 2010, July 2011, and August 2011). None of these samples tested positive for *E. coli* or fecal coliform bacteria. In these three instances, the District collected repeat samples per WAC 246-290-300 requirements. None of the repeat samples confirmed the coliform presence indicated in the routine samples. Therefore, the District has maintained compliance with the provisions of the TCR and WAC 246-290-300 (3).

8.3.12 Lead and Copper Rule

8.3.12.1 Regulatory Elements

Lead and copper are heavy metals that primarily enter the drinking water through plumbing materials. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage. In 1991, EPA established regulations for control of lead and copper known as the Lead and Copper Rule (LCR).

Under the LCR, systems are required to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 parts per billion (ppb) or copper concentrations exceed an action level of 1.3 parts per million (ppm) in more than 10% of customer taps sampled, the system must take actions for corrosion control. If the action level for lead is exceeded, the system must inform the public about steps they should take to protect their health, which may include replacing lead service lines under their control.

In 2004, EPA initiated a review of LCR implementation across the nation. This effort was focused on determining whether national lead levels are increasing. As a result of this effort, EPA identified several targeted changes to the existing rule that would meet short-term goals for improving

implementation of the LCR. These revisions, which were finalized in October 2007 and became effective in December 2007, are summarized in Table 8-4. The revisions are intended to enhance LCR implementation in the areas of monitoring, treatment, customer awareness, and lead service replacement.

Table 8-4. Lead and Copper Rule Revisions

Activity	Rule Revision
Monitoring	• Clarifies language in the rule regarding the number of samples required and the number of sites from which samples should be collected. • Modifies definitions for monitoring and compliance periods to make it clear that all samples must be taken in the same calendar year. • Clarifies the reduced monitoring criteria that would prevent small and medium water systems above the lead action level or large systems deemed to no longer meet Optimum Corrosion Control treatment from remaining on a reduced monitoring schedule.
Treatment or Source Water Changes	• Requires water systems to provide advanced notification to the primacy agency of intended changes in treatment or source water that could impact long-term water quality. • Requires the primacy agency to approve the planned changes using a process that will allow the states and water systems to take as much time as needed for systems and states to consult about potential problems.
Customer Awareness and Public Education	• Requires utilities to provide a notification of tap water monitoring results for lead to owners and/or occupants of homes and buildings that are part of the utility's sampling program. • Changes the content, delivery, and time frame of public education regarding lead action level exceedances. Systems must partner with additional organizations to disseminate the message to at-risk populations. • Requires that educational statements about lead in drinking water be included in all Consumer Confidence Reports.
Lead Service Line Replacement	• Requires utilities to reconsider previously "tested-out" lead service lines when resuming lead service line replacement programs.

8.3.12.2 District's Status

The District collects samples for lead and copper from its customers' taps. Due to historically low lead and copper levels at customer taps, the District has approval from DOH for a reduced monitoring schedule requiring collection of 30 tap samples every 3-year cycle. For the 6-year monitoring period from 2007 through 2012, the District collected samples in 2009 and 2012. The 90th percentile results from each of these rounds are summarized in Table 8-5. The District has continued to maintain compliance with lead and copper action levels and the broader requirements of the LCR.

Table 8-5. Lead and Copper Tap Monitoring Results

Sampling Date	Number of Samples	90th Percentile Lead Result	90th Percentile Copper Result
August 2009	30	0.003 mg/L	0.087 mg/L
September 2012	30	0.002 mg/L	0.070 mg/L

8.3.13 Stage 1 Disinfectants/Disinfection By-Products Rule

8.3.13.1 Regulatory Elements

Use of disinfectants is a highly effective measure for protection from water-borne diseases. However, disinfectants themselves can react with naturally occurring materials (NOM) in the water to form unintended byproducts posing certain health risks. A result from toxicological research has shown that many disinfection byproducts (DBP) are carcinogenic and can cause adverse reproductive or developmental effects in laboratory animals. In 1979, EPA enacted the Total Trihalomethane Rule, which set an interim MCL for TTHM of 0.1 mg/L as a running annual system-wide average based on quarterly monitoring within the distribution system. This rule applies to water systems using a chemical disinfectant and serving over 10,000 customers.

In 1998, EPA promulgated the Stage 1 Disinfectants/Disinfection By-Products Rule (D/DBPR) to further reduce the DBP levels in drinking water. The Stage 1 D/DBPR (effective since January 2002) applies to all community and non-transient non-community water systems that treat their water with a chemical disinfectant for either primary or residual treatment. The rule establishes maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs) for three chemical disinfectants: chlorine, chloramine, and chlorine dioxide. It also establishes maximum contaminant level goals (MCLGs) and MCLs for TTHM, haloacetic acids, chlorite, and bromate.

The Stage 1 D/DBPR lowered the MCL for TTHM to 0.080 mg/L, established an MCL of 0.060 mg/L for five haloacetic acids (HAA5) and 1.0 mg/L for chlorite, established a maximum residual disinfection level of 4.0 mg/L for chlorine residual and 0.8 mg/L for chlorine dioxide, and established TOC removal requirements for systems using conventional filtration (with TOC removal requirements based on source water TOC and alkalinity levels).

The Stage 1 D/DBPR also established new monitoring requirements to ensure compliance with these standards. For chlorinated surface water systems that serve over 10,000 people, the Stage 1 D/DBPR requires the collection of four paired TTHM and HAA5 samples (per treatment plant) from the distribution system each quarter. Compliance with MCLs is based on the system-wide running annual average (RAA) of quarterly results. At least 25% of the samples collected each quarter must be from locations representing maximum residence time in the system. The remaining samples must be taken at locations representing average residence time and providing thorough spatial coverage. The rule

allows reduced monitoring if the RAA of TTHM and HAA5 levels drops below 0.04 mg/L and 0.03 mg/L, respectively, over a 12-month sampling period.

8.3.13.2 District's Status

To comply with the Stage 1 D/DBPR, the District has been collecting paired samples for TTHM and HAA5 on a quarterly basis from the following locations in its distribution system:

- Site 1: Township Street
- Site 2: Mclean Road (maximum residence time)
- Site 3: Fruitdale Road
- Site 4: Hillcrest Park (average residence time)

Figures 8-22 and 8-23 depict site-specific results and the system RAA for TTHM and HAA5, respectively, for the period 2007 through 2012. The results indicate that DBP formation has been relatively high and that the District had TTHM exceedances in 2010, 2011, and 2012, and HAA5 exceedances in 2007, 2008, 2010, and 2011.

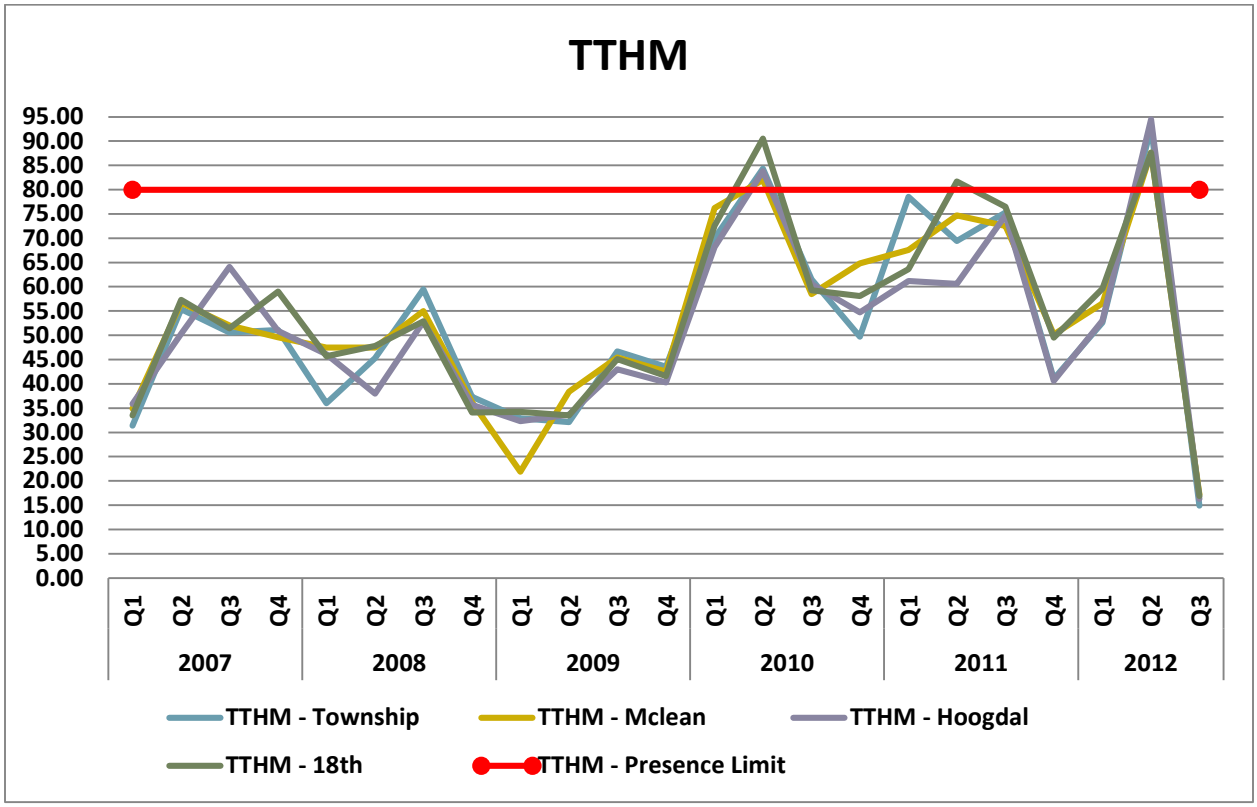

Figure 8-22. Distribution System TTHM, 2007–2012

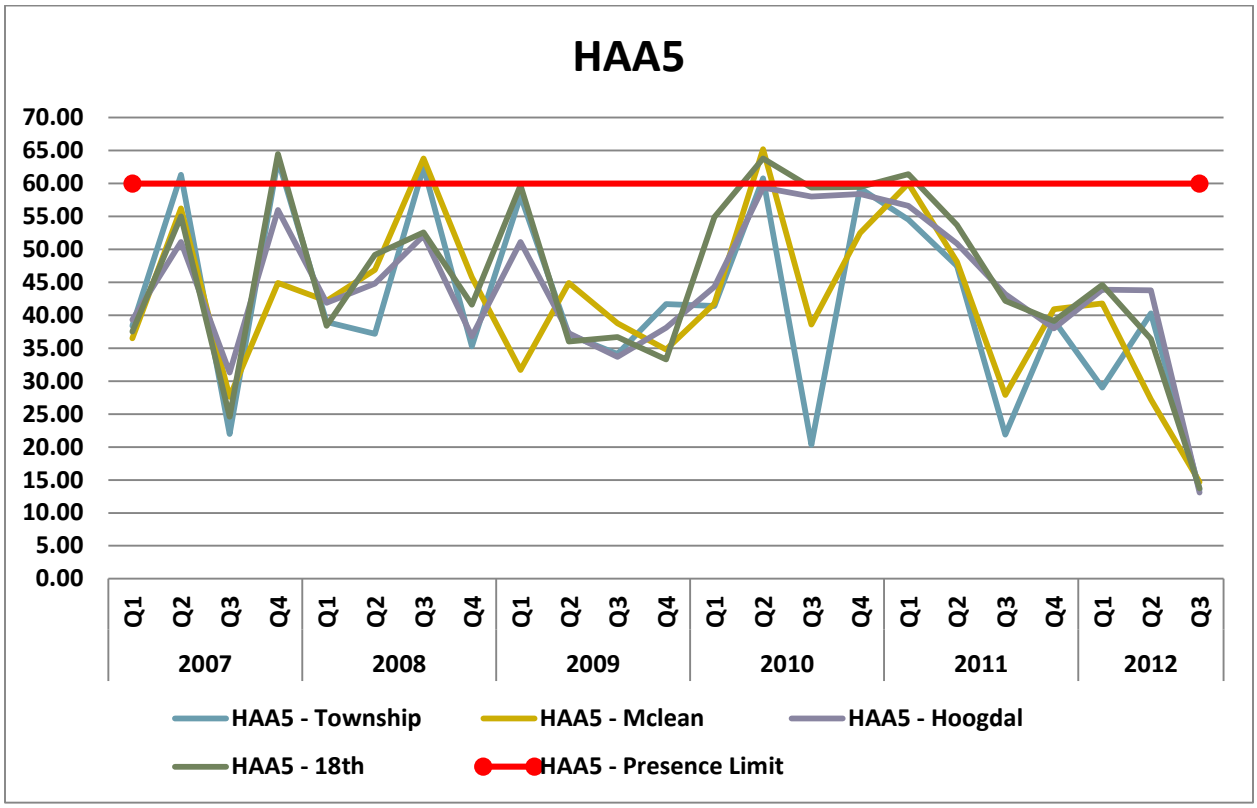

Figure 8-23. Distribution System HAA5, 2007–2012

The high DBP observations are attributed to higher TOC (above 2 mg/L) levels in the source water and presence of free residual chlorine in the finished water. These figures also show some significant variations in the TTHM and HAA5 results based on location, residence time, and seasonal changes (water temperature). The District took steps for reducing high levels of TTHMs and HAA5s by replacing its chlorine dioxide generator with a more efficient model, upgrading the chlorine generator with two discrete injection points for better control of the free residual chlorine. Significant improvement in Stage 1 (TTHMs and HAA5s) results were observed in the third quarter of 2012 and the first quarter of 2012 for Stage 2.

As discussed in Section 8.3.1.2, the District typically obtains a total of 70 to 80 distribution system chlorine residual measurements each month. Since January 2007, the system RAA chlorine residual has varied between 0.67 and 0.75 mg/L; therefore, the District has maintained compliance with the chlorine MRDL.

As part of Stage 1 D/DBPR, chlorine dioxide must be monitored daily at an entry point of the distribution system when in use and should not exceed an MRDL of 0.8 mg/L. Daily operational chlorite levels are measured as part of this rule at the WTP, and 3 samples a month from the distribution systems are submitted to a certified laboratory. The 3 sample locations are as follows:

- WTP (entry point to distribution system)
- 9th and Highland Street (average residence time)
- Fir Island Road (maximum residence time)

No exceedances for chlorine dioxide or chlorite levels for the 6-year period from 2007 through 2012 have been observed.

8.3.14 Stage 2 Disinfection By-Products Rule

8.3.14.1 Regulatory Elements

The Stage 2 Disinfection By-Products Rule builds upon the existing rule and is tightening compliance monitoring requirements for TTHMs and HAA5. This rule requires systems to meet maximum contaminant levels as an average at each compliance monitoring location in the distribution system (instead of as a running annual average [RAA]) for TTHM and HAA5. The goal of this rule is to reduce DBP exposure and related health risks.

Under this rule, systems are required to conduct an evaluation of their distribution systems, known as the Initial Distribution System Evaluation (IDSE), to establish locations with high DBP levels. Based on the results, these locations will be used for sampling sites for Stage 2 DBP rule compliance monitoring. Systems may receive an exemption from the IDSE based on 40/30 Certification if 2 years of eligible DBP data can be provided showing that all individual TTHM and HAA5 results are below 0.040mg/L and 0.030 mg/L, respectively.

The Stage 2 DBP rule also requires each system to establish whether it has exceeded an operational evaluation level, which is identified using the compliance monitoring results. The operational evaluation level provides early warning of possible future MCL violation and gives the system opportunity to review and change its operational practices in order to remain in compliance.

8.3.14.2 District's Status

As part of Schedule 2 (service population 50,000 to 99,999) under the LT2ESWTR, the District began compliance for Stage 2 DBP in October 2012. To comply with the Stage 2 DBP rule, the District was required to do the following:

- Submit an IDSE Plan or 40/30 Certification to DOH by April 1, 2007

- Complete a Standard Monitoring Plan or System-Specific Study, if required, to DOH by March 31, 2009
- Submit an IDSE report to DOH by July 1, 2009
- Begin monitoring per the Stage 2 DBP rule monitoring plan by October 1, 2012

In 2007, the District submitted its IDSE Plan for monitoring DBPs and identifying sites with the highest values for TTHMs and HAA5 based on water age and average chlorine residuals. Based on the IDSE Plan, 16 sites were scheduled to be monitored for TTHMs and HAA5s for 6 quarters and locational running annual average (LRAA) per site to be calculated. The plan was approved and the monitoring was performed from April 2008 through February 2009. The IDSE report was submitted to DOH on July 1, 2009, including results for TTHM and HAA5s for 16 locations, LRAA calculated for each location, and results from Stage 1 locations for 4 quarters and their LRAA. Based on this IDSE report and Stage 2 DBP requirements, 8 sites were identified for monitoring under the Stage 2 DBP rule. These 8 sites represent the highest TTHM (3), highest HAA5 (3), and existing Stage 1. In October 2012 the District collected its first round of dual samples for Stage 2. Table 8-6 lists the sites and results.

Table 8-6. Stage 2 DBP Monitoring Locations

Location	TTHM (mg/L)	HAA5 (mg/L)
Big Lake	17.0	20.5
Eaglemont	14.6	23.5
Hillcrest Park	14.8	22.7
Cascade Ridge #2	14.7	19.7
Swan Rd	15.1	15.8
Clear Lake	13.8	15
Fruitdale Rd	13.5	20
Bow Hill	16.5	18.7

8.3.15 Ground Water Rule

The Ground Water Rule applies only to the small satellite systems—Marblemount, Cedargrove, Skagit View Village, Alger, Mountain View, and Rockport. The purpose of this rule is to provide for increased protection against microbial pathogens, especially fecal contamination in PWSs using groundwater. Under this rule, systems must conduct compliance monitoring or triggered source monitoring. Systems that provide at least 4-log virus inactivation, removal, or a state-approved combination of these technologies are subject to compliance monitoring. Systems that do not

provide at least 4-log treatment or that do not purchase 100% of their water are subject to triggered source monitoring.

8.3.16 Consumer Confidence Reports and Public Notification Rule

8.3.16.1 Regulatory Elements

The Consumer Confidence and Public Notification Rule require systems to provide customers with water quality information on an annual basis, and when a regulatory violation occurs. The annual report must include the following information:

- Description of the source of drinking water
- Definition of terms used
- MCL for regulated contaminants and their levels in the drinking water
- Any violations and potential health effects
- Educational information on unregulated contaminants, if required
- Minimum requirements of the contents of the report per WAC 246-290-72001

While the Consumer Confidence Report (CCR) provides annual information regarding contaminant levels in the water, the Public Notification Rule (PNR) directs utilities in notifying customers of acute violations when they occur. The PNR was revised in May 2000 and outlines public notification requirements for violation of MCLs, treatment techniques, testing procedures, monitoring requirements, and violations of a variance or exemption. If violations have the potential for "serious adverse effect", consumers and the State must be notified within 24 hours of the violation. The notice must explain the violation, potential health effects, corrective actions, and whether consumers need to use an alternative water source. Notice must be provided to consumers within 30 days in an annual report, or by mail or direct delivery service within 1 year depending on the severity of the violation.

8.3.16.2 District's Status

The District prepares and distributes CCRs to its customers every year by July 1. A copy of the current CCR is included as Appendix N and is also available on the District's website. Regarding the PNR, because no acute violations have occurred since the promulgation of this rule, "timely" public notification has not been necessary.

8.3.17 Operator Certification

8.3.17.1 Regulatory Elements

Operator certification helps protect human health and the environment by setting minimum professional qualifications for individual operation of public water systems. EPA established in 1999 certification program guidelines for certification and recertification of operators of community and non-transient non-community public water systems. Each state is responsible for establishing the minimum of these guidelines, including the following:

- Each treatment facility or distribution system must be operated by a certified operator.
- Operator certification must be equal to or greater than the system classification being operated.
- All process control personnel must be certified.
- At least one certified operator must be available on every shift.
- Operators must sit for, and pass, a validated exam demonstrating skills, knowledge, ability, and judgment necessary for the system classification.
- Each operator must have a high school diploma, a General Educational Development (GED) degree, or state-approved experience and training.

8.3.17.2 District's Status

The District fully complies with EPA and DOH operator certification requirements. More details are provided in Chapter 9, Operations and Maintenance, regarding the appropriate levels of certification for each position in the District.

8.4 Anticipated Water Quality Regulations

Every year new water regulations are issued or updated. This section discusses the anticipated water regulations and their impact on the District. The EPA Contaminant Candidate List (CCL) is the primary source for tracking upcoming regulations or updates. The District makes changes to its system and/or procedures when necessary to comply with the new regulations.

8.4.1 Radon Rule

EPA proposed in 1999 new regulations on radon in order to reduce health risks. The proposed standards apply only to community water systems that regularly serve 25 or more people and that use groundwater or mixed ground and surface water. This will not apply to systems using surface water where radon levels are very low. This proposal also provides states with flexibility in how to limit exposure to radon by allowing them to focus on indoor air as a greater risk for radon exposure than drinking water. Based on this, states can choose to develop a Multimedia Mitigation (MMM) program assessing the health risks of radon exposure due to its presence in indoor air, while individual water systems reduce radon levels below 4,000 pCi/L. A second option allows states to not

develop MMM programs, but requires systems to reduce radon levels below 300 pCi/L. This rule would apply to the District whether or not Washington state develops an MMM program. So far it is not clear when this rule will be finalized.

8.4.2 Revised Total Coliform Rule

8.4.2.1 Regulatory Elements

The SDWA 1996 amendment requires EPA to review and revise each national primary drinking water regulation every 6 years. The Total Coliform Rule (TCR) has been effective since December 1990 and provides the following: (1) MCLG and MCL for total coliform and *E. coli*, (2) number of samples based on population served, (3) follow-up samples if total coliform or *E. coli* tests are positive, and (4) public notifications for violations. The Revised Total Coliform Rule (RTCR) was implemented and will be effective from April 1, 2016. Under the new RTCR a few changes are expected:

- Non-acute MCL violation for total coliforms under the TCR will be replaced under the RTCR by a coliform treatment technique.
- Level 1 and level 2 assessments depending on the violations.
- Total coliform positive samples do not result in public notifications.
- Reduced monitoring for smaller systems.
- Uncorrected or unexplored contamination results in violation.
- Failure to perform corrective action recommended by the State in a timely manner will result in a violation.

8.4.2.2 District's Status

The District will continue to follow any developments in the RTCR and will make the necessary changes to comply when the rule is adopted. Some of these changes will include preparation for system assessment in case of violation. The District will focus on better understanding its distribution system by hydraulic modeling and water quality modeling, evaluation of potential vulnerabilities (main break protocols, seasonal water quality issues, water age, representative sample sites, protocols for accepting new construction, etc.), and collaboration with the State.

8.4.3 Drinking Water Laboratory Certification and Data Reporting Rule (Lab Rule)

8.4.3.1 Regulatory Elements

The Drinking Water Laboratory Certification and Data Reporting Rule (Lab Rule) applies to all laboratories testing water samples for water systems. The rule was proposed in June 2006 because there were no specific requirements for labs to submit analytical results for drinking water compliance samples to DOH. Instead, water systems were responsible for submitting results to DOH. The goals of the Lab Rule are as follows: (1) labs must meet accreditation requirements established by the Washington State Department of Ecology (WAC 173-50), and (2) labs must meet reporting requirements under this rule.

Under the proposed changes in 2010 of the Lab Rule, labs must report results, submitting either hard copies (written data report forms) or electronic data (digital file). When labs submit analytical results on written forms to the State, labs need to include State Reporting Level (SRL) and Minimum Detection Limit (MDL) when they report electronically. Beginning in January 2014, all labs must submit their analytical results electronically. If labs are out of compliance with this rule, their certification may be revoked by the Washington State Department of Ecology (Ecology).

8.4.3.2 District's Status

Because the District has a certified laboratory, it will be affected by any changes in this rule. Currently, all water samples for total and fecal coliforms are processed in the WTP lab. The WTP lab submits two sets of hard copy results to DOH; a third copy is on file at the District. The WTP lab also has electronic copies of all results. The District will be storing the results of all monitoring in a database that will be accessible by the appropriate staff.

8.4.4 Waterworks Operator Certification Rule

8.4.4.1 Regulatory Elements

WAC 246-292-020 requires Group A water systems with surface water or groundwater under the influence of surface water as their source to be operated by certified operators. To become certified, operators must meet minimum education and experience requirements and pass an examination. In addition, certified operators must meet professional growth requirements every 3 years to maintain their certification status. Some of the new rule changes include the following:

- Strengthening DOH's authority to take immediate enforcement actions in cases of gross negligence.
- Clarifying DOH's authority to certify backflow assembly testers and cross-connection control specialists.

- Amending the definition of "Group A public water system" to be consistent with other related statutes.
- Adding a reference to Chapter 18.106 RCW for the specialty plumbers licensing requirements that cover some activities performed by a backflow assembly.
- Addressing large public water system recruitment issues to allow broader substitution options for minimum education requirements.
- Adding duties for operators in responsible charge and responsibilities for cross-connection control specialists and backflow assembly testers.
- Revising temporary certification requirements for surface water treatment plant operators to increase public health protections for these high-risk water systems.
- Adding minimum requirements for field test and inspection reports completed and submitted by backflow assembly testers.
- Improving overall clarity, simplifying language, and adding existing program practices and guidelines to the rule.

8.4.4.2 District's Status

This rule was changed in 2013 and affects the certification requirements for operators working with the satellite systems, as well as all certified operators in the District.

8.5 Regulatory Compliance Status

A review of monitoring procedures and water quality results from 2007 through 2012 indicates that the District has maintained compliance with all current and applicable state and federal drinking water regulations during the review period. The following recommendations and action items are intended to assist the District with near-term planning activities and continued compliance:

- Update of the District's Coliform Monitoring Plan to reflect additional monitoring requirements regarding change in service population.
- Develop and retain formal monitoring plans for regulated VOCs, SOCs, IOCs, and radiological parameters. These plans should document monitoring locations, frequencies, sample collection and preservation techniques, analytical and reporting requirements, and laboratory coordination issues.
- Prepare a *Cryptosporidium* monitoring plan and start monitoring in 2013.
- Prepare and evaluate the system for potential vulnerability to reflect with the new RTCR.

8.6 Laboratory Certification

Each testing parameter is performed in an Ecology- or EPA-accredited laboratory, except algae. All microbiological samples have been processed in the District's certified laboratory since June 2012 (prior to this date the samples were processed by Edge Analytical). The WTP lab is certified for SM 9223 B detection and enumeration, SM 9222 D&G, and Simplate. Edge Analytical in Burlington was used for all other parameters required by the State until the end of 2012. Historically, the District contracted with Western Washington University in Bellingham to analyze samples for algae count and identification, but now the algae analysis will be conducted in the District's lab by the Lab Analyst.

In 2012 the District reviewed its policies for selecting analytical labs for its compliance testing and established new policies to assess lab cost and performance. After a bidding process, the District selected Avocet Environmental Testing for providing laboratory services in 2013. The laboratories' names and associated contact information are provided below. Each of these laboratories is certified for the tested parameters.

Skagit PUD No.1 WTP Lab
11932 Morford Rd.
Sedro-Woolley, WA 98284

Edge Analytical
1620 S Walnut Street
Burlington, WA 98233

Avocet Environmental Testing
1500 State Street
Bellingham, WA 98225

8.7 Customer Water Quality Inquiries

The District is establishing a formal process for handling customer inquiries or complaints regarding water quality. Customer complaints are addressed within 24 hours. Currently, all calls regarding any water issues are transferred and processed by the Water Quality Program Facilitator. If a call is about water quality issues, staff members visit the customer's home and try to determine the problem. Usually on-site staff members measure chlorine residual and pH, and collect samples for coliform bacteria, if necessary. Other parameters could be analyzed as well if the staff member determines it is necessary. Once the results are complete, the customer is informed. All water quality complaints are recorded and included in the end of the month report submitted to DOH.

8.8 Future Monitoring Requirements

Table 8-7, Monitoring Roadmap for 2014 through 2019, provides a summary of upcoming water quality monitoring requirements for the next 6-year period from 2014 to 2019. The table is intended to serve as a monitoring roadmap. The District will consult with DOH and refer to its annual water quality monitoring report (WQMR) for DOH-mandated sampling and monitoring requirements. Table 8-7 does not take into account monitoring requirements associated with potential new or revised regulations, nor does it consider potential future waivers that may take effect.

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Table 8-7. Monitoring Roadmap for 2014 through 2019

Group	Regulation	Parameters	Locations	2013	2014	2015	2016	2017	2018	Notes
Inorganic Compounds	Lead and Copper Rule	Lead, Copper	Customer Taps	No Activity	No Activity	Sample at 30 Locations	No Activity	No Activity	Sample at 30 Locations	The District collects 30 samples once every 3 years (between June and September).
	Phase II and V Rules	Inorganic Compounds, including arsenic (As), nitrogen dioxide (NO_2), nitrate (NO_3)	Finished Water at Entry Point	Conduct Sampling	Conduct Sampling	Conduct Sampling	Conduct Sampling	Conduct Sampling	Conduct Sampling	Annual IOC monitoring.
	Phase II and V Rules	Asbestos	Distribution System – A-C pipe area	Conduct sampling	No Activity	No Activity	No Activity	No Activity	No Activity	Asbestos monitoring is more frequent than 9 years and is based on WQMR from DOH.
Organic Compounds	Phase I Rule	Volatile Organic Compounds	Finished Water at Entry Point	No Activity	Conduct Sampling	No Activity	Conduct Sampling	No Activity	Conduct Sampling	Based on WQMR reports.
	Phase II and V Rules	Synthetic Organic Compounds	Finished Water at Entry point	No Activity	Conduct Sampling	No Activity	No Activity	No Activity	No Activity	SOC monitoring twice every 5 years.
Radionuclides	Radionuclides Rule	Gross Alpha, Combined Radium	Finished Water at Entry Point	No Activity	No Activity	Conduct Sampling	No Activity	No Activity	No activity	Monitoring frequency is based on WQMR, currently is once every 6 years.
		Beta/Photon Emitters	Finished Water at Entry Point	No activity	No activity	Conduct Sampling	No Activity	No activity	No activity	Monitoring frequency is based on WQMR, currently is once every 6 years.
Microbiological Contaminants	Total Coliform Rule	Coliform Bacteria	Distribution System – TCR sites	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Collect 70 routine coliform samples per month.
	SWTR and IESWTR	Fecal Coliform Bacteria	Source Water	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample at a frequency ≥10% of the number of routine monthly total coliform samples collected in the distribution system.
		Turbidity	Source Water; IFE and CFE	Continuous; Continuous	Continuous; Continuous	Continuous; Continuous	Continuous; Continuous	Continuous; Continuous	Continuous; Continuous	Monitor continuously and record readings at 15-minute intervals.
	LT2ESWTR	*Cryptosporidium, E. coli*	Start Monitoring	Monitoring	Monitoring	No Activity	No Activity	No activity	No activity	Early start, because of combined source.
Disinfectant	SWTR	Disinfectant Residual	Entry Point Distribution System	Continuous; Monthly	Continuous; Monthly	Continuous; Monthly	Continuous; Monthly	Continuous; Monthly	Continuous; Monthly	Maintain a disinfectant residual ≥0.2 mg/L at entry point; maintain a detectable residual in ≥95% of monthly distribution system samples.
	Stage 1 D/DBP Rule	Disinfectant Residual, Chlorite	Distribution System	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Sample Monthly	Maintain chlorine residual below the MRDL of 4.0 mg/L and chlorite below 1.0 mg/L.
Disinfection By-Products	Stage 2 DBP Rule	TTHM, HAA5	Distribution System – eight locations	Sample Quarterly	Sample Quarterly	Sample Quarterly	Sample Quarterly	Sample Quarterly	Sample Quarterly	For routine monitoring, collect eight pair DBP samples per quarter from Stage 2 locations.
Consumer Confidence Report	Consumer Confidence Report	All Regulated Contaminants	Not Applicable	Annual CCR	Annual CCR	Annual CCR	Annual CCR	Annual CCR	Annual CCR	Prepare and Distribute CCR prior to July 1 of each year.

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9 Operations and Maintenance

This chapter summarizes the programs and procedures used to ensure the safe and reliable supply of potable water to District customers. It describes water system management and personnel, operator certification requirements, system operations, supervisory control and data acquisition (SCADA) and telemetry systems, asset management, the emergency response program, safety procedures, the cross-connection control program, the records keeping and reporting program, design and construction standards, and any recommended improvements.

9.1 Water System Management and Personnel

The District is guided by a Board consisting of three Commissioners who are elected by the public and who serve terms of 6 years. Each Commissioner represents a given area that has political boundaries similar to those of the three elected Skagit County Commissioners. The Commissioners are responsible for establishing District policy and for appointing three officers: the General Manager, the Auditor, and the Treasurer (Figure 9-1). The General Manager is responsible for achieving the short- and long-term goals established by the Commission.

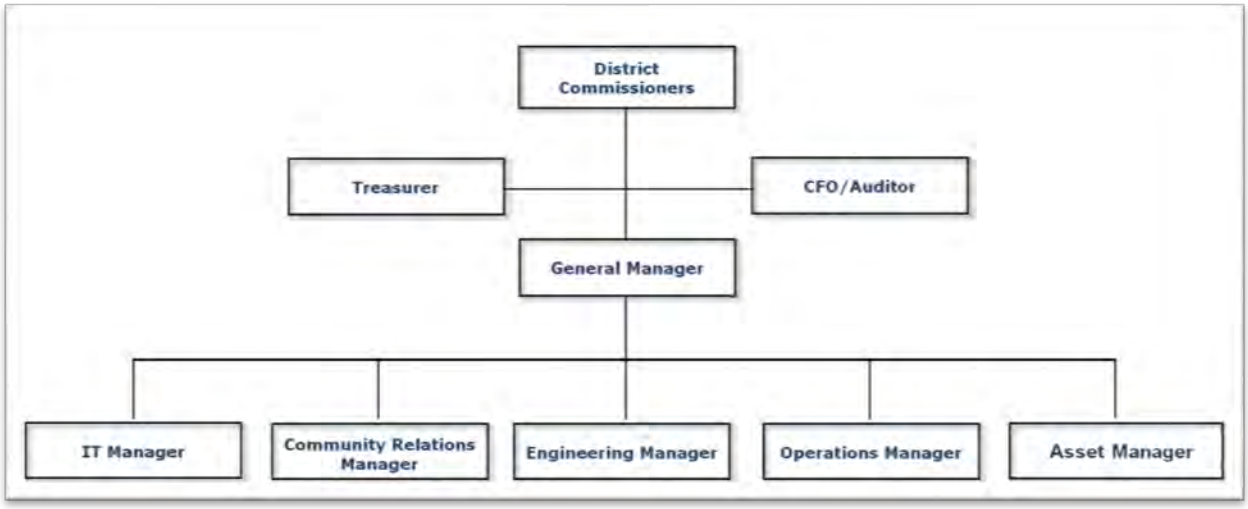

Figure 9-1. Organizational Chart of District Management

9.1.1 General Manager

The General Manager manages District operations in accordance with the objectives and policies of the Commission and in conformance with the statutory requirements of RCW 54.16.100. The General Manager establishes short-term and long-term systemic business plans and objectives for the District, and makes recommendations for action to the Commission. The General Manager executes the plans for capital improvements and operational goals through the work of the Engineering Manager and the Operations Manager, who report directly to the General Manager.

9.1.2 Treasurer/CFO

The Treasurer, as appointed by the District Commissioners, provides the overall direction for District fiscal and accounting functions in accordance with the policies and objectives of the General Manager and in compliance with legal and regulatory limitations. The Treasurer is responsible for ensuring a fiscally sound organization. As a member of the General Manager's management team, the Treasurer participates in short- and long- term planning to support the District's mission and vision. The Treasurer develops and maintains systems and procedures that conform to generally accepted accounting principles within the confines of governing laws and District resolutions.

9.1.3 Auditor

The Auditor is appointed by the Commission and reports to the General Manager for administrative functions. The Auditor monitors financial activities within the District and prepares financial analyses of operations, including interim budget status information. The Auditor establishes and monitors the District's internal controls and financial policies, and prepares and monitors the District's annual operating and capital budgets. In the absence of the General Manager, the Auditor serves as Assistant General Manager. The Auditor is responsible for establishing and maintaining effective systems of internal control designed to ensure compliance in areas under the audit authority of the Washington State Auditor; Washington State Departments of Revenue, Labor and Industries, Employment Security, and Public Employee Retirement System; and the Internal Revenue Service.

9.1.4 Community Relations Manager

The Community Relations Manager strengthens and maintains strong working relationships between the District and its customer/owners. The Community Relations Manager oversees the District's customer service department, water meter readers, departmental budget, and staffing and personnel, and ensures the integrity of existing customer services by developing new programs and services, as appropriate. News releases to keep the community informed about District issues and activities, and responses to media inquiries, are responsibilities of the Community Relations Manager. This includes providing evening and weekend on-call duty to meet public information responsibilities regarding water outages and emergencies such as fires and accidents.

9.1.5 IT Manager

Reporting directly to the General Manager, the IT Manager is responsible for the direction, management, and integrity of the District's data and phone networks, applications, and web environments. This position is responsible for information systems infrastructure and services to support District operational and administrative functions, including security and SCADA.

9.1.6 Asset Manager

Reporting directly to the General Manager, the Asset Manager is responsible for the District's Asset Management Program and performs tasks related to the implementation and maintenance of the Computerized Maintenance Management System to assist the District in making prudent, cost effective decisions on maintaining and replacing District infrastructure. The Asset Manager is also responsible for management of the District's asset database and the GIS mapping system.

9.1.7 Engineering Manager

Reporting directly to the General Manager, the Engineering Manager is responsible for planning and carrying out system improvements, environmental planning and permitting, and the design and construction of the District's Capital Improvement Plan. The Engineering Manager provides direct management of the Construction and Engineering departments (Figure 9-2). The Construction Department is supervised by the Construction Superintendent, who manages the construction of prioritized projects, while the Engineering Department is supervised by the Engineering Supervisor, who oversees those performing capital design work and reviewing private development submittals. Other senior staff within the Engineering Department also report directly to the Engineering Manager. The Engineering Manager works closely with the Operations Manager in the coordination of repairs, planning, and emergency response.

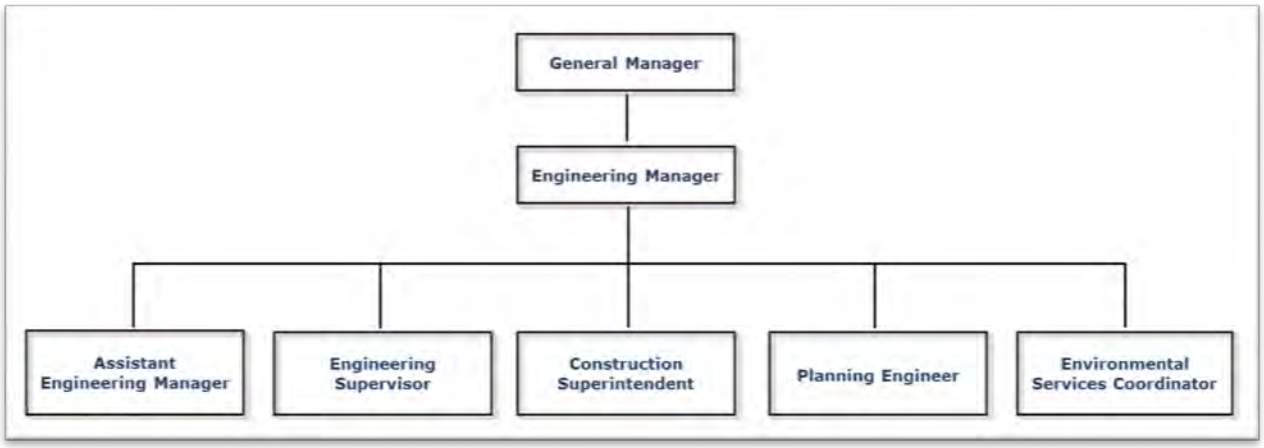

Figure 9-2. Engineering Organizational Chart

9.1.7.1 Assistant Engineering Manager

Reporting to the Engineering Manager, the Assistant Engineering Manager is responsible for design and project management of District projects. The Assistant Engineering Manager works as a team leader to organize and direct the efforts of the Engineering Department toward meeting strategic goals. Activities include preparing budgets, project planning and management, prioritizing tasks, controlling costs, coordinating with the District's Operations Department, and monitoring project progress.

9.1.7.2 Engineering Supervisor

Reporting to the Engineering Manager, the Engineering Supervisor is responsible for daily supervision and management of the District's Engineering Department, including oversight of engineering personnel and management of routine engineering projects. This includes supervising the design and development of District projects that are small- to mid-scale. Other responsibilities include supervising the District's overall Cross-Connection Control Program (CCCP); coordinating with engineers, technicians, and inspectors to ensure that plan review, inspection, and compliance with the CCCP are implemented; and coordinating engineering activities with the Engineering Manager, Planning Engineer, Environmental Services Coordinator, Contract Administrator, and Operations Manager in the development of Local Utility Districts and other projects.

9.1.7.3 Construction Superintendent

Reporting to the Engineering Manager, the Construction Superintendent is responsible for managing the Construction Division to construct and maintain the District's infrastructure. The Construction Superintendent provides supervision to the Construction Division to repair, replace, and construct extensions of the District's water system. The Construction Superintendent ensures that service interruptions are coordinated with customers and other departments by providing sufficient advance notice, coordinates on-call response to emergency situations and restoration of service, and assists with interpretation and/or revisions to District policy, practices, and procedures.

9.1.7.4 Planning Engineer

Reporting to the Engineering Manager, the Planning Engineer is primarily responsible for the planning and coordination of short-term and long-term programs and projects for the District. Other tasks include representing the District on issues concerning federal, state, or local water planning, resource, or regulatory matters. The Planning Engineer maintains and updates the District's pipeline hydraulic model, forecasts future water demands, and outlines long-term operational and maintenance requirements for all District water systems.

9.1.7.5 Environmental Services Coordinator

Reporting to the Engineering Manager, the Environmental Services Coordinator is responsible for coordinating all District environmental planning and permitting activities and the management and enforcement of the District's Watershed Control Program. Tasks include writing and reviewing land use and environmental permits, researching and writing grant funding applications, facilitating easement actions, participating in outreach activities, supporting District planning efforts, monitoring the activities within the District's watershed, coordinating with watershed landowners for potential future land clearing activities, and being the point person for District-wide environmental activities. The Environmental Services Coordinator coordinates all land use and environmental permitting activities for the District's water system, including satellite systems and within the Judy Reservoir watershed. The Environmental Services Coordinator participates in and coordinates community and district outreach activities and initiatives, and serves as a liaison between the Engineering,

Operations, and Community Relations departments on permitting, natural resource management, and community outreach initiatives and issues.

9.1.8 Operations Manager

Reporting to the General Manager, the Operations Manager is responsible for supervising the general operation and maintenance of the District's water system, including overseeing the District's source waters, the WTP and processes, and storage and distribution system. The Operations Manager and staff work closely with the Engineering Department in response to emergencies and in the design of water system improvements.

The Operation Manager's direct responsibility includes oversight of two water quality divisions: (1) Distribution, and (2) the WTP, with appropriate staff as shown in Figure 9-3. The Operations Manager sees that employees are trained in the safe use of tools and equipment and that they follow the safety codes of the Washington Industrial Safety and Health Act of 1973 (WISHA), and ensures that key Operations staff members are appropriately certified to perform their duties. Responsible for the distribution system, the Operations Manager ensures the functionality of the District's water system 24 hours per day, including responses to emergency trouble calls, reports of water main failures and leaks, water distribution issues, and long-term planning. The Operations Manager also provides technical expertise and support to the overall water distribution system, and in conjunction with other District departments, resolves issues to ensure long-term quality and continuity of water service to each customer. Overall, the Operations Manager ensures proper operation of systems through the timely maintenance and repair of water main and water service line equipment, meters, valves, and other equipment or appurtenances. The Operations Manager coordinates with the Water Treatment Plant Superintendent to develop service levels and establish operating criteria for the WTP.

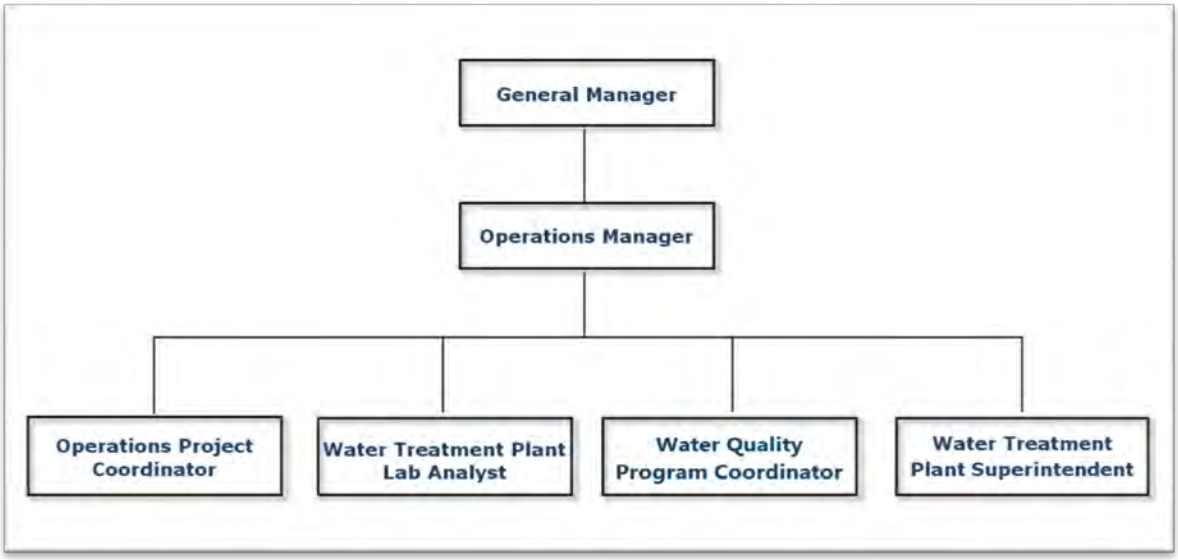

Figure 9-3. Operations Organizational Chart

9.1.8.1 Water Treatment Plant Superintendent

Reporting to the Operations Manager, the Water Treatment Plant Superintendent is responsible for the day-to-day operation of the District's WTP. In conjunction with the Operations Manager and the Construction Superintendent, the Water Treatment Plant Superintendent provides technical expertise and support to staff members who operate the water distribution system, and in conjunction with other District departments, resolves issues to ensure long-term quality and continuity of water service to each customer. The Water Treatment Plant Superintendent ensures that equipment is properly maintained, that the inventory of chemicals is at proper levels, that production matches demand, that security systems are in place, and that repair and maintenance are coordinated with District staff.

9.1.8.2 Water Treatment Plant Lab Analyst

The Water Treatment Plant Lab Analyst reports to the Operations Manager and operates the water treatment laboratory. The work involves a combination of field sampling and laboratory testing responsibility related to chemical, physical, and biological analyses of water samples. Maintenance of laboratory facilities and equipment and various other tasks associated with water quality assurance and control, as well as process control in compliance with applicable regulations, are responsibilities of the Lab Analyst. The Lab Analyst also works closely with the Water Treatment Plant Superintendent by providing results required by regulatory agencies and by conducting chemical, biological, and physical investigations of raw water and treated water, ensuring compliance with standard testing methods, procedures, and regulations. The Lab Analyst samples potable water from designated sample sites and logs the results, develops and oversees a chemical hygiene program for safety requirements, monitors Material Safety Data Sheets (MSDS) compliance for safety gear and practices in the laboratory, and follows all applicable regulations concerning disposal of hazardous waste.

9.1.8.3 Operations Project Coordinator

Reporting to the Operations Manager, the Operations Project Coordinator has primary responsibility for ensuring organizational effectiveness by providing coordination of the District's functions. Working with the management team, the Operations Project Coordinator also contributes to the research, development, and implementation of strategies, policies, practices, and procedures to improve the same in support of the District's mission. The Operations Project Coordinator plays a significant role in long-term planning and asset management, including strategic planning with the Operations Manager toward operational excellence.

9.2 Operator Certifications

9.2.1 Key Personnel Required to have Certifications

State public health and safety requirements, through RCW 70.119, mandate that operators of public water systems be recognized as competent through the Washington State Water Works Certification Program. Requiring minimum levels of operator competency at various levels within the District organization ensures that the water system is run prudently and that water supplies meet minimum standards. The law requires that each individual responsible for daily technical operation of the water system(s) be certified as a Water Distribution Manager. The Water and Wastewater Operator Certification Board of Examiners has adopted a policy that requires shift supervisor positions, any position that involves sole decision-making authority for major water quality control programs, and any position that involves the overall daily technical operation of a public water system, distribution system, or purification plant be staffed by individuals who hold the appropriate operator certificate.

The District's WTP is staffed with eight employees: the Water Treatment Plant Supervisor and seven Water Treatment Plant Operators. The Water Treatment Plant Supervisor maintains a certification of Water Treatment Plant Operator 4 (WTPO-4). In order to work any shifts at the WTP by themselves, such as the night shift, the Water Treatment Plant Operators must maintain a certification level of WTPO-3. If the WTPO 3 certification level is not met, then an operator is only allowed to work when other operators are present. At any given time, a minimum of one operator is present at the plant, while often there are two or more.

9.2.2 Experience Requirements

The District's internal culture places value on education and certification of its employees. These values are backed by (a) offering in-house training to help employees prepare for certification exams and (b) linking field employees' internal advancement directly to furthering their depth of knowledge and attainment of certifications. Table 9-1 summarizes the District's advancement requirements for members of the Teamsters Union, who are the primary operators of the District's water system.

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Table 9-1

Worker Hierarchy Organization Plan Providing Experience Requirements

WATER TREATMENT PLANT WORKERS

District Wage Classification	WTPO Level	District Experience	Total Experience
6	4	2	10
	3	4	10
5	4	0	8
	3	0	6
4	2	0	3
3	1	0	1
2			
1			
Beginner			

NOTES:
A new WTP Worker will typically be hired as either a Level 3, 4, or 5. Additional certifications, a minimum of 2 years experience at the existing position and a satisfactory performance evaluation is required to be considered for promotion.

CONSTRUCTION WORKERS

District Wage Classification	WDS Certification	WDM Level	District Experience	Total Experience
Foreman	X	3	10	17
6	X	2	6	13
5	X	2	4	11
4	X	1	2	9
3	X			7
2				5
1				3
Beginner				1

NOTES:
A new Construction Worker will typically be hired as either a Level Beginner, 1, 2, or 3. Additional certifications, a minimum of 2 years experience at the existing position and a satisfactory performance evaluation is required to be considered for promotion.

WATER DISTRIBUTION WORKERS

District Wage Classification	WDS Certification	CCS Certification	WDM Level	WTPO Level	District Experience	Total Experience
6	X	X	3	2	8	15
5	X	X	2	1	6	13
4	X		1		4	11
3	X		1		2	9
2						
1						
Beginner						

NOTES:
A new Water Distribution Worker will typically be hired as either a Level 3 or 4. Additional certifications, a minimum of 2 years experience at the existing position and a satisfactory performance evaluation is required to be considered for promotion.

METER TECHNICIANS

District Wage Classification	WDS Certification	WDM/CCS Level	District Experience	Total Experience
6	X	2/X	8	15
5	X	2/X	6	13
4	X	1	4	11
3	X	1	2	9
2				
1				
Beginner				

NOTES:
A new Meter Technician will typically be hired as either a Level 3 or 4, and will need District experience. Additional certifications, a minimum of 2 years experience at the existing position and a satisfactory performance evaluation is required to be considered for promotion.

WATER QUALITY TECHNICIAN

District Wage Classification	WDS Certification	CCS Certification	WDM Level	District Experience	Total Experience
6	X	X	2	8	8
5	X	X	2	6	6
4	X		1	4	4
3	X			2	2
2					
1					
Beginner					

NOTES:
A new Water Quality Technician will typically be hired as either a Level 3 or 4. Additional certifications, a minimum of 2 years experience at the District and a satisfactory performance evaluation is required for advancement.

MECHANIC

District Wage Classification	WDS Certification	WDM Level	District Experience	Total Experience
6				15
5				
4				
3				
2				
1				
Beginner				

NOTES:
A new Mechanic will typically be hired as a Level 6, with 15 years experience in the automotive mechanic field.

CARPENTER

District Wage Classification	WDS Certification	WDM Level	District Experience	Total Experience
6				15
5				
4				
3				
2				
1				
Beginner				

NOTES:
A new Carpenter will typically be hired as a Level 6, with 15 years of experience in the carpentry field.

STOREKEEPER

District Wage Classification	WDS Certification	WDM Level	District Experience	Total Experience
6	X	2	10	15
5				
4				
3				
2				
1				
Beginner				

NOTES:
A new Storekeeper is typically hired from existing staff, will have a minimum of 10 years District experience, and will already be a Level 6.

The District works closely with the Pacific Northwest subsection of the American Water Works Association (AWWA) and the Washington Environmental Training Center (WETRC) to ensure that employees receive their required triennial 3.0 continuing education units (CEUs) to maintain their certifications. Personnel are encouraged to attend local (within 100 miles) programs when they are offered, provided the session is applicable to the employee's position at the District. The District also funds attendance at training outside the state if the benefits to the employee and the District are significant.

As illustrated in Table 9-2 below, the District's internal culture results in a wealth of redundant knowledge and certificated employees.

Table 9-2. Number of Certified Staff Members

Certification Level	Number Certified
Cross-Connection Specialist	15
Water Distribution Specialist	26
Water Distribution Manager 1	7
Water Distribution Manager 2	19
Water Distribution Manager 3	4
Water Distribution Manager 4	8
Basic Treatment Operator	3
Water Treatment Plan Operator 1	1
Water Treatment Plan Operator 2	0
Water Treatment Plan Operator 3	6
Water Treatment Plan Operator 4	2

9.3 Routine System Operations

Chapter 2 of this Water System Plan describes the District's facilities in detail and should be referenced for statistical information relating to the system's characteristics. This section focuses on the organizational structure, staffing, and specific operations at each component of the system.

9.3.1 Water Treatment

Water treatment in Judy Reservoir is a function of the District's Operations Department. Led by the Operations Manager, the Water Treatment Plant Superintendent is responsible for operation of the source water and water treatment facilities. Reporting to the Superintendent are seven Water

Treatment Plant Operators who carry out the daily tasks of operating the filtration plant, the grounds, raw water intakes, and reservoir.

9.3.1.1 Source Water

OPERATIONS

As discussed in Chapter 2, Judy Reservoir is supplied by five sources of raw water: Gilligan Creek, Mundt Creek, Turner Creek, Salmon Creek, and the Skagit River. Chapter 7 provides specific information about each of these water rights and the amount of water the District may divert.

The *Skagit River Pump Station and Pipeline Operations and Maintenance Manual* by Kennedy/Jenks (2010) is incorporated in the Water System Plan by reference. This document provides operational and maintenance procedures specific to the Skagit River intake, pump, and pipes.

As described in Chapter 2, diversions from the Skagit River are used to supplement diversions from the four streams to achieve the raw water volumes required by the Judy System. With a focus on maintaining operational efficiency, instream flows, and raw water quality, the District strives to balance the contribution from each of the raw water sources. Source water from the streams gravity-feeds through pipe diversions to Judy Reservoir. Diverting water from the Skagit River, however, requires an exceptional amount of power to energize the pumps that lift the water to Judy Reservoir. Current power rate structures include both a demand charge and a usage charge. The demand charge is a monthly lump sum cost applied to each billing period. Demand charges are established by applying a rate to the highest level of power use during a month. Rates for demand charges vary throughout the year and are lower during the months of April through September. Also, demand charges for the months of April through November are at least 60% of the highest demand charge incurred during the previous months of December through March. As a result, diverting water from the Skagit River during the months of December through March creates monthly demand charges for the following months of April through November regardless of the amount of power used during these billing periods.

In addition to the demand charges that the District is required to pay, there are constraints established on the use of the pumps based on Puget Sound Energy's (PSE's) ability to provide adequate power. The District's agreement with PSE says that the District can use 3 of the 5 pumps at the SRD at any time. In an emergency situation when more than 3 pumps are required, the District can utilize 4 or 5 pumps by providing advance notification to PSE of the increased electrical demand. However, if the District would like to have regular use of 4 or 5 pumps, then an upgrade to PSE facilities will be required at the District's cost. At the current time, the regular use of 4 or 5 pumps is not anticipated during this planning period, so the District has not budgeted for any upgrade to PSE infrastructure. The District will continue to monitor the pump usage and the electrical demands and notify PSE if there are any changes to the operating scenarios.

As discussed in Section 8.3.2.2, when individual stream turbidities exceed 5 NTU or color exceeds 35 color units, water from that stream is typically not diverted into Judy Reservoir. And conversely, if the Skagit River water turbidity exceeds 10 NTU, it is not pumped into Judy Reservoir. With the multiple sources available, the NTU and color criteria usually allow the District to select a source that is suitable.

As a result of the conditions described above, the more cost efficient source water from the streams is maximized in accordance with instream flows and water quality parameters. Each year, the District analyzes climate and snowpack forecasts to calculate an estimate of the potential diversions available from the streams during the upcoming rainy season. Estimated stream diversions and system demands are used to forecast diversions from the Skagit River and establish target elevation levels for Judy Reservoir. Diversions from the Skagit River are then scheduled during the least costly periods of the year (April through October) to achieve these target reservoir levels. These forecasts are revisited and adjusted on a monthly basis throughout the year. Figure 9-4 is shows an example of how the Judy Reservoir water level is managed for any given year, using 2013 as the example. The graph shows the actual water level at the reservoir and the actual volume of water taken from the streams and from the Skagit River. In this case, the graph shows the state of the reservoir in August, so the water level is dropping during the high demand part of the year. At this point, the District plans to divert water from the Skagit River to raise the level in the reservoir because this is the least costly time of the year to perform this task. The graph also shows the point at which it is planned to stop diverting water from the river and start taking water from the streams. The goal during the last half of the year is to raise the forecasted water level in the reservoir to begin the cycle over again the following year.

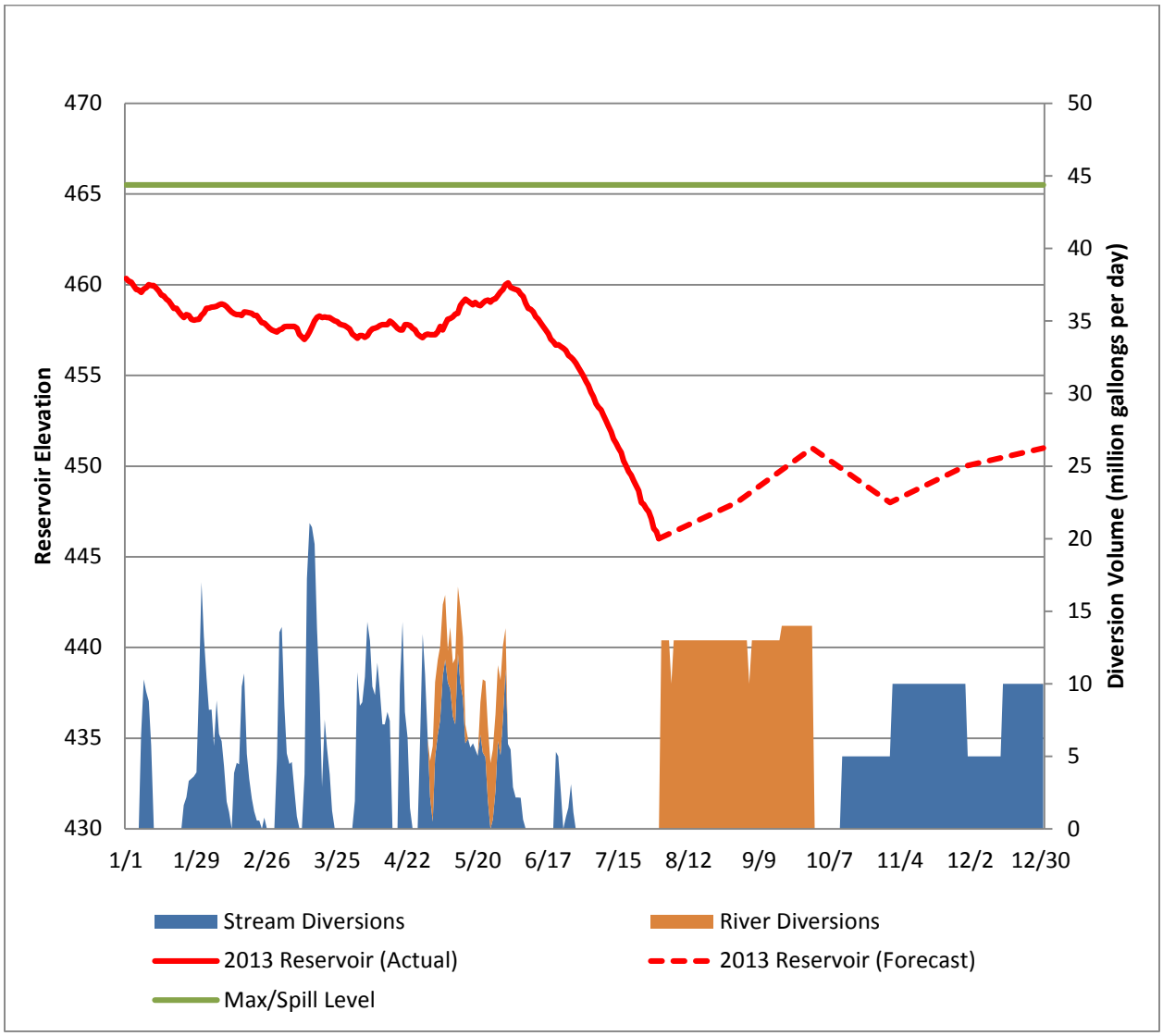

Figure 9-4. Reservoir Management Plan Using 2013 as an Example

MAINTENANCE

Routine, preventative maintenance of the water intakes is essential to their long-term efficient operation. Routine inspections provide opportunities to identify other maintenance needs before they become catastrophic problems. Other routine maintenance measures that District personnel perform are listed below.

Daily:

- Clear primary diversion racks
- Adjust valves to targeted flows
- Record staff gage and flow measurements

- Test for turbidity and color
- Check diversion intakes
- Measure intake flow
- Read the stream gages

Weekly:

- Three times per week scour/air burst Skagit River diversion intakes
- Check security / status of locked access gates
- Check road and drain culvert integrity
- Measure A & B dam drain weirs

Monthly:

- Measure A & B dam piezometers

Bi-annually:

- Clear Gilligan Creek diversion rack

Yearly:

- Perform road and culvert maintenance as necessary

Other:

- Mow grass areas
- Maintain vegetation on dam
- Repair erosion
- Monitor damage from wildlife
- Dredge reservoir
- Dredge intake

9.3.1.2 Treatment Facility

The Judy Reservoir WTP is a direct filtration facility placed in service in 1990 and expanded in 2006. This section summarizes more detailed documents on operation and maintenance of the WTP, and includes them by reference. These documents include the *Skagit Water Treatment Plant Operations Manual (*CH2M HILL 1990) and *Water Treatment Plan As-Builts, CO-3234 (*CH2M HILL 1990 and 2007). As shown in Table 9-3, the WTP has a treatment capacity of 24 MGD with a peak hydraulic capacity of 30 MGD.

Table 9-3. Water Treatment Plant Capacities

Design Flow	Treatment Capacity	24 MGD
	Hydraulic Capacity	30 MGD
Flocculation	Retention Time	17 minutes
	Number of Trains	2
	Basins per Train	4 (8 total)
	Basin Length	18 feet
	Basin Width	18 feet
	Basin Depth	16.4 feet
	Flocculators per Basin	1 (8 total)
	Flocculator Energy Input (max)	70/sec
Filters	Number of Filter Beds	8
	Loading Rate Capacity	6.0 gpm/sq ft
	Filter Area	500 sq ft
	Filter Height	24.5 ft
	Height to Backwash	9.5 ft
	Four Old Filters	
	Media	3 feet anthracite 1 foot sand
	Underdrains	Low Profile Stainless Steel
	Backwash System	Air Scour Blowers
	Design Loading Rate	2-5 SCFM/sq ft
	Blower Capacity	2,500 SCFM @ 6.3 psi
	Blower Power	100 Hp
	Four New Filters	
	Media	18-inches anthracite 1 foot sand 18-inches gravel
	Underdrains	Ceramic Block Underdrains
	Backwash System	Hydraulic Nozzle Sweeps

FILTRATION PROCESS

In general, the raw water impounded in Judy Reservoir flows by gravity from one or more gates of the intake tower in Judy Reservoir to the raw water pumping station (see Figure 9-5 below). The raw water is disinfected with chlorine dioxide (ClO_2) and pumped up to the control building; carbon dioxide and coagulant aids are also added at this stage. The water flows through an in-line static flash mixer to two 2-stage flocculation basins. The water flows from there to the filter basins. There are four filter basins, 500 square feet each, utilizing a high-speed filtration process through coal and sand filter media. The filtered water is disinfected again with chlorine and flows by gravity to three finished water reservoirs (clearwells) near the WTP; these include one steel 3-MG tank and two steel 1.22-MG tanks. Caustic soda (NaOH) and ammonia (NH_3) are added before the clearwells to produce a chloramines residual. Finished water from the clearwells flows by gravity down the transmission lines to the distribution system and the District's customers.

Use of the WTP filters is alternated to maintain finished water production and backwashed regularly to remove suspended solids, including microorganisms, which are trapped by the filter media. The filter backwash water is diverted to the backwash water recycle basin; filter-to-waste water is also diverted to the recycle basin. Two recycle pumps send the backwash and filter-to-waste water from the recycle basin to one of two 19,000-square-foot settling lagoons. The majority of the water from the lagoons is decanted back to Judy Reservoir and the backwash solids remain. The District contracts for the solids to be removed and disposed of off-site.

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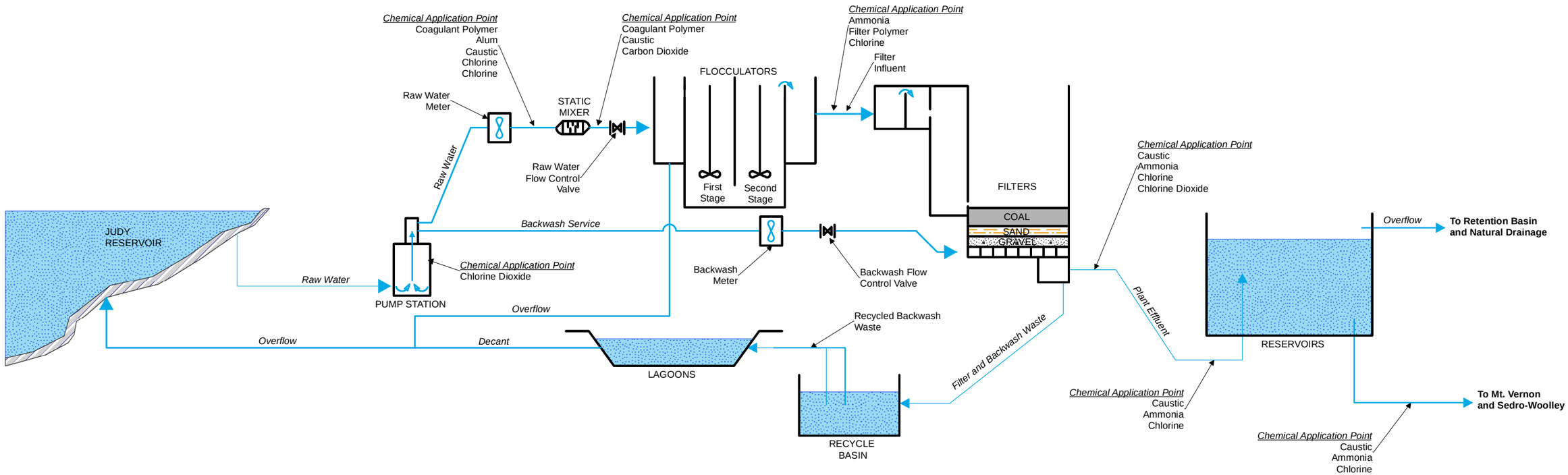

Skagit PUD
PUBLIC UTILITY DISTRICT

N

Water Treatment Plant Process Schematic

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83 | Not to Scale | **Figure 9-5**

STAFFING

The WTP is semi-automated to allow for unattended operation, although there are operators on-site 24 hours per day, 7 days per week. Operators work in three shifts:

Day Shift – The Day Shift Operator is directly responsible for the WTP operation while on duty. The Operator must collect all pertinent readings and perform all lab checks, dosage checks, equipment inspections, routine operations and maintenance, and other tasks as assigned.

Swing Shift – The Swing Shift Operator is directly responsible for the WTP operation while on duty. The Operator must collect all pertinent readings and perform all lab checks, dosage checks, equipment inspections, routine operations and maintenance, and other tasks as assigned.

Night Shift – The Night Shift Operator is directly responsible for the WTP operation while on duty. The Operator must collect all pertinent readings and perform all lab checks, dosage checks, equipment inspections, routine operations and maintenance, and other tasks as assigned.

The operator on duty is required to completely fill out the Weekly Operator Checklist for his or her period of duty, record all chemical feed data, record all completed maintenance tasks in equipment logs, calculate and log CT at the end of the shift, and record a brief description of shift events on the daily calendar.

The WTP Superintendent schedules work shifts, oversees the day-to-day operation of the WTP, and assumes operator duties as scheduled. The control building at the WTP is centrally located, allowing operators to control and monitor WTP functions and receive WTP alarms. The control system includes trending software to log data regarding WTP processes and production.

The WTP control system is the basis for the District's supervisory control and data acquisition (SCADA) system, providing monitoring and alarm indication from remote water facilities, remote data logging, and control of specific functions at the remote sites. The SCADA system is discussed in Section 9.4.

MAINTENANCE

The operations staff members at the Judy Reservoir WTP conduct routine preventative maintenance and repairs to the assets at the raw water facilities and the plant. These activities, along with staffing, are recorded in a daily log. Some of the more common preventative maintenance includes the activities listed below.

Daily:

- Check water service pumps and backwash filters
- Record chemical usage

- Verify that chemical feed calibration is correct
- Calibrate process control analyzers
- Inspect pump and check lubricants/fluid levels
- Maintain facility and grounds

Weekly:

- Calibrate turbidity and pH meters
- Fill bulk chemical needs

Monthly:

- Change lead/lag chemical feed systems and service pumps

Quarterly:

- Run-test the backup generation equipment

Bi-annually:

- Inspect and clean media
- Inspect filter bed scour system
- Inspect heating, ventilation, and air conditioning (HVAC) system filters and belts

Yearly:

- Dispose of sludge
- Perform major servicing of raw water pumps
- Perform major servicing of diesel generators and engines
- Rebuild chlorine and chlorine dioxide generators
- Perform maintenance on air compressor

9.3.2 Transmission and Distribution

Transmission and distribution account for the reservoirs, pumps, valves, and pipes that supply the District's customers. The daily tasks relating to these operational functions are distributed between the District's Operations and Engineering divisions.

The Operations Manager supervises four Distribution Operators and the Water Quality Program Coordinator to help maintain the distribution system. The Operations Manager is responsible for operations and maintenance of the District's mechanical systems, reservoirs, pressure control valves, and interties.

The Construction Superintendent, who reports to the Engineering Manager, supervises 12 construction workers and the Construction Foreman. The Construction Superintendent is responsible for overseeing construction projects, for maintaining hydrants and mains, and for exercising valves.

9.3.2.1 Piping and Valves

The distribution piping network is described in Chapter 2. Refer to Chapter 2 for detailed information regarding the system and age of pipes.

The 12 construction workers are typically sent out in two groups: one group of 8 that is responsible for the construction of new water line replacement projects, tie-ins to the existing system, and other larger projects; and one group of 4 that is responsible for leak repairs, meter service installations, and other maintenance-type projects. The District has typically installed new water lines throughout the year, even in the winter during inclement weather.

The District is in the process of implementing a Computerized Maintenance Management System (CMMS) that will utilize a software program called Cityworks. This program will help the District implement and coordinate a maintenance program for the distribution system involving maintenance duties such as valve exercising, valve repairs, raising valve boxes, and the overall identification of the status of the distribution system. These duties will be planned for the winter months when the construction of new water lines is not efficient or practical. The Operations Manager, the Engineering Manager, and the Construction Superintendent will coordinate the efforts of the 12 construction workers, along with the Distribution Operators, to perform the preventative maintenance planned through the CMMS.

Legislation has recently passed at the state level that places all fire hydrants under District ownership. As a result, maintenance of the fire hydrants will also be included in the duties for the District staff as part of the CMMS.

9.3.2.2 Pump Stations and Pressure-Reducing Valves

Statistical data associated with the District's pumps and automatic control valves are contained in Chapter 2. Automatic control valves are monitored by the District on a regular basis. These valves are normally associated with mainline meters (pressure-reducing valves [PRVs] between pressure zones) and reservoirs (altitude valves), and are monitored with these other facilities as scheduled. Control valves are repaired or rebuilt as deemed necessary by the District. Control valves are listed

in Table 2-9 and are principally of the diaphragm-type. New diaphragm valves are ordered with an interior epoxy coating and stainless steel trim to minimize maintenance requirements.

District employees visit booster and well pump stations on a regular basis. Booster pumps are checked for power source and pressure inconsistencies, overheating, and leaks two to three times per week, and preventative maintenance on motors is performed annually or as required.

The well systems / booster pump sites are monitored by the SCADA system, which notifies the District on-call personnel of specific failures and allows immediate response via a computer connection at any time from almost any location. The District monitors the booster and well pump stations constantly and visits them as required, and at least twice weekly.

As mentioned in Chapter 2, not all of the District's booster pump stations have a dual pump setup to provide for redundancy. However, the District then keeps at least one spare pump in stock at the warehouse in the event that a failure occurs at any booster pump station. So even though there is not the immediate redundancy of a dual pump booster station, the District has an additional pump that can be installed in the place of a failed pump within hours.

The District has a large standby generator and transfer switches at most of its critical facilities. The priority during a widespread power loss would be refilling critical tanks in the Judy System and remote systems. If the power loss was limited to a closed system, the District would consider using a generator or booster stations depending on the duration of the outage and the ability to avoid interference with electrical repair crews.

Pumps at District treatment facilities, groundwater sources, and distribution systems are checked on a regular basis to ensure that their power sources are intact, their input and output pressures are within range, and there are no indications of imminent failure. Pump motors are maintained annually or as required. Other routine preventative maintenance is listed below.

Daily:

- Monitor 24 hours per day for loss of pressure, pump failure, smoke alarm, intrusion, flooding, power loss, etc.

Weekly:

- Check pressure
- Visually inspect systems

Biannually:

- Check pump amperage
- Verify flow volumes for deviation

Yearly:

- Lubricate all pumps and motors
- Replace well pumps and motors
- Rebuild PRVs

9.3.2.3 Reservoirs

The majority of the District's reservoirs are located where they can obtain the best hydraulic advantage, in many cases remote from dense population. This is an advantage in that catastrophic failure would not normally physically damage a large area or populace. Reservoirs are all checked on a regular basis to ensure they are intact, working properly, and the water is cycling adequately. The District currently monitors storage reservoirs through the SCADA system and by weekly site inspections.

The District has developed a regular schedule of interior and exterior cleaning for its reservoirs, with a painting schedule. Exterior cleaning is scheduled when a reservoir's appearance is undesirable or when it becomes difficult to monitor exterior finish integrity.

Interior cleaning is performed in each reservoir at least every 5 to 7 years through underwater diving services. Timing depends on need, and on the complexity of draining a reservoir and removing it from service for the period it is under repair. Recent diving technology improvements allow interior cleaning and repair of storage reservoirs while they remain in service. While this method is more expensive, it mitigates other negative impacts and makes the process more attractive than conventional methods. The District considers this option when selecting a maintenance method.

An inspection checklist for District storage facilities was developed for preventative maintenance. The checklist is included as Table 9-4.

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Table 9-4. Storage Facility Inspection Checklist

Skagit PUD #1 O&M schedule for storage facilities

Daily or weekly

- ☐ Check storage tank for signs of security breaches – damaged fences, open gates, graffiti, vandalism, etc.
- ☐ Check water level indicator – functioning, adequate amount of stored water, excessive water use.
- ☐ Check storage tank and site after any adverse weather – high winds, heavy snow, ice, rains, etc.

Monthly

- ☐ Check water level indicator
- ☐ Verify all openings are protected from surface runoff, windblown contaminants, insects, birds and animals.
- ☐ Check tank overflow lines for signs of damage, such as, screens, flapper valves, check valves, splash plate, etc.
- ☐ Check control valves for proper positions, open or closed and any leaks.
- ☐ Check ladder access locks, roof access hatches, and controls that are readily visible from the ground for damage, vandalism, or other conditions.

Quarterly

- ☐ Check water level indicator.
- ☐ Visually inspect tank exterior and roof for signs of damage, corrosion, degradation, leakage, or structural problems, with particular focus on all openings into the reservoir: reservoir roof and side wall vents, access hatch, and overflow outlet.
- ☐ Check tank supporting structure for signs of damage, corrosion, degradation, structural or seismic inadequacy.
- ☐ Tank catwalks/ladders free from signs of damage, corrosion, degradation, structural condition, vandalism, etc.
- ☐ Tank area for water ponding, poor drainage areas, excessive vegetation, unhealthy tress, fire hazards, etc.

Annually or seasonally

- ☐ Check storage tank structural, seismic and sanitary integrity – leaks, corrosion, cracks, supports, warping, etc.
- ☐ Exercise valves and make repairs as needed.
- ☐ Document inspection and maintenance activity as part of an O&M program.
- ☐ Inventory and evaluate storage facilities capacity, condition, replacement costs and plan for improvements
- ☐ Plan for storage facility improvements and budget for the associated cost.

Three to five year inspections

- ☐ Drain, inspect, clean and disinfect storage tank or use a diving maintenance service without draining tank.
- ☐ Respond to any evidence of storage tank problems – see storage tank troubleshooting guide.

Employee name/number _____ Date _____

9.3.2.4 Equipment

The District's mechanic reports to the Operations Manager. The mechanic is responsible for routine maintenance and repair of the District's vehicle fleet, construction equipment, and emergency pumps and generators. Most work is performed in the District's shop. When the maintenance or repair requires specialized work or resources not immediately available to the mechanic, the work is outsourced. In addition to the equipment manufacturer's suggested maintenance practices, the mechanic performs the preventative measures listed below.

Daily:

- Visual check of vehicles and equipment leaving the yard
- Fuel vehicles
- Check fluid levels and air pressure
- Wash vehicles

Weekly:

- Maintain security gate to yard
- Replace wearing parts on equipment
- Reinforce parts for vactor truck

Monthly:

- Update records to reflect maintenance performed and fluid and parts consumed maintaining vehicles for the month

Yearly:

- Conduct a comprehensive examination of equipment
- Weatherize equipment not used for winter
- Check all fire extinguishers
- Prepare equipment for next year's construction season

9.3.3 Meters and Utility Billing

The following section provides a brief explanation of how the meter and billing system is constructed and how it generally operates. Chapter 3 of the District's Water Policy Manual sets out specific policies related to services, meters, and billing.

9.3.3.1 Organization

Metering and utility billing function through the Customer Service branch of the District, which is headed by the Community Relations Manager. Reporting to the General Manager, the Community Relations Manager oversees the work of the Customer Service Supervisor and the Meter Crew Leader (Figure 9-6).

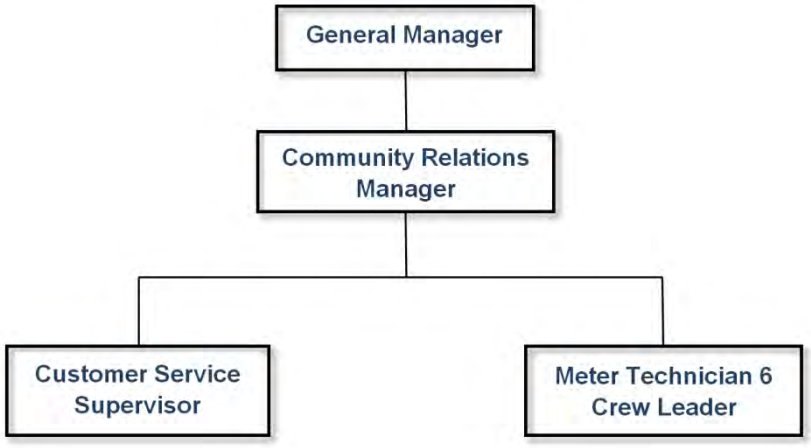

Figure 9-6. Community Relations/Metering Organization Chart

The Customer Service Supervisor oversees the work of the Billing Clerk and four Customer Service Representatives. Customer Service is the customer's first contact for all questions related to service. Generally, these contacts are related to monthly usage statements and payment, establishing and terminating accounts, and concerns about meters and suspected leaks. If the calls require service, the Customer Service Representative contacts the Meter Crew Leader to schedule an investigation and repair.

The Meter Crew is made up of the Crew Leader and three Meter Technicians. The crew leader is responsible for scheduling the work of the three technicians. The crew leader also investigates potential repairs and coordinates with contractors needing temporary service. Two of the technicians are responsible for reading the District's meters. When these two technicians are not reading meters they are performing repairs or conducting maintenance. The remaining technician is responsible for turning on and off water service when requested or as a result of delinquent payment.

9.3.3.2 Meter Reading and Billing

The District has divided the customer base into several groups, known as cycles, so that reading and billing can be distributed evenly throughout the months and years. There are a total of nine cycles. Cycles 1–4 are residential services that are billed on even months. Cycle 1 represents those meters that are read the first week of an even month, Cycle 2 is the second week of an even month, etc.

Similarly, Cycles 5–8 correspond to the meters that are read and billed on odd months. The last cycle, Cycle 9, represents the commercial meters that are read and billed every month.

Utility billing is done on the same cyclic basis as the meters are read. The District produces and mails all customer water bills using in-house equipment and personnel. Additional information ("billing inserts") such as a quarterly newsletter, conservation information, etc., may also be included in the same envelope with a water bill at various times of the year. Currently, customers may pay their bill by mail using the envelope enclosed with the bill, or may pay in person at the District headquarters in Mount Vernon or at any one of three designated branch offices of Skagit State Bank (one in Burlington, one in Mount Vernon, and one in Sedro-Woolley). The District also accepts payment by electronic funds transfers from a customer's bank and is currently considering Internet-based billing. Use of this technology could incorporate use and payment history as well as accept credit card payments.

9.3.3.3 Maintenance and Repair

The District performs routine maintenance and calibration on all meters 2 inches and larger. Every year the District contracts with a private firm to calibrate these larger meters. The number of meters calibrated each year is one-third of the meters in this size range. Therefore, each meter is calibrated every third year.

Beyond performing routine maintenance on meters 2 inches and larger, the District's meter technicians conduct spot repairs as needed. When not engaged in reading meters, crews repair leaks and uncover buried meters.

9.3.4 Warehouse

Under the General Manager, the Chief Financial Officer/Auditor (CFO) is the lead purchasing agent. Under the direction of the CFO are two storekeepers (Figure 9-7) who are responsible for maintaining warehouse inventories and filling all purchases requiring a purchase order (more than $100 in value).

Figure 9-7. Purchasing and Warehouse Organizational Chart

Commonly purchased items are stored in the warehouse. These items include service corporations, tubing used for service connections, fittings, pipe, office supplies, common tools, and expendable parts like saw blades. When the inventory of these items becomes depleted, the storekeepers, through standard purchasing procedure, order materials to resupply the inventory. Asset management software that the District is currently implementing will allow the storekeepers to set target levels for reordering. When the inventory falls to this target level, the storekeeper will be notified that supplies need to be reordered. Access to the warehouse is limited to very specific individuals.

The storekeepers maintain inventory levels based on historical demand. Service trucks are stocked with frequently used parts and supplies. When parts from a service truck are incorporated into a project, the materials used are reported to the storekeeper, who resupplies the service truck. Other parts are removed from inventory and go directly to the site. This is common on construction projects where valves, piping, and large fittings are incorporated into the project.

With very few exceptions, all materials purchased go to the warehouse prior to use. Two of the more common exceptions are when materials such as asphalt or backfill are being incorporated into a construction project and are delivered directly to the site. Another exception is the chemicals consumed in the purifications process. The WTP is located 12 miles from the District's warehouse. Rather than delivering these chemicals to the warehouse, unloading them, reloading them, and delivering them to the WTP, it is more practical to ship them directly to the WTP. An added benefit of direct shipping is reducing risk by transferring the chemicals fewer times.

Fueling for the District is coordinated through a typical fuel management vendor. The District employs multiple levels of accounting to verify the proper use of fuel.

9.4 SCADA and Telemetry Systems

The District has extensive SCADA systems throughout its service area. SCADA systems are typically found on reservoirs, wells, pump stations, mainline meters, intakes, and treatment facilities. The degrees to which the systems are able to be controlled by SCADA vary from site to site depending on the equipment and type of communication connections. In total, the District has 61 sites using SCADA systems.

The capabilities of these sites range from full control to simply monitoring. Of the 61 SCADA sites, 25 have full control because they can be fully monitored and operated from remote locations and mobile devices. The remaining 36 sites have monitoring capabilities only. Types of communication lines serving the sites include DSL, telephone, radio, and limited Wi-Fi capability.

The District's SCADA systems are monitored by the Distribution Operators in the Operations Department. During normal business hours, the systems are monitored from the District offices. After normal working hours, the systems are monitored by the on-call Distribution Operator. While the operators monitor the systems for necessary corrective action before an alarm goes off, additional protections are in place should an event or power outage be overlooked. Redundancy includes an alarm system that automatically makes multiple calls to operators and managers when an alarm is activated.

9.5 Asset Management

The District is in the process of implementing a functional asset management database from which assets can be properly tracked and routinely maintained. The District is implementing a software program called Cityworks, which is a CMMS. Cityworks will operate as a GIS-centric asset management program that will standardize data and allow the users to reuse, coordinate, and share information in an efficient and effective manner by making the GIS geo-database the asset registry. At this time, the District will focus the asset registry on hard assets such as pipes, valves, and hydrants. Soft assets such as permits, licenses, easements, and other land use activities may be implemented at a later date.

The goal of the CMMS program is to coordinate and prioritize the District's maintenance program involving such things as valve exercising, valve repairs, raising valve boxes, replacing or rebuilding pumps, inspecting reservoirs, painting or coating reservoirs, and replacing pipes. Performing tasks such as condition assessments to determine remaining service life of an asset will help the District to focus its time and money on those assets that are in need of replacement, rather than running that asset to failure or replacing it before it was necessary. One of the important areas where a CMMS will be valuable is to perform condition assessments on existing transmission and distribution piping so that the District can adjust its capital replacement programs to better focus on long-range strategies while meeting immediate demands. In the meantime, the District has developed a modified approach to its annual pipe replacement as discussed in Section 10.2.

Another goal of the CMMS is to provide an accurate and reliable water system map that uses the asset database to provide accurate coordinates for the assets. The District has already completed many activities required for the construction of an asset database that is linked with the GIS system. Staff has used hand-held Global Positioning System (GPS) units to collect coordinate information on all of the District's water meters, valves, and fire hydrants. This information is being combined with the existing AutoCAD water system map to produce a GIS-based water system map that contains all of the asset information so that assets are shown in actual coordinates and can be found on-site.

9.6 Emergency Response Program

9.6.1 General

Safe and reliable drinking water is vital to every community. Planning for events that may threaten the system's ability to deliver safe and reliable drinking water is an essential part of managing a drinking water system.

Each emergency has unique effects on different parts of a water system. Events that demand a response range from routine operating emergencies such as pipe breaks, pump malfunctions, coliform contamination, and power outages to more serious non-routine emergencies that may result from intentional acts of sabotage, chemical spills, floods, earthquakes, windstorms, or droughts.

All supervisory and senior staff members from the District have obtained certifications from the Federal Emergency Management Agency (FEMA) for Incident Command System (ICS) 100 and 200, National Incident Management System (NIMS) 700, and National Response Framework (NRF) 800. This training will allow the District to communicate efficiently and effectively with local, state, and federal agencies in the event of an emergency or disaster. Figure 9-8 is a typical organizational structure for the Incident Command System.

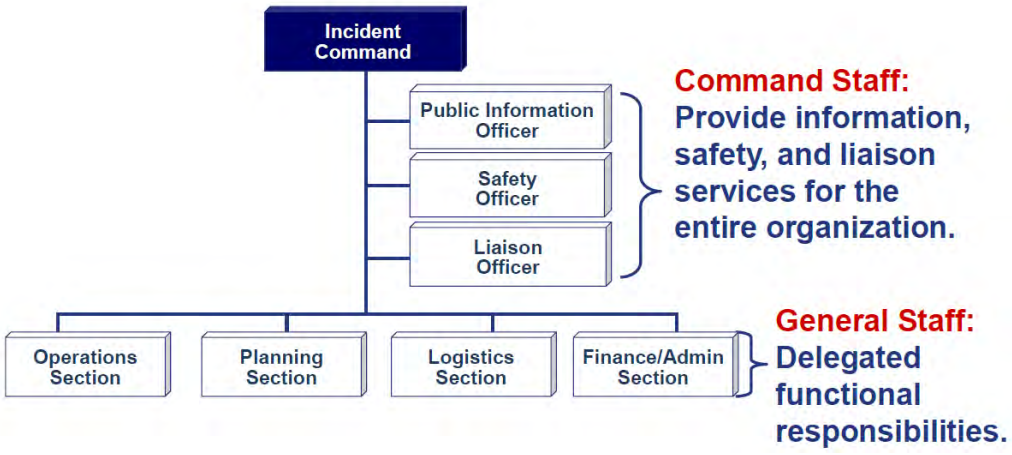

Figure 9-8. Incident Command Organization

Depending on the type of incident, different District staff members are responsible for filling the various roles within the ICS organizational structure. Table 9-5 below is an organizational chart of the Incident Command System in terms of how it applies to the District and which staff are typically assigned to specific roles.

Table 9-5. Incident Command System Roles

Title	Role During an Emergency	District Staff
Incident Commander	• Provides overall leadership for incident response. • Delegates authority to others. • Takes general direction from agency administrator/ official. • Ensures incident safety. • Provides information services to internal and external stakeholders. • Establishes and maintains liaison with other agencies participating in the incident. • Establishes incident objectives. • Directs staff to develop the Incident Action Plan. • Assesses the need for staff. • Takes responsibility for all activities and functions until delegated and assigned to staff.	Typically filled by first respondent, then it will transfer to more senior staff as they arrive on-site. District role will likely be filled by: Bob Powell – General Manager, or Mike Fox – Operations Manager, or George Sidhu – Engineering Manager
Public Information Officer (PIO)	• Advises Incident Commander on information dissemination and media relations. Incident Commander approves information that the PIO releases. • Obtains information from and provides information to Planning Section. • Obtains information from and provides information to community and media.	Kevin Tate Community Relations Manager
Safety Officer	• Advises Incident Commander on issues regarding incident safety. • Works with Operations to ensure safety of field personnel. • Ensures safety of all incident personnel.	Position currently vacant
Liaison Officer	• Assists Incident Commander by serving as point of contact for agency representatives who are helping to support the operation. • Provides briefings to and answers questions from supporting agencies.	Mark Handzlik, P.E. Assistant Engineering Manager Or Dale Wardell – Water Treatment Plant Superintendent
Operations Section Chief	• Develops and implements strategy and tactics to carry out the incident objectives. • Organizes, assigns, and supervises the tactical field resources. • Supervises resources in staging area.	District role will likely be filled by: Mike Fox – Operations Manager, or George Sidhu – Engineering Manager, or Dale Wardell – Water Treatment Plant Superintendent, or Construction Superintendent

Title	Role During an Emergency	District Staff
Planning Section Chief	• Gathers, analyzes, and disseminates information and intelligence. • Manages the planning process. • Compiles the Incident Action Plan. • Manages technical specialists.	District role will likely be filled by: George Sidhu - Engineering Manager, or Mark Handzlik – Assistant Engineering Manager
Logistics Section Chief	• Provides resources and services required to support incident activities. • Develops portions of the Incident Action Plan and forwards them to Planning Section. • Contracts for and purchases goods and services needed at the incident.	District role will likely be filled by: Scott Kilpatrick – Chief Storekeeper, or Kurt Van Burkleo – Operations Coordinator
Finance/Administration Section Chief	• Responsible for financial and cost analysis. • Oversees contract negotiations. • Tracks personnel and equipment time. • Processes claims for accidents and injuries. • Works with logistics to ensure resources are produced.	Vanessa Dales – Treasurer

The District's Emergency Response Plan (ERP) is currently being edited to reflect the protocols of the ICS and NIMS systems so that the District can cooperate efficiently and effectively with local, state, and federal agencies in the event of an emergency. The ERP will address situations in which the District will be required to take a lead role in an incident, such as a major water line break or a water treatment plant disaster. However, it is more likely that the District will be required to act in a supporting role to other agencies by providing water for fire suppression, furnishing potable water for residents, or shutting down portions of the system to assist in reducing damage. To maximize the District's preparedness and response time in a disaster situation, the District has contracted with a third-party vendor who provides disaster recovery solutions and emergency response services. The vendor's services include providing temporary offices, power, computers, and communication services. The vendor also maintains a copy of the District's ERP, staff contacts, and community contacts. The schedule for completing important milestones in the District's Emergency Response Program is as follows:

Completion of updated Emergency Response Plan utilizing protocols from ICS and NIMS training	July 2015
Participation in tabletop exercise with Skagit County Emergency Management Division as a supporting agency	Dec 2015
Participation in tabletop exercise with Skagit County Emergency Management Division as a supporting agency	Dec 2016

Because the ERP may contain sensitive information, it will not be incorporated into the Water System Plan. The ERP will be stored in a safe and secure location both in hard copy and on a secure server that is available in times of emergency. A copy of the current ERP's table of contents is included in Appendix K.

9.6.2 Federal Statutes

Title IV of the Public Health Security and Bioterrorism Preparedness and Response Act, Public Law 107-188, requires drinking water facilities serving populations of more than 3,300 to perform vulnerability assessments and to prepare an ERP that incorporates the results of the vulnerability assessment. Developing an ERP can require significant time and effort.

It is important to note that the water system ERP is a "living" document that receives periodic updates. It is maintained in a three-ring binder notebook to accommodate revisions. The ERP is flexible and easily implemented during an emergency, with the ability to provide removable checklists of tasks for different people and different situations, depending on the emergency.

The Bioterrorism Act requires drinking water utilities to identify plans, procedures, and equipment that can be implemented or utilized in the event of a terrorist or intentional attack, or that can obviate or significantly lessen the impact of a terrorist or other intentional attack on the utility.

The Bioterrorism Act also calls for coordination with local emergency planning committees.

9.6.3 State Statutes

The operations and maintenance section of the state rule, Chapter 246-290-415 (2)(b) WAC, requires public water systems in Washington to have an ERP as part of a water system plan or small water system management program. It also requires that systems employ reasonable security measures to protect the raw water intake facilities, water treatment processes, storage facilities, pump houses, and distribution systems from possible damage or intruders.

9.7 Safety Procedures

9.7.1 General

The personal safety and health of District employees are of primary importance. The District is committed to providing a safe work environment for all staff. The District wants each employee to have a safe and productive work setting, and return home free from injury each day to family and friends. All activities are conducted in accordance with the Department of Occupational Safety and Health/Washington Industrial Safety and Health Administration (DOSH/WISHA) requirements.

The District provides training, equipment, and safe work procedures and practices to ensure that all activities will be performed safely and efficiently. Supervisors are responsible for the safety of their employees, and as a part of their daily duties, must check the workplace for unsafe conditions, watch

employees for unsafe actions, and take prompt action to eliminate any hazards. Supervisors are trained and are expected to be leaders, setting a proper example by showing dedication and support in compliance with all policies, laws, rules and regulations, and good practice. In addition, all employees are responsible for performing their jobs in accordance with the established facility safety rules, regulations, and procedures.

The District has three core documents that complete the District's safety procedures: the Safety Manual, the Water Treatment Plant Process Safety Manual and Risk Management Plan, and the Chlorination Process Safety Manual. Attached as Appendix O are copies of the covers and tables of contents for these documents.

9.7.2 Organization

The District's safety program is guided by a Safety Committee. The committee is composed of both staff and management such that the number of staff members always exceeds the number of managers serving on the committee.

The committee is organized with a Chair, Secretary, and regular members. Each term is 2 years and the number of members ranges from 3 to 10. Members are required to meet once a month to approve minutes, review recent incidents, and review new procedures. These monthly meetings are then followed with a training video or presentation regarding a safety issue. Construction crews and office staff receive training specific to their work.

9.8 Cross-Connection Control Program

9.8.1 Overview

The District annually reviews its cross-connection program. Attached in Appendix P is the table of contents for the most current copy of the District's Cross-Connection Control Program (CCCP) document and a copy of the District's most recent Annual Summary Report (ASR).

The purpose of the District's CCCP is to protect the public water system from contamination via cross-connections. Reporting to the Engineering Supervisor, the Cross-Connection Control Coordinator organizes the District's program (Figure 9-9).

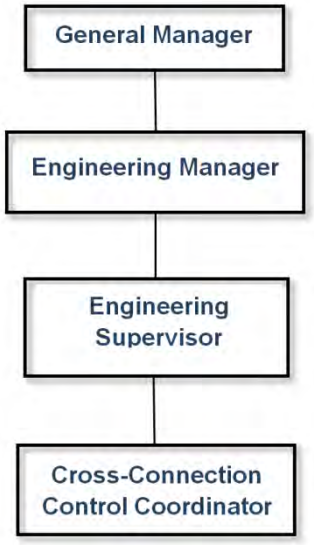

Figure 9-9. Cross-Connection Control Program Organizational Chart

Resolution 1744-97 and Water Policy Manual 2004 Section 2.5.5 Cross Connections Control, give the District the authority to operate the CCCP. The District's program meets the requirements of the State of Washington regulation WAC 246-290-490.

Under this authority, the District ensures that cross-connections between the District's distribution system and a customer's premises are eliminated or controlled by the installation of a State of Washington approved backflow preventer. Selection of the backflow prevention device is based on industry standards and guidance, including the type of hazard and the risk. Customers failing to install, maintain, repair, inspect, or test backflow prevention assemblies required by the District may have service suspended until the condition is remedied.

9.8.2 Use of a Qualified Cross-Connection Specialist

The District strives to coordinate with the Authorities Having Jurisdiction (AHJ)—the cities of Mount Vernon, Sedro-Woolley, and Burlington, as well as Skagit County—on issues concerning cross-connections within the customer's property lines. The District refers to WAC 246-290-490, Cross-connection control; the Pacific Northwest Section (PNWS) AWWA *Cross-Connection Control Manual*, Seventh Edition (current edition), 2012; the current *Manual of Cross-Connection Control* (USC Manual), 2011; and Section 2.5.5 of the District's Water Policy Manual on issues concerning cross-connection control. The District ensures that at least one person certified as a Cross-Connection Specialist (CCS) is employed to develop and implement the CCCP. The CCS's responsibilities include the following:

1. Administer the CCCP.
2. Evaluate service connections for backflow hazards.

3. Provide information for the Annual Summary Report (ASR) to DOH.
4. Assist with public education.
5. Investigate water quality concerns where backflow is suspected.
6. Ensure that backflow preventers are installed in accordance with the requirements of WAC 246-290-490(6).
7. Keep current records of all backflow preventer testing, air gaps installed in lieu of approved backflow preventers, test kit calibration, and tester certification.
8. Help eliminate or control cross-connections between the distribution system and customer's premises.
9. Ensure quality control for backflow testing.

9.8.3 Maintenance of Program Records

An adequate record system is essential for the operation of a cross-connection control program. These records form the basis for any enforcement action or legal defense by the District, and provide a basis for comparing test results of different backflow assemblies.

Records are kept in the Program Health Hazard Evaluation file. This hard copy file system retains records on all services that have a cross-connection preventative device installed. These records will be kept on file for the life of the backflow prevention assembly. Individual files are composed of the following items:

- Copies of all cross-connection control correspondence with the customer.
- Copy of health hazard evaluation reports complete with filed drawings.
- Copies of backflow prevention assembly test reports for all assemblies.
- A master list of service connections and/or customer's premises where approved backflow prevention assemblies protect the water system from contamination, and the assessed hazard of each connection. These records will be kept for as long as the premises pose a cross-connection hazard to the water system.
- Inventory information on the following:
    - Approved air gaps installed in lieu of approved assemblies, including exact location, assessed hazard, installation date, history of health hazard evaluations, inspection results, and person conducting the inspections.
    - Approved backflow prevention assemblies including exact location, assembly description (type, manufacturer, model, size, and serial number), assessed hazard, installation date,

history of health hazard evaluations, tests and repairs, test results, and the backflow assembly tester (BAT) performing the tests.

- An annual Cross-Connection Control Summary Report and Backflow Incident Report will be made available to DOH upon demand. These reports will describe the status of the District's cross-connection control program as well as any backflow incidents that occurred. These records will be kept on file for 5 years.

In addition to the hard copy files, electronic backups of many documents exist in the District's electronic filing system. At a minimum, backflow prevention assembly test report forms are entered into a computer program that tracks assembly testing and dates of tests. Backflow prevention assemblies that are replaced are double-checked to ensure that they appear on the list of approved assemblies. If they do not appear on the list, the customer is issued a letter to replace with an approved assembly.

9.8.4 Recent CCC Report

Each year the District completes a Public Water System Cross-Connection Control Activities Annual Summary Report (ASR). A copy of this report is submitted to DOH for review. The report assists the District in assessing the effectiveness of the CCCP. Over the past 5 years, the District has been improving on the successes from previous years. Working with DOH, the District will continue to improve its record of compliance. Appendix P contains a copy of the 2011 ASR.

9.9 Records Keeping and Reporting Program

The District maintains several hard copy file storage systems. The Engineering Department maintains the most extensive file, i.e., the Construction Order (CO) file. This file is a catalog of all construction-related projects since the inception of the District, for which the District has records. The Program Health Hazard Evaluation file, or Cross-Connection file, is also maintained by the Engineering Department.

Financial and administrative files are maintained by the administrative staff. The administrative files contain a historical record of the Commissioners' actions in the form of approved meeting minutes, resolutions, contracts, and all other matters of record. The Finance Department maintains copies of its records.

The WTP maintains its own set of files at the facility because it is impractical to maintain hard-copy files at the Engineering and Operations office 12 miles away. All information in these files is related to the WTP including the Daily Activity Log, Water Quality Test Reports, the Monthly Chemical Usage Report, and the Surface Water Treatment Protection Plan.

These files are also duplicated electronically on District servers. While the District's goal is to make all documents available electronically, there is a backlog given the volume of information that needs scanning.

The electronic files are subdivided into the various categories: Engineering, Operations, and the WTP files. Access to each file is limited, requiring permission based on who uses the information and to what degree. These permissions are established through standard cataloging of information. In the near future, the District will also carry much of this information within the District's Geographic Information System (GIS). The District's GIS will also reference all infrastructure for better implementation of the District's asset management program.

9.10 Design and Construction Standards

The District's water system design and construction standards are described in the District's Water Policy Manual (see Appendix G), and are also detailed in Appendix Q. Appendix G contains all of the District's policies, procedures, and process in terms of managing extensions and improvements to the District's infrastructure. Appendix Q includes engineering standard documents that are used by District staff to provide water service requirements and plan review and approval. When a new project is submitted to the District, all of the documents must meet the requirements of the Plan Review Checklist prior to being reviewed by an Engineering Technician. After the documents have been reviewed by the District, all approved sheets will receive a Plan Approval stamp from the Engineering Manager with his signature.

The District has a set of Engineering Standards for Design and Construction that were last updated in February 2009. This document is meant to provide guidance and direction for consulting engineers on the design of infrastructure projects and the selection of materials that are acceptable to the District. An update to the Engineering Standards for Design and Construction is in process to provide additional detail and specificity to certain material standards and construction practices. When complete, the standards will be presented as a stand-alone document separate from the Water Policy Manual and will be available at the District's Engineering counter and on the website.

The design standards used by the District are a compilation of industry standards, District practice, and District experience. They are modified as needed to reflect current practice and regulation. By reference, the most current versions of the following standards are incorporated into the District's standards:

- Minimum Design Standards, Chapter IV, Regional Supplement, Skagit County Coordinated Water System Plan
- Washington State Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction, including the American Public Works Association (APWA) Supplement
- Standards of the American Water Works Association

- International Association of Plumbing and Mechanical Officials (IAPMO) Uniform Plumbing Code
- International Conference of Building Officials (ICBO) Uniform Building Code
- Water System Design Manual, Washington State Department of Health
- Recommended Standards for Water Works, Great Lakes – Upper Mississippi River Board of State Sanitary Engineers
- Cross-Connection Control Requirements, AWWA Pacific Northwest Section

The District also has construction standards regarding the planned discharge of potable water during events such as water line flushing, discharging of hydrostatic test water, and water line draining to facilitate repairs. The standards involve the de-chlorination of the water to a chlorine concentration of 0.1 ppm or less through the use of sodium thiosulfate or ascorbic acid (vitamin C) and discharging to either a storm sewer or a sanitary sewer. Where possible, discharges to a sanitary sewer are preferred because of the neutralizing capabilities of the organic matter in the sewer.

9.11 Recommended Improvements

The District has modified its internal organization over the years in search of a more efficient division of responsibilities among Engineering, Construction, and Operations. With the implementation of a CMMS and a focus on improved maintenance, the challenge for the District is to balance the maintenance needs of such a large system with the goal of continued replacement of aging and undersized pipe.

The District continues to improve its safety and emergency response. These two items are very important to the District. In the future, key staff should receive training in their responsibilities related to emergency response or evacuation.

This Water System Plan references several reports, but does not incorporate them directly. While the District is not advocating for full incorporation of these documents, it is prudent to have a central location, or library, where all information can be quickly gathered.

The District's electronic filing system is serviceable; however, it lacks many of the components of a true document management system. This has been budgeted for and will greatly enhance the way the District shares and uses electronic information.

The District's computer hydraulic model is used to develop capital projects and provide developers and engineers planning information for required infrastructure improvements. It is important to improve the quality and accuracy of the District's hydraulic model by performing flow tests in each pressure zone to help calibrate the model.

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10 Capital Improvement Plan (CIP)

This chapter describes the methods used in developing the District's Capital Improvement Plan (CIP).

10.1 Major CIP Project Development

Major CIP projects include construction of major infrastructure such as new reservoirs, new transmission pipelines, new booster stations, etc. They do not include system maintenance, such as yearly pipe replacement projects. Major CIP projects are developed based on two elements:

- **WSP System Analysis:** As described in Chapter 6, the District's source, storage, and distribution facilities were analyzed to determine whether they have sufficient capacity to meet current and future demands. When deficiencies were identified, major CIP projects were developed to rectify the deficiencies.
- **District CIP:** District staff had previously identified several projects, which were included in the 2007 Water System Plan. In addition, staff meets on a yearly basis to develop major projects that would benefit the system.

The list of major CIP projects for the next 20 years is summarized in Table 10-1, and the project locations are shown in Figures 10-1 through 10-4. The table includes projects related to (a) new reservoirs that were identified as a result of the storage analysis, (b) new transmission pipelines that are planned to provide redundancy and additional capacity as a result of the hydraulic analysis, (c) new pipelines that will be used to strengthen the District's system in rural areas, (d) booster stations to increase flow to specific pressure zones, and (e) fiber optic lines to build the secure communication network for District facilities. Also included in the major CIP projects are battery replacements for the District's radio-read water meters, software, water treatment plant projects, and the yearly vehicle and equipment replacement program that is needed to keep vehicles and equipment in reliable condition.

In addition to the projects that are planned as part of the District's System Analysis or previous CIP, there are some "future" projects that are identified for potential completion with the hope that outside funding is available in the form of state or federal loans or grants, private funding from developers, or through the Local Utility District (LUD) process. These projects are identified in this Water System Plan so that the projects are open to potential funding sources in the event that they are completed within the current planning period.

Brief descriptions of each major project are provided below.

10.1.1 Pipeline Projects

P-1, Fir Island Road Pipeline: This project is located on Fir Island Road from Skagit City Road to Maupin Road. The project will replace existing 3-, 4-, and 6-inch plastic, AC, and PVC pipes to help improve system pressures and flows on Fir Island. The existing pipes are undersized and numerous leaks have resulted in increasing maintenance costs. This pipeline will eventually connect to a future pipeline crossing of the North Fork of the Skagit River and the existing water line on Best Road to complete a distribution loop for this area that will help increase system reliability and performance.

P-2, Josh Wilson Road Improvements: This project is located on Josh Wilson Road in rural Skagit County, west of the intersection of Josh Wilson Road and Higgins Airport Way. The project will extend the 18-inch-diameter pipeline west to Farm to Market Road, and continue west with a new 12-inch-diameter water line to connect with the existing 12-inch-diameter pipeline. The new water lines will help system hydraulics and improve the flows to Bay View Ridge so that the existing Bay View standpipe can be taken out of service. The standpipe has deferred maintenance and needs a seismic upgrade as well as lining and coating replacements.

P-3, North 30th Street and Digby Road Pipeline: This project is located on North 30th Street and on Digby Road in Mount Vernon. The pipeline on North 30th Street will be a new 18-inch-diameter dedicated tank inlet line from the Judy Reservoir to Mount Vernon transmission pipeline to the new Division Street tank. The dedicated inlet will allow for all of the water in the 322-foot HGL pressure zone to flow through the new tank, thereby reducing the water age that could result from such a large tank. The pipeline on Digby Road will be a new 12-inch-diameter pipeline that will feed water from the new Division Street booster pump station to the 560-foot HGL pressure zone.

P-4, Transmission Line, Judy Reservoir to Mount Vernon (Phase 2): This project is located in rural Skagit County, along the District's existing easement from Mount Vernon to the Judy Reservoir WTP. The project consists of constructing a new 36-inch-diameter pipeline to be built within the same easement as the existing 24-inch-diameter concrete cylinder pipeline. The District's hydraulic model has shown that the 24-inch-diameter pipeline is exceeding design velocities during peak day demands. In addition, future growth scenarios show that the 24-inch-diameter pipeline will be inadequate to deliver average day flows within the planning horizon of this WSP. Also, with the majority of the District's customers located downstream of the Judy Reservoir to Mount Vernon pipeline, a redundant and reliable transmission feed is an important part of the District's future, especially since the existing 24-inch-diameter pipeline was constructed in 1961 and is very difficult to access during most of the year.

P-5, Mclean Road Pipeline: This project is located along Mclean Road in rural Skagit County, between Best Road and Wall Street in Mount Vernon. The project will construct a new 12-inch-diameter pipeline to replace the existing 8-inch-diameter AC pipeline. The new pipeline will serve to improve system pressures and flows to the far reaches of the District's system at the south end of Best Road and on Fir Island.

P-6, Best Road Pipeline: This project is located on Best Road in rural Skagit County, from Valentine Road south to Summers Drive. The project will replace existing 3- and 6-inch-diameter PVC to help improve system pressures and flows near Pleasant Ridge and on Fir Island. The existing pipes are undersized and create a bottleneck in delivering adequate flows to this area. The pipeline will eventually connect to a future crossing of the North Fork of the Skagit River and the existing water line on Fir Island Road to complete a distribution loop for this area that will help increase system reliability and performance.

P-7, Burklund Road Pipeline: This project is located on Burklund Road in rural Skagit County, south of the City of Mount Vernon, between Stackpole Road and SR 534. The project will replace existing 8-inch-diameter AC pipe from 1962 to help improve system pressures and flows to the Conway area and Fir Island. This existing pipe is undersized and creates a bottleneck in delivering adequate flows to this area. A portion of the existing pipe between East Johnson Road and SR 534 is located in a 25-foot easement through active farmers' fields. There are no services on this line, so it is an option to construct the new line on this same alignment to reduce the overall project length. However, access to this easement is limited in most months of the year due to groundwater levels and farming activities.

P-8, North Fork Skagit River Crossing: This project is located in rural Skagit County, on the North Fork of the Skagit River between Pleasant Ridge and Fir Island. Currently, the District does not have a crossing of the North Fork so the water systems on Fir Island and Pleasant Ridge are not looped and require shutdowns during periods of construction or when leaks occur. A new crossing of the North Fork would serve to loop the District's system in this area so that water can be delivered from different directions and reduce the need for system shutdowns and flushing of dead-end lines. Skagit County is proposing to replace the North Fork bridge at some point and the new water line could be built as part of the new bridge construction. However, the District would prefer to construct a sub-surface crossing of the river so that any issues with the bridge in the future would not impact the water line.

P-9, Transmission Line, Judy Reservoir to Sedro-Woolley – Skagit River Crossing: This project is the replacement/upsizing of the existing aerial crossing of the Skagit River from South Skagit Highway to River Road in Sedro-Woolley. The existing water line is a 24-inch-diameter ductile iron pipe from 1958 that will reach its peak day hydraulic capacity sometime in the next decade, depending on growth and water demand in areas north of the Skagit River. The new water line has not been sized yet, and it has not been determined on the alignment whether it will be an aerial crossing or a subsurface crossing.

P-10, Bayview Ridge Reservoir to Allen West Road Pipeline: This project is located in rural Skagit County from Benson Heights Place, along Benson Road to Allen West Road. The project will add piping to connect the Bayview Ridge Reservoir to the rural 214-foot HGL pressure zone in Edison to provide a redundant feed in addition to the normal feed from the PRV station at Cook Road and Old Highway 99. The project will also replace the existing 2-, 3-, and 4-inch-diameter plastic pipes from

the 1960s and 1970s on Benson Road to provide delivery of adequate system pressures and flows to the Edison area.

P-11, Transmission Line, Judy Reservoir to Sedro-Woolley – New Pipeline: This project is located between the Judy Reservoir WTP and Sedro-Woolley, along the District's existing easement. There is an existing transmission line that supplies water to Sedro-Woolley, which ranges in size from 20- to 30-inch-diameter and is made of ductile iron, steel, and concrete cylinder pipe. The District's hydraulic model has shown that the existing pipeline will eventually exceed the design criteria and be inadequate during peak day demands. The project involves construction of a new 24-inch-diameter pipeline to provide additional capacity and a redundant supply to Sedro-Woolley. The timing of the project depends on the growth of the Sedro-Woolley area and the water demands. The alignment of the new pipeline has not been detailed at this time, but it is expected that it would be constructed within the same easement as the existing pipeline.

10.1.2 Reservoir Projects

R-1, East Division Reservoir, Pump Station and Piping: This project is located in the District's 322-foot HGL pressure zone in Mount Vernon, and it involves construction of the following facilities:

1. Construction of a new 6-MG reservoir located at the intersection of Division Street and Digby Road at the site of the existing 1-MG Division Street Reservoir. The District's 322-foot HGL pressure zone is deficient in standby storage volume, so the existing 1-MG reservoir will be removed and the new 6-MG reservoir will be constructed.

2. Construction of a new booster pump station to deliver water to the 560-foot HGL pressure zone. Currently, the Fir-Waugh booster station is the only feed to the 560-foot HGL zone and this new pump station will be a redundant measure.

3. Construction of a new pipeline to connect the new booster pump station to the 560-foot HGL pressure zone. The new pipeline will start at the new reservoir site and proceed south along Digby Road until reaching Woodland Drive (Project P-3).

4. Construction of a new dedicated pipeline feed to supply the new 6-MG reservoir. This project will involve a new connection to the existing 36-inch-diameter transmission line from Judy Reservoir at North 30th Street in Mount Vernon. The new pipeline will proceed south on North 30th Street until reaching Division Street, then turn east and end at the new reservoir site with a PRV station (Project P-3).

5. Installation of new fiber optic cable from the intersection of North 30th Street and College Way to the new 6-MG Division Street Reservoir. This new cable will provide redundant communication between District facilities in the event of an emergency when regular communication is not available. It will also improve the District's ability to monitor system status at various sites throughout Mount Vernon and allow for remote operation. The cable is not intended to be used for commercial purposes or by the general public.

R-2, Cascade Ridge Reservoir (858 / 592-foot HGL): This project is located in the Cascade Ridge development south of Mount Vernon. The development is currently served by three glass-lined bolted steel tanks that are undersized and in need of maintenance. The project will involve construction of a larger, new reservoir to serve the upper pressure zone, and PRV stations to serve the lower pressure zones.

R-3, Big Lake Reservoir (356-foot HGL): This project is located in the 356-foot HGL pressure zone near Big Lake, east of Mount Vernon. The 356-foot HGL zone is still experiencing growth, and it is projected that an additional storage reservoir will be needed. There is the potential for the reservoir to be a developer-driven requirement, with the District contributing to the up-sizing of the reservoir. This project will not be fully defined until the status of a number of potential developments in the Big Lake area is finalized.

R-4, Pleasant Ridge Area Reservoir (290-foot HGL): This project is located in the Pleasant Ridge area of rural Skagit County off Valentine Road. This area currently does not have a reservoir to provide standby storage or fire flow. The project will construct a new reservoir at the 290-foot HGL to create a new pressure zone that will serve the residents at the higher elevations in this area.

R-5, North Sedro-Woolley Reservoir #2 (430 / 350-foot HGL): This project is located in the north part of Sedro-Woolley and will serve future demands in this area as the population and water demand increase. The existing Hoogdal Reservoir also serves this area, but it is not adequate to provide standby storage as the demand in this pressure zone increases. A site has not yet been selected for this reservoir.

R-6, Burlington Reservoir (214-foot HGL): This project will be located somewhere north of Burlington to provide standby and fire flow storage to Burlington and the rural areas north of SR 20. Currently, the storage for these areas is provided by the 9th and Highland Reservoir in Mount Vernon and the clearwells located at the WTP, but it would be more beneficial if there were a local storage reservoir that could respond to local demands. The site for the new reservoir has not been decided at this time, and the timing of the reservoir depends on the growth and the future water demand of this area. If there is significant growth in areas such as Bay View, then the timing of the reservoir could be pushed forward.

R-7, Mount Vernon – County Reservoir (214-foot HGL): This project will be located somewhere in Mount Vernon or south Mount Vernon to provide additional standby and fire flow storage for Mount Vernon and the rural areas to the west. The main storage reservoir for this pressure zone is the 9th and Highland Reservoir in Mount Vernon, but eventually the storage volume of that tank will be inadequate. A site for the new reservoir has not been decided at this point, and the timing of the reservoir is dependent on population growth and water demand forecasts.

10.1.3 Fiber Optic Projects

FO-1, Josh Wilson Road Fiber: This project will be performed in conjunction with the new pipeline to extend the District's fiber optic network to Bay View, to facilitate direct SCADA connections to more of the District's facilities.

FO-2, Old Highway 99 Fiber: This project is located on Old Highway 99 between Burlington and the Chuckanut interchange on I-5. As part of the 2013 Josh Wilson Road transmission pipeline project, new fiber was installed from Higgins Airport Way to Old Highway 99. This project will allow the District to directly connect the Port of Skagit County to the fiber already installed in Burlington and Mount Vernon to facilitate direct SCADA connections to more of the District's facilities.

FO-3, Cascade Ridge Fiber: This project is located in the Cascade Ridge development south of Mount Vernon and involves construction of new fiber optic line from the lower elevations of the development to the top of the new reservoir to facilitate direct SCADA connections to more of the District's facilities.

FO-4, Sedro-Woolley to Burlington Fiber: This project is located along SR 20 from Fruitdale Road in Sedro-Woolley to Burlington, and involves construction of new fiber optic line to facilitate direct SCADA connections to more of the District's facilities.

10.1.4 Other Projects

O-1, Computer Software: This is the completion of a multi-year project in which the District's Customer Information Service software is being replaced, the financial software is being replaced, and a new Computerized Maintenance Management System is being installed.

O-2, Dukes Hill Pump Station (214-foot HGL to 459-foot HGL): This project is located at the Dukes Hill Reservoir site. The project will provide a redundant feed to the higher pressure zones in Sedro-Woolley using Dukes Hill Reservoir as the source.

O-3, Cedar Hills Booster Station: This project is located in the Cedar Hills development off East Blackburn Road in Mount Vernon. The project will replace the existing booster station, which serves approximately 25 customers, due to increasing age and maintenance. This booster station will be temporary until a new development-driven pipeline connects East Blackburn Road to the Eaglemont Golf Course development.

O-4, WTP Chemical Feed System Replacement: This project is directly related to worker safety and risk management in the operation of the WTP. It involves replacement of existing chemical feed pumps at the WTP. The existing pumps are 25 years old and reaching the end of their supportable life span.

O-5, Document Management Software: This project involves implementation of a software program that will help manage project files and e-mails in an environment where multiple people are accessing the information, both in the office and from mobile platforms. The software will also address the archiving and storage of historical files.

O-6, WTP Dry Scrubber Retrofit: This project is also directly related to worker safety and risk management in the operation of the WTP. It involves replacement of the chlorine scrubber system at the WTP. The project will replace the aging wet caustic system by using new technology to install a new dry chlorine scrubber with controls and an alarm system.

O-7, Computer Server Hardware: This project is for the replacement of end of life (EOL) equipment in the District's data center. The first portion of the project is for server hardware and switching equipment upgrades and replacements, and the second portion is for storage hardware and storage networking upgrades and replacements.

O-8, Badger Orion 5/8-inch Water Meter Transmitter Replacement: This project involves all of the District's existing 5/8-inch water meters that were installed in the past 6 years. The new water meters have radio-read technology and the battery life is expected to be about 15 to 20 years. This project involves changing the batteries and possibly the entire transmitter on the meters, depending on the options and technology available at the time.

10.1.5 Future Projects

F-1, Bow Hill to Alger Pipeline: This project is located in rural Skagit County, along Highway 99 between Bow Hill Road and Alger Cain Lake Road. The project consists of the construction of a new 12-inch-diameter pipeline to bring water from the District's Judy System up to Alger so that the residents currently supplied by the District's Alger well can be transferred to the Judy System. The new pipeline will also allow for the potential wheeling of water from the Judy System farther north along Lake Samish Road toward Nulle Road for residents at the south end of Lake Samish.

F-2, Lake McMurray Pipeline: This project is located in rural Skagit County, along State Route 9 from the south end of Big Lake to Lake McMurray. The project will involve construction of new 8-inch and 12-inch-diameter water lines, a new booster pump station, and a new reservoir to bring water from the District's Judy System south to Lake McMurray so that the residents currently supplied by wells can be transferred to the Judy System.

F-3, Micro-Hydroelectric Projects: This project is not specific to any one location within the District's many water systems. Instead, it is a placeholder for the construction of new micro-hydroelectric plants at any one of the various locations within the District's many water systems, such as the Creek intake pipeline at Judy Reservoir or one of the many PRV stations along the District's transmission pipelines. The project(s) would include a feasibility study, licensing, permitting, design and construction of the plant.

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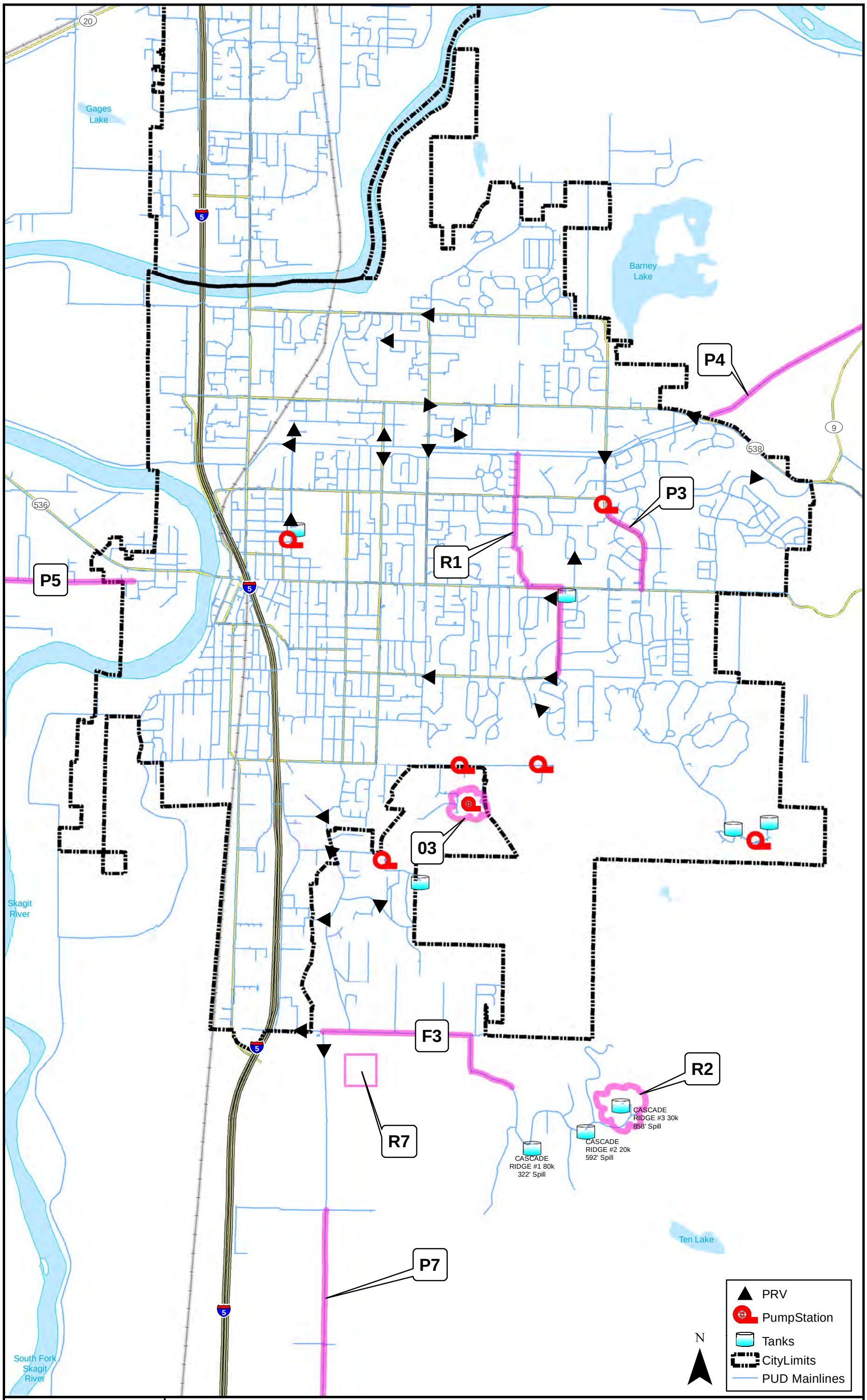
Table 10-1 Major Capital Improvement Plan

Project	Name	Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
P-1	**Fir Island Road Pipeline**	14-inch HDPE pipeline	$ 1,900,000																				
O-1	**Computer Software**		$ 300,000																				
O-2	**Dukes Hill Pump Station (214'-459')**	Redundant Pump Station to feed Hoogdal		$ 150,000																			
O-3	**Cedar Hills Booster Station**	Replacement Booster Pump Station		$ 60,000																			
O-4	**WTP Chemical Feed System Replacement**			$ 125,000																			
O-5	**Document Management Software**			$ 200,000																			
O-6	**WTP Dry Scrubber Retrofit**			$ 125,000																			
	Water Loss Control Action Plan	Activities to reduce DSL		$ 70,000																			
R-1	**E. Division Reservoir, Pump Station and Piping**	6 MG tank, Redundant PS for 560 Zone			$ 10,000,000																		
P-2	**Josh Wilson Road Improvements**	18, 12 and 8-inch pipeline			$ 200,000	$ 1,300,000																	
FO-1	**Josh Wilson Fiber**	Higgins to Bayview Reservoir				$ 130,000																	
FO-2	**Old Highway 99 Fiber**	Fairhaven to Chuckanut				$ 60,000																	
P-3	**North 30th St and Digby Road Pipelines**	12 and 18-inch pipeline for Division Street Tank			$ 2,400,000																		
P-4	**Transmission Line, Judy - MV (Phase 2)**	Parallel 5-mile 36-inch transmission pipeline from WTP to Mount Vernon		$ 300,000	$ 800,000	$ 4,000,000	$ 9,200,000																
O-7	**Computer Server Hardware**						$ 175,000	$ 175,000															
P-5	**McLean Road Pipeline**	12-inch pipeline					$ 300,000	$ 4,400,000															
R-2	**Cascade Ridge Reservoir (858'/592' HGL)**	0.1 MG Tank					$ 50,000	$ 150,000															
FO-3	**Cascade Ridge Fiber**	I-5 to Tank #3						$ 250,000															
P-6	**Best Road Pipeline**	12-inch pipeline						$ 300,000	$ 2,100,000														
P-7	**Burklund Road Pipeline**	12-inch pipeline						$ 300,000	$ 3,100,000														
R-3	**Big Lake Reservoir (356' HGL)**	0.2 MG Tank						$ 50,000	$ 350,000														
P-8	**North Fork Skagit River Crossing**	12-inch pipeline							$ 500,000	$ 2,300,000													
R-4	**Pleasant Ridge Area Reservoir (290' HGL)**	0.2 MG Tank							$ 100,000	$ 400,000													
FO-4	**SW - Burlington Fiber**	Fruitdale Rd to Burlington							$ 150,000	$ 600,000													
P-9	**Judy - SW Transmission Line**	Skagit River Crossing								$ 300,000	$ 700,000												
P-10	**Bayview Ridge Reservoir to Allen West Rd**	12-inch pipeline									$ 400,000	$ 2,000,000											
R-5	**N Sedro Woolley Reservoir #2 (430'/350' HGL)**	1 MG Tank									$ 250,000	$ 250,000	$ 250,000	$ 1,250,000									
O-8	**Badger ORION 5/8 Meter Transmitter Replacement**														$ 2,500,000								
P-11	**Judy - SW Transmission Line**	Parallel 3-mile 24-inch transmission pipeline from WTP to Sedro Woolley												$ 100,000	$ 700,000	$ 5,100,000							
R-6	**Burlington Reservoir (214' HGL)**	2 MG Tank													$ 250,000	$ 300,000	$ 700,000	$ 3,650,000					
R-7	**Mount Vernon - County Reservoir (214' HGL)**	2 MG Tank															$ 250,000	$ 300,000	$ 700,000	$ 3,650,000			
	Annual Pipe and Vehicle Replacement	Yearly Program	$ 3,336,500	$ 3,430,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
		TOTAL	**$ 5,536,500**	**$ 4,460,000**	**$ 16,900,000**	**$ 8,990,000**	**$ 13,225,000**	**$ 9,125,000**	**$ 9,800,000**	**$ 7,100,000**	**$ 4,850,000**	**$ 5,750,000**	**$ 3,750,000**	**$ 4,850,000**	**$ 6,950,000**	**$ 8,900,000**	**$ 4,450,000**	**$ 7,450,000**	**$ 4,200,000**	**$ 7,150,000**	**$ 3,500,000**	**$ 3,500,000**	**$ 3,500,000**

	Future Projects		
F-1	**Bow Hill to Alger Pipeline**	12-inch pipeline	$4,200,000
F-2	**Lake McMurrary Pipeline**	8 and 12-inch pipeline, booster station and reservoir	$7,500,000
F-3	**Micro Hydroelectric Projects**	Various	Unknown



Skagit PUD
PUBLIC UTILITY DISTRICT

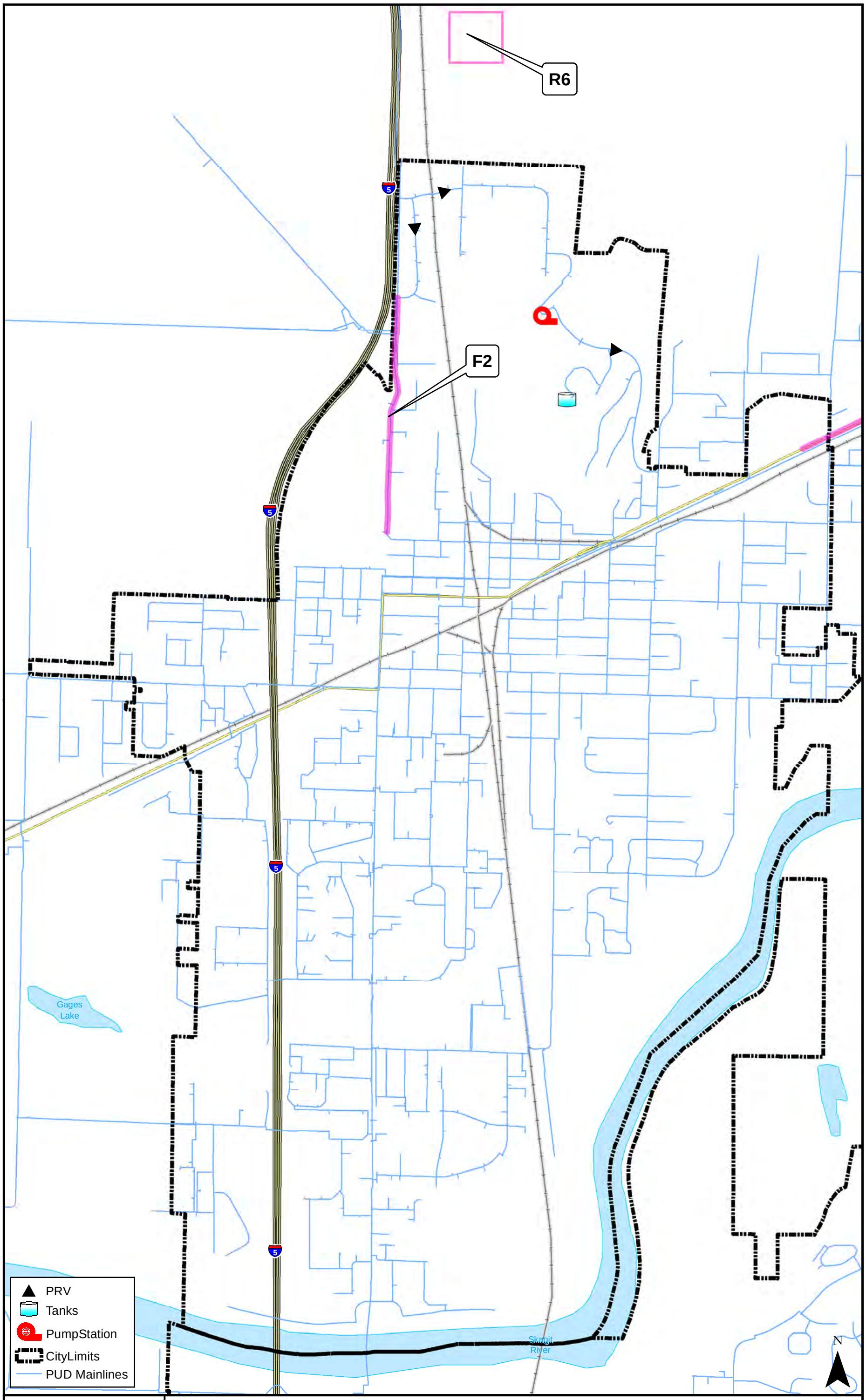
Major CIP Projects - City of Mount Vernon

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.5 1 Miles

Figure 10-1



Skagit PUD
PUBLIC UTILITY DISTRICT

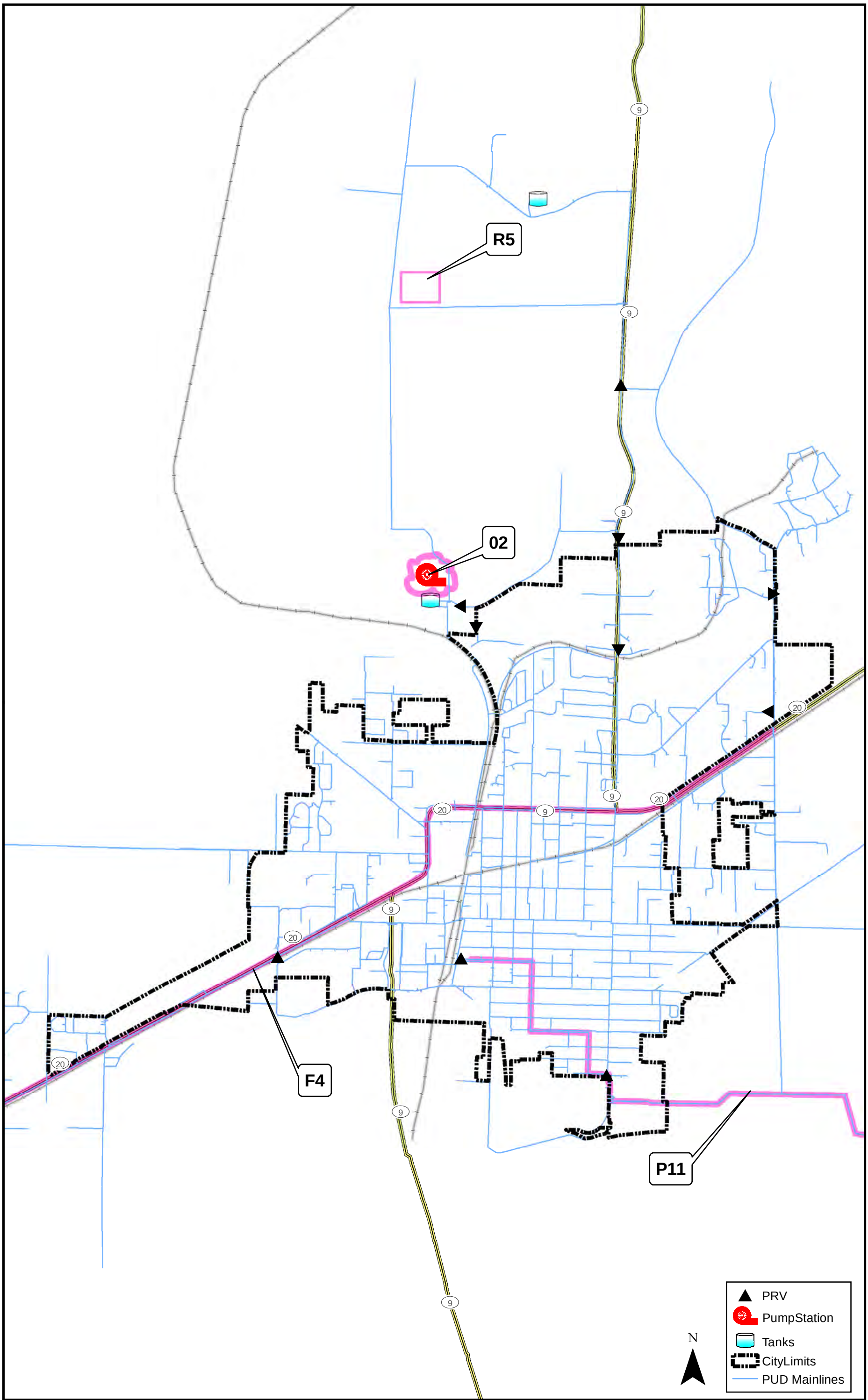
Major CIP Projects - City of Burlington

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure 10-2



Skagit PUD
PUBLIC UTILITY DISTRICT

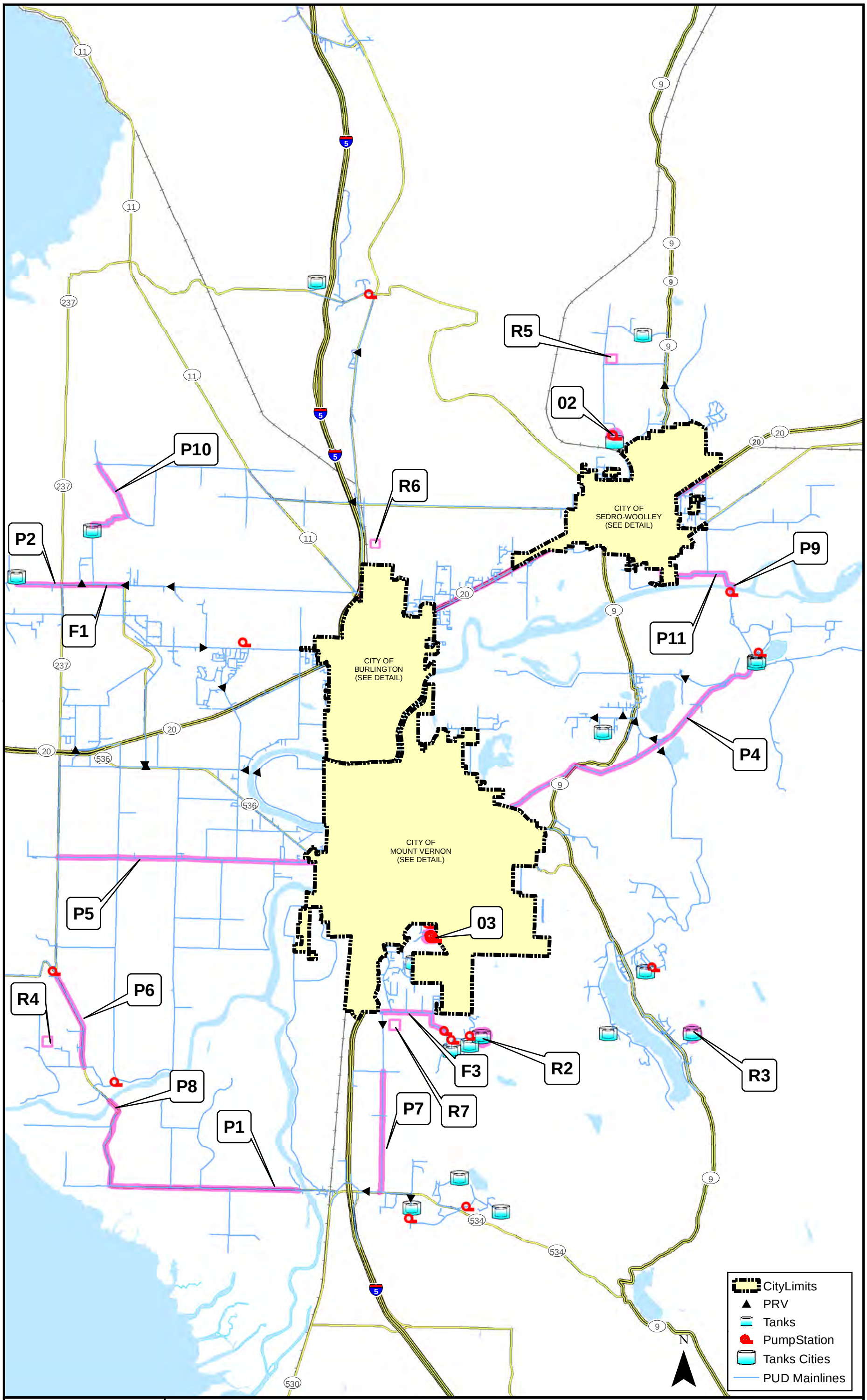
Major CIP Project - City of Sedro-Woolley

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

0 0.4 0.8 Miles

Figure 10-3



Skagit PUD
PUBLIC UTILITY DISTRICT

Major CIP Projects - Rural Areas

2013 Skagit PUD Water System Plan

Coordinate System: WA State Plan North, NAD83

Figure 10-4

10.2 Minor CIP Project Development

Minor CIP projects are the yearly pipe replacement projects that help improve system operation. Three main elements are used to develop the list of minor CIP projects:

- **WSP System Analysis:** As described in Chapter 6, the District's distribution facilities were analyzed during peak hour and fire flow demands to determine whether they have sufficient capacity to meet current and future demands. When deficiencies were identified, CIP projects were developed to rectify the deficiencies.
- **District CIP:** District staff had previously identified several projects specifically related to system maintenance and water main replacement programs.
- **District Staff:** A record of system leaks and breaks is compiled and tracked in the District's database. This information is used to develop projects based on the number of leaks on a given pipeline.

After a project is developed and put on the list of minor CIP projects, it then must be prioritized using a number of evaluation criteria so that the most important projects are completed ahead of other projects. Because so many projects are identified, the District recently began using an asset management approach to the selection of projects, based on a scoring and ranking system for each criterion. The following evaluation criteria are mainly used in the development of minor CIP projects:

- **Pipe Material:** Certain types of pipe materials are prone to leaks and breaks. Asbestos-cement and plastic pipes are targeted for replacement whenever possible and are assigned a higher score during the evaluation of a new project.
- **Pipe Age:** Older pipes are assigned a higher score during the evaluation process, with existing pipes 50 years old and older receiving the maximum score.
- **Number of Leaks:** If the existing pipe has a record of leaking, it will be assigned a higher score during the evaluation.
- **Fire Flow Availability:** The ability of the existing pipe to meet the current fire flow goal is an important factor in the evaluation of a project. A lower available fire flow will result in a higher score for the new project.
- **Hydraulics/System Gridding:** If the existing pipeline is responsible for looping and gridding the water system, then it will be assigned a higher score in the evaluation of the new project.
- **Level of Service:** The existing pipeline is evaluated for the level of service that it provides, where the more critical lines receive a higher score in the evaluation.

- **Agency Coordination:** If other local agencies are planning projects in the same area, then a project will receive a higher score based on how soon those projects are planned.
- **Minimize Dependency on Anacortes:** If a new project will minimize or eliminate the process of purchasing water from the City of Anacortes, then it will receive a higher score.

Other criteria are also used in the development of minor CIP projects such as construction cost, water quality improvement, soil conditions, condition assessment, etc. However, these criteria are not used in the scoring and ranking system and represent a secondary evaluation system.

Each main evaluation criterion listed above was assigned an importance weighting factor from 1 to 3, where a higher factor means the criterion is more important for the project. Then, each criterion is scored from 0 to 5, where the higher score means the criterion is more important for the project. Next, those two numbers are multiplied to yield a total score for that criterion, and the total scores for the criteria are added together to determine a total score for the project. A summary of the importance weighting factors and scoring for each criterion is provided in Table 10-2.

Table 10-2. Summary of Weighting and Scoring Factors

Evaluation Criteria	Importance Weighting Factor	Scoring					
		0	1	2	3	4	5
Hydraulics/System Gridding	3		No improvement		Some improvement		Significant improvement
Fire Flow (FF) Availability	3		Meets/exceeds FF goal	75% of goal	50% of goal	25% of goal	Less than 25% of goal
Anacortes Dependency	3	No effect					Will minimize dependency
Level of Service	3		Dead end line		Distribution line		Transmission/critical supply
Number of Leaks	3	None			1		2 or more
Agency Coordination	2		5+ years away	4 years away	3 years away	2 years away	1 year away
Pipe Material	1		DI/Steel/HDPE	CCP/CI	PVC	AC	ABS Plastic
Pipe Age	1		10 yrs old	20 yrs old	30 yrs old	40 yrs old	50+ yrs old

DI = ductile iron; HDPE = high density polyethylene; CCP=concrete cylinder pipe; CI = cast iron; PVC = polyvinyl chloride; AC = asbestos-cement

Table 10-3 is an example of the weighted scoring process for three example projects.

Table 10-3. Scoring and Ranking for Three Example Projects

	Material	Age	Fire Flow	Agency	Gridding	Anacortes	LOS	Leaks	Score
Importance Weighting Factor	1	1	3	2	3	3	3	3	
Project A 4-inch AC from 1953 (dead-end)	4	5	3	1	1	0	1	3	35
Project B 3-inch ABS from 1967 (main grid)	5	4	5	1	5	0	5	0	56
Project C 8-inch AC from 1968 (distribution line)	4	4	1	1	3	0	3	5	46

LOS = level of service

So for Project A, the score was calculated as follows:

Material importance factor x score	1 x 4 = 4
Age importance factor x score	1 x 5 = 5
Fire flow importance factor x score	3 x 3 = 9
Agency coordination importance factor x score	2 x 1 = 2
System gridding importance factor x score	3 x 1 = 3
Anacortes dependency importance factor x score	3 x 0 = 0
Level of service importance factor x score	3 x 1 = 3
Leaks importance factor x score	3 x 3 = 9

Total score for Project A = 35

In looking at the three example projects, Project B scored the highest because it received high scores in the criteria that had the highest importance factors.

This method of evaluation does not rely on one single evaluation criterion as the means for selecting a project, but instead considers many different criteria that are separated by their importance.

Table 10-4 lists the minor CIP projects that have currently been identified. This table includes all the pipeline replacement projects that were identified, and the table also includes the score for each project based on the ranking and scoring method discussed above. The District typically revisits this list every year to determine if additional projects should be added, or if projects need to be shuffled based on priorities.

Table 10-4 - Minor Capital Improvement Plan

	MINOR CAPITAL IMPROVEMENT PROJECT LIST	Old Pipe	New Pipe	Length	Cost	Material Wgt = 1	Age Wgt = 1	Fire Flow Wgt = 3	Agency Wgt = 2	Hydraulics Wgt = 3	Anacortes Wgt = 3	L.O.S. Wgt = 3	Leaks Wgt = 3	Overall Weighted Score
						Score	Score	Score	Score	Score	Score	Score	Score	
	2014 PROJECTS													
	PUD CONSTRUCTION													
2014	Mtn View Dr., Streeter Pl., N. 21st St., Cascade Ave & Highland Ave	4-in AC	8-in DI	4,262	$822,609	4	5	2	1	3	0	3	5	46
2014	Belair Dr, N Belair Dr., E Viewmont Dr. & Carmel Ave	4-in & 6-in AC	8-in DI	1,670	$250,500	4	5	2	1	3	0	3	3	44
2014	Summers Dr To Beaver Marsh, N to 8 -in PVC	4-in AC	8-in DI	3,998	$599,700	4	4	5	1	5	0	3	5	60
2014	S. Gardner, Sanchez Ln. To E. Rio Vista & Cascade Vista	6-in AC	8-in DI	1,753	$262,950	4	5	2	1	5	0	3	3	46
2014	Old Hwy 99 N. Rd., County Shop Ln to Gear Rd. - Abandon 8-in AC	8-inch AC	6-in & 8-in DI	200	$124,000	4	5	2	1	5	0	5	5	58
2014	Mary Lane, SR-20 N. & Peter Anderson Rd., SR-20 N. to Aliston Ln.	2-in PL & 4-in & 6-in AC	6 or 8-in DI	2,200	$330,000	4	5	5	1	1	0	1	5	43
2014	Francis Rd., North 30th to Swan Rd. & Swan, Francis to Trumpeter Ln.	4-in Stl & 3-in PVC	12-in DI	3,250	$650,000	3	5	5	1	5	0	5	5	70
2014	Ellison Rd., Willett St. to Blodgett Rd.	6-in PVC	12-in DI	1,650	$330,000									100
	CONTRACTOR CONSTRUCTION													
2014	Old Day Creek Road, A Street to Transmission Line	6-in PL	8-in DI	6,800	$1,012,112									99
2014	Switch PRVS off of College Way and N. 30th with spring assisted Check Valves				$40,000									
2014	Little Mountain Pump Station & Piping - Park Ave to Skyridge Tank (Directional drill down the slope?)	8 & 10-in AC	12-in DI or HDPE	2,700	$540,000									98
2014	Bored Crssngs Ph 1 : S. Pine to Anacortes, I-5 Conway & Hickox, Chuckanut Drive Joe Leary Slough, Buchanan, SR-9,		DI & HDPE		$150,000									
	AGENCY PROJECTS													
2014	Pioneer Hwy/Fir Island Rd. Roundabout	4-in & 8-in AC	8-in & 12-in DI	996	$199,200									
2014	City of Mount Vernon Floodwall Protection Project Phase II	1-in & 1-in CPR & PVC	2-in PVC	330	$50,000	5	3	5	4	5	0	5	5	71
2014	Rio Vista, Section to Gardner & Sunset Dr., Vine St. & Sparr's Ln.	2-in PL, 4-in & 6-in A/C	8-in DI	2,802	$420,300	4	5	3	5	3	0	3	3	55
2014	Calhoun Rd., Beaver Marsh to Kamb	3-in & 4-in PVC	8-in DI	4,000	$600,000									
	2015 PROJECTS													
	PUD CONSTRUCTION													
2015	Denny, Section to Hazel, Hazel Denny to 15th; Quentin Ave, Section to Hazel & S. 19th, Broadway to Section	2-in PL	8-in DI	2,446	$366,900	5	5	5	1	1	0	3	3	48
2015	Ball Rd. East (500') (Permit Ball Rd., Ovenell S. & Ball Rd. West to Farm to Mrkt Rd. - 2,551')					4	5	0	1	3	0	0	0	20
2015	Hazel Ave and Avon Ave, N. Oak St. to N. Anacortes St & Hazel Ave from Burl Blvd to N Walnut St; Anacortes St., SR-20 to Magnolia; Magnolia, Pine St. to Cherry St. & Cherry St., SR-20 to Fritsch	2 & 6-in PVC, 4-in & 6-in AC & CI	8-in DI	3,688	$553,200	5	5	2	1	5	0	3	5	57
2015	Clear Lake - N. Front St., School Dr., Lake Dr., & Bartle St.	1-in CPR , 4 & 6 in AC & 6-in PVC	8-in DI	2,747	$412,050	5	5	5	1	5	0	5	3	66
2015	N. Walnut, Victoria to Washington; Alley S. of E Fairhaven, N. Walnut & N. Spruce & Alley S. of Victoria	1-in PVC, 2-in PVC & 4-in AC	8-inch DI	1,245	$186,750	5	5	5	1	5	0	3	3	60
2015	Memorial Highway, N. Wall to Moores's Garden	6-in AC & CI	12-in DI	2,939	$587,800	4	5	2	1	5	0	5	5	62
2015	Discovery, Peterson-Gailee & Gull Dr., Gailee to Maple Crest Dr.	4-in AC	8-in DI	1,880	$282,000	4	5	3	1	3	0	3	5	53
2015	Farm to Market Rd., Josh Wilson Rd. to Marihugh Rd.	2-in PL	12-in DI	2,587	$517,400	5	5	5	1	5	0	5	0	57
	CONTRACTOR CONSTRUCTION													
2015	Bored Crssngs Ph 2 : Jackson, SR-9 to Fir, Rolling Ridge to Plaza Dr., Cook Rd. over Maddox Crk.		DI & HDPE		$150,000									
	2016 PROJECTS													
	PUD CONSTRUCTION													
2016	7th St., Division to Fulton; Warren, 7th to 10th; 8th St., Division to Fulton & Warren, 11th E.	1-in & 1.5-in PVC & 4-in AC	8-in DI	2,250	$337,500	4	5	4	1	5	0	3	3	56
2016	Alexander, 6th to 11th PL. & Sterling, Township E. to 6-inch PVC	2-in ABS PL & 4 & 6-in A/C	8-in DI	2,905	$435,750	5	4	5	1	3	0	3	5	58
2016	S 2nd, Milwaukee To Park & Milwaukee, 1st to 2nd	6-in PL & 6 & 8-in CI	8 & 12-in DI	1,365	$273,000	2	5	1	1	5	0	5	3	51
2016	Vaughan Rd.; Nilson Rd. & Avon Allen Rd., Nilson to Memorial Hwy (800 LF)	2-in PVC, 4-in & 6-in AC	8 & 12-in DI	2,160	$432,000	4	5	3	1	5	0	5	5	65
2016	S. Wall Street, S. of W. Blackburn Rd. & S. Wall St., N. of W. Blackburn Rd.	2-in PL & 4-in A/C	8-in DI	1,031	$154,650	4	5	5	1	5	0	3	5	65
2016	Best Road, Young Rd. S. to 8-inch & Young Rd., Best to S. Fredonia Rd.	3-in PVC & 4-in AC	8-in DI	2,280	$342,000	3	5	5	1	5	0	5	0	55
2016	3rd St., Josh Wilson to E; E St., 3rd to Bayview Edison; Bayview Edision, E. St., S to Marihugh Rd.	2-in PL & 4-in AC	8-in DI	4,060	$609,000	5	5	3	1	5	0	3	3	54
2016	Highland 4th to 9th; E. Lawrence, 6th to 8th; E. Spruce, from 6th to N. 4th & E. Evergreen Street from 6th to N. 4th	4 & 6-in AC & 6 & 12-in CI	8-in & 18-in DI	2,932	$586,400	4	5	3	1	5	0	5	3	59
	CONTRACTOR CONSTRUCTION													
2016	N. Wall, W.Division to W. Lincoln; W. Lincoln, W End to N. Ball; N. Barker, W. Lincoln to Dunbar; Cosgrove, N. Wall to N. Baker; Cascade St., N. Wall W. & S. Baker, Mem Hwy to Garfield; Garfield & S. Bkr to Mem Hwy	4 & 6-in AC & CI	8-in DI	5,761	$864,150	4	5	3	1	5	0	3	5	59
2016	Valley Rd, Dodge Valley Rd West (2,715) & Dodge Valley Rd., Valley Rd. S (3,860)	2-in PL	4-in HDPE	6,575	$657,500	5	5	5	1	3	0	3	3	54
	2017 PROJECTS													
	PUD CONSTRUCTION													
2017	Upland, E. Fir to Iroquois; Iroquois, Upland to N. 30th & Commanchee, Upland to N. 30th; & Upland to Elliott	4-in & 6-in AC	8-in DI	4,035	$605,250	4	5	2	1	3	0	3	5	50
2017	Talcott, 3rd-Township (Concrete Paving - Design to avoid)	4-in AC	8-in DI	2,870	$430,500	4	5	3	1	3	0	3	3	47
2017	Alta Vista, Vista View & Plaza Drive	2-in PL & 4-in & 6-in AC	8-in DI	3,950	$592,500	4	5	3	1	3	0	3	5	53
2017	Blackburn Road - 13th to 18th & S. 19th St., Blackburn Rd. to Aemmer Place, Aemmer Street & S. 20th St.	4 & 6-in AC	8-in DI	2,700	$405,000	4	5	3	1	5	0	5	0	50
2017	State, 3rd to Eastern & Eastern to Ferry (No cut til 2017)	6-in CI	12-in DI	1,655	$331,000	2	5	1	1	5	0	5	5	57
2017	Forest Drive, Windsor Dr. to Forest Ridge Pl. & Forest Ridge Pl., Windsor to Forest Dr.	4 & 6-in AC	8-in DI	2,650	$397,500	4	5	1	1	3	0	3	5	47
	CONTRACTOR CONSTRUCTION													
2017	Olympic PL., Skyridge to Soundview; Soundview, Olympic PL N.; Meadow Ln. & Skyridge Rd., W. Skyridge Dr. W.	2 & 4-in AC & 2-in PVC	8-inch DI	2,970	$445,500	5	5	4	1	3	0	3	3	51
2017	Belmont St., Clarmont Place & E. Montomery, N 15th E.	2 & 3-in PL & 4 & 6-in AC	8-in DI	2,560	$384,000	5	5	3	1	3	0	3	5	54
2017	Peterson, Pulver-Avon Allen & Sunrise Lane E.	6 & 8-in AC	12-in DI	5,463	$1,092,600	4	5	1	1	5	0	5	5	59
2017	W. Taylor Street; Harrison to 3rd ; 3rd, S. 2nd to W. Section	6-in A/C & CI?	8-in DI	3,115	$467,250	4	5	1	1	5	0	3	5	53
2017	College Way, Freeway Drive E. to 12-in DI	8-in AC	12-in DI	1,350	$270,000	4	5	1	5	5	0	5	0	52
2017	1st, Division to West Kincaid; W. Gates, 1st to 2nd & Pine, 1st West	1-in CPR & 8-in CI	12-in DI	1,740	$348,000	2	5	1	1	5	0	5	0	42
	2018 PROJECTS													
	PUD CONSTRUCTION													
2018	Trumpeter Ct. Martin Rd. to N. Trumpeter Dr. & N.Trumpeter Dr, Trumpeter Ct. to Martin Rd.	6-in PVC	12-in DI	2,165	$433,000	3	3	3	1	5	0	5	0	47
2018	S. Alder Street, From E. Rio Vista to E. Sharon St	4-in AC	8-in DI	625	$93,750	4	5	3	1	3	0	3	3	47

Table 10-4 - Minor Capital Improvement Plan

	MINOR CAPITAL IMPROVEMENT PROJECT LIST	Old Pipe	New Pipe	Length	Cost	Material Wgt = 1	Age Wgt = 1	Fire Flow Wgt = 3	Agency Wgt = 2	Hydraulics Wgt = 3	Anacortes Wgt = 3	L.O.S. Wgt = 3	Leaks Wgt = 3	Overall Weighted Score
						Score	Score	Score	Score	Score	Score	Score	Score	
2018	Summers Drive to Bradshaw Rd.	4-in AC	8-in DI & HDPE	2,475	$371,250	4	4	3	1	5	0	5	0	49
2018	S Pine, Orange S. (2500 LF), E. Sharon, Railroad to Anacortes (780 LF) & Olympia RR to Anacortes (816 LF)	2-in PVC & 4-in AC	8-in DI	4,100	$615,000	4	5	3	1	1	0	3	5	43
2018	N. Skagit St., Liberty Ln N. & Huff Rd. & Lei Garden Rd., N. Skagit to N. Section St.	2-in PVC & 4-in AC	8-in DI	2,016	$302,400	4	5	1	1	5	0	3	3	47
2018	Junquist Rd., Beaver Marsh Intersection Improvements	3-in PVC	8-in DI	60	$15,000	4	4	5	1	5	0	3	0	49
2018	Haines, SR-20 to Northern; Waldron, Reed to Central; Munro, Haines to Central & Northern, Metcalf to Central	1 PL; 2 -3-in PL & 4-in AC, PL	8-in DI	3,140	$471,000	4	5	5	1	5	0	3	0	50
	CONTRACTOR CONSTRUCTION													
2018	Carter St., Polte to McGarigle (12-in Crossing SR-20); SR-20, Township to Fruitdale (12-in DI) (2,600 LF)	4-in AC	8-in & 12-in DI	4,561	$912,200	4	5	3	1	5	0	5	0	50
2018	Eagle Dr., Fairview W; Fairview Dr.; Country Club Dr., Fairview to Rainier	2-in PL & 4-in AC	8-in DI	5,547	$832,050	5	5	1	1	5	0	3	5	54
2018	College Wy, Urban to LaVenture & Crossings At Leigh, Windsor & N. 19th	8-in AC	12-in DI	5,515	$1,103,000	4	4	3	1	5	0	5	0	49
	2019 PROJECTS													
	PUD CONSTRUCTION													
2019	10th, Division to Broad & E. Kincaid St; S. 10th to S. 11th	1-in CPR & 6-in AC	8-in DI	2,630	$394,500	4	5	3	1	3	0	3	0	38
2019	Wicker Rd., Columbia Wy to Fruitdale Rd. & Whatcom Ln., Wicker to State St.	3-in PL, 4-in AC & 6-in AC	8-in DI	2,614	$392,100	5	5	2	1	5	0	3	0	42
2019	Blackburn, S 3rd to Henson	10-in CI	12-in DI	1,129	$225,800	2	5	2	1	5	0	5	0	45
2019	Mary Lane	2-in PL & 4-in AC	8-in DI	1,310	$196,500	5	5	5	1	1	0	1	3	42
2019	Dunbar Rd., Avon Allen to Memorial Hwy & Dunbar Lane	4 & 6-in AC	6-in & 8-in DI	3,700	$555,000	4	5	3	1	3	0	3	5	53
2019	SR-9, McGarigle to Sapp Rd.	6-in A/C	12-in DI	2,186	$437,200	4	5	1	1	5	0	5	0	44
2019	Monica Drive & Cindy Place	4-in & 6-in PVC	8-in DI	1,800	$270,000	3	3	2	1	1	0	3	5	41
	CONTRACTOR CONSTRUCTION													
2019	Moore's Garden Rd., Mem Hwy E & Dunbar Rd., Mem Hwy E	4-in AC	8-in DI	5,485	$822,750	4	5	3	1	1	0	3	5	47
2019	Riverbend Rd., Freeway Drive W. (8,570 LF)	4-in AC	8-in HDPE (Burst)	8,570	$1,285,500	4	5	3	1	1	0	3	3	41
	2020 PROJECTS													
	PUD CONSTRUCTION													
2020	N 19th, College Way To Kulshan & Roosevelt, 18th to N. 20th PL.	2-in PL & 4-in AC	8-in DI	1,889	$283,350	4	5	2	1	3	0	3	0	35
2020	Northern, Metcalf To Murdock & Northern, Reed to Central (approaching aprons newly paved)	1-in, Cop & 1-1/2-in PL	8-in DI	1,145	$171,750	5	5	5	1	3	0	3	0	40
2020	4th St., E. Division S.; E. Division, 4th to 5th & Jefferson, 4th to 5th	1 & 1.5 -in PL	8-in DI	778	$116,700	5	5	5	1	1	0	1	3	42
2020	Cohoe, Chinook to West Chinook & Country Lane & Joy Place	4-in AC & PVC	6-in & 8-in DI	2,104	$315,600	4	5	3	1	1	0	1	5	41
2020	6th, Union to Hazel, 7th, Section To Hazel; Hazel, 6th To 7th & E. Section, RR to S. 7th	6-in AC & CI	8-in & 12-in DI	2,864	$572,800	4	4	5	1	3	0	3	0	43
2020	Fidalgo St., 3rd to 7th & Nelson, 6th to 7th and 6th, Nelson to Bennett	1-in CPR, 2-in PL & 4-in AC	8-in DI	2,630	$394,500	5	4	4	1	3	0	3	0	41
2020	N 14th, E. Fir To Florence; N 15th, E. Fir N. & N. 16th, Florence N.	6-in AC	8-in DI	1,654	$248,100	4	5	1	1	1	0	3	3	35
	CONTRACTOR CONSTRUCTION													
2020	10th, Skagit-Hazel; Hazel, 10th-11th; 12th, Section to Fowler; 12th, E. Kincaid to E. Skagit; 13th, Broadway to Skagit; Skagit, 11th to 16th & E. Section 11th to 15th	1-in PL, 2-in CI, & 4 & 6-in AC	8-in DI	6,920	$1,038,000	4	5	1	1	5	0	3	5	53
2020	Josh Wilson Road, Bayview Elementary to View Ridge Drive & 2-in E to Jensen	4-in AC, 2-in PL	12-in DI & 2-in PE	5,834	$1,166,800	4	5	3	1	3	0	1	5	47
2020	Township, State to Polte; Township, Waldron to Cultus Loop Rd. & Township, McGarigle-Sapp Rd.	6-in AC & CI	12-in DI	5,214	$1,042,800	4	5	1	1	5	0	5	0	44
	2021 PROJECTS													
	PUD CONSTRUCTION													
2021	Geneva Alley, E. Spruce to E. Highland; E. Spruce, 16th W & N. 16th, E. Spruce S.	4-in AC & 6-in AC & PVC	8-in DI	1,258	$188,700	4	5	3	1	3	0	3	0	38
2021	Claybrook, Wicker to Polte & Thresher Ave, Wicker N.	4-in AC & 4-in PVC	8-in DI	2,190	$328,500	4	5	2	1	5	0	3	0	41
2021	Douglas St., Blackburn to W. Hazel and Walter, W. Hazel S to Park	6-in AC & 4-in AC & 2-in PL	8-in DI	2,292	$343,800	5	5	1	2	3	0	3	3	44
2021	N. Section, E. Hazel to Monroe St., Monroe St., N. Section W.; Short St. & E. Hazel Ave, E of Caroline St.	2-in & 4-in & 6-in ABS & A/C	8-in DI	2,304	$345,600	4	5	3	1	3	0	3	0	38
2021	Sterling Rd., Lafayette Rd. to SR-20; Sterling Dr. (1,019 LF)	2-in PL, 4-in & 6-in A/C	2-in PE & 8-in DI	2,869	$430,350	5	5	5	1	1	0	1	5	48
2021	E. Sharon St., S. Skagit W.; Curtis St., S. Skagit E. & S. Holly, E. Rio Vista to Olympia	2-in PL & 4-in AC	4-in PVC & 8-in DI	1,551	$232,650	4	5	3	1	3	0	3	0	38
2021	Jaqueline Pl., N. LaVenture E.	4-in AC	8-in DI	1,181	$177,150	4	5	3	1	3	0	1	0	32
2021	E. Fir, N. LaVenture to Apache	4-in & 6-in AC	12-in DI	2,603	$520,600	4	5	3	1	3	0	0	0	29
	CONTRACTOR CONSTRUCTION													
2021	Ball St., State St. to Evans Dr. & Evans Dr., Ball St. to SR-9	4-in AC	8-in DI	4,650	$697,500	4	5	1	1	3	0	3	0	32
2021	Deception Rd. Yokeko to Front	6-in AC (Burst)	8-in HDPE	1,567	$235,050	4	3	3	1	3	0	5	0	42
2021	Yokeko, Deception S	4-in AC	8-in DI	3,994	$599,100	4	5	3	1	1	0	1	5	41
2021	Victoria, N. Regent to N. Skagit; Hawthorne, E. Fairhaven N., Rainbow Dr., E. Fairhaven S., Pioneer, E. Fairhaven S., Swank PL. & Kenkirk PL.	2-in PL, 4-in AC & 6-in AC	8-in DI	3,709	$556,350	4	5	2	1	3	0	3	0	35
	2022 AND BEYOND PROJECTS													
	Rockport State Park Waterline Replacement		8-in DI	1,000	$150,000	4	5	0	1	3	0	0	0	20
	Entner, Gibralter to Jura Way	1.5-in PL	8-in DI		$0	4	5	0	1	3	0	0	0	20
	Polte, Claybrook to Fruitdale & Fruitdale North	4-in AC	8-in & 12-in DI	2,588	$517,600	4	5	1	1	5	0	3	0	38
	Minkler Rd., Fruitdale East	4-in AC & 4-in PVC	8-in or 12-in DI?	4,480	$896,000	4	5	3	1	1	0	1	3	35
	Haines, E. State to SR-20	1-in CPR & 4-in AC	8-in DI	2,688	$403,200	4	5	1	1	3	0	3	0	32
	Central, E. State to SR-20	4-in AC	8-in DI	2,650	$397,500	4	5	1	1	3	0	3	0	32
	Puget St., E. State to SR-20	4-in & 6-in A/C	8-in DI	2,577	$386,550	4	5	1	1	3	0	3	0	32
	Rhodes Rd., SR-20 S. to Corner	4-in AC	8-in & 12-in DI	1,416	$283,200	4	5	1	1	1	0	3	0	26
	Markwood Rd., Myrtle Dr. to Andis Rd. & Myrtle Dr.	2-in PL & 4-in AC	4-in PVC & 8-in DI	1,400	$210,000	4	5	3	1	3	0	3	0	38
	Gardner Rd., Poplar Pl. to SR-20, Willow Dr., Maple St., Sunne St., Bernice St. & Galbreath St., Sunne St. N.	2-in PL & 4-in & 6-in AC	8-in DI	3,562	$534,300	4	5	1	1	3	0	3	0	32
	Ridge Place, Clara PL. N & Rolling Ridge Dr., Ridge Place to Collins Rd., Rolling PL. & Cummings Dr.	2-in PVC & 4-in AC	8-in DI	2,450	$367,500	4	5	2	1	1	0	1	3	32
	Bradley Road west of Avon Allen	2,3 & 6-in PL & AC	8-in DI	2,550	$382,500	4	4	5	1	1	0	1	0	31
	Avon Ave (SR-20), Walnut to Cascade Hwy	6-in AC & CI	8 & 12-in DI	2,322	$464,400	4	4	1	1	3	0	3	0	31
	Cook Rd., Prospect W. & Glenwood Acres, Cook Rd. S.	2 & 3-in PL & 6-in AC	8-in DI	2,310	$346,500	5	5	4	1	1	0	1	0	30
	Chuckanut Dr, south of Cook Road	2 & 3-in PL	8-in DI	1,700	$255,000	5	5	4	1	1	0	1	0	30

Table 10-4 - Minor Capital Improvement Plan

	MINOR CAPITAL IMPROVEMENT PROJECT LIST	Old Pipe	New Pipe	Length	Cost	Material Wgt = 1	Age Wgt = 1	Fire Flow Wgt = 3	Agency Wgt = 2	Hydraulics Wgt = 3	Anacortes Wgt = 3	L.O.S. Wgt = 3	Leaks Wgt = 3	Overall Weighted Score
						Score	Score	Score	Score	Score	Score	Score	Score	
	Cedar Lane, SR-20 to Collins Rd.	4-in AC	8-in DI	837	$125,550	4	5	1	1	1	0	3	0	26
	Green Road, north of cook road	4-in AC	8-in DI	435	$65,250	4	5	3	1	1	0	1	0	26
	E. Orange, S. Cherry to S. Skagit & S. Regent, E. Orange to E. Rio Vista	6-in AC	8-in DI	1,940	$291,000	4	4	1	1	1	0	3	0	25
	Morris St. S.3rd St. West	4-in AC	6-in PVC	800	$120,000	4	4	3	1	1	0	1	0	25
	North off of E. MarketPlace Dr.	2-in PL	8-in DI	351	$52,650	3	4	3	1	1	0	1	0	24
	Lafayette Road	4-in AC	8-in DI	740	$111,000	5	5	1	1	1	0	1	0	21
	Auto Blvd	6-in PVC	8-in DI	1,405	$210,750	3	3	2	1	1	0	1	0	20
	Construction Ready Projects In Inventory													
	Green St., State to Dean Dr., Dean Dr., Greet St. to Virginia Ave., & Virginia Ave, Dean Dr. to Wicker Rd.	4-in AC	8-in DI	2,169	$325,350	4	5	3	1	1	0	3	5	43
	Projects to be Designed and Placed in Inventory													
	Cedar Street, Pringle to Buchanan (w/PRV)	1.5-in & 2-in PVC	8-in DI	1,045	$156,750	3	5	5	1	5	0	3	3	55
	Woodland Place & Woodland Drive, Woodland Place South to Lindsay Place	4 & 6-in AC	8-in DI	3,036	$455,400	4	5	3	1	5	0	3	5	59
	Reed, Ferry to SR-20 & Waldron, Reed to Central	4-in AC	8-in DI	2,540	$381,000	4	5	1	1	3	0	3	0	32
	Buchanon St/Mud Lake Rd, west of Glenwood Drive & Sunday Lane	2-in PL & 4-in PVC	8-in DI	1,811	$271,650	5	5	4	1	3	0	1	0	36
	Warner, Township to 10th & Jameson St., Township E. to S. 11th PL.	4-in AC	8-in DI	1,576	$236,400	4	5	1	1	3	0	3	0	32
	Non Major & Major Capital Projects: 2022 and Beyond													
	Nookachamps Pressure Revision					4	5	0	1	3	0	0	0	20
	Gilligan & Mundt Intake Improvements				$250,000									
	Panorama Supply to Future Tank		8-in DI	2,300	$345,000									
	Eaglemont Tank Overflow Line		12-in HDPE	1,430	$286,000									
	Bulson Road Area Tank				$50,000									
	Fencing of Properties				$75,000	4	5	0	1	3	0	0	0	20
	Potlatch CT Improvements				$75,000	4	5	0	1	3	0	0	0	20
	Bayview Airport Tank				$50,000	4	5	0	1	3	0	0	0	20
	Projects Contingent On Road Improvements													
	E Blackburn, Cedar Hills E. to 12-in	6-in AC	12-in DI	2,050	$410,000	4	5	5	1	5	0	5	3	65

10.3 Development of CIP Costs

Development of the District's CIP was based on planning-level cost estimates that were used to prepare the overall financial obligation of the projects. The cost for each major project listed in this chapter includes the following components:

- **Base construction cost:** Includes labor and material costs needed to construct a project. For most projects, construction costs were estimated based on unit construction costs from similar recent projects in western Washington from 2007 to 2012.
- **Sales tax:** Calculated as 8.5% (the 2012 local tax rate) of the base construction cost.
- **Construction contingency:** Takes into account the uncertainties associated with estimating project costs at this planning level. Calculated as 20% of the base construction cost.
- **Design engineering/geotechnical/surveying/construction engineering/ legal/ administration/ land:** Includes District and consultant engineering costs, and other related cost items such as geotechnical, surveying, legal costs, administration, and land/easements. Each item was assigned its own percentage of the base construction cost, but the average sum of these costs was usually around 25% of the sum of the base construction cost, sales tax, and contingency.

These four components were summed to determine the total project-level cost estimate for a major CIP project, as expressed in 2013 dollars.

The planning-level project costs for the minor CIP projects were based on the average pipe replacement costs for actual District projects from 2009 through 2012. They include all District costs for engineering, construction, permitting, and administration. If there were any consultant or contracted costs such as design or material testing, they were also included in the average costs. In terms of the District's pipe replacement program, approximately $3.5 million is set aside yearly (2013 dollars) to complete this work.

After the major and minor CIP projects were developed and their costs determined, they were scheduled over the 20-year planning period. The District contracted with a financial consulting firm to develop the scheduling of the CIP projects so that they can be integrated with other ongoing financial obligations. The District's financial plan for the CIP is provided in Chapter 11.

10.4 CMMS as a Tool for CIP Development

As mentioned in earlier chapters, the District is implementing a Computerized Maintenance Management System (CMMS) for coordinating and prioritizing the District's maintenance program. The District will gather information to input into the CMMS in order to develop maintenance priorities, and that information will also be utilized to help develop pipe replacement projects for the CIP program. Condition assessments will be performed on existing transmission and distribution piping so that the District can adjust its capital replacement programs to better focus on long-range strategies while meeting immediate demands.

11 FINANCIAL PLAN

11.1 Introduction

This chapter was prepared by FCS GROUP to provide a financial program that will allow the District to remain financially viable during the planning period. This financial viability analysis considers the historical financial condition, current and identified future financial and policy obligations, operation and maintenance needs, and the ability to support the financial impact related to the completion of the capital projects identified in this WSP. Furthermore, this chapter provides a review of the utility's current rate structure with respect to rate adequacy, promotion of water conservation, and customer affordability. Appendix R presents backup documentation related to this financial plan.

11.2 Past Financial Performance

This section includes a historical summary of financial performance as reported by the District on the fund resources and uses arising from cash transactions, the comparative statements of revenues, expenses, and changes in fund net position, as well as a historical summary of comparative statements of net position, which are useful indicators of the financial position of the District.

11.2.1 Comparative Financial Statement

The District legally owns and operates a water utility fund. Table 11-1 summarizes the comparative statements of revenues, expenses, and changes in fund net position for the District for the 6 years from 2007 through 2012. Table 11-2 summarizes assets and liabilities, with the difference between the two reported as "net position". Increases or decreases in net position are useful indicators of the financial position of the District. Noteworthy findings and trends are discussed to demonstrate the historical performance and condition of the District.

Table 11-1. Summary of Historical Comparative Statements of Revenues, Expenses, and Changes in Fund Net Position

	2007	2008	2009	2010	2011	2012
Operating Revenue						
Water Sales						
Residential-Multiple	$ 9,049,838	$ 9,482,574	$ 10,162,024	$ 10,017,452	$ 9,824,749	$ 10,339,605
Commercial-Industrial-Farms	2,901,840	3,164,839	3,269,545	3,276,755	3,247,353	3,239,624
Government	359,527	371,693	395,721	391,570	374,145	402,691
Resale	74,919	61,455	85,186	77,534	73,340	75,183
Irrigation	393,171	336,883	382,841	294,494	275,354	304,056
Other Revenues	180,696	172,958	189,650	328,656	388,427	405,259
Total Operating Revenue	**$ 12,959,991**	**$ 13,590,402**	**$ 14,484,967**	**$ 14,386,461**	**$ 14,183,368**	**$ 14,766,418**
Operating Expenses						
Supply	$ 563,409	$ 671,885	$ 640,454	$ 880,940	$ 977,464	$ 1,052,303
Treatment	1,098,815	1,152,428	1,298,343	1,320,909	1,456,774	1,373,883
Transmission & Distribution	1,426,012	1,736,685	1,786,317	1,625,978	1,956,332	2,224,308
Broadband	-	113,756	7,882	12,927	26,744	11,229
Customer Accounts	767,168	842,060	873,145	828,355	981,620	1,000,952
Administrative and General	2,487,848	3,549,023	3,650,693	3,934,010	3,826,311	3,538,790
Utility Taxes	665,454	686,973	690,892	721,085	698,460	746,410
Depreciation Expense	3,201,495	3,368,843	3,543,783	4,010,814	4,656,360	4,343,133
Total Operating Expenses	**$ 10,210,201**	**$ 12,121,652**	**$ 12,491,509**	**$ 13,335,018**	**$ 14,580,065**	**$ 14,291,008**
Operating Income (Loss)	**$ 2,749,790**	**$ 1,468,750**	**$ 1,993,458**	**$ 1,051,443**	**$ (396,697)**	**$ 475,410**
Non Operating Revenue	$ 1,558,056	$ 735,670	$ 382,192	$ 382,639	$ 254,297	$ 253,508
Non Operating Expenses	(569,881)	(567,822)	(519,805)	(788,246)	(832,306)	(569,228)
Capital Contributions	5,732,323	5,143,917	2,811,673	1,433,914	3,083,642	1,523,905
Special Item [a]	-	-	-	1,300,000	-	-
Change in Net Assets	**$ 9,470,288**	**$ 6,780,515**	**$ 4,667,518**	**$ 3,379,750**	**$ 2,108,936**	**$ 1,683,595**

[a] A legal settlement related to the Skagit River Diversion project was started in 1999 and put into use in Jan 2010

Table 11-2. Summary of Historical Comparative Statements of Net Position

	2007	2008	2009	2010	2011	2012
Assets						
Current Assets						
Cash and Cash Equivalents	$ 17,104,620	$ 13,712,497	$ 11,636,850	$ 13,681,365	$ 13,806,258	$ 9,368,143
Other Unrestricted Current Assets	4,602,598	5,825,922	3,936,327	3,307,231	3,295,315	7,754,252
Total Unrestricted Current Assets	$ 21,707,218	$ 19,538,419	$ 15,573,177	$ 16,988,596	$ 17,101,573	$ 17,122,395
Restricted Current Assets	5,190,824	335,441	559,426	629,269	634,183	603,310
Total Current Assets	$ 26,898,042	$ 19,873,860	$ 16,132,603	$ 17,617,865	$ 17,735,756	$ 17,725,705
Noncurrent Assets						
Other	$ 2,657,027	$ 2,351,392	$ 2,529,396	$ 2,335,382	$ 2,089,364	$ 1,982,628
Capital Assets Not Being Depreciated [a]	-	-	49,633,545	22,894,126	16,847,092	20,082,239
Capital Assets Net of Accumulated Depreciation	119,789,469	132,801,055	93,998,317	120,127,251	125,877,451	126,465,410
Total Noncurrent Assets	$ 122,446,496	$ 135,152,447	$ 146,161,258	$ 145,356,759	$ 144,813,907	$ 148,530,277
Total Assets	**$ 149,344,538**	**$ 155,026,307**	**$ 162,293,861**	**$ 162,974,624**	**$ 162,549,663**	**$ 166,255,982**
Liabilities						
Current Liabilities						
Current Operating & Deferred Liabilities	$ 1,520,530	$ 2,989,996	$ 1,986,424	$ 1,776,172	$ 1,244,507	$ 2,125,341
Bonds and Loans Payable, Principal and Interest	2,139,316	2,139,616	2,517,737	2,507,258	2,518,387	2,702,571
Total Current Liabilities	$ 3,659,846	$ 5,129,612	$ 4,504,161	$ 4,283,430	$ 3,762,894	$ 4,827,912
Total Restricted Current Liabilities	$ 1,125,405	$ 53,822	$ -	$ -	$ -	$ -
Noncurrent Liabilities						
Non-operating	$ 594,287	$ 622,351	$ 327,156	$ 308,684	$ 547,231	$ 769,355
Bonds & Loans	24,941,921	23,416,928	26,991,433	24,531,649	22,248,892	22,974,403
Total Noncurrent Liabilities	$ 25,536,208	$ 24,039,279	$ 27,318,589	$ 24,840,333	$ 22,796,123	$ 23,743,758
Total Liabilities	**$ 30,321,459**	**$ 29,222,713**	**$ 31,822,750**	**$ 29,123,763**	**$ 26,559,017**	**$ 28,571,670**
Total Deferred Inflows of Resources	**$ -**	**$ -**	**$ -**	**$ -**	**$ 30,849**	**$ 40,920**
Net Position						
Net Investment in Capital Assets	$ 92,941,025	$ 107,617,316	$ 114,604,672	$ 116,482,831	$ 118,406,936	$ 121,268,644
Restricted	5,190,824	335,441	559,426	629,269	634,183	603,310
Unrestricted	20,891,230	17,850,837	15,307,013	16,738,761	16,918,678	15,771,438
Total Net Position	**$ 119,023,079**	**$ 125,803,594**	**$ 130,471,111**	**$ 133,850,861**	**$ 135,959,797**	**$ 137,643,392**

[a] 2007 & 2008 financial statements did not separate assets not being depreciated

11.2.2 Findings and Trends

- The District's water sales increased by 11.9% from 2007 to 2009, and an additional 0.5% from 2009 to 2012. The lower increases in later years were likely due to cooler than normal weather conditions and the depressed economy. Total expenses increased each year through 2011; in 2012, lower depreciation and administrative expenses assisted with net operating income becoming positive again.

- The O&M Coverage Ratio (total operating revenue divided by total operating expenses) began 2007 at 126.9%, declined to 97.3% in 2011, and ended 2012 at 103.3%. A ratio of 100% or greater shows that revenue will successfully cover expenses. The lowest ratio in 2011 was largely due to a 6-year high depreciation expense of $4.66 million.

- Net Operating Income as a percent of Operating Revenue was the highest in 2007 at 21.2%, decreasing steadily to -2.8% in 2011 and turning around in 2012 to end at 3.2%. Similar to the O&M Coverage Ratio, these trends help show how successfully operating revenue actually covered operating expenses, with higher positive numbers being the best and negative numbers showing need for improvement.

- The Debt Service Coverage Ratio is required by bond covenants to remain above 1.25 during the life of the loans. This ratio is calculated by dividing cash operating income (revenue less expenses before depreciation) by annual revenue bond expenses. This ratio remains above the target, beginning 2007 at a high of 2.78, decreasing to 1.69 in 2011, and climbing again to 1.78 in 2012.
- The Current Ratio is calculated by dividing unrestricted current assets by current liabilities. This ratio ranges from a high of 14.3 in 2007 to a low of 6.5 in 2008 and increases to 8.1 in 2012. Anything above 2.0 for this liquidity ratio is good.
- The Debt to Net Position Ratio compares total debt to total net position, which is the difference between current assets and liabilities. This ratio begins at 0.23 or 23% debt in 2007, decreases to 0.18 in 2011, and increases slightly to end 2012 at 0.19. For utility districts, a ratio of 50 to 60% helps normalize rate impacts, and there is less need to test the total level of debt service to net operating revenues.
- The Debt to Noncurrent Capital Asset Ratio compares total debt to noncurrent assets, which are also known as property, plant, and equipment. This ratio begins at 0.22 or 22% debt to 78% noncurrent assets in 2007. Noncurrent capital assets increase more than debt throughout the 6-year history and the ratio lowers to 0.17 in 2011 and 2012. Similar to the debt to net position ratio, a 60% debt to 40% equity is a general industry target.

11.3 Current Financial Structure

This section summarizes the current financial structure used as the baseline for the capital financing strategy and financial forecast developed for this WSP.

11.3.1 Financial Plan

The District is responsible for funding all of its costs. The primary source of funding is derived from ongoing monthly charges for service, with additional revenues coming from miscellaneous revenues, services, penalty income on Local Utility Districts (LUDs), and non-donated plant. The District controls the level of user charges and, subject to the Board of Commissioners approval, can adjust user charges as needed to meet financial objectives.

The financial plan can only provide a qualified assurance of financial feasibility if it considers the total system costs of providing water services, both operating and capital. To meet these objectives, the following elements have been completed:

1. **Capital Funding Plan.** Identifies the total Capital Improvement Plan (CIP) obligations of the planning period. The plan defines a strategy for funding the CIP including an analysis of available resources from rate revenues, existing reserves, connection charges, debt financing, and any special resources that may be readily available (e.g., grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue available for capital funding.

2. **Financial Forecast.** Identifies future annual non-capital costs associated with the operating, maintenance, and administration of the water system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any coverage requirements associated with long-term debt. The plan also identifies the future adjustments required to fully fund all utility obligations in the projection period.

11.3.2 Capital Funding Plan

The CIP developed for this WSP identifies $62.50 million in project costs over the 6-year planning horizon and $138.40 million in the 20-year period. This CIP consists of 31 projects, including annual pipe and vehicle replacement, new pump stations, and pipelines. Costs are stated in 2013 dollars and are escalated by 3.16% annually to the year of planned spending for financing projections.

A summary of the 20-year CIP is shown in Table 11-3. As shown, each year has varied capital cost obligations depending on construction schedules and infrastructure planning needs. Approximately 45.16% (2013 dollars) of the capital costs are included in the 6-year planning period. Annual Pipe and Vehicle Replacement accounts for 33.49% and the Transmission Line, Judy – MV (Phase 2) project accounts for 22.88% of the 6-year CIP. Table 11-4 provides more detail for the 6-year CIP.

Table 11-3. 6- and 20-Year CIP

Year	2013$	Inflated
2014	$ 4,360,000	$ 4,497,927
2015	16,900,000	17,986,159
2016	8,990,000	9,870,458
2017	13,325,000	15,092,830
2018	9,125,000	10,662,577
2019	9,800,000	11,813,573
6-Year Total	**$ 62,500,000**	**$ 69,923,524**
2020-2033	75,900,000	114,858,708
20-Year Total	**$ 138,400,000**	**$ 184,782,232**

Table 11-4. 6-Year CIP (2013)

Project	2014	2015	2016	2017	2018	2019
Dukes Hill Pump Station	150,000					
Cedar Hills Booster Station	60,000					
WTP Chemical Feed System Replacement	125,000					
Document Management Software	200,000					
WTP Dry Scrubber Retrofit	125,000					
Water Loss Control Action Plan	70,000					
E. Division Tank, Pump Station and Piping		10,000,000				
Josh Wilson Road Improvements		200,000	1,300,000			
Josh Wilson Fiber			130,000			
Old Highway 99 Fiber			60,000			
North 30th St and Digby Road Pipelines		2,400,000	0			
Transmission Line, Judy - MV (Phase 2)	200,000	800,000	4,000,000	9,300,000		
Computer Server Hardware				175,000	175,000	
McLean Road Pipeline				300,000	4,400,000	
Cascade Ridge Reservoir				50,000	150,000	
Cascade Ridge Fiber					250,000	
Best Road Pipeline					300,000	2,100,000
Burklund Road Pipeline					300,000	3,100,000
Big Lake Reservoir					50,000	350,000
North Fork Skagit River Crossing						500,000
Pleasant Ridge Area Reservoir						100,000
SW - Burlington Fiber						150,000
Annual Pipe and Vehicle Replacement	3,430,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000
Total	**$ 4,360,000**	**$ 16,900,000**	**$ 8,990,000**	**$ 13,325,000**	**$ 9,125,000**	**$ 9,800,000**

11.3.3 Capital Financing Strategy

An ideal capital financing strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are very limited and competitive in nature and do not provide a reliable source of funding for planning purposes. It is recommended that the District pursue these funding avenues but assume bond financing to meet needs for which the District's available cash resources are insufficient. Other than the Drinking Water State Revolving Fund (DWSRF) loan that has already been approved for the E. Division Tank Pump Station and Piping project, revenue bonds have been used as the debt funding instrument in this analysis. The capital financing strategy developed to fund the CIP identified in this WSP assumes the following funding resources:

- Accumulated cash reserves
- Transfers of excess cash (over minimum balance targets) from the Revenue Fund
- Transfers of excess cash (after 30% of annual debt service is covered) from the System Development Fund
- Annual cash from rates earmarked for routine capital funding
- Interest earned on Major Capital Fund balances and other miscellaneous capital resources

- DWSRF loan that has been approved
- Revenue bond financing

Based on information provided by the District, the water utility began 2013 with $10.39 million in the Revenue Fund and $2.12 million in the Major Capital Fund. This financial analysis is based on the assumption that additional funds beyond the Revenue Fund target of 2-1/2 months of operations and maintenance (O&M) expenses plus depreciation are transferred to the Major Capital Fund. Routine capital funding is budgeted at $3.26 million in 2013, increasing to $8.05 million to match depreciation by 2033. Again, this financial analysis is based on the assumption that the System Development Fund transfers to the Major Capital Fund are below $100,000 in 2014–2022 and increase steadily to $1.06 million in 2033.

The resources described above are forecasted to fund 100% of the 20-year CIP. Table 11-5 presents the corresponding 20-year capital financing strategy.

Table 11-5. 20-Year Capital Funding Strategy

Year	Capital Expenditures 2013$	Capital Expenditures Escalated	DWSRF Loan Financing	Revenue Bond Financing	Cash Funding	Total Financial Resources
2014	$ 4,360,000	**$ 4,497,927**	$ -	$ -	$ 4,497,927	**$ 4,497,927**
2015	16,900,000	**17,986,159**	10,004,050	-	7,982,109	**17,986,159**
2016	8,990,000	**9,870,458**	-	9,870,458	-	**9,870,458**
2017	13,325,000	**15,092,830**	-	7,029,542	8,063,288	**15,092,830**
2018	9,125,000	**10,662,577**	-	10,662,577	-	**10,662,577**
2019	9,800,000	**11,813,573**	-	837,423	10,976,150	**11,813,573**
Subtotal	**$ 62,500,000**	**$ 69,923,524**	**$ 10,004,050**	**$ 28,400,000**	**$ 31,519,474**	**$ 69,923,524**
2020-2033	75,900,000	**114,858,708**	-	3,700,000	111,158,708	**114,858,708**
Total	**$ 138,400,000**	**$ 184,782,232**	**$ 10,004,050**	**$ 32,100,000**	**$ 142,678,182**	**$ 184,782,232**

The 20-year capital funding plan identifies 77.21% cash funding for capital projects. The remaining capital costs are projected to be covered 5.41% by a DWSRF Loan and 17.37% by revenue bond financing. This type of planning looks at average growth over the 20-year period and does not take into consideration the current economic conditions, which can have a negative impact on annual growth. It is assumed that if growth is not occurring at the planned rate, the timing of capital projects would be adjusted accordingly.

11.4 Available Funding Assistance and Financing Resources

Feasible long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the CIP identified in this WSP. In addition to the District's resources such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources such as grants, low-interest loans, and bond financing. The following is a summary of the District's internal and external resources.

11.4.1 District Resources

Resources appropriate for funding capital needs include accumulated cash in the Major Capital Fund, rate revenues designated for capital spending purposes, and capital-related charges such as the System Development Fee (SDF). The first two resources are discussed in the Fiscal Policies section (11.5.2) of the Financial Forecast. Capital-related charges are discussed below.

11.4.1.1 Capital Connection Charges

A connection charge such as the SDF refers to a one-time charge imposed on new customers as a condition of connecting to the water system. The purpose of the connection charge is two-fold: to promote equity between new and existing customers, and to provide a source of revenue to fund capital projects. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects. The District currently charges an SDF for all new metered water services. The cost is $4,005 for a 5/8-inch meter times a meter capacity weighting factor as identified in the AWWA C-700 and C-702 standards, and rounded to the nearest $5.00 increment.

11.4.1.2 Location Facilities Charges

While a connection charge is the manner in which new customers pay their share of general facilities costs, local facilities funding is used to pay the costs of local facilities that connect each property to the system's infrastructure. Local facilities funding is often overlooked in rate forecasting because it is funded upfront by either connecting customers, developers, or through an assessment to properties, but never from rates.

A number of mechanisms can be considered toward funding local facilities. One of the following scenarios typically occurs: (a) the utility charges a connection fee based on the cost of the local facilities (under the same authority as the SDF); (b) a developer funds extension of the system to its development and turns those facilities over to the utility (contributed capital); or (c) a local assessment is set up called a Utility Local Improvement District (ULID/LID) or a Local Utility District (LUD) that collects tax revenue from benefited properties.

A local facilities charge (LFC) is a variation of the connection charge. It is a District-imposed charge to recover the cost related to service extension to local properties. Often called a front-footage charge and imposed on the basis of footage of the main "fronting" a particular property, it is usually implemented as a reimbursement mechanism to a District for the cost of a local facility that directly serves a property. It is a form of connection charge and thus can accumulate up to 10 years of interest. It typically applies in instances when no developer-installed facilities are needed through developer extension due to the prior existence of available mains already serving the developing property.

The developer extension is a requirement that a developer install on-site and sometimes off-site improvements as a condition of extending service. These are in addition to the connection charge required and must be built to District standards. Part of the agreement between the District and the

developer planning to extend service might include a late-comer agreement, resulting in a late-comer charge to new connections to the developer extension.

Late-comer charges are a variation of developer extensions whereby new customers connecting to a developer-installed improvement make a payment to the District based on their share of the developer's cost. The District passes this charge on to the developer who installed the facilities. As part of the developer extension process, this defines the allocation of costs and records late-comer obligations on the title of affected properties. No interest is allowed, and the reimbursement agreement cannot exceed 20 years in duration.

LID/ULID is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of specific facilities. Most often used for local facilities, some ULIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which a ULID can be rejected.

11.4.2 Outside Resources

This section outlines various grant, loan, and bond opportunities available to the District through federal and state agencies to fund the CIP identified in the WSP.

11.4.2.1 Grants and Low Cost Loans

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining miscellaneous grant programs are generally lightly funded and heavily subscribed. Nonetheless, even the benefit of low-interest loans makes the effort of applying worthwhile. Grants and low-cost loans for Washington State utilities are available from the Department of Commerce including two assistance programs that the District may be eligible for.

Public Works Trust Fund (PWTF) – Cities, towns, counties, and special purpose districts are eligible to receive loans from the PWTF for water, sewer, storm, roads, bridges, and solid waste/recycling construction projects to address critical needs. Due to current funding restrictions and funding allocations, the Public Works Board has suspended the non-Construction Programs. As the economy builds, the Board will attempt to re-institute these programs. Currently, Construction Loans are available only for drinking water, sanitary sewer, storm water, and solid waste/recycling.

PWTF loans are available at interest rates ranging from 0.50 to 2.00% depending on the repayment term. The standard loan offer is 1.00% interest repaid over a 20-year term. All loan terms are subject to negotiation and Board approval. Due to changes in 2012, a local match is no longer required. Currently, the maximum loan amount is $5 million per jurisdiction.

However, due to legislative budget changes made on June 30, 2013, the 2014 Construction Loan cycle did not receive funding. The Legislature also passed a statute with the intent of redirecting tax revenue from the Public Works Assistance Account for 6 years to the state General Fund. Loan repayment revenues will continue to be available in future biennia. The effect of this diversion will result in a decrease in funding available to local governments for high-priority infrastructure projects from the Public Works Trust Fund. The Board does expect to accept applications for funding for the next biennium. Information regarding the application process as well as rates and terms will be posted on its website in 2014.

Further detail is available at http://www.pwb.wa.gov.

Drinking Water State Revolving Fund (DWSRF) Loan Program – Funding historically targets protection of public health, compliance with drinking water regulations, and assistance for small and disadvantaged communities. Low interest rates provided are 1.0 – 1.5% and no local match is required.

All public water systems that receive loans or grants for infrastructure are also required to complete an Investment Grade Efficiency Audit (IGEA). This is an effort to apply energy efficiency to water systems, similar to DOH's Green Projects that were started in 2009, and may be financed as part of the DWSRF loan.

In 2012 there were 105 applicants requesting over $218 million. After the scoring and ranking process that addressed the most serious risks to public health, 54 applicants were approved for $130 million, including 13 approved to receive principal forgiveness.

The DWSRF Loan Program generally accepts applications from January through March 1 annually. It takes about 6 months to find out which loans have been approved.

Further detail is available at http://www.doh.wa.gov.

11.4.2.2 Bond Financing

General Obligation Bonds – General Obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

The District has the authority to issue G.O. bonds under the authority of RCW 54.24.020. In addition, RCW 54.24.018 states:

> *"In the event the proposed general indebtedness to be incurred will bring the nonvoter approved indebtedness of the public utility district to an amount exceeding three-fourths of one percent of the value of the taxable property of the public utility district, … the proposition of incurring such indebtedness and the proposed plan or system shall be submitted to the qualified electors of said public utility district for their approval or rejection at the next general election held in such public utility district."*

While bonding capacity can limit availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs, and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an *ad valorem* property tax levy.

Revenue Bonds – Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The District agrees to satisfy these requirements by resolution as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic.

11.5 Financial Forecast

The financial forecast, or revenue requirement analysis, forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, O&M expenses, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, the revenue needs also include debt covenant requirements and specific fiscal policies and financial goals of the District.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency tests have been developed to reflect the financial goals and constraints of the District: cash needs must be met, and debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test – The cash flow test identifies all known cash requirements for the District in each year of the planning period. Typically these include O&M expenses, debt service payments, depreciation funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the District are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfalls are established.

Coverage Test – The coverage test is based on a commitment made by the District when issuing revenue bonds and some other forms of long-term debt. For purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the District would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.0 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25% of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any purpose, including funding capital projects. Targeting a higher coverage factor can help the District achieve a better credit rating and provide lower interest rates for future debt issues.

In determining the annual revenue requirement, both the cash and coverage sufficiency test must be met and the test with the greatest deficiency drives the level of needed rate increase in any given year.

11.5.1 Current Financial Structure

The District maintains a fund structure and implements financial policies that target management of a financially viable and fiscally responsible water system.

11.5.2 Fiscal Policies

A brief summary of the key financial policies employed by the District, as well as those recommended and incorporated in the financial program, is provided below.

Minimum Fund Balances – Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower than expected revenue collections. The District's current policy is to maintain a minimum balance in the Revenue Fund equal to 2-1/2 months of O&M plus depreciation. This target is reasonable for a water system, given the variability in revenue collections due to changing weather patterns that can significantly affect revenue collections during the summer season.

A capital contingency reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. The reserve also could be used for other unanticipated capital needs including capital project cost overruns. Industry practices range from maintaining a balance equal to 1 to 2% of fixed assets, an amount equal to a 5-year rolling average of CIP costs, or an amount determined sufficient to fund equipment failure (other than catastrophic failure). The final target level should balance industry standards with the risk level of the District. The District does not currently have a policy to maintain a minimum balance in the Major Capital Fund, but the higher than average operating fund minimum balance makes this reasonable. In addition, the District aims to keep total net liquidity above 180 days of O&M expenditures and capital replacement (depreciation less debt service) and is forecast to be only slightly below this target in 2015.

System Reinvestment – The purpose of system reinvestment funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operation. Each year, the District's assets lose value, and as they lose value they are moving toward eventual replacement. That accumulating loss in value and future liability is measured for reporting purposes through annual depreciation expense, which is based on the original cost of the asset. While this reported expense reflects the consumption of the existing asset and its original investment, the replacement of that asset will likely cost much more, factoring in inflation and construction conditions. Therefore, the added annual replacement liability is even greater than the annual depreciation expenses.

The District has historically funded system reinvestment at varying levels. In this analysis, the routine capital expense for system reinvestment starts at $3.26 million per year and increases to $8.05 million in 2033, which is equal to depreciation. This analysis assumes that these monies are put directly into the Major Capital Fund and are made available for capital project costs.

Debt Management – It is prudent to consider policies related to debt management as part of broader utility financial policy structure. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage, and total debt coverage targets. The District's existing bond covenants require a minimum 1.25 debt coverage test; however, the target set by the District is 2.0, which is met throughout the forecast.

11.5.2.1 Financial Forecast

The financial forecast is developed from 2013 budget documents along with other key factors and assumptions to develop a complete portrayal of the District's annual financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast:

- **Revenue** – The District has two general revenue sources: revenue from charges for service (rate revenue) and miscellaneous (non-rate) revenue. In the event of a forecasted annual shortfall, rate revenue can be increased to meet the annual revenue requirement. Non-rate revenues are

forecast to increase with customer growth or not escalate depending on the nature of the revenue.

- **System Development Fee Revenue** – The current SDF of $4,005 is expected to increase annually based on construction cost inflation and to generate between $773,000 in 2014 and $2.07 million in 2033 collected from 187 to 277 new connections. This money is used to fund growth-related capital projects and to pay up to 30% of debt service incurred to finance those projects.
- **Growth** – Rate revenue is escalated based on the growth rates provided in Chapter 4 of this WSP, which average 0.81% per year through 2019 and 1.00% per year thereafter.
- **Expenses** – O&M expense projections are based on the 2013 budget and are forecasted to increase with general and labor cost inflation of 2.07%, construction cost inflation of 3.16%, and benefit cost inflation of 10.00%. Budget 2013 figures were used for 2013 taxes; future taxes are calculated based on forecasted revenues and prevailing tax rates.
- **Existing Debt** – The District currently has a total of 11 outstanding debt issues, including three revenue bonds, three PWTF loans, and five DWSRF loans. Revenue bond annual payments range from $1.34 million decreasing to $365,000 and expire between 2016 and 2029. PWTF annual payments range from $1.33 million decreasing to $170,000 and expire between 2021 and 2031. DWSRF annual payments range from $304,000 to $117,000 and expire in 2021 and 2022.
- **Future Debt** – The capital financial strategy developed for this WSP forecasts the need to issue $42.10 million new debt in amounts ranging from $3.70 million to $16.90 million. Other than the $10.00 million DWSRF loan that has already been approved, the analysis performed assumes all revenue bond financing.
- **Revenue Bond Assumptions** – The forecast assumes a revenue bond interest rate of 5.0%, an issuance cost of 1.5%, and a term of 20 years.
- **Transfer to Capital** – Any Operating Fund balance above the minimum requirement is assumed to be available to fund capital projects and is projected to be transferred to the Capital Fund in most years. The 2013 Operating Fund balance is expected to end the year at 209 days of O&M expenses plus depreciation, well above the minimum target for that year. The Capital Fund balance is expected to end the year at approximately $4.13 million.

Although the financial plan is completed for the 20-year time horizon of this WSP, the rate strategy focuses on the shorter-term planning period 2014 through 2019. It is imperative that the District revisit the proposed rates every 2 to 3 years to ensure that the rate projections developed remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

Table 11-6 summarizes the annual revenue requirements based on the forecast of revenues, expenditures, fund balances, and fiscal policies.

Table 11-6. 6-Year Financial Forecast

Revenue Requirement	2014	2015	2016	2017	2018	2019
Revenues						
Rate Revenues Under Existing Rates	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573
SDF Revenue Towards Debt	770,928	801,320	835,819	863,730	900,060	937,450
Rate Stabilization Revenue	-	-	-	-	-	-
Non-Rate Revenues	852,267	871,196	876,605	903,712	909,975	926,039
Total Revenues	**$ 17,678,041**	**$ 17,849,567**	**$ 18,013,631**	**$ 18,192,804**	**$ 18,360,853**	**$ 18,541,063**
Expenses						
Cash Operating Expenses	$ 11,868,263	$ 12,113,061	$ 12,363,403	$ 12,709,335	$ 12,928,610	$ 13,197,268
Existing Debt Service	2,965,108	2,980,095	2,971,158	2,962,609	2,751,807	2,027,030
New Debt Service	-	150,061	2,125,299	2,118,153	3,130,938	3,123,792
Routine Capital	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000
Total Expenses	**$ 18,133,371**	**$ 18,543,216**	**$ 20,759,860**	**$ 21,090,096**	**$ 22,111,355**	**$ 22,848,090**
Net Surplus (Deficiency)	**$ (455,330)**	**$ (693,649)**	**$ (2,746,229)**	**$ (2,897,293)**	**$ (3,750,502)**	**$ (4,307,027)**
% of Rate Revenue	**2.84%**	**4.29%**	**16.85%**	**17.64%**	**22.66%**	**25.83%**
Annual Rate Adjustment	**0.00%**	**8.00%**	**8.00%**	**8.00%**	**4.00%**	**4.00%**
Cumulative Annual Rate Adjustment	**0.00%**	**8.00%**	**16.64%**	**25.97%**	**31.01%**	**36.25%**
Rate Revenues After Rate Increase	$ 16,054,846	$ 17,471,215	$ 19,013,728	$ 20,691,226	$ 21,683,234	$ 22,723,269
Additional Taxes from Rate Increase	$ -	$ 65,084	$ 136,413	$ 214,530	$ 258,109	$ 304,038
Net Cash Flow After Rate Increase	**(455,330)**	**535,431**	**(170,121)**	**1,154,041**	**1,123,805**	**1,434,630**
Coverage After Rate Increases	**3.83**	**4.66**	**2.62**	**3.11**	**2.59**	**3.48**

In place of a rate increase in 2013, the District added a capital improvement surcharge that has been included in the non-rate revenue shown above. The rate revenues under existing rates in the table above include an 8.0% rate increase effective January 1, 2014 that is applied equally to all customer classes except for the contracted Sierra Pacific Industries customer. Future increases are assumed to be applied equally to all customers. The financial forecast indicates the need for additional rate increases of 8.0% per year in 2015 through 2017 followed by 4.0% per year increases in 2018 and 2019. The 2014 rate increase is required to cover the existing level of O&M expenses and rebuild adequate ending fund balance targets, while the following increases are there to support new debt service needed to fund the capital program.

11.5.3 District Funds and Reserves

Table 11-7 shows a summary of the projected Revenue Fund and Major Capital Fund ending balances through 2019 based on the rate forecasts presented above. The combined minimum target balance is based on 2-1/2 months of O&M plus depreciation and the funds remain above the target throughout the forecast.

Table 11-7. Ending Cash Balance Summary

Ending Fund Balances	2014	2015	2016	2017	2018	2019
Revenue Fund	$ 5,892,750	$ 3,928,181	$ 3,616,770	$ 3,751,725	$ 3,841,835	$ 3,947,029
Major Capital Fund	2,942,339	975,903	11,458,109	801,657	5,983,942	63,635
Total	**$ 8,835,089**	**$ 4,904,084**	**$ 15,074,878**	**$ 4,553,382**	**$ 9,825,777**	**$ 4,010,664**
Combined Minimum Target Balance	*3,397,546*	*3,523,488*	*3,616,770*	*3,751,725*	*3,841,835*	*3,947,029*

11.6 Current and Projected Rates

11.6.1 Current Rates

The District's current rate structure consists of three rate components:

1. A fixed monthly charge based on meter size
2. A variable monthly charge per hundred cubic feet (ccf)
3. A fixed capital improvement surcharge

The variable monthly charge has three blocks that include one block for usage up to 3 ccf, a second block for usage between 4 and 100 ccf, and a third block for usage over 100 ccf. The capital improvement surcharge is a fixed charge per account per month. Table 11-8 shows the existing rate structure.

Table 11-8. 2013 Existing Rate Structure

Monthly Basic Fixed Charge	
5/8-inch	$ 18.10
3/4-inch	18.10
1-inch	30.20
1.5-inch	60.15
2-inch	96.10
3-inch	180.15
4-inch	300.00
6-inch	599.90
8-inch	959.75
Consumption Charges	
Single-Family & Duplex	
0-3 ccf	$ 2.00
4-100 ccf	3.14
101 +	1.83
All Others	
0-3 ccf	$ 3.14
4-100 ccf	3.14
101 +	1.83
Capital Improvement Surcharge	
All Accounts	$ 1.25

11.6.2 Projected Rates

As stated above, the District added a capital improvement surcharge in place of a rate increase in 2013. The analysis for this WSP shows that if the surcharge remains in effect at the same rate, this would be followed by increases of 8.0% per year in 2014 through 2017, and 4.0% per year in 2018 and 2019. Table 11-9 shows the proposed rates for the 6-year planning period.

Table 11-9. 6-Year Proposed Rates

	Existing	Proposed					
	2013	2014	2015	2016	2017	2018	2019
Monthly Basic Fixed Charge							
5/8-inch	$ 18.10	$ 19.55	$ 21.11	$ 22.80	$ 24.63	$ 25.61	$ 26.64
3/4-inch	18.10	19.55	21.11	22.80	24.63	25.61	26.64
1-inch	30.20	32.62	35.23	38.05	41.09	42.74	44.44
1.5-inch	60.15	64.96	70.16	75.77	81.83	85.10	88.51
2-inch	96.10	103.79	112.09	121.06	130.75	135.98	141.41
3-inch	180.15	194.56	210.12	226.93	245.09	254.89	265.09
4-inch	300.00	324.00	349.92	377.91	408.15	424.47	441.45
6-inch	599.90	647.89	699.72	755.70	816.15	848.80	882.75
8-inch	959.75	1,036.53	1,119.45	1,209.01	1,305.73	1,357.96	1,412.28
Consumption Charges							
Single-Family & Duplex							
0-3 ccf	$ 2.00	$ 2.16	$ 2.33	$ 2.52	$ 2.72	$ 2.83	$ 2.94
4-100 ccf	3.14	3.39	3.66	3.95	4.27	4.44	4.62
101 +	1.83	1.98	2.14	2.31	2.49	2.59	2.70
All Others							
0-3 ccf	$ 3.14	$ 3.39	$ 3.66	$ 3.95	$ 4.27	$ 4.44	$ 4.62
4-100 ccf	3.14	3.39	3.66	3.95	4.27	4.44	4.62
101 +	1.83	1.98	2.14	2.31	2.49	2.59	2.70
Capital Improvement							
All Accounts	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25

Table 11-10 shows single-family monthly bill comparisons for the proposed annual increases.

Table 11-10. Monthly Bill Comparison

	Existing	Proposed					
Single-Family	2013	2014	2015	2016	2017	2018	2019
Monthly Bill	$ 34.77	$ 37.45	$ 40.35	$ 43.47	$ 46.85	$ 48.68	$ 50.57
$ Difference		$ 2.68	$ 2.90	$ 3.13	$ 3.38	$ 1.82	$ 1.90
Rate Increase		8.00%	8.00%	8.00%	8.00%	4.00%	4.00%

Note: Assumes 5/8" meter and 6 ccf monthly usage plus capital improvement surcharge

11.7 Affordability

The Department of Health and the Department of Commerce Public Works Board use an affordability index to prioritize low-cost loan awards depending on whether rates exceed 2.0% of the median household income for the service area. The District serves multiple cities and towns, with the greatest population of customers in Mount Vernon, Sedro-Woolley, and Burlington. The weighted average median household income for these cities was $53,302 in 2007 – 2011 according to U.S. Census Bureau data. The 2011 figures are escalated based on the assumed 2.07% general cost inflation to show the median household income in future years. Table 11-11 presents the District's

rates with the projected rate increases for the forecast period, tested against the 2.0% monthly affordability threshold.

Table 11-11. Affordability Test

Year	Inflation	Median HH Income	2% Monthly Threshold	Projected Monthly Bill	% of Median HH Income
2011		$ 53,302	$ 88.84		
2012	2.07%	54,405	90.68		
2013	2.07%	55,531	92.55	34.77	0.75%
2014	2.07%	56,681	94.47	37.45	0.79%
2015	2.07%	57,854	96.42	40.35	0.84%
2016	2.07%	59,052	98.42	43.47	0.88%
2017	2.07%	60,274	100.46	46.85	0.93%
2018	2.07%	61,522	102.54	48.68	0.95%
2019	2.07%	62,795	104.66	50.57	0.97%

Applying the 2.0% test, the District's rates are forecast to remain within the indicated affordability range through 2019.

11.8 Conclusion

The results of this analysis indicate that rate increases are necessary to fund ongoing operating needs and future debt requirements to fund the CIP. Implementation of the proposed rate increases should provide for continued financial viability while maintaining generally affordable rates.

It is important to remember that the analysis performed in this chapter assumes growth rates from Chapter 4 of this WSP. If the future growth rates change, the proposed annual rate increases may need to be updated and revised.

It is recommended that the District regularly review and update the key underlying assumptions that compose the multi-year financial plan to ensure that adequate revenues are collected to meet the District's total financial obligations.

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12 SATELLITE SYSTEM MANAGEMENT

12.1 Satellite System Program

The District is the primary Satellite Management Agency for Skagit County (SMA #103) as identified in the CWSP. The District provides satellite service inside Skagit County to all areas not already designated as the service area of another state-approved water utility. The District's goal as SMA is to maximize water availability and maintain satisfactory water quality, as well as to assist other public water systems (water systems serving two or more service connections) with technical and administrative tasks. The District runs a Satellite System Program, operating both large and small District-owned systems, assisting troubled and failing water systems, and providing other water systems by contract with various services. By operating more than one water system, economies of scale make it possible for the District to employ qualified personnel, provide good system management and operation, and meet the stringent standards of the Safe Drinking Water Act.

The District will provide Ownership Service to water systems whenever financially feasible and meeting the requirements of the District's Water Policy Manual. The District's Satellite System Program is detailed and explained in Appendix S.

12.2 District Satellite Systems

This section summarizes the status of each of the District's eight satellite systems. As part of the pre-planning meeting with DOH, and as part of the appropriate level of planning guideline, it was decided that a full system analysis was not required from each satellite system because these systems have not changed drastically from the time when the 2007 plan was completed. As a result, each system is addressed based on its Coliform Monitoring Plan, 6-year CIP needs, any sanitary survey corrections, and if there is a water loss control action plan based on DSL exceeding 10%. A copy of each sanitary survey can be found in Appendix S.

12.2.1 Fidalgo Island (PWSID 00932 Y)

The Fidalgo Island System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – Projects are identified in the Fidalgo Island System that will improve system hydraulics and allow for the removal of the wood stave Similk Tank.

Table 12-1. Fidalgo Island System 6-Year CIP

Year	Project	Old Pipe	New Pipe	Length (feet)	Cost (2013 Dollars)
2015	Ivy St, Hoxie Ln to Lincoln St; Jefferson St, Ivy St N; Seashell St, Deception Rd to Lincoln St & Erie St, Gibralter S.	1 & 2-inch PL and 8-inch PVC	8 & 12-inch DI	3,019	$600,000
2015	Slice, Satterlee - Thompson (2,600); Satterlee, Gibralter to Driver (3,462) & Dungeness Ln, Turnstone to Jura Way (550)	4-inch AC	8-inch DI	6,612	$990,000
2015	Gibralter, Remington to Salmon Beach & Jura Way & Dewey Crest E. 1050 feet to N. Dewey & N. Dewey, SR-20 to Central	4-inch AC	6 & 8-inch DI	7,311	$1,100,000
2019	Satterlee Road, Summit Park to Driver	6-inch AC	8-inch HDPE	4,800	$720,000

Sanitary Survey Corrections – The sanitary survey conducted on June 14 and 18, 2010, provided three recommendations:

1. The Bridgeway Tanks should be scheduled for replacement due to their age and vulnerability to earthquake damage. In the interim, please install a screen or flap valve on the drain line discharge.

   Response: The screen has been installed on the drain line discharge. There is no schedule on the replacement of the Bridgeway Tanks at this point. We will be performing some hydraulic modeling on the Fidalgo Island System to determine if the proposed pipeline improvements on Slice Street and Satterlee Road will allow the District to take these tanks out of service.

2. The Similk wood stave tank should be scheduled for replacement due to its high maintenance needs and vulnerability to earthquake damage. In the interim, please inspect the roof of the tank to ensure that all openings are screened, and that the mesh size is sufficient to exclude insects.

   Response: The openings have been screened. Similar to point 1 above, we anticipate that the upcoming pipeline replacements will allow us to take the tank out of service.

3. The District should evaluate measures such as fencing, intrusion alarms, and telemetry to improve security at its reservoir sites.

   Response: The District is evaluating each reservoir site and installing signage, fencing, telemetry, and security measures as appropriate.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Fidalgo Island System is 7.2% and therefore does not require a Water Loss Control Action Plan.

12.2.2 Alger (PWSID 01400 K)

The Alger System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – As mentioned in the sanitary survey, the District has long-term plans to merge the Alger System with the Judy System through the Bow Hill pump station. Construction of the new pipeline would need to be paid for by a line extension from a third party, and recent discussions with residents of the Lake Samish area in Whatcom County and the Whatcom PUD have re-initiated the conversation of extending wholesale service to that area. The District has taken the position that the extension of service to Whatcom County will only be considered if the water comes from the Judy System and not directly from the Alger System. At the current time, there are no plans for any CIP work for the Alger System.

Sanitary Survey Corrections – The sanitary survey conducted on February 28, 2011, provided the following recommendations:

1. Thank you for the revised coliform monitoring plan. Please provide an additional map showing the distribution system west of the freeway. I recommend that you add a third routine sample site, possibly along Old Highway 99, to better represent the distribution system. All of your coliform monitoring plans should note the Ground Water Rule requirement for a raw water source sample in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system.

   Response: A third sample site is currently being selected for incorporation into the Coliform Monitoring Plan.

2. I recommend that you make provisions for backup power at the well site to improve reliability.

   Response: As explained in Chapter 9, the District has contracted with a third-party vendor who provides disaster recovery solutions and emergency response services. The vendor's services include providing temporary offices, power, computers, and communication services. The vendor also maintains a copy of the District's ERP, staff contacts, and community contacts. Backup power can be made available within a short period of time.

3. The well is over 50 years old and lacks a surface seal. The District should evaluate the need to replace this well based on the anticipated time frame for merging Alger with the Judy System.

   Response: As mentioned above, recent discussions with Whatcom PUD have re-initiated the conversation about extending wholesale service to residents of the Lake Samish area and extending the Judy System to connect with Alger.

4. To ensure the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every 3 months is recommended.

   Response: Iron and manganese sampling has been initiated at each of our well sites**.**

5. Please provide current photos of the reservoir hatch, hatch seal, and air vent.

   Response: Complete.

6. Cimmaron ridge pump station: re-evaluate the number of pressure tanks now that a variable frequency drive (VFD) pump is being used; provide a pressure relief valve on each pressure tank (on the tank side of the shutoff valve) per Washington State Department of Labor & Industries (L&I) requirements; and screen the relief valve that discharges outside the pump house.

   Response: The number of pressure tanks at Cimmaron Ridge is currently the same. The screen has been placed on the relief valve.

7. Appaloosa pump station: Provide a pressure relief valve on the pressure tank (on the tank side of the shutoff valve); evaluate pump capacity for summer demands.

   Response: A pressure relief valve was installed on the pressure tank. The pump was replaced in 2013 with a larger pump to provide for additional capacity.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Alger System is 7.3% and therefore does not require a Water Loss Control Action Plan.

12.2.3 Cedargrove (PWSID 11917 4)

The Cedargrove System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – There are no CIP projects planned for the Cedargrove System in the next 6 years.

Sanitary Survey Corrections – The sanitary survey conducted on February 28, 2011, provided the following recommendations:

1. Thank you for the revised coliform monitoring plan. All of your coliform monitoring plans should note the Ground Water Rule requirement for a raw water source in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system.

   Response: All updated coliform plans will incorporate the new Ground Water Rule.

2. The District should evaluate measures to improve monitoring and security at all its reservoir sites. Security measures such as intrusion alarms, surveillance, and water quality monitoring systems should be considered in the context of the District's overall vulnerability assessment and emergency response program.

   Response: The District is evaluating each reservoir site and installing signage, fencing, telemetry, and security measures as appropriate.

3. Please contact our certification program staff and let them know that Todd Bos no longer works for your utility.

   Response: Complete.

4. Correct freezing problem with upriver distribution sample taps.

   Response: Complete.

5. To ensure that the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every 3 months is recommended.

   Response: Iron and manganese sampling has been initiated at each of our well sites.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Cedargrove System is 3.5% and therefore does not require a Water Loss Control Action Plan.

12.2.4 Marblemount (PWSID AA642 3)

The Marblemount System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – There are no CIP projects planned for the Marblemount System in the next 6 years.

Sanitary Survey Corrections – The sanitary survey conducted on May 30, 2012, provided the following recommendations:

1. Add a third coliform sample site at the east end of the system. Update the coliform monitoring plan to include a map and designated repeat sample sites. Discuss policy issues with management.

   Response: A third sample site is currently being selected for incorporation into the Coliform Monitoring Plan. All updated coliform plans will incorporate the new Ground Water Rule.

2. Replace the source water sample tap at the well with a smooth nosed model with no interior or exterior threads. This will help prevent false positive samples.

   Response: Complete.

3. Screen the discharge pipe on the air vac valve at the well site.

   Response: Complete.

4. Remove yellow jacket nests from reservoir vent and hatch.

   Response: Complete.

5. Eliminate the gap under the fencing around the storage reservoir.

   Response: Complete.

6. Re-evaluate system design capacity using metered water usage.

   Response: See below.

7. Revise design standards for remote systems to (1) facilitate future disinfection treatment and (2) minimize water age.

   Response: These issues are currently under consideration.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Marblemount System is 7.3% and therefore does not require a Water Loss Control Action Plan.

System Capacity Analysis

The system capacity analysis performed as part of the 2007 Water System Plan was done using an estimated demand of 400 gpd/ERU, because the system had only recently been installed and there was no water meter history from which to develop a water demand. Now that the District has over 5 years of water demand history, a more accurate system capacity analysis can be completed.

The first step in determining the capacity analysis is to develop a water use factor, a growth projection for the system, and a water demand projection for the system. Based on the number of residential customers and their water demands between 2008 and 2012, a water use factor was developed that was equal to the average of the water use factors for each of the analysis years. Table 12-2 shows the water use factors from 2008 through 2012.

Table 12-2. Water Use Factors from 2008–2012

Year	Residential Meters	Residential Demand (gpd)	Water Use Factor
2008	8	477	59.7
2009	11	801	72.8
2010	13	1,166	89.7
2011	14	2,144	153.1
2012	15	1,682	112.1
		Average	97.5

The water use factor that will be used for the capacity analysis is the average from 2008 through 2012, which is 97.5 gpd/ERU.

After reviewing the number of new customers each year between 2008 and 2012, it was assumed that the growth rate for the Marblemount System would be an additional two customers for each subsequent year. Table 12-3 summarizes the growth of the system and the water demand projections up to 2033.

Table 12-3. Water Demand Projections

Year	Number of Customers	Average Day Demand (gpd)	Maximum Day Demand (gpd)
2014	35	10.146	19,277
2019	45	12,888	24,486
2033	73	20,565	39,074

The MDD is calculated by using a factor of 1.9, which was taken from the 2000 CWSP as a District standard.

Using the information presented above, Tables 12-4 and 12-5 show the source and storage analyses for the Marblemount System.

Table 12-4. Evaluation of Source Adequacy for the Marblemount System

	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERUs)	104	132	211	1,080
Average Day Demand (gpd)	10,146	12,888	20,565	105,347
Maximum Day Demand (gpd)	19,277	24,487	39,074	200,160
Available Existing Source				
Well Pump[2] (gpd)	128,160	128,160	128,160	200,160
Source Surplus/(Deficiency) (gpd)[3]	108,883	103,673	89,087	0

Notes:

1. Projected demands based on the average of existing water meter readings from 2008 - 2012. ERUs calculated as Average Day Demand / ERU water use factor (97.5 gpd/ERU).
2. The pumping capacity of the well pump used for 2014, 2019, and 2033 is 100 gpm. The maximum water right is equal to 150 gpm and is used for the maximum case. However, 11 gpm is used for streamflow augmentation and so all of the existing source values are reduced by this amount.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with existing sources, based on maximum production rate.
5. A peaking factor of 1.9 was used to back-calculate the Average Day Demand based on the Maximum Day Demand.

Table 12-5. Evaluation of Storage Adequacy for Marblemount System

	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERUs)[2]	104	132	211	108
Average Day Demand (gpd)	10,146	12,888	20,565	105,347
Maximum Day Demand (gpd)	19,277	24,487	39,074	200,160
Available Source (gpd)				
Water Treatment Plant Source[3]	128,160	128,160	128,160	200,160
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	10,569	10,569	10,569	10,569
Equalizing Storage (gal)[6]	964	1,224	1,954	10,008
Standby Storage (gal)[7]	41,625	52,874	84,369	43,367
Fire Flow Storage (gal)[8]				
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	11,533	11,793	12,523	20,577
Greater than 20 psi at highest meter (gal)[10]	53,157	64,667	96,892	63,944
Existing Storage Greater Than 30 psi (gal)[11]				
Marblemount Reservoir	63,944	63,944	63,944	63,944
Storage Surplus/(Deficiency) at 30 psi (gal)	52,411	52,151	51,421	43,367
Existing Storage Greater Than 20 psi (gal)[11]				
Marblemount Reservoir	63,944	63,944	63,944	63,944
Storage Surplus/(Deficiency) at 20 psi (gal)	10,787	(723)	(32,948)	0

1. Projected demands based on the average of existing water meter readings from 2008 – 2012. ERUs calculated as Average Day Demand / ERU water use factor (97.5 gpd/ERU).
2. Number of ERUs is based on Average Day Demand divided by 97.5 gpd per ERU.
3. Available source is assumed to be the pumping capacity of the well pump of 100 gpm. The maximum water right is equal to 150 gpm and is used for the maximum case. However, 11 gpm is used for streamflow augmentation and so all of the existing source values are reduced by this amount.
4. No multi-source credit is used.
5. Required operational storage is based on 2 feet of storage in the tank.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage is nested within the standby storage.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The 20 psi and 30 psi requirement is based on the highest service within any given pressure zone, and total storage available within the system.

As shown by the above analysis, the capacity of the Marblemount System is limited by the storage capacity to a maximum of 108 ERUs.

12.2.5 Mountain View (PWSID 03774 Y)

The Mountain View System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – There are no CIP projects planned for the Mountain View System in the next 6 years.

Sanitary Survey Corrections – The sanitary survey conducted on April 16, 2012, provided the following recommendations:

1. Please provide a revised coliform monitoring plan, incorporating Ground Water Rule requirements.

   Response: All updated coliform plans will incorporate the new Ground Water Rule.

2. The well casing needs to be provided with an inverted screened vent.

   Response: Complete**.**

Water Loss Control Action Plan – The District has only been tracking the DSL for the Mountain View System since 2012. The 1-year DSL is approximately 15.2%, but there is not enough information for a 3-year rolling average. At this point, the District does not have a Water Loss Control Action Plan for this system, but it is being monitored because of the high DSL. The system is constructed of aging 3-inch-diameter galvanized pipe that is in need of replacement. However, instead of replacing the pipe and the wellhead piping, the District prefers to consolidate this system with the Judy System. The District has approached DOH about possible funds to assist with the consolidation, but no plan has been developed at this time.

12.2.6 Potlatch Beach (PWSID 69034 L)

The Potlatch Beach System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – There are no CIP projects planned for the Potlatch Beach System in the next 6 years. Recent projects have included replacing the pump to the higher pressure zone; adding telemetry between the well, reservoir, and plant; installing a new magnetic flow meter at the plant; and changing the chlorine injection point to improve contact time.

Sanitary Survey Corrections – The sanitary survey conducted on March 14, 2012, provided the following recommendations:

1. Obtain certification for day to day operators.

   Response: In progress.

2. Install a splash block on the reservoir overflow and a flap valve or screen on the drain line discharge.

   Response: Complete.

3. Install an ASME pressure relief valve at pump station; consider backup power.

   Response: The pressure relief valve is installed. The pump station has the ability to be fed from a temporary generator, but the District is still considering the capital and maintenance costs of providing full-time backup power.

4. Because sea water sources are vulnerable to contamination by viruses and to provide a multiple barrier or protection, the level of disinfection treatment needs to be increased to provide at least 99.99% (4-log) virus inactivation. Please submit a report by September 1, 2012 to address this issue.

   Response: The District has changed the location of the chlorine injection point to improve the contact time. The District would like to discuss the issue of multiple barrier protection at this location prior to submitting a report.

5. Evaluate alternatives to resolve the pump corrosion issue.

   Response: A new pump that had many improvements was installed in February 2013, and this pump has currently lasted twice as long as any previous pump.

6. Please send a copy of your revised coliform monitoring plan that includes the new sample stations and incorporates the new Ground Water Rule requirements.

   Response: An updated coliform plan will be forwarded to you.

7. Complete a written monitoring plan for stage 1 disinfection byproducts. I gave Darlene a template she can use for that purpose.

   Response: In progress.

8. Secure the well cap on the emergency well.

   Response: Complete.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Potlatch Beach System is 8.4% and therefore does not require a Water Loss Control Action Plan

12.2.7 Rockport (PWSID 73600 6)

The Rockport System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – The District is planning to remove and replace the Ecology blocks and stabilize the bank at the access road to the reservoir. This project is being planned for 2014 at an estimated cost of about $75,000. Future projects will be dependent on the overall responsibility of the well and the ongoing discussions of the ownership of the well with State Parks.

Sanitary Survey Corrections – The sanitary survey conducted on February 28, 2011, provided the following recommendations:

1. A screened vent should be installed on the well casing to allow controlled entry of air when the submersible pump turns on.

   Response: Complete.

2. The fence at the reservoir site needs to be repaired. The District should evaluate measures to improve monitoring and security at all its reservoir sites. Security measures such as intrusion alarms, surveillance, and water quality monitoring systems should be considered in the context of the District's overall vulnerability assessment and emergency response program.

   Response: The District is evaluating each reservoir site and installing signage, fencing, telemetry, and security measures as appropriate.

3. Please meet with State Parks and clarify roles and responsibilities for their system. Now that Rockport State Park is day use only, can the State Park system be incorporated into the PUD system?

   Response: The District has met with State Parks a number of times and indicated the desire to incorporate the State Parks well and reservoir in the District's system, and provide State Parks with a connection off that system. State Parks is in favor of the District's proposal, but does not want to relinquish the water right to the well. The District has solicited the assistance of DOH to mediate this issue.

4. Thank you for the revised coliform monitoring plan. All of your coliform monitoring plans should note the Ground Water Rule requirement for a raw water source sample in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system.

   Response: All updated coliform plans will incorporate the new Ground Water Rule.

5. Correct freezing problem with upriver distribution sample taps.

   Response: Complete.

6. Please contact our certification program staff and let them know that Todd Bos no longer works for your utility.

   Response: Complete.

7. Locate the missing TTHM and HAA5 sample results for 2008, or re-sample in August 2011.

   Response: The results from 2008 were not located and new samples were taken in August 2011.

8. To ensure that the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every 3 months is recommended.

   Response: Complete.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Rockport System is 15.7%. This high rolling average is attributable to an excessively high DSL in 2010 of 31.8% due to

water leaks, aging meters, and limited telemetry to alert staff of tank overflows. Since then, the DSL has been 8.0% in 2011 and 7.2% in 2012. While a formal Water Loss Control Action Plan has not been developed, the District has improved telemetry to the Rockport System, replaced meters on the system, and maintained its weekly inspection of the system to stay on top of water loss issues. It is expected that the 3-year rolling average will drop below 10% after reporting of the 2013 DSL.

12.2.8 Skagit View Village (PWSID 96879 5)

The Skagit View Village System has not changed significantly from the 2007 plan in terms of water demand and system infrastructure. Therefore, a detailed system analysis will not be conducted as a part of this plan. The following items will be addressed per the requirements of the DOH pre-planning meeting:

Coliform Monitoring Plan – The updated Coliform Monitoring Plan to reflect the Ground Water Rule changes has been completed.

6-year CIP Needs – There are no CIP projects planned for the Skagit View Village System in the next 6 years.

Sanitary Survey Corrections – The sanitary survey conducted on May 22, 2013, provided the following recommendations:

1. Seal the opening of the reservoir overflow discharge or replace it with a flap valve.

   Response: Complete.

2. Replace the reservoir hatch seal, as it is showing signs of deterioration.

   Response: Complete.

3. Complete the remaining elements of your draft revised coliform monitoring plan.

   Response: In progress.

4. Develop a system-wide program for routine flushing and exercising of distribution system valves.

   Response: Complete.

5. Continue to explore options to assure availability of portable generators and fuel during emergency conditions.

   Response: As explained in Chapter 9, the District has contracted with a third-party vendor who provides disaster recovery solutions and emergency response services. The vendor's services include providing temporary offices, power, computers, and communication services. The vendor also maintains a copy of the District's ERP, staff contacts, and community contacts.

Water Loss Control Action Plan – The 3-year rolling average for DSL for the Skagit View Village System is 6.9% and therefore does not require a Water Loss Control Action Plan.

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APPENDIX A

PROCEDURAL DOCUMENTS

Water System Plan Submittal Form

Pre-Plan Agenda

Local Government Consistency Checklists

State Environmental Policy Act (SEPA) Documentation

Water Rights Self Assessments (Judy System and Satellite Systems)

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water System Plan Submittal Form

This form must be completed and submitted along with the Water System Plan (WSP). It will expedite review and approval of your WSP. **All water systems should contact their regional planner before developing any planning document for submittal.**

PUD No. 1 of Skagit County Judy Reservoir System	**79500 E**	**PUD No.1 of Skagit County**
1. Water System Name	PWS ID# or Owner ID#	System Owner Name
Dale Wardell	**(360) 848-2132**	**Water Treatment Plant Superintendent**
Contact Name for Utility	Phone Number	Title
1415 Freeway Drive, PO Box 1436	**Mount Vernon**	**WA 98273**
Contact Address	City	State Zip
George Sidhu, P.E.	**(360) 848-4436**	**Engineering Manager**
2. Project Engineer	Phone Number	Title
1415 Freeway Drive, PO Box 1436	**Mount Vernon**	**WA 98273**
Project Engineer Address	City	State Zip
3. Billing Contact Name (required if not the same as #4)	Billing Phone Number	Billing Fax Number
Billing Address	City	State Zip

4.	How many services are presently connected to the system?	29,893 per WFI
5.	Is the system expanding? (seeking to extend service area or increase number of approved connections)	☒ Yes ☐ No
6.	If number of services is expected to increase, how many new connections are proposed in the next six years?	**See section 4.3**
7.	If the system is private-for-profit, is it regulated by the State Utilities and Transportation Commission?	☐ Yes ☒ No
8.	Is the system located in a Critical Water Supply Service Area (i.e., have a Coordinated Water System Plan)?	☒ Yes ☐ No
9.	Is the system a customer of a wholesale water purveyor?	☐ Yes ☒ No
10.	Will the system be pursuing additional water rights from the State Department of Ecology in the next twenty years?	☐ Yes ☒ No
11.	Is the system proposing a new intertie?	☐ Yes ☒ No
12.	Do you have projects currently under review by the Department of Health?	☐ Yes ☒ No
13.	Are you requesting distribution main project report and construction document submittal exception, and if so, does the WSP contain standard construction specifications for distribution mains?	☒ Yes ☐ No
14.	Are you requesting distribution related project report and construction document submittal exception, and if so, does the WSP contain distribution facilities design and construction standards, including internal engineering review procedures?	☒ Yes ☐ No
15.	The purveyor is responsible for sending a copy of the WSP to adjacent utilities for review or a letter notifying them that a copy of the WSP is available for their review and where the review copy is located. Has this been completed?	☒ Yes ☐ No
16.	The purveyor is responsible for sending a copy of the WSP to all local governments within the service area. (County and City Planning Departments, etc). Has this been completed?	☒ Yes ☐ No
17.	Are you proposing a change in the place of use of your water right?	☐ Yes ☒ No

If answer to questions 7,8, 11, 15and/or 16 is "yes," list who you sent the WSP to: **A copy of the plan was sent for comments to Skagit County Planning, the City of Mount Vernon, City of Sedro Woolley, and the City of Burlington. A letter was sent for notification of the plan to Skagit County Health, City of of Anacortes, North Fir Island Water Association, and Samish Farms Water Association. Plans and letters are being sent concurrently with DOH submittal.**

Is this plan: ☒ an Initial Submittal ☐ a Revised Submittal

Please enclose the following number of copies of the WSP:

3 copies for Northwest and Southwest Regional Offices **OR 2** copies for Eastern Regional Office (We will send one copy to Ecology)
1 additional copy if you answered "yes" to question 7. ___3___ Total copies attached

Please return completed form to the Office of Drinking Water regional office checked below.

☒ **Northwest Drinking Water Operations**
Department of Health
20425 72nd Avenue South, Suite 310
Kent, WA 98032-2358
(253) 395-6750

☐ **Southwest Drinking Water Operations**
Department of Health
PO Box 47823
Olympia, WA 98504-7823
(360) 236-3030

☐ **Eastern Drinking Water Operations**
Department of Health
16201 East Indiana Avenue Suite 1500
Spokane Valley, WA 99216
(509) 329-2100

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD, call (800) 833-6388.
DOH Form 331-397 (Revised 11/11)

Water System Plan (WSP) Pre-Plan Agenda

	√Required	Content Description	WSP Page #
Chapter 1		**Description of Water System**	
	(√)	Ownership and management	2.2
	(√)	System history and background	2.3
	(√)	Inventory of existing facilities	2.5
	(√)	Related plans: Coordinated Water System Plan (CWSP), Comp./Community	3.0
	(√)	Information & Maps: Service area, **identify retail service area☆**, designated land use and zoning, future comprehensive plan request for changes to land use, & agreements	2.1
	(√)	Policies: Service area, SMA, conditions of service, annexation	3.1
	(√)	**Duty to serve☆** requirement: identify process, timeframes, conditions, appeals	3.1
	(√)	**Consistency** from **local planning☆** agency	App A
	(?)	Consistency for local watershed☆ (Ecology comments)	
Chapter 2		**Basic Planning Data**	
	(√)	Current water use: Population, service connections, & ERUs and data reporting	4.1, 4.2
	(√)	Consecutive 6 & 20th year projections: Population, service connections, & ERUs	4.3
	(√)	Consecutive 6 & 20th year projections: Demand forecasts **w/ & w/o expected efficiency savings☆**	4.3
	(√)	Monthly and annual production. Totals per source. **Water Supply Characteristics☆**	4.3.2
	(?)	Annual usage for water supplied to other systems	
	(√)	Annual usage by customer class. **Demand Characteristics (see Ch.4)☆**	4.3.2
	(√)	Historical total water loss **(DSL) – percent and volumes☆**	5.2.1.8
	(√)	**>1000, seasonal variations in consumption by customer class☆**	
Chapter 3		**System Analysis**	
	(√)	Capacity analysis with **water right self assessment** (3 forms DOH/ECY per MOU: Existing, 6, and 20-year projections)	6.2,6.3,6.4
	(√)	System design standards	6.1
	(√)	Water quality analysis	8.0
	(√)	System inventory, description and analysis	
	(√)	Source	2.5.1, 6.3
	(√)	Treatment	2.5.2
	(√)	Storage	2.5.4, 6.4
	(√)	Distribution system/hydraulics	2.5.7, 6.5
	(√)	Summary of system deficiencies	6.2,6.3,6.4,6.5
	(√)	Analysis of possible improvement projects	6.5
Chapter 4		**Water Use Efficiency Program and Water Resource Analysis**	
	(√)	**Water Use Efficiency Program per WAC 246-290-810☆ Budget line item for measures.☆ >1,000 Estimate water savings from measures past six years. ☆**	5.2, 5.3
	(√)	**Source & Service Meters/Or schedule w/activities to minimize leakage☆**	5.2.1.8
	(√)	**Water supply and demand characteristics – Subtitles with description & discussion on effect of water use☆**	5.3
	(?)	Source of supply analysis and evaluation of supply alternatives	
	(?)	Interties	
	( )	**≥1,000 connections explore reclaimed water opportunities☆**	
Chapter 5		**Source Water Protection (Check One or Both)**	
	(√)	Wellhead protection program	
	( )	Watershed control program	3.3.3, App E 3.3.4, App F
Chapter 6		**Operation and Maintenance Program**	
	(√)	Water system management and personnel	9.1
	(√)	Operator certification	9.2
	(√)	Routine operating procedures and preventive maintenance	9.3, 9.5

	√Required	Content Description	WSP Page #
	(√)	Water quality sampling procedures & program – Identify **WQ PN Requirements**	8.7
	(√)	Coliform monitoring plan/map. **Add** Ground Water Rule (GWR) **narrative, actions**	8.2.11.2
	(√)	Emergency program, water shortage plan, service reliability per WAC 246-290-420	9.6, 9.7
	(√)	Address sanitary survey findings	
	(√)	Cross-connection control program – Summarize **next actions to address**	9.8
	(√)	Recordkeeping, reporting, and customer complaint program	9.9
	(√)	Summary of O&M deficiencies	9.11
Chapter 7		**Distribution Facilities Design and Construction Standards**	
	(?)	Standard construction specification for distribution mains	9.10, App Q
Chapter 8		**Improvement Program**	
	(√)	Capital improvement schedule for 6 and 20 years	10.1, 10.2
Chapter 9		**Financial Program**	
	( )	≥1000 connections – Balanced 1-year budget – recommend 6 years	
	(√)	<1000 connections – Balanced 6-year budget, w/ Financial Viability	11.5
	(√)	Revenue and cash flow stability to fund capital and emergency improvements	11.5
	(√)	**Evaluation of affordable rate structure that encourages water demand efficiency☆ Budget line item if Water Loss Control Action Plan is required☆**	11.6
Chapter 10		**Miscellaneous Documents**	
	(√)	Meeting of the consumers (documentation). **Approval by EGB prior to DOH approval (per WAC Change in 2007)☆**	
	(√)	County/Adjacent Utility Correspondence	App. A
	( )	≥1000 connections - State Environmental Policy Act (SEPA) Determination	App. A
	(?)	Agreements (intertie, service area, franchise, etc.)	3.0
	(?)	Satellite Management Program	12.0

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Local Government Consistency Review Checklist

Water System Name: PUD No. 1 of Skagit County - Judy Reservoir System PWS ID: 79500 E

Planning/Engineering Document Title: 2013 Water System Plan Plan Date: _____

Local Government with Jurisdiction: City of Burlington

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(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Figure 2-4 City Limits w/o UGA	yes
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 4	yes
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	N/A	N/A
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Chapter 3	yes
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Throughout	yes

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Margaret Fleek — 2/13/14
Signature — Date

Margaret Fleek Planning Director City of Burlington
Printed Name, Title, & Jurisdiction

Washington State Department of Health

Local Government Consistency Review Checklist

Water System Name: PUD No. 1 of Skagit County - Judy Reservoir System PWS ID: 79500 E

Planning/Engineering Document Title: 2013 Water System Plan Plan Date: _____

Local Government with Jurisdiction: City of Mount Vernon

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(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.		YES
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.		YES
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.		NA
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].		YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.		YES

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

_____ 3/4/14
Signature Date

Jana Hanson CED Director, Mount Vernon
Printed Name, Title, & Jurisdiction

Washington State Department of Health

Local Government Consistency Review Checklist

Water System Name: PUD No. 1 of Skagit County - Judy Reservoir System PWS ID: 79500 E

Planning/Engineering Document Title: 2013 Water System Plan Plan Date: _____

Local Government with Jurisdiction: City of Sedro Woolley

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(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	FIGURE 2-7	YES
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	4-1	YES
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	NA	NA
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	3-4	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	3-7	YES

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Signature _____ Date 4-18-14

JOHN COLEMAN - PLANNING DIRECTOR - CITY OF SEDRO WOOLLEY
Printed Name, Title, & Jurisdiction

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Local Government Consistency Review Checklist

Water System Name: PUD #1 OF SKAGIT COUNTY PWS ID: _____

Planning/Engineering Document Title: 2013 WATER SYSTEM PLAN (DECEMBER, 2013 (DRAFT)) Plan Date: _____

Local Government with Jurisdiction: SKAGIT COUNTY

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(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	FIGURE 2-2 & 2-3; PAGE 2-13	YES
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	PAGE 4-1 – 4-3	YES
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.		NA
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	CHAPTER 3	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	CHAPTERS 3-1; AND 10-1	YES

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Signature _____ Date 5/27/14

Dale Pernula, Director, Skagit County Dept PDS
Printed Name, Title, & Jurisdiction

Skagit PUD
PUBLIC UTILITY DISTRICT

NOTICE
SEPA DETERMINATION OF NON-SIGNIFICANCE

Description of Proposal: This proposal is a non-project action by Public Utility District No. 1 of Skagit County (District) to update the District's Water System Plan (2013 Water System Plan). The 2013 Water System Plan evaluates future water supply, infrastructure projects, and operations and maintenance activities for the District's water systems for the period 2014 through 2019, and beyond, as required based upon the plan's forecast of future water demands. The District is required to update its water system plan every six years under Washington State Department of Health regulations. The 2013 Water System Plan has been prepared in accordance with Department of Health requirements and under the direction of a registered professional engineer.

Proponent: Public Utility District No. 1 of Skagit County

Location of Proposal: All designated service areas of the District and any undesignated service area in the remainder of Skagit County and adjacent areas, per the Skagit County Coordinated Water System Plan Regional Supplement. The boundaries of the District include, but are not limited to, the boundaries of Skagit County, Washington.

Lead Agency: Public Utility District No. 1 of Skagit County

Threshold Determination: The District, acting as lead agency for this proposal, has determined the proposal does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This determination was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

This determination is issued pursuant to WAC 197-11-340(2). The lead agency will not act on this proposal for 14 calendar days from the date issued.

Comments: Comments regarding this Determination of Non-significance must be submitted to the Lead Agency in writing by June 12, 2014. Send comments to the attention of Bill Trueman, Environmental Services Coordinator, at the address listed below.

SEPA Responsible Official: George Sidhu, P.E., Engineering Manager

Staff Contact Person: Bill Trueman, Environmental Services Coordinator
Post Office Box 1436
Mount Vernon, WA 98273-1436
(360) 424-7104

Date of Issuance: May 29, 2014

Signature: _____
George Sidhu, Engineering Manager

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 1

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY (DISTRICT) JUDY RESERVOIR GROUP A (PWSID 79500E) WATER SYSTEM PLAN WATER RIGHTS SELF ASSESSMENT – EXISTING STATUS

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		EXISTING CONSUMPTION		CURRENT WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. Certificate 26	District	9-28-1917	Mundt Creek or the Skagit River	No. See footnotes.	2.5 cfs	1,810 afy				
2. Certificate 411	District	10-10-1929	Gilligan Creek or the Skagit River	No. See footnotes.	1.5 cfs	1,086 afy				
3. GWP 2911	District	3-26-1953	Skagit River	No. See footnotes.	2.0 cfs	1,440 afy				
4. GWP 3350	District	5-12-1954	Skagit River	No. See footnotes.	8.91 cfs	6,400 afy				
5. S1-00724C	District	10-30-1963	Gilligan Creek or the Skagit River	Yes. See footnotes.	8.89 cfs	3,700 afy				
6. S1-00737C	District	10-30-1963	Mundt Creek or the Skagit River	Yes. See footnotes.	8.0 cfs	3,886 afy				
7. S1-00739C	District	10-30-1963	Turner Creek or the Skagit River	Yes. See footnotes.	6.2 cfs	3,022 afy				
8. S1-*18219P	District	10-30-1963	Salmon Creek and the Skagit River	Yes. See footnotes.	4.0 cfs	307 afy				
9. S1-25129P	District	11-16-1987	Gilligan Creek and the Skagit River	Yes. See footnotes.	13.15 cfs	3,700 afy				
10. S1-27862P	District	10-22-1997	Turner Creek and the Skagit River	Yes. See footnotes.	6.6 cfs	3,022 afy				

Claims 1. 009333	District	Prior to 1917	Turner Creek or the Skagit River	No. See footnotes.	4.3 cfs	2,300 afy				
2. 009332	District	Prior to 1917	Salmon Creek or the Skagit River	No. See footnotes.	1.8 cfs	307 afy				
3.										
4.										
TOTAL	**********	*********	*********	**********	55.39 cfs	18,755 afy	21.63 cfs	9,076 afy	33.76 cfs excess	9,679 afy excess

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		EXISTING CONSUMPTION THROUGH INTERTIE		CURRENT INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1. Avon	City of Anacortes	See footnotes for intertie information.					
2. Riverbend	City of Anacortes						
3. Lefeber	City of Anacortes						
4. Fredonia	City of Anacortes						
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1. S1-27861	District	10-22-1997	No. See footnotes.	16.06 cfs	
2. S1-27860	District	10-22-1997	No. See footnotes.	12.8 cfs	
3.					
4.					

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DOH Form 331-371 (Updated 08/10)

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Footnotes:

1. Existing consumption is related to projected production in 2013 and as detailed in Table 4-13 of the District's 2013 Water System Plan.
2. Water rights listed are related to currently active sources. Storage and currently inactive water rights are listed in Table 7-1 and 7-2 of the District's 2013 Water System Plan. Additional information related to listed water rights is also located in these tables.
3. Listed water rights are included in the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for instream and Out of Stream Purposes. Total combined water right available from the river, streams, or a combination of both is 55.39 cfs. The total water right not subject to Lower Skagit River Instream Flows is 42.59 cfs. Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon Creeks) are subject to Cultus Mountain Instream flow rules. As a result of the cumulative nature of these water rights, existing and forecasted water use and water right status is detailed only on a cumulative basis.
4. Total annual quantity for existing claims, permits, and certificates is limited as follows:
    - Mundt Creek: 3,886 afy
    - Gilligan Creek: 3,700 afy
    - Turner Creek: 3,022 afy
    - Salmon Creek: 307 afy
    - Cultus Mountain Streams and the Skagit River: 18,755 afy
5. Interties with the City of Anacortes water system are available to the District on an "as-needed" basis:
    - Four interties (Avon, Riverbend, Lefeber, Fredonia) are connected to the Judy Reservoir Group A Water System (PWSID 79500E) with a projected production of 49.3 million gallons in 2013.
    - Seven interties are connected to the Fidalgo Island System (PWSID 03774Y) with a projected production of 49.4 million gallons in 2013.
    - The total projected production from all interties with the City of Anacortes is projected to be 98.7 million gallons in 2013. The existing agreement with the City of Anacortes limits the District's use of the interties to 375 million gallons per year, resulting in an excess supply of 276.3 million gallons per year (848 afy).
6. S1-00724C: Qi is 8.89 cfs (7.39 primary; 1.5 supplemental) and Qa is 3,700 afy (2,614 primary; 1,086 supplemental) in total with SWC 411.
7. S1-00737C: Qa is 3,886 afy (2,076 primary; 1,810 supplemental) in total with SWC 26.
8. S1-00739C: Qa is 3,022 afy (722 primary; 2,300 supplemental) in total with Claim 009333.
9. S1-18219P: Qa of 307 afy is entirely supplemental to Claim 009332.
10. S1-25129P: Qa of 3,700 afy is entirely supplemental to SWC 411 and Certificate S1-00724C.
11. S1-27862P: Qa of 3,022 afy is entirely supplemental to Claim 009333 and Certificate S1-00739C.

Please return completed form to the Office of Drinking Water regional office checked below.

☒ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
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Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
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☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 2

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY (DISTRICT)
JUDY RESERVOIR GROUP A (PWSID 79500E) WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 6 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (6-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. Certificate 26	District	9-28-1917	Mundt Creek or the Skagit River	No. See footnotes.	2.5 cfs	1,810 afy				
2. Certificate 411	District	10-10-1929	Gilligan Creek or the Skagit River	No. See footnotes.	1.5 cfs	1,086 afy				
3. GWP 2911	District	3-26-1953	Skagit River	No. See footnotes.	2.0 cfs	1,440 afy				
4. GWP 3350	District	5-12-1954	Skagit River	No. See footnotes.	8.91 cfs	6,400 afy				
5. S1-00724C	District	10-30-1963	Gilligan Creek or the Skagit River	Yes. See footnotes.	8.89 cfs	3,700 afy				
6. S1-00737C	District	10-30-1963	Mundt Creek or the Skagit River	Yes. See footnotes.	8.0 cfs	3,886 afy				
7. S1-00739C	District	10-30-1963	Turner Creek or the Skagit River	Yes. See footnotes.	6.2 cfs	3,022 afy				
8. S1-*18219P	District	10-30-1963	Salmon Creek and the Skagit River	Yes. See footnotes.	4.0 cfs	307 afy				
9. S1-25129P	District	11-16-1987	Gilligan Creek and the Skagit River	Yes. See footnotes.	13.15 cfs	3,700 afy				
10. S1-27862P	District	10-22-1997	Turner Creek and the Skagit River	Yes. See footnotes.	6.6 cfs	3,022 afy				

Claims 1. 009333	District	Prior to 1917	Turner Creek or the Skagit River	No. See footnotes.	4.3 cfs	2,300 afy				
2. 009332	District	Prior to 1917	Salmon Creek or the Skagit River	No. See footnotes.	1.8 cfs	307 afy				
3.										
4.										
TOTAL	**********	*********	*********	**********	55.39 cfs	18,755 afy	22.17 cfs	9,311 afy	33.22 cfs excess	9,444 afy excess

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1. Avon	City of Anacortes	See footnotes for intertie information.					
2. Riverbend	City of Anacortes						
3. Lefeber	City of Anacortes						
4. Fredonia	City of Anacortes						
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1. S1-27861	District	10-22-1997	No. See footnotes.	16.06 cfs	
2. S1-27860	District	10-22-1997	No. See footnotes.	12.8 cfs	
3.					
4.					

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DOH Form 331-372 (Updated 08/10)

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Footnotes:

1. Forecasted consumption is related to projected production as detailed in Table 4-13 of the District's 2013 Water System Plan.
2. Water rights listed are related to currently active sources. Storage and currently inactive water rights are listed in Table 7-1 and 7-2 of the District's 2013 Water System Plan. Additional information related to listed water rights is also located in these tables.
3. Listed water rights are included in the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for instream and Out of Stream Purposes. Total combined water right available from the river, streams, or a combination of both is 55.39 cfs. The total water right not subject to Lower Skagit River Instream Flows is 42.59 cfs. Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon Creeks) are subject to Cultus Mountain Instream flow rules. As a result of the cumulative nature of these water rights, forecasted water use and water right status is detailed only on a cumulative basis.
4. Total annual quantity for existing claims, permits, and certificates is limited as follows:
    - Mundt Creek: 3,886 afy
    - Gilligan Creek: 3,700 afy
    - Turner Creek: 3,022 afy
    - Salmon Creek: 307 afy
    - Cultus Mountain Streams and the Skagit River: 18,755 afy
5. Interties with the City of Anacortes water system are available to the District on an "as-needed" basis:
    - Four interties (Avon, Riverbend, Lefeber, Fredonia) are connected to the Judy Reservoir Group A Water System (PWSID 79500E) with a projected production of 49.3 million gallons in 2013.
    - Seven interties are connected to the Fidalgo Island System (PWSID 03774Y) with a projected production of 49.4 million gallons in 2013.
    - The total projected production from all interties with the City of Anacortes is projected to be 98.7 million gallons in 2013. The existing agreement with the City of Anacortes limits the District's use of the interties to 375 million gallons per year, resulting in an excess supply of 276.3 million gallons per year (848 afy).
6. S1-00724C: Qi is 8.89 cfs (7.39 primary; 1.5 supplemental) and Qa is 3,700 afy (2,614 primary; 1,086 supplemental) in total with SWC 411.
7. S1-00737C: Qa is 3,886 afy (2,076 primary; 1,810 supplemental) in total with SWC 26.
8. S1-00739C: Qa is 3,022 afy (722 primary; 2,300 supplemental) in total with Claim 009333.
9. S1-18219P: Qa of 307 afy is entirely supplemental to Claim 009332.
10. S1-25129P: Qa of 3,700 afy is entirely supplemental to SWC 411 and Certificate S1-00724C.
11. S1-27862P: Qa of 3,022 afy is entirely supplemental to Claim 009333 and Certificate S1-00739C.

Please return completed form to the Office of Drinking Water regional office checked below.

☒ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
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Fax: (253) 395-6760

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☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 3

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY (DISTRICT)
JUDY RESERVOIR GROUP A (PWSID 79500E) WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 20 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (20-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. Certificate 26	District	9-28-1917	Mundt Creek or the Skagit River	No. See footnotes.	2.5 cfs	1,810 afy				
2. Certificate 411	District	10-10-1929	Gilligan Creek or the Skagit River	No. See footnotes.	1.5 cfs	1,086 afy				
3. GWP 2911	District	3-26-1953	Skagit River	No. See footnotes.	2.0 cfs	1,440 afy				
4. GWP 3350	District	5-12-1954	Skagit River	No. See footnotes.	8.91 cfs	6,400 afy				
5. S1-00724C	District	10-30-1963	Gilligan Creek or the Skagit River	Yes. See footnotes.	8.89 cfs	3,700 afy				
6. S1-00737C	District	10-30-1963	Mundt Creek or the Skagit River	Yes. See footnotes.	8.0 cfs	3,886 afy				
7. S1-00739C	District	10-30-1963	Turner Creek or the Skagit River	Yes. See footnotes.	6.2 cfs	3,022 afy				
8. S1-*18219P	District	10-30-1963	Salmon Creek and the Skagit River	Yes. See footnotes.	4.0 cfs	307 afy				
9. S1-25129P	District	11-16-1987	Gilligan Creek and the Skagit River	Yes. See footnotes.	13.15 cfs	3,700 afy				
10. S1-27862P	District	10-22-1997	Turner Creek and the Skagit River	Yes. See footnotes.	6.6 cfs	3,022 afy				

Claims 1. 009333	District	Prior to 1917	Turner Creek or the Skagit River	No. See footnotes.	4.3 cfs	2,300 afy				
2. 009332	District	Prior to 1917	Salmon Creek or the Skagit River	No. See footnotes.	1.8 cfs	307 afy				
3.										
4.										
TOTAL	**********	*********	*********	**********	55.39 cfs	18,755 afy	25.41 cfs	10,659 afy	29.98 cfs excess	8,096 afy excess

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1. Avon	City of Anacortes	See footnotes for intertie information.					
2. Riverbend	City of Anacortes						
3. Lefeber	City of Anacortes						
4. Fredonia	City of Anacortes						
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1. S1-27861	District	10-22-1997	No. See footnotes.	16.06 cfs	
2. S1-27860	District	10-22-1997	No. See footnotes.	12.8 cfs	
3.					
4.					

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DOH Form 331-373 (Updated 08/10)

To return form, please see reverse side.

Footnotes:

1. Forecasted consumption is related to projected production as detailed in Table 4-13 of the District's 2013 Water System Plan.
2. Water rights listed are related to currently active sources. Storage and currently inactive water rights are listed in Table 7-1 and 7-2 of the District's 2013 Water System Plan. Additional information related to listed water rights is also located in these tables.
3. Listed water rights are included in the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for instream and Out of Stream Purposes. Total combined water right available from the river, streams, or a combination of both is 55.39 cfs. The total water right not subject to Lower Skagit River Instream Flows is 42.59 cfs. Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon Creeks) are subject to Cultus Mountain Instream flow rules. As a result of the cumulative nature of these water rights, forecasted water use and water right status is detailed only on a cumulative basis.
4. Total annual quantity for existing claims, permits, and certificates is limited as follows:
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    - Gilligan Creek: 3,700 afy
    - Turner Creek: 3,022 afy
    - Salmon Creek: 307 afy
    - Cultus Mountain Streams and the Skagit River: 18,755 afy
5. Interties with the City of Anacortes water system are available to the District on an "as-needed" basis:
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    - The total projected production from all interties with the City of Anacortes is projected to be 98.7 million gallons in 2013. The existing agreement with the City of Anacortes limits the District's use of the interties to 375 million gallons per year, resulting in an excess supply of 276.3 million gallons per year (848 afy).
6. S1-00724C: Qi is 8.89 cfs (7.39 primary; 1.5 supplemental) and Qa is 3,700 afy (2,614 primary; 1,086 supplemental) in total with SWC 411.
7. S1-00737C: Qa is 3,886 afy (2,076 primary; 1,810 supplemental) in total with SWC 26.
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9. S1-18219P: Qa of 307 afy is entirely supplemental to Claim 009332.
10. S1-25129P: Qa of 3,700 afy is entirely supplemental to SWC 411 and Certificate S1-00724C.
11. S1-27862P: Qa of 3,022 afy is entirely supplemental to Claim 009333 and Certificate S1-00739C.

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Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 1

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY (DISTRICT)
SATELLITE SYSTEMS-WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – EXISTING STATUS

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		EXISTING CONSUMPTION		CURRENT WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G1-*05743C (Certificate No. 8 Page 3885-A)	Alger Community Club, Inc.	9-21-1960	Well Alger	No	100 gpm	100 afy		21.3 afy		78.7 afy excess
2. G1-25994C	District	12-5-1990	Well Cedargrove	No	262 gpm	53.8 afy		25.4 afy		28.4 afy excess
3. G1-25509C	District	8-25-1989	Well Rockport	Yes. See footnotes.	95 gpm	19.0 afy		9.3 afy		9.7 afy excess
4. G1-20763P	District	7-24-1973	Well Skagit View Village	Yes. See footnotes.	200 gpm	38.4 afy		11.3 afy		27.1 afy excess
5. G1-28137P	District	6-4-2002	Well Marblemount	No	150 gpm	9.4 afy		4.8 afy		4.6 afy excess
6. G1-25755C	District	6-26-1990	Well Mountain View	No	41 gpm	3.8 afy		3.3 afy		0.5 afy excess
Claims 1.										
2.										
3.										
4.										
TOTAL	**********	*********	*********	**********						

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		EXISTING CONSUMPTION THROUGH INTERTIE		CURRENT INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1. Fidalgo Island water system interties	City of Anacortes	See footnotes for intertie information					
2.							

3.								
4.								
TOTAL	**********							

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
4.					

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

To return form, please see reverse side.

Footnotes:

1. District satellite water systems:
    i. Alger (PWSID 01400K)
    ii. Cedargrove (PWSID 119174)
    iii. Rockport (PWSID 736006)
    iv. Skagit View Village PWSID 968795)
    v. Marblemount (PWSID AA6423)
    vi. Mountain View (PWSID 03774Y)
    vii. Fidalgo Island (PWSID 00932Y)
    viii. Potlach Beach (PWSID 69034L)
2. Existing consumption is related to 2012 annual production.
3. Interties with the City of Anacortes water system are available to the District on an "as-needed" basis:
    - Four interties (Avon, Riverbend, Lefeber, Fredonia) are connected to the Judy Reservoir Group A Water System (PWSID 79500E) with a projected production of 49.3 million gallons in 2013.
    - Seven interties are connected to the Fidalgo Island System (PWSID 03774Y) with a projected production of 49.4 million gallons in 2013.
    - The total projected production from all interties with the City of Anacortes is projected to be 98.7 million gallons in 2013. The existing agreement with the City of Anacortes limits the District's use of the interties to 375 million gallons per year, resulting in an excess supply of 276.3 million gallons per year (848 afy).
4. G1-25509C: the total withdrawal in combination with G1-22623C (Washington State Parks and Recreation Commission) shall not exceed 100 gpm and 38.6 afy.
5. The Potlach Beach water system (PWSID 69034L) uses saltwater from a marine water body and a water right permit is not required (Ecology POL 1015).

Please return completed form to the Office of Drinking Water regional office checked below.

☒ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 3

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY (DISTRICT)
SATELLITE SYSTEMS-WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 20 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (20-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G1-*05743C (Certificate No. 8 Page 3885-A)	Alger Community Club, Inc.	9-21-1960	Well Alger	No	100 gpm	100 afy		38.2 afy		61.8 afy excess
2. G1-25994C	District	12-5-1990	Well Cedargrove	No	262 gpm	53.8 afy		79.6 afy		25.8 afy deficiency
3. G1-25509C	District	8-25-1989	Well Rockport	Yes. See footnotes.	95 gpm	19.0 afy		13.8 afy		5.2 afy excess
4. G1-20763P	District	7-24-1973	Well Skagit View Village	Yes. See footnotes.	200 gpm	38.4 afy		11.8 afy		26.6 afy excess
5. G1-28137P	District	6-4-2002	Well Marblemount	No.	150 gpm	9.4 afy		23.1 afy (2033)		13.7 afy deficiency
6. G1-25755C	District	6-26-1990	Well Mountain View	No	41 gpm	3.8 afy		See footnotes		See footnotes
Claims 1.										
2.										
3.										
4.										
TOTAL	**********	*********	*********	**********						

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1. Fidalgo Island water system interties	City of Anacortes	See footnotes for intertie information.					

2.								
3.								
4.								
TOTAL	**********							

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
4.					

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To return form, please see reverse side.

Footnotes:

1. District satellite water systems:
    i. Alger (PWSID 01400K)
    ii. Cedargrove (PWSID 119174)
    iii. Rockport (PWSID 736006)
    iv. Skagit View Village PWSID 968795)
    v. Marblemount (PWSID AA6423)
    vi. Mountain View (PWSID 03774Y)
    vii. Fidalgo Island (PWSID 00932Y)
    viii. Potlach Beach (PWSID 69034L)

2. With the exception of the Marblemount water system, demand forecasts related to the District's satellite systems have not been updated since the District's 2007 Water System Plan. The Marblemount water system's 20-year demand forecast is related to the 2033 information detailed in the District's 2013 Water System Plan. 20-year forecasts for the remaining satellite systems are related to 2027 demand forecasts listed in the District's 2007 Water System Plan.
3. Interties with the City of Anacortes water system are available to the District on an "as-needed" basis:
    - Four interties (Avon, Riverbend, Lefeber, Fredonia) are connected to the Judy Reservoir Group A Water System (PWSID 79500E) with a projected production of 49.3 million gallons in 2013.
    - Seven interties are connected to the Fidalgo Island System (PWSID 03774Y) with a projected production of 49.4 million gallons in 2013.
    - The total projected production from all interties with the City of Anacortes is projected to be 98.7 million gallons in 2013. The existing agreement with the City of Anacortes limits the District's use of the interties to 375 million gallons per year, resulting in an excess supply of 276.3 million gallons per year (848 afy).
4. The Mountain View water system is projected to be connected to the Judy Reservoir Group A Water System (PWSID 79500E) in the near future. A forecasted water use and water right status has not been completed for this satellite water system.
5. G1-25509C: the total withdrawal in combination with G1-22623C (Washington State Parks and Recreation Commission) shall not exceed 100 gpm and 38.6 afy.
6. The Potlach Beach water system (PWSID 69034L) uses saltwater from a marine water body and a water right permit is not required (Ecology POL 1015).

Please return completed form to the Office of Drinking Water regional office checked below.

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APPENDIX B

WATER FACILITIES INVENTORY FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/15/2013
Printed: 03/20/2013
WFI Printed For: On-Demand
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
79500 E	SKAGIT COUNTY PUD 1 JUDY RES	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

DALE C. WARDELL [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-2132	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 610-3757	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 856-1808	Owner Evening Phone:	(360) 661-5630
Fax:	E-mail: wardell@skagitpud.org	Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

☒ Agricultural	☒ Hospital/Clinic	☒ Residential
☒ Commercial / Business	☒ Industrial	☒ School
☒ Day Care	☒ Licensed Residential Facility	☒ Temporary Farm Worker
☒ Food Service/Food Permit	☒ Lodging	☒ Other (church, fire station, etc.):
☒ 1,000 or more person event for 2 or more days per year	☒ Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)

☐ Association	☐ County	☐ Investor	☒ Special District
☐ City / Town	☐ Federal	☐ Private	☐ State

14. STORAGE CAPACITY (gallons)

24,120,000

--- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES ---

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
79500 E	SKAGIT COUNTY PUD 1 JUDY RES	SKAGIT	A	Comm

15	16	17	18										19			20	21						22	23	24				
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	JUDY RESERVOIR									X			X			Y			X			X		18900	NW NE	05	34N	05E
S02	RANNEY WELL										X				X	Y		X				X		2800	NW NE	07	34N	04E
S03	TOWNSHIP STREET		X												X	Y		X				X	55	600	NW NW	30	35N	05E
S04	02200C/ANACORTES	02200 C											X			Y	X							2000	NW SW	09	34N	03E
S05	InAct 06/03/1991 02200C/ANACORTES	02200 C												X			X							1500	NW SE	03	34N	02E
S06	InAct 06/03/1991 WHITMARSH 1		X											X			X						190	35	NW SE	03	34N	02E
S07	InAct 06/03/1991 WHITMARSH 2		X											X			X						18	35	NW SE	03	34N	02E
S08	02200C/ANACORTES	02200 C												X		Y	X							1000	SW SW	12	34N	03E
S09	02200C/ANACORTES	02200 C												X		Y	X							3250	SE NW	13	34N	03E
S10	02200C/ANACORTES(BEAVER MARSH	02200 C											X			Y	X							6900	SE SW	10	34N	03E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
79500 E	SKAGIT COUNTY PUD 1 JUDY RES	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	27600	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	20134		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	1258		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	7466		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	2293	2293	
28. TOTAL SERVICE CONNECTIONS		29893	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 65000

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	70	70	70	70	70	70	70	70	70	70	70	70

35. Reason for Submitting WFI:

☐ **Update - Change** ☐ **Update - No Change** ☐ **Inactivate** ☐ **Re-Activate** ☐ **Name Change** ☐ **New System** ☐ **Other** _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

APPENDIX C

SANITARY SURVEYS

2010 Sanitary Survey of Judy System

2013 Sanitary Survey of Water Treatment Plant

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
20435 72nd Ave. S. , Suite 200, K17-12• Kent, Washington 98032 -2358

August 25, 2010

DAVID JOHNSON JR
SKAGIT COUNTY PUD 1
PO BOX 1436
MT VERNON WA 98273-1436

Subject: Skagit County PUD No 1-Judy Reservoir (ID#79500)
Skagit County
Routine Sanitary Survey-Distribution System

Dave

Dear Mr. Johnson:

On June 14 and 18, 2010 I met with PUD staff and conducted a sanitary survey of the Judy Reservoir system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time District staff devoted to showing me your water system and answering my questions.

A sanitary survey of the filtration plant was completed on June 14. This is covered in a separate letter.

The attached reports contain a number of recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by October 1, 2010.

The Drinking Water Regulations require that all Group A public water systems have a sanitary survey every 5 years. In order to receive credit for the survey, a sanitary survey fee must be paid. Enclosed is an invoice for $2448.00. Please remit your complete payment in the form of a check or money order within thirty days of the date of this letter to: DOH, Revenue Section, P.O. Box 1099, Olympia, WA 98507-1099. This fee also covers the survey for the Fidalgo Island system, which was conducted concurrently.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary, Water Quality Monitoring Requirements, Photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Dave Ostergaard, Mike Fox, Becky Zorn, Skagit County PUD

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
20435 72nd Ave. S., Suite 200, K17-12 • Kent, Washington 98032 -2358

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: June 14 and 18, 2010

NAME OF SYSTEM: Skagit PUD-Judy Reservoir (ID#79500E)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Dave Ostergaard, Mike Fox, Becky Zorn

REASON FOR INSPECTION: Routine Sanitary Survey-Distribution system

---------- OBSERVATIONS ----------

Source/Treatment. This water system is located in west Skagit County and serves about 19,000 residential connections. The source of supply is filtered surface water from Judy Reservoir supplemented by filtered surface water purchased from the City of Anacortes. The sanitary survey of the filtration plant was completed on June 14 and is covered in a separate report.

Distribution. The Judy Reservoir system covers an extensive area including the cities of Mount Vernon, Burlington and Sedro Woolley and the surrounding rural areas. The service area is divided into about twenty separate pressure zones with twenty two storage reservoirs and a similar number of booster pump stations. During the survey we focused on distribution water quality, general operations and maintenance procedures, older facilities and facilities that were not covered by the previous survey in 2005. Eight storage facilities were inspected during this survey: 9th and Highland, Division St, Nookachamps Hills, East Big Lake (2), West Big Lake, Bulson Road, Little Mountain and the Bayview Standpipe.

The distribution system consists of a mix of ductile iron, plastic and asbestos cement. Ductile iron pipe is the standard for new mains.

Water Quality. This system is in compliance with all primary drinking water quality standards and has completed the required distribution system water quality monitoring as summarized in the attached table. Although disinfection by-products monitoring has been completed, quarterly reporting of the results has not been completed as required.

Design Approval/Planning. The District's most recent water system plan was approved by the Department on November 12, 2008. This system has a green operating permit, indicating that it is in substantial compliance with the drinking water regulations and is considered by the department to be adequate for both existing uses and projected growth.

Operations. The system is operated by well qualified and motivated people. Staff have made significant progress in improving the water quality monitoring and cross connection control programs.

---------- RECOMMENDATIONS/DIRECTIVES ----------

1. Please resume quarterly reporting of disinfection by-products results, and provide results from January, 2007 forward. Your reporting format needs to include the running annual average, calculated quarterly.

2. Please provide an updated coliform monitoring plan. We support your plans to add more dedicated sample stations for coliform monitoring.

3. The 9th and Highland Reservoir is located in a vulnerable location next to a high school, but lacks telemetry and security alarms. The District should evaluate measures to improve monitoring and security at all its reservoir sites. Security measures such as fencing, intrusion alarms, surveillance and water quality monitoring systems should be considered in the context of the District's overall vulnerability assessment and emergency response program.

4. The Division Street Reservoir overflow/drain line outlet was buried. Reservoir drain lines should discharge to daylight and have a screen or flap valve on the discharge end.

5. The East Big Lake Reservoirs have a submerged drain line discharge. A sample tap should be installed for each reservoir.

6. The West Big Lake Reservoir has a submerged drain line discharge and no flap valve.

7. The Little Mountain Reservoir has poor access which hampers maintenance. The drain line is wood stave and is in extremely poor condition. Use of this drain line would likely wash out the access road and possibly damage the adjacent property. This needs to be a high priority for replacement.

8. The exterior paint on the Bay View standpipe is in poor condition. The drain line discharge needs a flap valve or screen.

9. We recommend that 24-mesh non-corrodible insect screen be used to protect openings in all ground level tanks. When retrofitting older tanks, you should evaluate the size of the vent to ensure that a tight mesh will not excessively restrict the flow of air during draining and filling operations.

WATER QUALITY MOI ORING COMPLIANCE

System Name: Skagit PUD – Judy ID#: 79500 County: Skagit

System Type: (A-Comm) A-TNC, A-NTNC, B Population: 65,000

DISTRIBUTION MONITORING

Type of Sample	# Samples	Frequency	Sample Location	Most Recent on File	Notes
Coliform bacteria	70	monthly	per your coliform monitoring plan ☐ ★ need update	May 2010	No coliforms detected in past 12 months
Lead & Copper	30	3 years	customer's taps in high risk homes	Aug 2009 Pb_{90} = .003 Cu_{90} = .087	Next due June – Sep 2012
Chlorine Residual	1 70	daily month	representative points in distribution system	May 2010	same time and location as coliform samples
Asbestos	1	9 years	in the distribution system	11/30/2009 (ND)	for systems with A/C pipe
D/DDB Stage 1 – TTHM & HAA5	4	Quarter	per DDBP monitoring plan	3/30/2010	Qtrly reports not submitted **
D/DDB Stage 2	Monitoring starts in 2012. EPA approved IDSE			Std Mon Rpt – 12 Dec 2009	

SOURCE MONITORING

Type of Sample	# Samples	Frequency	Sample Location	Most Recent Samples on File S- 01	S-	S-	Notes
Inorganic Chemical and Physical Parameters (IOC)	1	36 mos	Each source or wellfield after treatment	6/23/2008			waiver granted
Nitrate	1	12 mos	see above	8/18/2009			nitrate < detection limit
VOC	1	36 mos	see above	6/23/2008			waiver granted thru 2010
SOC *	waived		see above	12/15/2006			waiver granted thru 2010
Radionuclides	1	36 mos	see above	8/10/2009			
(Gross Alpha)							

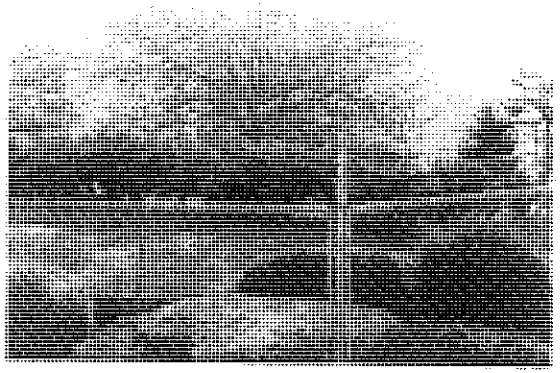
* herbicides, pesticides, insecticides

Sanitary Survey
Skagit PUD Judy Reservoir
Distribution system

18 June 2010

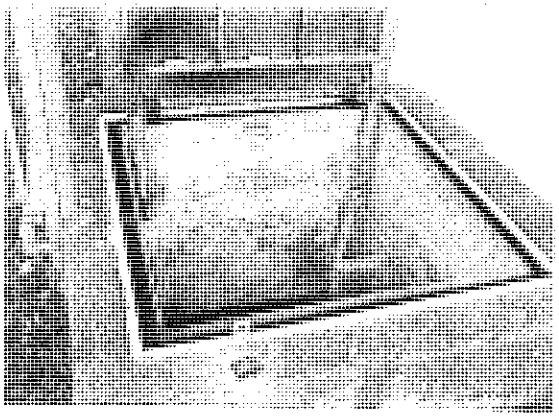
Nancy Feagin

Ninth & Highland reservoir



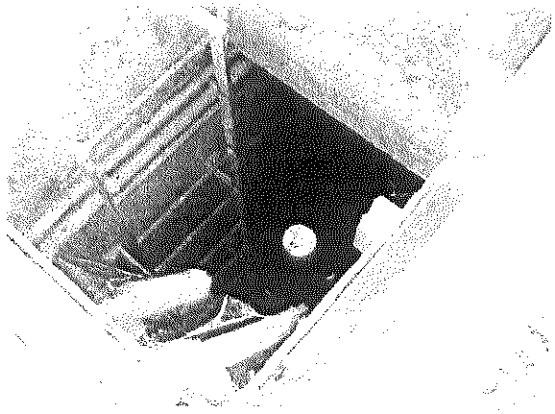
Ninth & Highland reservoir

valve vault

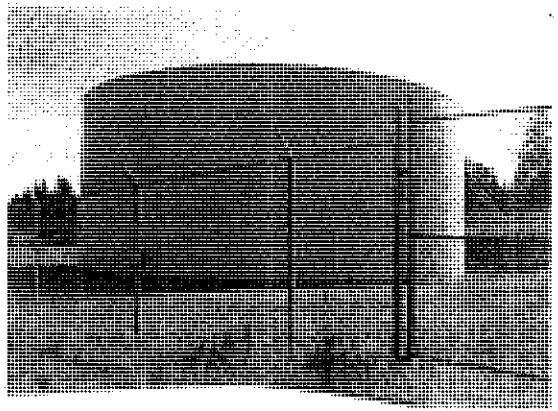


Ninth & Highland reservoir

valve vault

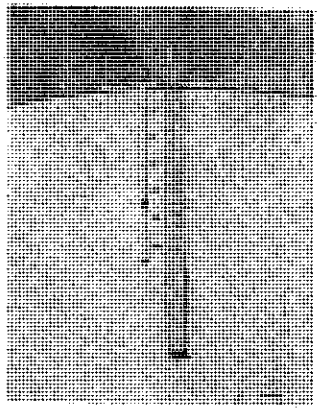


Division St reservoir



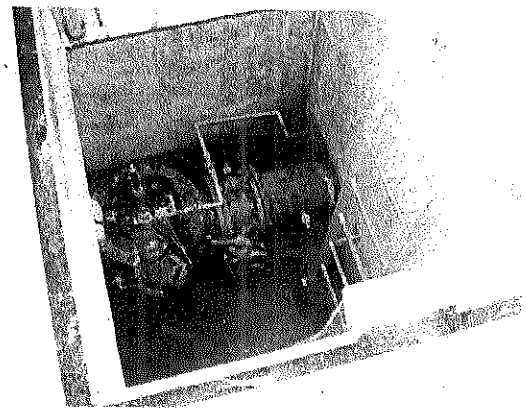
Division St reservoir

access ladder & level gage



Division St reservoir

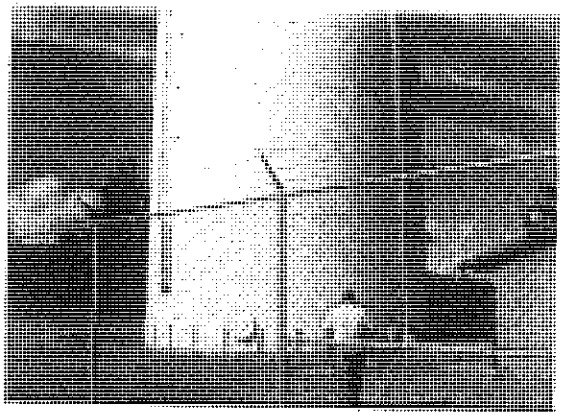
altitude valve vault



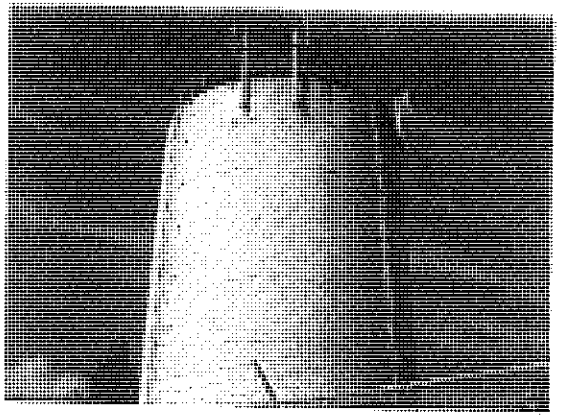
Division St reservoir

overflow/drain line discharge

Nookachamps reservoir

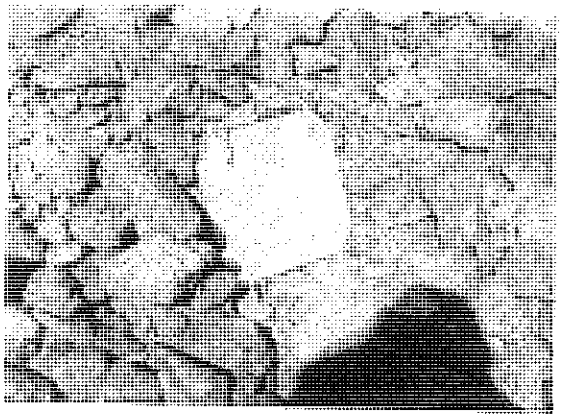


Nookachamps reservoir

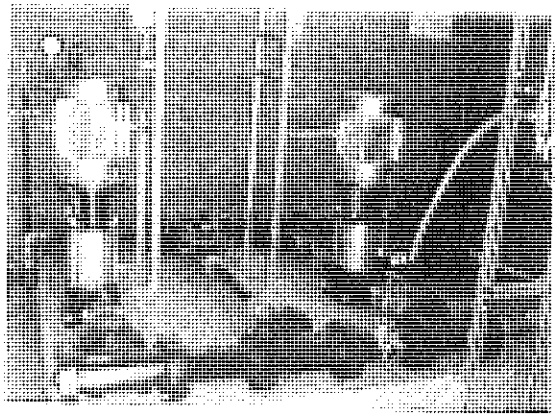


Nookachamps reservoir

overflow/drain line discharge



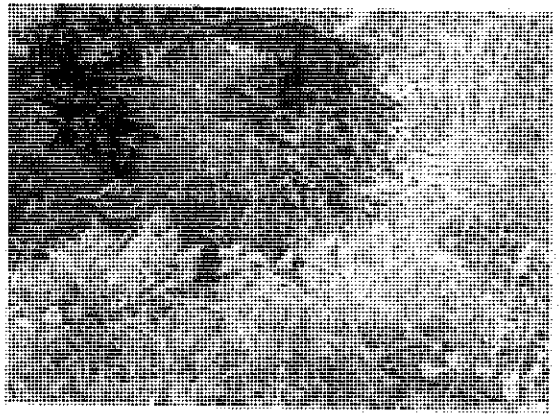
Nookachamps pump station



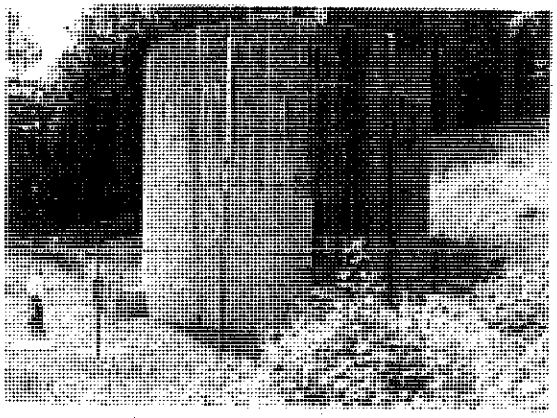
East Big Lake Reservoirs

East Big Lake Reservoirs

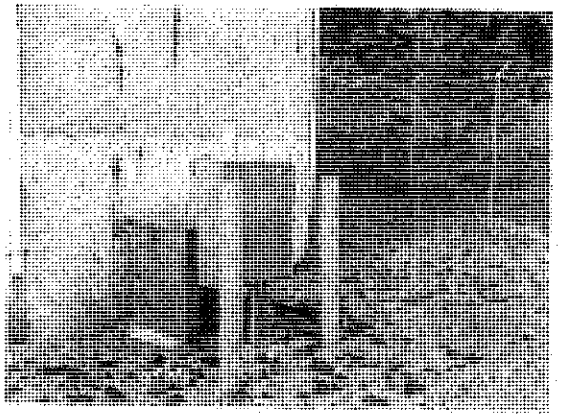
overflow/drain line discharge



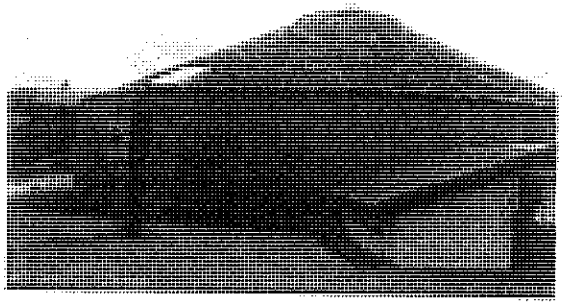
West Big Lake reservoir



West Big Lake reservoir

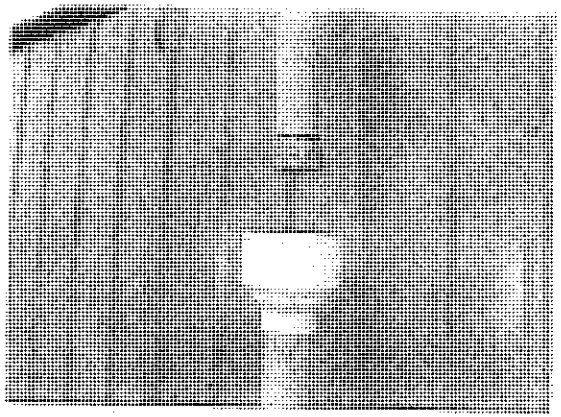


Bulson Rd reservoir



Bulson Rd reservoir

overflow air gap

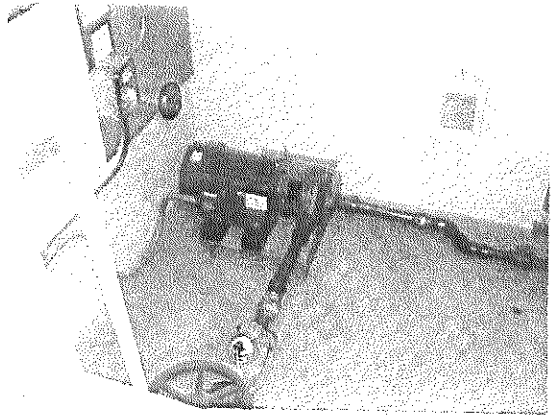


Bulson Rd reservoir

overflow/drain line discharge

Bulson Rd reservoir

pump station

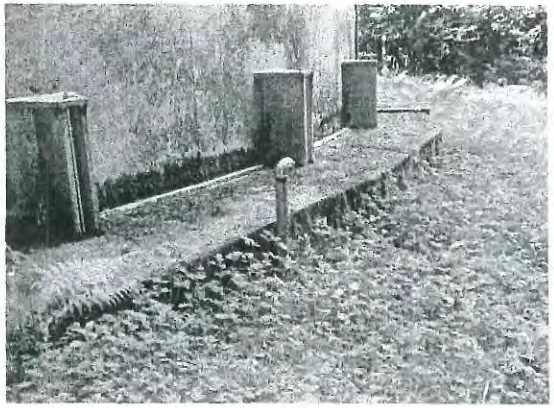


Little Mountain reservoir

Little Mountain reservior

overflow air gap

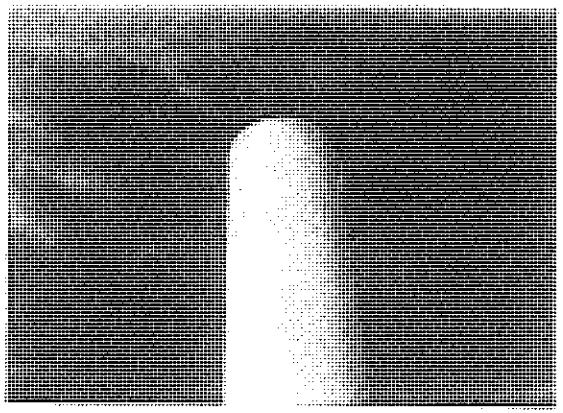
Little Mountain reservoir



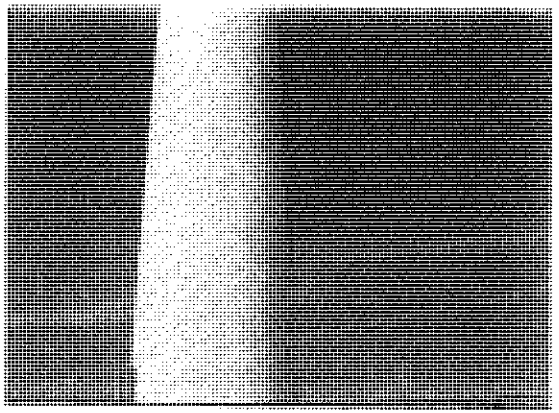
Little Mountain reservoir

wood stave drain line

Bayview standpipe

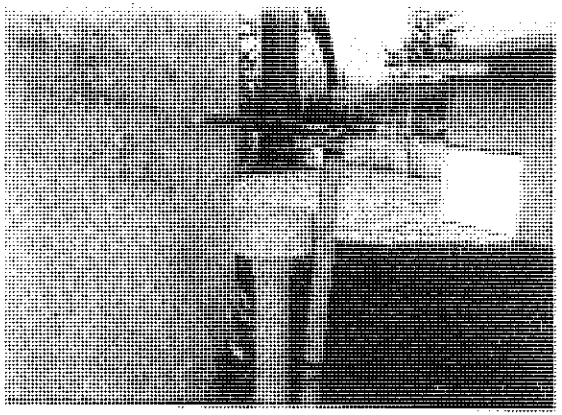


Bayview standpipe



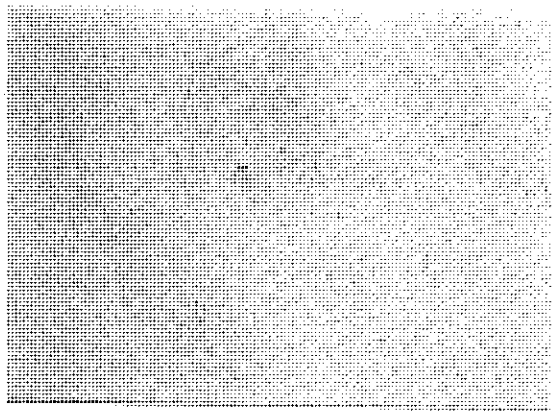
Bayview standpipe

overflow air gap



Bayview standpipe

external corrosion



STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310, Kent Washington 98032-2388

October 1, 2013

DALE WARDELL
SKAGIT COUNTY PUD 1 JUDY RES
PO BOX 1436
MT VERNON, WA 982731436

Subject: Skagit County PUD No 1-Judy Reservoir (ID# 79500E)
Skagit County
Sanitary Survey-Filtration Plant Only

Dale
Dear Mr. Wardell:

On September 11, 2013 members of this department met with you and other PUD staff to carry out a sanitary survey of your filtration plant. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations.

The plant is well operated by highly capable staff. The PUD consistently meets finished water turbidity limits established under the Surface Water Treatment Rule. In addition, PUD meets optimized treatment goals established by EPA. For 2012, your plant ranked in the top two treatment plants in Washington State based on turbidity performance. Nice work!

Major findings and recommendations

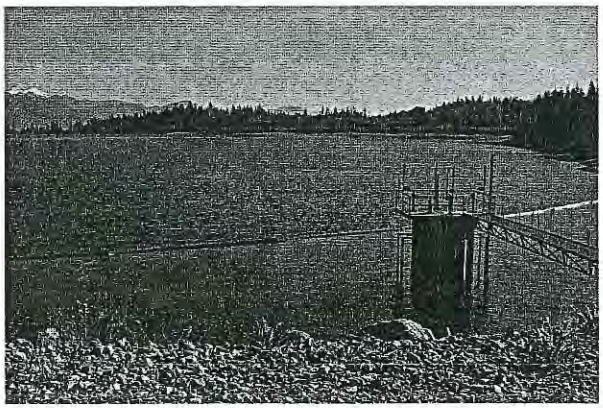
1. In previous surveys, we recommended that you make security improvements such as providing video cameras and motion sensors at the pump station and clearwells. This has not been followed up on. During this inspection we noticed outer doors at the filter plant left ajar. PUD should evaluate measures to improve monitoring and security at its water treatment plant facilities. Security measures should be considered in the context of the District's overall vulnerability assessment and emergency response program.

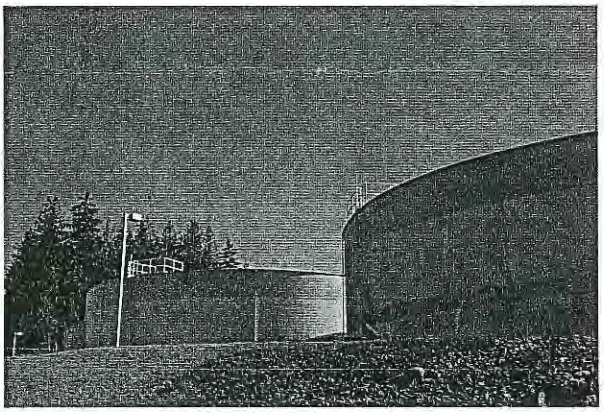
2. Monitoring & reporting. Attached is a summary of your SWTR monitoring and reporting practices. Some changes are needed to make reporting more accurate and comply with regulatory requirements. The more significant items include:
   - A continuous turbidimeter installed on the combined filter effluent pipe;
   - A pH and chlorine residual monitoring station installed at the end of stage 4 (prior to ammonia injection).
   - A new tracer study of the clearwells to determine if the contact time provided by the current piping configuration is consistent with your calculated values.

By December 1, please send your plan and schedule for making all of the changes identified in the enclosed summary.

3. The particle counters have not been operational since the plant expansion was completed. This remains from the previous survey. Also the raw water turbidimeter (SS6) was not working properly. All monitoring equipment should be kept in good working order.

4. We recommend you zero out the streaming current monitor when the plant is optimized for easier interpretation of the reading. The owner's manual has more details.





We appreciate the time you and the other PUD staff spent showing us the plant. Please review the attached field report and call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The total cost of this survey is $1,836. An itemized invoice showing the amount due is enclosed.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (SWTR Monitoring Summary, Sanitary Survey Field Data Sheet including schematic)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Mike Fox, Skagit County PUD No. 1

SWTR Monitoring
Skagit PUD-Judy Reservoir ID#79500

Turbidity Monitoring & Reporting:

	Current Location	Reported value	*Changes needed*
Raw	raw water meter. (normally agrees well with grab sample from raw water pumpstation)	Average of 2 hour readings recorded on the daily log sheet	
Combined Filter Effluent (CFE)-4 hr rdgs	filter effluent pipe	Grab samples every 2 hours, report every other reading	*Need continuous turbidimeter*
CFE-daily max	filter effluent pipe	Max of two hour grab samples	*Need to report max daily value from continuous turbidimeter*

Turbidimeter settings: error hold mode should be set to "transfer" to 0.000 NTU. The signol spon should be set to detect the regulatory limit, >2.0 NTU for individual filters, and > 1.0 NTU for the combined filter effluent.

Disinfection Monitoring:

	Current Location	Reported value	*Changes needed*
Chlorine at Distribution Entry	after clearwell (W1 pump/plant water)	Minimum value for day (From continuous readings)	
Inactivation Ratio			
Stage 1	From raw water pumps to start of floc basins		
Peak hourly flow	raw water meter	maximum value for day	
Temp	end of floc basins	average for the day	*use lowest, not average*
pH	raw water meter	average of 6 grabs	*use highest, not average*
disinfectant residual	raw water meter	lowest value at PHF	
Stage 2	Floc basins- *need to correct spreadsheet to colculate based on no. of basins in service*		
Peak hourly flow	raw water meter	maximum value for day	
Temp	end of floc basins	average for the day	*use lowest, not average*
pH	end of floc basins	average of 6 grabs	*use highest, not average*
disinfectant residual		lowest value at PHF	
Stage 3	From end of floc basins to filter effluent pipe		
Peak hourly flow	raw water meter	maximum value for day	
Temp	end of floc basins	average for the day	*use lowest, not average*
pH	filter influent channel after chlorine injection (sample pump)	average of 6 grabs	*need to move to combined filter effluent, use highest*
disinfectant residual		lowest value at PHF	*need to move to combined filter effluent*
Stage 4	Combined filter effluent pipe to ammonia injection		
Peak hourly flow	raw water meter	maximum value for day	
Temp	end of floc basins	average for the day	*use lowest, not average*
pH	combined filter effluent pipe after chlorine injection. Also take daily grab at sample line- not reported	average of 6 grabs	*move sampling point to end of stage 4, use highest*
disinfectant residual		lowest value at PHF	*move sampling point to end of stage 4*

Stage 5	Clearwells- *Need to run new tracer study to confirm contact time*		
Peak hourly flow	raw water meter	maximum value for day	*Need to use outflow from clearwell*
Temp	end of floc basins	average for the day	*use lowest, not average*
pH	after clearwell (W1 pump/plant water)	average of 6 grabs	*use highest, not average*
disinfectant residual	after clearwell (W1 pump/plant water)	lowest value at PHF	
tank level		minimum level at peak hourly flow	

9.30.2013 NF

Washington State Department of Health
Environmental Health Programs
Office of Drinking Water

Sanitary Survey of Rapid Rate Filter Plant

Field Data Sheet

System Name	I.D. Number	Date	Evaluation By
Skagit PUD No. 1-Judy Res	**79500E**	**11 Sep 2013**	**Nancy Feagin & Krista Chavez**

Operator(s) Present	WTPO#	Certification Level	Title	Phone Number
Dale Wardell (lead) **Mike Fox (operations)** **Emilia Blake (lab)**	**003874**	**WTPO4**	**Water Treatment Plant Superintendent**	**360-848-2132**

Identify lead operator/WTP supervisor above.
Is lead operator new since the last survey? (Y/N) **Y**
Does this person sign the reports? (Y/N) **Y** Present during the survey? (Y/N) **Y**

Source Water & Watershed Information *(Review Watershed Risk Report from Surface Water Database (SWDB); Gather information needed if incomplete) Intake: Protection provided to Intake facilities; adequate screening; adjustable levels of withdrawal; pumped or gravity (reliability concerns)? Frequency and location of raw water turbidity and fecal coliform samples.*

The previous survey of this plant was completed in June, 2010.

Judy Reservoir is fed by diversions from the Skagit River & four streams in the Cultus Mountain (CM) Watershed: Gilligan, Salmon, Turner and Mundt. Among the four CM streams, Gilligan provides the majority of the flow (91%). The predominant land use in the CM watershed is forestry, and the majority of the watershed is owned by DNR and Weyerhauser. The CM watershed has been rated by the department as having a low risk to microbial contamination.

When the Skagit river diversion is in operation, the watershed risk is estimated to be high. This is due to the low degree of watershed control, types of land use and known sources of contamination present in the Skagit River watershed. The reservoir area is patrolled daily and approximately 60 percent of the reservoir perimeter is fenced. In the summer the CM watershed is patrolled weekly.

Raw water fecal coliform is monitored at the plant intake, representing a blend of water from the Skagit River and the CM streams. In the previous two years levels have averaged 4.9/100 ml with a maximum of 130/100 mL. Migratory birds (snow geese, swans and Canada geese) frequent the reservoir and may impact fecal coliform levels. The source was previously classified as bin 1 under LT2. PUD began a second round of monitoring in April 2013 to evaluate impact of the Skagit River diversion.

The reservoir spill elevation is 465 ft and the historical low level is 430 ft. The water level on the day of our visit was 448 ft. The plant intake has a ¼ inch fixed screen and four intake levels available; PUD typically uses the lowest one (El 429). A separate emergency intake is also available. Skagit river water could also be pumped directly into the plant under emergency conditions, but this would be after the point of primary disinfection and would require a health advisory.

In summer, PUD aerates the water in Judy reservoir to help control algae.

Plant Schematic *– Use schematic from Comprehensive Performance Evaluation (CPE) report, if available; Show actual compliance monitoring locations for Combined Filter Effluent (CFE) turbidity, Concentration of Residual x Time of Contact (CT), and residuals @ entry point to Distribution System (DS); Place arrow and letter at chemical addition points and identify in tables below.*

(See separate page)

Chemical Addition - Coagulant(s), Filter Aid(s), pH Adjustment, Pre-Cl_2 /Rapid Mix:

Chemical		Location	Dose	Chemical		Location	Dose
~~Alum~~-ACH	B	u/s static mixer	3.0 mg/L (range 2.5-3.5)	Soda Ash			
Ferric Cl/SO$_4$				Caustic Soda			
PACl				Lime			
CAP:	B	u/s static mixer	0.9 mg/L (range 0.9-2.5)	Pre Chlorine			
CAP:				Potassium Perm			
FAP:	D1	filter influent flume	0.06 mg/L (range 0.02-1.0)	Other: CO2	C	d/s static mixer	600 lbs/day

All chemical used in the WTP NSF Standard 60 Approved: [X]

Note: PACl = Polyaluminum Chloride; CAP = Coagulant Aid Polymer; FAP = Filter Aid Polymer; Insert name(s).
How are dosages determined; how are they controlled?(Jar tests, Visual floc formation, streaming current monitor, historical, monitoring data, etc.); what turbidity variation triggers a change?(Compare monthly chemical usage to dosage.) Bulk storage? Day tanks?

ACH-aluminum chlorohydrate: **Isopac 80**
CAP-coagulant aid polymer: **catiouic polymer Floquat FL-4520 PWG (currently) ; earlier in the year used Magnifloc LT 7990 & 7981**
FAP-filter aid polymer **Kemira Superfloc A-1849RS**

The plant has day tanks, calibration cylinders and redundant feed pumps for each chemical feed system. The raw water quality is stable, but changes in turbidity are noticeable about 3 hrs after placing the Skagit River source on-line. Coagulant dosages are set using operator experience from historical operation with input from streaming current monitor (SCM), turbidity, and observed filter run length.

CO_2 lowers the pH (goal=6.6) to improve Giardia inactivation & increase removal of disinfection by-product precursors.

Rapid Mix Type: Static Mixer [X] Mechanical Mixers [ ] Injection Mixers [ ] In-line Blender Mixers [ ]

Mixing Energy (G or GT): **4000 s^{-1}**

Flocculation:

Flocculator Type: **NONE** [ ] Hydraulic [ ] Mechanical [X] No. of basins **2 trains, 2 stage**

Target Mixing Energy (G or GT): **40 s^{-1}**

Appearance of floc; tapered energy input?

Sedimentation/Clarification:

NONE (Direct Filtration) [X] Horizontal-flow rectangular [ ] Tube Settlers [ ] Dissolved Air Flotation [ ]
Adsorption Clarifier [ ] Horizontal-flow round [ ] Inclined-plate [ ] Other _____ [ ]

Basin Dimensions: Length: _____ Width: _____ Depth: _____

Number of basins _____ Total Basin Volume: _____ Gallons

Contact clarifier media type? Cleaning frequency?

Filtration:

Single Media		Dual Media	X	Mixed Media		Pressure Filter		Deep Bed Mono-media	
Media Type:		Sand	12	Anthracite	24/32*	Garnet		Other: _____	

Filter Dimensions: Length: **20ft-1 in** Width: **25 ft** No. Filters: **8**

Total Area: **502x8=4016 sf** Max. plant flow rate: **34-36 MGD** Filter Rate: **7** gpm/sq ft

today: 8300 gpm= 12 MGD

Individual Filter Turbidimeters [X] Combined Filter Effluent Turbidimeter [G] Calibration Date: **9/5/2013**

G-No on-line unit, using grab samples

Backwash criteria: **n/a** hrs **22** ft **0.04** ntu Rate **20** gpm/sq ft Time **80,000 gal** ~~min~~

Backwash to: Lagoon [ ] Lagoon To Raw Water [X] Plant intake [ ] Sanitary Sewer [ ]

Filter-to-waste: No [ ] Yes [X] Time **n/a** min Stopped @ **0.04** ntu

Condition of media (mounding, cracking, mudballs); when replaced; Control of filter rate and backwash rate; Variability of filter rate; Turbidimeters properly operating? Numbers reported when plant is running? Models of turbidimeters: continuous and benchtop; filter to waste (FTW) at all start-ups or after backwash (BW)? Recycle backwash water, thickener supernatant, or sludge dewatering process liquid? Where to? Request to see required records.

***The old filters (1-4) have an anthracite depth of 24 inches, while the new ones (5-8) installed in 2009 have a depth of 32 inches. The newer filters have gravelless underdrains and air scour.**

Termination of backwash is based on total volume, which has been found by experience to be a good balance between sufficient cleaning and minimizing ripening time. They do not monitor backwash water tnrbidity. Plant staff complete maintenance & inspection of each filter once every six months. Process inclndes: drain, measure media depth from a fixed control point, pressure wash, treat with 50 ppm caustic & superchlorinate with 50 ppm cl2 for 72 hours.

Monitoring equipment:

continuous turbidimeters:	**HACH Surface Scatter 6 & HACH 1720C (raw), HACH 1720 E (IFE), HACH 1720 E post clearwell.**
benchtop turbidimeter:	**HACH 2100 N**
particle counters:	**Laser Trac PC 2400 D (old filters)/Chemtrac PC 2400 (new) NOT OPERATIONAL**
streaming current monitor	**SCM 2500 (reading -67)**

Raw water Surface Scatter & HACH 1720C readings not consistent

Turbidity Readings (NTU):

Raw	2.37	SS6 reading 1.03						
IFE	(1) Offline	(2) 0.034	(3) Offline	(4) 0.020	(5) 0.020	(6) 0.019	(7) 0.015	(8) 0.024
CFE	n/a							
Post Clearwell	0.021							

Chemical Addition – Disinfection:

Chemical		Location	Dose	Chemical		Location	Dose
Gas Chlorine*	A	raw water pump station		UV*			
Gas Chlorine	D1	exiting floc basins	0.55 mg/L	Ozone			
Gas Chlorine	F	not used		Ammonia	F	prior to clearwell	0.31 mg/L
ClO_2*	A	raw water pump station	0.75 mg/L	Other: **chloramines**	F	total residual	1.29 mg/L

** Cl02 formed using ADOX 3125 aqeous sodium chlorite and chlorine gas, ratio adjusted to provide free chlorine residual, controlled by solution pH*

Clearwell Dimensions: Length: _____ Width: _____ Depth: _____

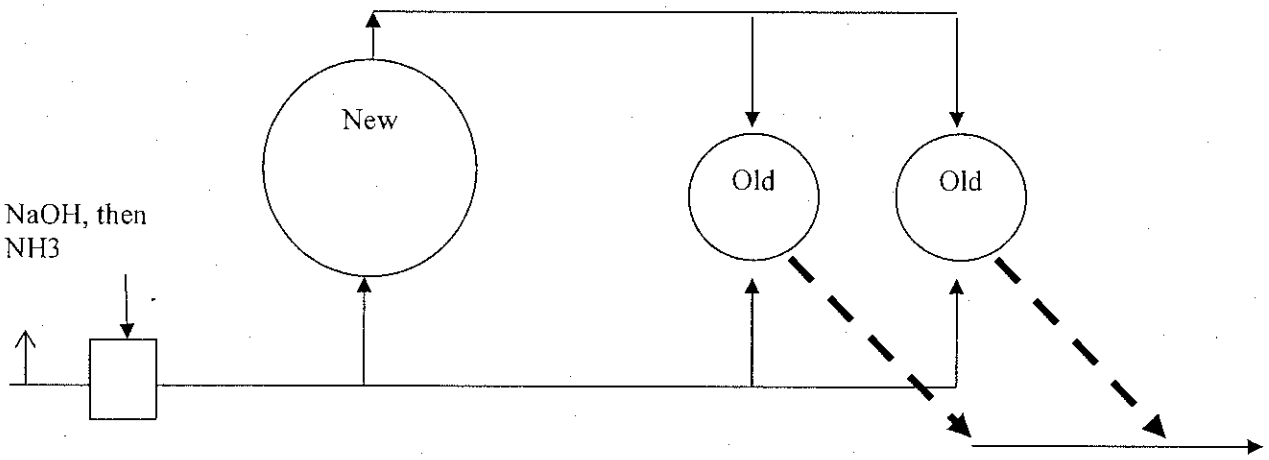
Parameter Monitored	Location	When/ Frequency
pH		
Temperature	See separate sheet	
Disinfectant Residual		
Disinfectant Residual		
Peak Hourly Flow (PHF)		
Other:		

Redundancy of equipment; Contact time (T) evaluation – how derived, variable or constant; How is Peak Hourly Flow (PHF) determined – compare to value used for T in CT calcs; Check CT Summary Report in database, complete as necessary (If CT summary Report is not available, review CT determination in system files); Clearwell vents and screens; Calibration of pH meters and disinfectant residual monitors

Inactivation ratios are always well above 1.

	Diameter (ft)	Depth (ft)	Volume (MG)
#1	95	23	1.22
#2	95	23	1.22
#3	157	23.9	3.3

Flow through the clearwells has been modified to provide consistent pH and chlorine residual:



Monitoring equipment: pH/temp: HACH One pH EC1000 controller & pH pump module; Cl2: HACH CL 17

Chemical Addition – Corrosion Control/Stability/Other:

Chemical		Location	Dose	Chemical		Location	Dose
Soda Ash				Orthophosphate			
Caustic Soda	F	clearwell inlet	13-20 mg/L	Polyphosphate			
Lime				Other:			

Target finished optimal water quality parameters:

pH: **8.4 (goal); 8.58 (today)** Alk: _____ Phosphorus: _____ Other: _____

Best for creation of chloramines

Fluoridation: None [X] Hydrofluosilicic Acid [ ] Sodium Fluoride (Saturator) [ ] Sodium Silicofluoride (Dry Feed) [ ]

Location and Dose:

General Plant Operations/ Cross-Connection Protection (CCP)
Has purveyor had plant hazard evaluation by Cross Connection Control Specialist (CCS)? If so, when?

Internal CCP – chemical makeup; use of day tanks; chemical feed/ makeup interconnections; split chemical feeds? submerged inlets in chemical feed tanks? surface washers? FTW connections? Protection from overfeed? Connections to pumps? Hoses/ hose bibs? Any other treatment provided?

CCCS routinely inspects plant, no obvious cross connections observed

Is plant staffed during all times of operation? No [ ] Yes [X]

Hours of operation: Start: 24/7 Stop: _____ | Number of Shifts 3

Plant staffing – plant rating/mandatory level; certification levels of operators; coverage, shift operation; vacations/ weekends/holidays

The plant is currently rated as a level 4 plant. There are 8 operators, 7 of whom are certified at a level 3 or 4. The plant is staffed using 3 overlapping 10 hour shifts per day. When an operator is sick, the others work overtime to cover.

If unattended or operated remotely, how many hours a day is an operator at the WTP?
N/A

What type of security is provided for the facility and operators?

Plant is fenced with locked gate. Exterior doors open. Pump station is also fenced.

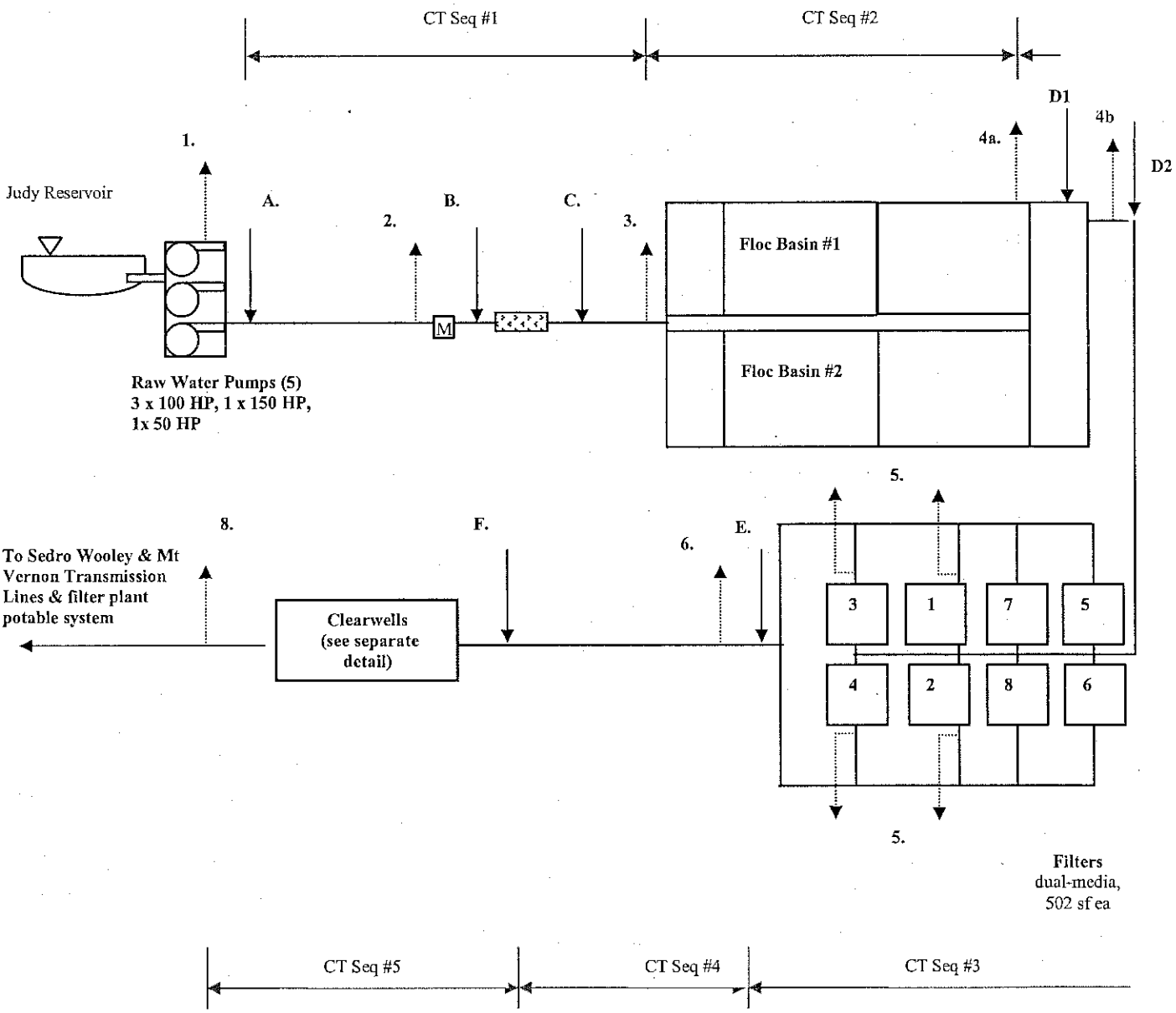
Critical Water Quality Alarms:

Parameter	Monitoring Point	Alarm Level	Shutdown Level	Response
Turbidity - Raw	**raw water meter 1720C**			
Turbidity - IFE	**effluent of each filter**			
Chlorine Residual				
pH - Finished				
Turbidity - Finished	**Grab sample-no alarm**			
Other:				
Other:				
Other:				
Other: (e.g. Clearwell Level)				

When was the last time critical water quality alarms were tested? What was done?
There are 27 alarms, 6-8 of which trigger a plant shut down.

The diesel generator can power the entire plant and is typically needed several times per year. Fuel is sufficient for approximately 3 days of operation. The generator is tested quarterly.

Skagit PUD Judy Reservoir Treatment Plant (Skagit County)
Sept 2013



Chemical addition points:

A. ClO_2, Cl_2

B. CAP, ACH

C. CO_2

D1 Cl_2

D2 FAP

E. Cl_2

F. NaOH, NH_3 (vault)

Monitoring Locations:

1. NTU (grab), pH, alkalinity
2. raw NTU (on-line), particles (on-line) ,temp/ClO_2/ Cl_2 /pH (pumped sample to lab)
3. streaming current
4a. Cl_2, pH (grab)
4b. Cl_2, pH (grab)
5. IFE NTU (on-line), particles (on-line)
6. CFE NTU (grab), temp, Cl_2, pH (pumped sample to lab)
7. Cl_2 (grab)
8. NTU (on-line), chlorite (grab), NH_2Cl (on-line & grab), pH (on-line), alk (grab)

APPENDIX D

WATER SERVICE AGREEMENTS

Skagit County Service Area Agreement from CWSP

Skagit County Franchise Agreement

City of Anacortes Joint Operating Agreement

Water Supply Agreement with Samish Farms Water Association

Water Supply Agreement with North Fir Island Water Association

Water Supply Agreement with Sierra Pacific

AGREEMENT FOR ESTABLISHING WATER UTILITY SERVICE AREA BOUNDARIES

PREAMBLE

This Agreement for water utility service area boundaries identifies and establishes between the undersigned parties the external boundary of the service area for which the designated water purveyor has assumed direct retail water service responsibility. The responsibilities accepted by the water purveyor are outlined in the Skagit County Coordinated Water System Plan (CWSP), and as defined by the adopted rules and regulations of the Washington State Department of Health (DOH). Except as specifically provided herein, this Agreement does not give new authorities or responsibilities to any water purveyor or to Skagit County or State regulatory agencies, but acknowledges the geographical area for these designated service responsibilities.

The terms used within this Agreement shall be as defined in the implementing regulations of Chapter 70.116 RCW, except as identified below.

1. Skagit County Critical Water Supply Service Area Map shall mean the map incorporated into this Agreement as Attachment A for the retail service area, except as amended in accordance with the CWSP procedures and with the concurrence of the affected water purveyors.

2. Retail Service Area shall mean the designated geographical area in which a purveyor shall supply water either by direct connection to the existing system, by a remote/detached system, or through interim service by an adjacent utility under agreement with the designated utility.

3. Wholesale Service Area shall mean the designated geographical area in which a purveyor, a group of purveyors, or another organization provides water to other water purveyors on a wholesale basis. A wholesale water supplier shall not provide water to individual customers in another purveyor's retail service area except with the written concurrence of the purveyor responsible for the geographical service area in question.

4. Lead Agency for administering the Agreement For Establishing Water Utility Service Area Boundaries shall be the Skagit County Department of Health, unless otherwise established by amendment to the CWSP.

The authority for this Agreement is granted by the Public Water System Coordination Act of 1977, Chapter 70.116 RCW.

TERMS OF AGREEMENT

WHEREAS, Such an Agreement is required in WAC 246-293-250, Service Area Agreements-Requirement, of the Public Water System Coordination Act; and

WHEREAS, Designation of retail water service areas, together with the cooperation of utilities, will help assure that time, effort, and money are best used by avoiding unnecessary duplication of service; and

WHEREAS, Definite future service areas will facilitate efficient planning for, and provision of, water system improvements within Skagit County as growth occurs; and

WHEREAS, Responsibility for providing water service through ownership and/or management of water systems in a designated service area is vested in the designated utility; and

WHEREAS, Definite retail and wholesale service areas will help assure that water reserved for public water supply purposes within Skagit County will be utilized in the future in an efficiently planned manner,

NOW, THEREFORE, the undersigned parties, having entered into this Agreement by signature of its authorized representatives, concur with and will abide by the following provisions:

Section 1. Service Area Boundaries. The undersigned parties acknowledge that the Skagit County Critical Water Supply Service Area Map, included as Attachment A to this Agreement and as may be subsequently updated, identifies the purveyor's future water service area. The undersigned further acknowledge that there are no service area conflicts with adjacent water purveyors, or, where such conflicts exist, agrees that no new water service will be extended within disputed areas until such conflicts are resolved.

Section 2. Common Service Area Transfer. It is understood that purveyors may initially continue existing water service within the boundaries of neighboring purveyors, as defined in Attachment A. Such common service areas, if they exist, are described in Attachment B to this agreement. Also included in Attachment B are copies of, or a list of, all resolutions, ordinances, or agreements permitting these uncontested overlays. The undersigned parties agree that any water line for retail service extending outside of the retail service area boundary, as set forth in Attachment A, shall be phased out and service transferred to the designated adjacent purveyor on an economic basis or by mutual agreement.

Economic basis considerations shall include, but are not limited to:

(a) A determination by the present owner of service lines that maintenance, repair, and/or replacement costs exceed attributable income.

(b) Planned or imminent major street improvements or major improvements to either or both water systems which include an opportunity to transfer service.

The terms of the transfer of service area described in this Section shall be established in a separate agreement among the adjacent purveyors whose boundaries are affected.

Section 3. Boundary Streets. Unless separate agreements exist with adjacent purveyors concerning water services or other utility services, the parties agree that the water purveyor which is located to the north or east of boundary streets between this purveyor and adjacent purveyors shall be entitled to provide future water service on both sides of those streets. Depth of service on boundary streets shall be limited to one platted lot or as otherwise agreed by the utilities. Existing services on boundary streets shall remain as connected unless transfer of service is agreed to by both purveyors, as per Section 2. These provisions do not disallow the placement of mains in the same street by adjacent purveyors where geographic or economic constraints require such placement for the hydraulic benefit of both purveyors.

Section 4. Boundary Adjustments. If, at some time in the future it is deemed appropriate by one or both of the undersigned parties to make service area boundary adjustments, such modifications must receive written concurrence (which shall not be unreasonably withheld) of all purveyors that would be directly affected by such a boundary adjustment and the legislative authority(ies) having jurisdiction. These written modifications shall be noted and filed with the designated Skagit County lead agency and DOH. It is understood by the undersigned parties that if, as provided by RCW 70.116.040, the purveyor is unable to provide service within its designated service area boundary it may decline to do so. But, in that case, an applicant will first be referred to adjacent purveyors with an approved water system plan that provides for expansion. An existing system shall be considered "adjacent" to the proposed development if service can be provided with a waterline extension not to exceed one-half mile in length. If service will not be provided by an adjacent purveyor, the developer will be referred to the Skagit County PUD. The original service area boundary will be adjusted accordingly. This provision does not apply where boundary adjustments are made as a result of municipal annexations or incorporations, nor is it intended to modify the provisions of state law.

Section 5. Service Extension Policies. The undersigned parties agree that prior to expanding the purveyor's water service area, other than by addition of retail customers to existing water mains, the purveyor shall have adopted design standards

customers to existing water mains, the purveyor shall have adopted design standards and utility service extension policies. The design standards shall meet or exceed the Skagit County CWSP Minimum Design Standards.

Municipalities further agree that if an individual municipality identifies a service area outside of its existing municipal corporate boundaries, said municipality shall assume full responsibility for providing water service equivalent to (excluding rates and charges) the level of service provided for their inside-city customers. This shall be in conformance with applicable land use policies.

Section 6. Systems Placed in Receivership. RCW 43.70.195 enacted in the 1990 Regular Session of the Washington State Legislature provides that whenever an action is brought in superior court to place a public water system in receivership, the petition to the court shall name candidates for receiver who have consented to assume operation of the water system. The undersigned purveyor agrees to be named as receiver in such actions initiated for systems within its designated service area, which includes all portions of Skagit County not assigned through the CWSP to purveyors other than the Skagit County PUD. By this consent, the undersigned does not waive its rights to appear and participate in the court proceedings to determine acceptable conditions of receivership.

This agreement by reference includes the following attachments:

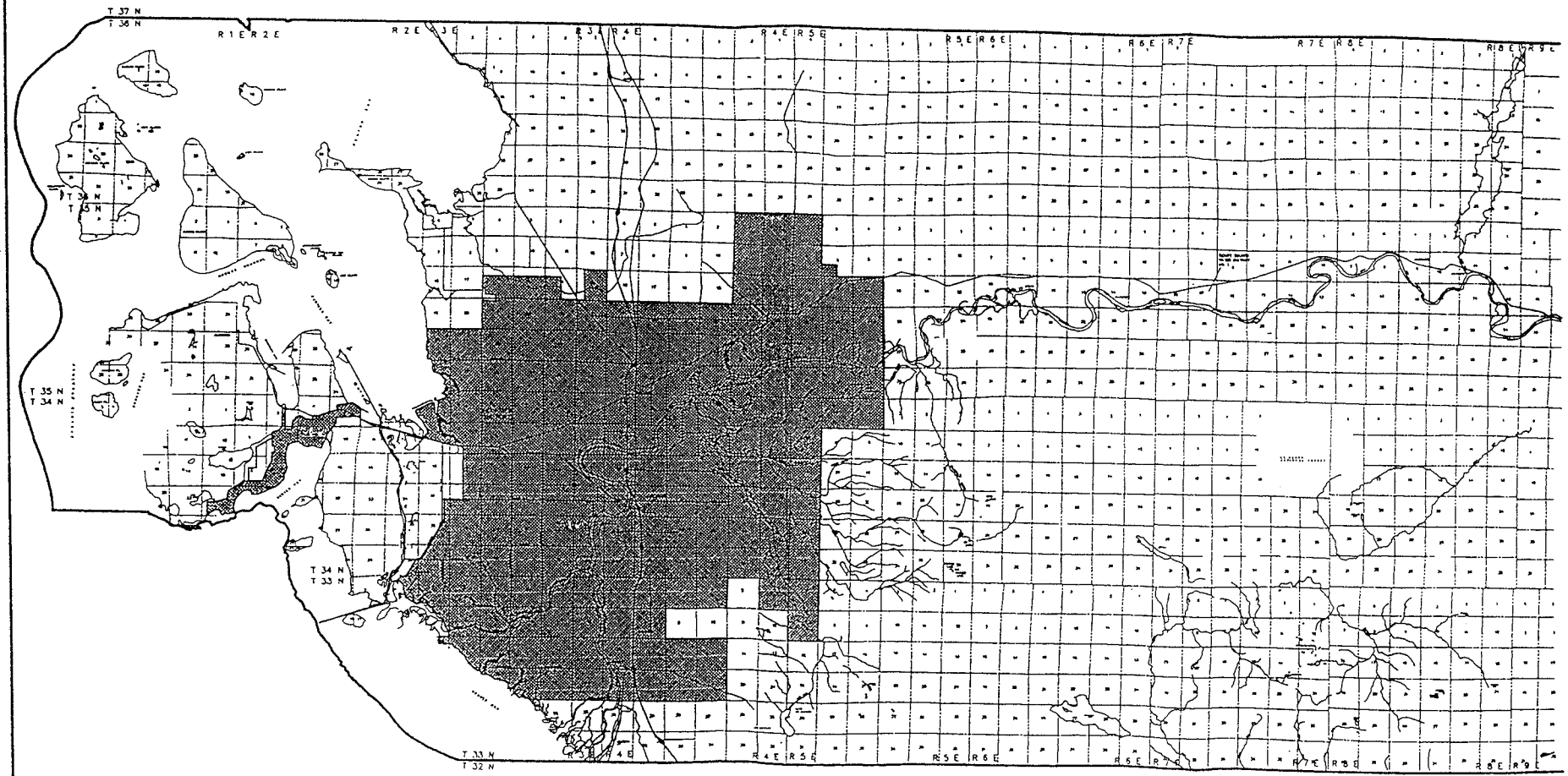
Attachment A - Skagit County Critical Water Supply Service Area Map. (see Section 1)

Attachment B - Common Service Area Agreement - Optional - Utility may attach copies or list such agreements if relevant. (see Section 2)

IN WITNESS WHEREOF, the undersigned parties have executed this Agreement.

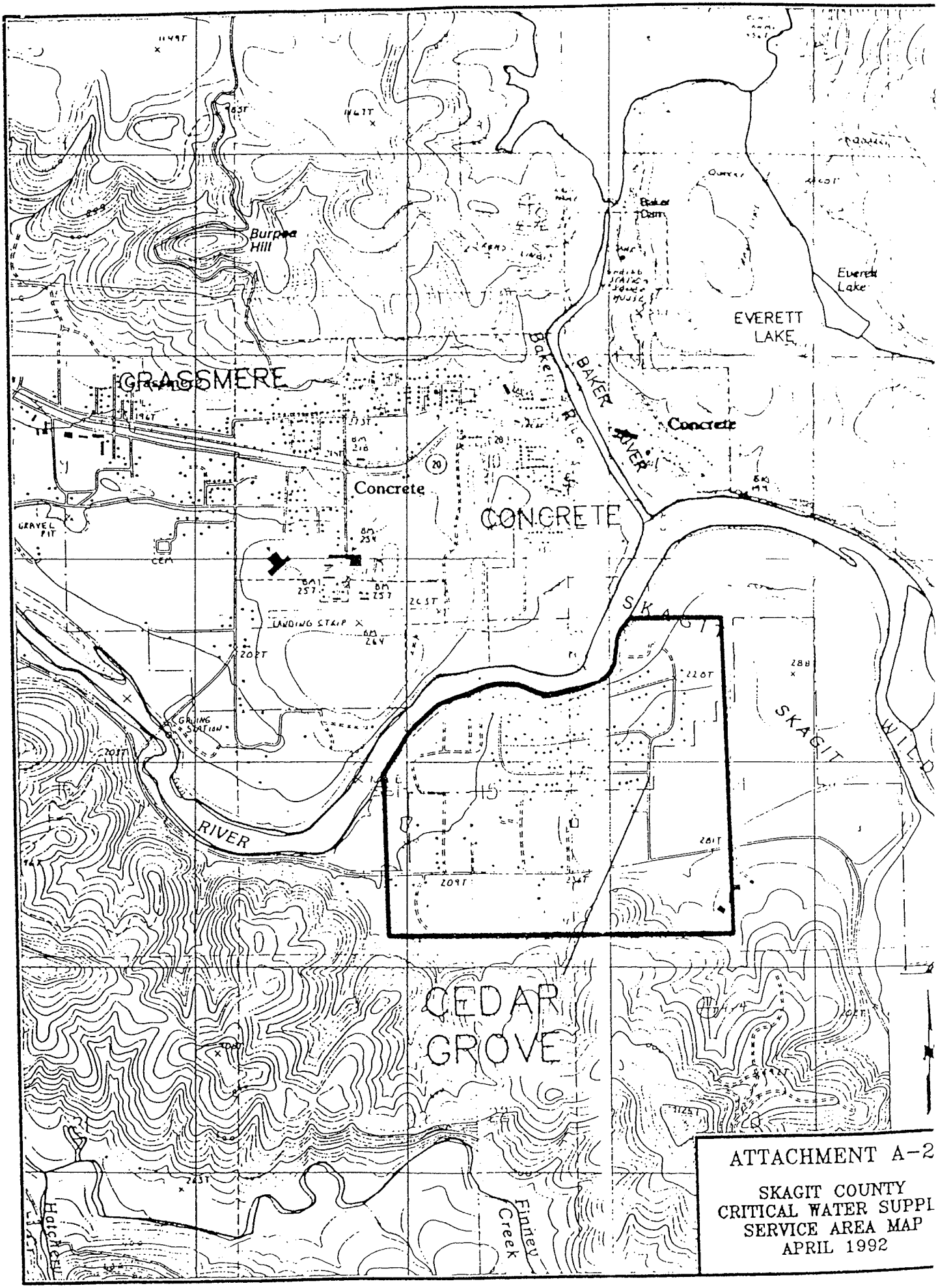
Board of County Commissioners Skagit County, Washington	PUD #1 of Skagit County Water Purveyor
W. W. Vaux, ~~Chairman~~ Comm.	Representative
Robby Robinson, Commissioner	General Manager Title
Ruth Wylie, Commissioner	
10/6/92 Date	June 3, 1992 Date

001452



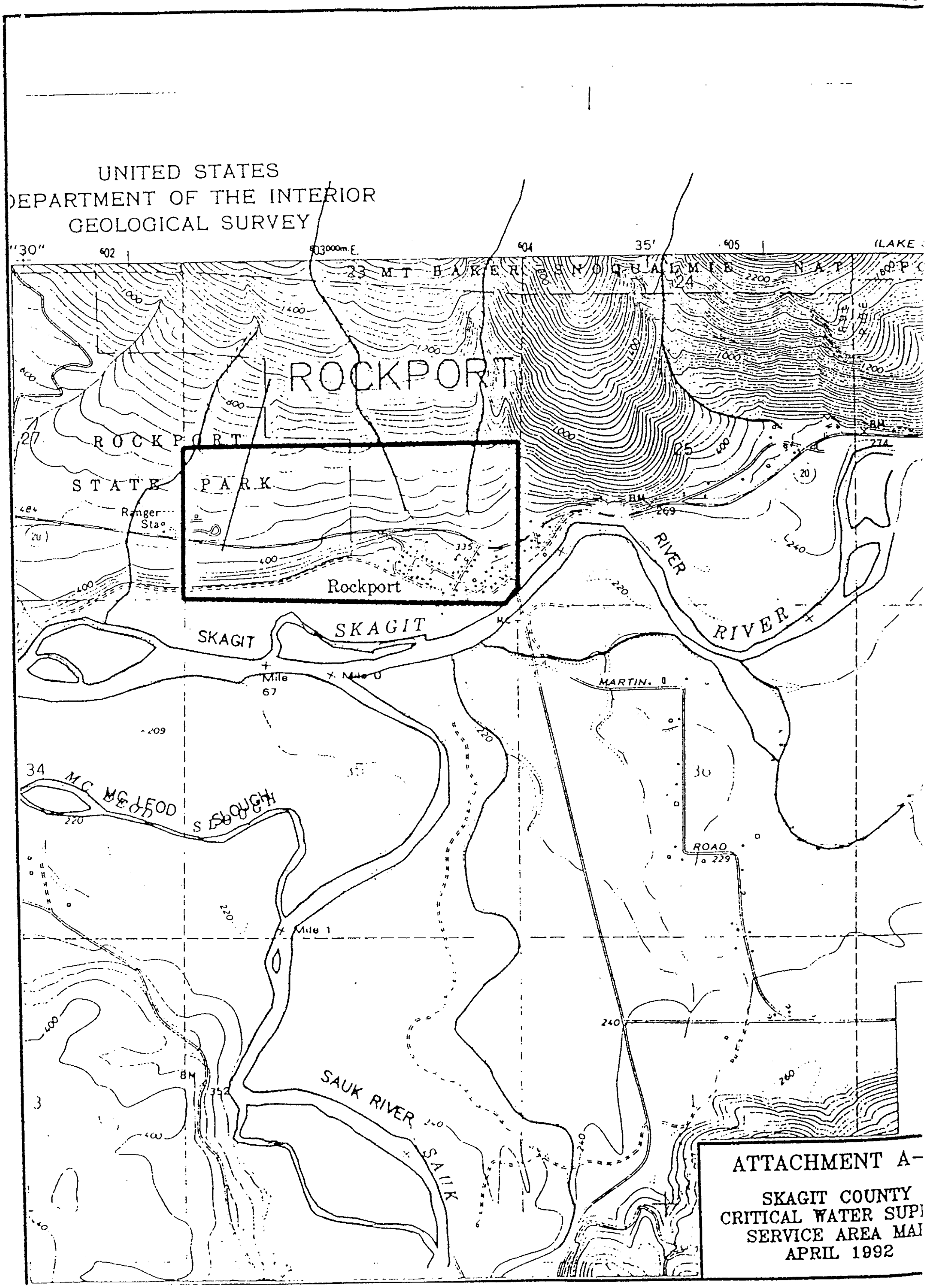
ATTACHMENT A-1

SKAGIT COUNTY
CRITICAL WATER SUPPLY
SERVICE AREA MAP



ATTACHMENT A-2

SKAGIT COUNTY
CRITICAL WATER SUPPL
SERVICE AREA MAP
APRIL 1992



ATTACHMENT A-
SKAGIT COUNTY
CRITICAL WATER SUPI
SERVICE AREA MAI
APRIL 1992

SUMMARY OF RECEIVERSHIP LEGISLATION

Objectives of Legislation

Substitute Senate Bill 6447, entitled An Act Relating to Failing Public Water Systems, was enacted by the 1990 State Legislature. The receivership provisions are now codified as RCW 43.70.195 (Public water systems - Receivership actions brought by secretary). Legislative objectives were stated as: to improve coordination between State and local health agencies, to place failing public water systems into receivership to provide continued service under safe and reliable conditions, and to address new operating requirements of the Federal Safe Drinking Water Act.

Provisions of Statute

- In any action brought by the secretary of health or by a local health officer to place a public water system in receivership, the petition shall include the names of one or more suitable candidates for receiver who have consented to assume operation of the water system.

- If there is no other person willing and able to be named as receiver, the court shall appoint the county in which the water system is located as receiver.

- The county may designate a county agency to operate the system, or it may contract with another individual or public water system to provide management for the system.

- In any petition for receivership, the department shall recommend that the court grant to the receiver full authority to act in the best interests of the customers served by the public water system.

- The receiver shall assess the capability, in conjunction with the department and local government, for the system to operate in compliance with health and safety standards, and shall report to the court its recommendations for the system's future operation.

- If a petition for receivership and verifying affidavit allege an immediate and serious danger to residents constituting an emergency, the court may appoint a temporary receiver upon the strength of such petition and affidavit pending a full evidentiary hearing.

- A bond, if any is imposed upon a receiver, shall be minimal and shall reasonably relate to the level of operating revenue generated by the system.

- The receiver shall not be held personally liable for any good faith, reasonable effort to assume possession of, and to operate, the system in compliance with the court's orders.

- The court shall authorize the receiver to impose reasonable assessments on a water system's customers to recover expenditures for improvements necessary for the public health and safety.

ADDENDUM No. 1 to the
AGREEMENT FOR ESTABLISHING
WATER UTILITY SERVICE AREA BOUNDARIES
between
Public Utility District No. 1 of Skagit County, Washington
and
Skagit County, Washington

Attachment A-1 of the Agreement for Establishing Water Utility Service Area Boundaries of October 6, 1992 between Public Utility District No. 1 of Skagit County (Water Purveyor) and Skagit County, Washington is hereby amended per Attachment A-1.1 of this Addendum. All other terms of the original Agreement remain unchanged.

Board of Commissioners
Skagit County, Washington

Robert Hart, Commissioner

Harvey Wolden, Commissioner

Ted Anderson, Commissioner

September 26, 1995
Date

PUD No.1 of Skagit County
Water Purveyor

James P. Kirkpatrick
General Manager

August 14, 1995
Date

RECEIVED
DEC 26 1995
SKAGIT P.U.D.

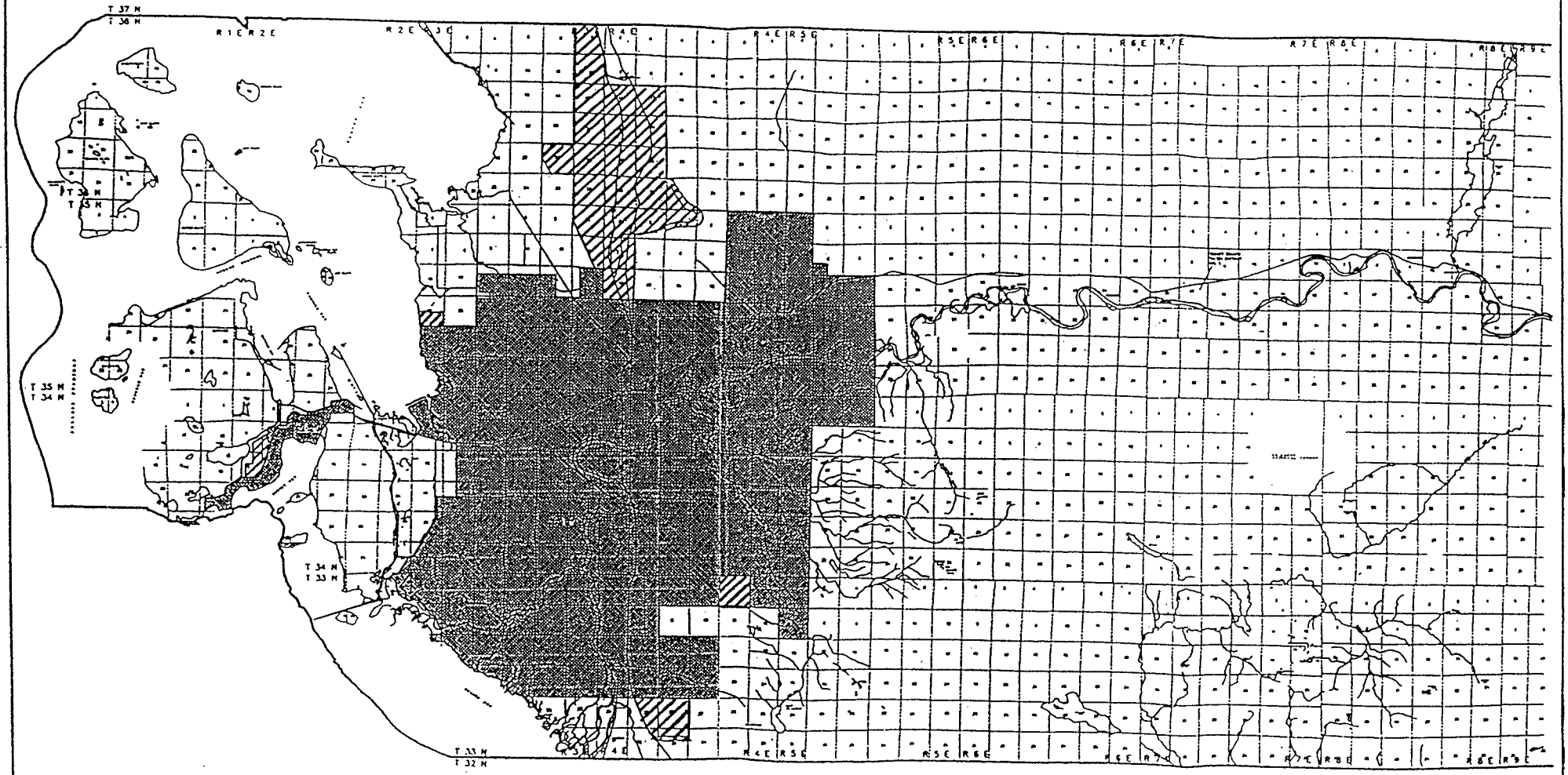
Reviewed by:

Skagit County Department of Planning and Community Development

Skagit County Fire Marshal

Skagit County Department of Health

RECEIVED
AUG 14 1995
SKAGIT COUNTY
HEALTH DEPT.



Added by Addendum No. 1

ATTACHMENT A-11

SKAGIT COUNTY
CRITICAL WATER SUPPLY
SERVICE AREA MAP
APRIL 1992

WATER SUPPLY AGREEMENT

This agreement entered into this 1st day of April, 1989 between the "City" of Anacortes, hereinafter referred to as the City, and P.U.D. #1 of ~~Skagit County~~ is for the purpose of the City supplying water to Skagit P.U.D., hereinafter referred to as the "Customer". It replaces and supercedes any previous agreements or understandings between the parties.

The Customer is entering into this agreement to secure a supply of water for its industrial and/or municipal water supply requirements. The City owns and operates a Water Supply System, has water available to serve the Customer, and is willing to supply water according to the terms and conditiions of this agreement.

The City's Water Supply System is defined for purposes of this agreement to include: 1) the water intake and treatment facilities near Avon on the Skagit River; 2) the City's water transmission pipelines from the water treatment facilities to the 3 million gallon reservoir on Whistle Lake Road near Anacortes; 3) one-third of the 3 million gallon reservoir, and 4) the 10-inch water supply pipeline along SR20 from Dean's Corner to the Oak Harbor metering point just north of the Deception Pass Bridge.

In accordance with this agreement, the City agrees to supply the Customer water in accordance with the following terms and conditions:

1. Quantity

   The City agrees to supply quantities and pressures of water at location(s) and in amounts as stated in this agreement (Exhibits A & B), and any subsequent amendments to this agreement (Exhibit C).

2. Delivery Points

   2.1 Approved Delivery Points - the City shall deliver water to the Customer at the approved delivery points listed in Exhibit A.

   2.2 New Delivery Points - the Customer may request service at additional delivery points subject to the approval of the City. The City may approve new service connections consistent with the concept that the Water Supply System is not a distribution system but the Customer has responsibility for constructing and maintaining a distribution system adequate for its service area.

   The Customer shall be responsible for paying all costs associated with installing new service connections. The connection shall include the necessary piping and valves, metering equipment of standard manufacture, and suitable isolating or backflow prevention devices as appropriate. If required by the City, the meter shall be of a type capable of transmitting continuous

readings to the City's Water Treatment Plant. The Customer shall prepare the design for the proposed service connection, submit it to, and receive the approval of the City prior to its installation. The City shall own the meter and be responsible for maintaining it in good repair.

3. Quality of Water

The City shall operate and maintain its Water Supply System in order to supply water for municipal and industrial purposes that meets the water quality standards of the Washington State Department of Social and Health Services and the U.S. Environmental Protection Agency, including periodic revisions to these standards. The City shall employ the normal care and practices of water utilities with respect to meeting water quality standards.

The City shall not be liable to the Customer for failure to meet the water quality standards for reasons that are outside the control of the City. The Customer shall hold the City harmless from any water quality related claim for damages by third parties served by the Customer, to the extent that the claim arises out of customer's negligence.

4. Rates and Charges

The City has established the following rates and charges and billing procedures for customers of its Water Supply System, which apply to this agreement.

4.1 Rate Structure - The City has defined the following costs associated with the facilities, operation and maintenance of its water supply system:

Capital Cost - Those costs incurred for the betterment and rehabilitation of the Water Supply System. Includes amounts paid from revenues, water system funds, and debt service on bonds issued for the betterment or rehabilitation of the system.

Fixed Operating Cost - The cost of labor, supervision, supplies, utilities, services, taxes, insurance, and all other expenses required to operate and maintain the Water Supply System other than those items included under Variable Operating Cost.

Variable Operating Cost - The cost of chemicals and electric power required to deliver water from the Water Supply System.

4.2 Cost Allocation - The Customer shall pay its proportionate share of the Capital Cost, Fixed Operating Cost, and Variable Operating Cost. These costs shall be allocated as follows:

Capital Cost - Allocated to all Water Supply System customers based on the estimated volume of water to each customer in

proportion to the total water supply requirements.

Fixed Operating Cost - Allocated to all Water Supply System customers based on the metered water volume of each customer as a percentage of the total metered volume of all customers, with the following exceptions:

(1) Administrative support services and all employee benefits shall be allocated to customers in the same proportions that the total cost of all other Personnel Services is divided among them.

(2) The State Excise Tax shall be allocated based on actual (or projected) billings to each of the customers. In accordance with Washington State Law, no Excise Tax will be assessed to wholesale customers purchasing water for resale.

Variable Operating Cost - Allocated to all Water Supply System customers in accordance with the metered water volume of each customer as a percentage of the total metered volume of all customers.

4.3 Billing Basis -

(1) The Capital Cost Allocation to customers is determined each time a water rate analysis is prepared by the City and is set for the ensuing rate period (Usually 3 to 5 years). Each customer's "estimated" volume used to calculate the Capital Cost for the rate period shall be agreed upon between the City and the Customer based upon current usage and estimated increased water requirements during the rate period. The current Capital Cost is shown in Exhibit B.

(2) The Fixed and Variable Operating Costs shall be determined as part of the City's annual budgeting process. Rates current as of the date of this agreement are shown on Exhibit B and are used as the basis for the customer billings according to the volume of water used. Each year, the City will calculate the unit Fixed and Variable Operating Costs for the next year based upon projected operating costs and projected water use and will notify the customers of these rates (Exhibit C). These revised costs will be used as the basis for billing customers during the year. Following the end of each calendar year, the City will calculate and report actual costs and retroactively adjust each customer's charges (i.e., increase or decrease) to actual costs, as shown in Exhibit C.

4.4 Billing - The City shall read the Customer meters each month, calculate, and issue a bill to the Customer. The bill shall identify the Capital Cost, the Fixed Operating Cost, the volume of

metered water delivered to the Customer during the month, and the corresponding Variable Operating Cost. The Capital Cost and Fixed operating Cost are payable regardless of the volume of water consumed while the Variable Operating Costs shall be paid according to the volume of metered water delivered to the Customer. Payment by the Customer is due within 15 days of the receipt of the bill.

4.5 Late Payment - If a bill remains unpaid after 30 days, the City may assess interest on the delinquent amount at the rate of 12% per annum. If a bill still is not paid after 90 days, the City may use other remedies legally available to it, including shutting off service to enforce payment.

4.6 Additional Charge - During the rate period, the Customer is entitled to the quantity of water fixed as the basis for the capital charge. Should the Customer use an annual volume greater than the volume shown on Exhibit B or as amended on Exhibit C, it shall pay an additional charge equal to 50% of the Variable Operating Cost for any excess volume. This additional charge is calculated to partially compensate for the additional use the Customer is making of the system capital facilities and the incremental operating costs associated with higher demands on the Water Supply System. Any such charge will be calculated at the end of each year and billed to the Customer.

5. Metering

The volume of water delivered to the Customer shall be measured by metering equipment installed in accordance with Article 2. The meter shall be maintained and read by the City. It shall be tested by the City periodically, but not less than once per year, to assure its continuing accuracy and conformance to the standards of measurement and service accepted in the water industry. The Customer has the right to be notified ahead of time and be present at any of the regularly scheduled tests. The cost of conducting such tests shall be borne by the City. These tests may also be conducted at other times at the request of the Customer and the customer may elect to have a representative witness the meter test. If the meter is accurate, the customer shall pay for the cost of the test; but if the test reveals an inaccuracy of more than 2 percent, the City shall pay for the test. If an inaccuracy of more than 2 percent is discovered, all billings for water furnished hereunder for one-half the time from the date of the preceding test shall be adjusted. The adjustment shall be for the full amount in excess of 2 percent.

6. Continuity of Service

The City shall use reasonable diligence to provide a regular and uninterrupted supply to the Customer's approved delivery point(s), but shall not be liable to the Customer for damages, breach of contract, or otherwise for interruption of service or curtailment of supply for any cause beyond the control of the City. These could include, but are not limited to, Acts of God, sabotage, war,

fires, floods, earthquakes or other catastrophes, strikes, or failure or breakdown of the Water Supply System. The Customer shall hold the City harmless from any claim for damages related to continuity of service by third parties served by the Customer, to the extent that the claim arises out of Customer's negligence.

7. Conflicts

To the extent that there is any inconsistency between the provisions of this agreement, any exhibit incorporated as part of this agreement, or subsequent amendments and other rules and regulations of the City, the provisions of this agreement shall control.

8. Future Supply

8.1 Service Area - This agreement between the City and the Customer is to supply water to the Customer's existing industrial operations and/or water service area. In this regard, the Customer agrees not to increase its industrial operations, to add new customers, or to expand its service area in a manner that would increase its water requirements by more than 10 percent without the prior approval of the City.

8.2 Water Supply Requirements - The City operates its Water Supply System for the purpose of delivering an adequate supply of good quality water to all of its customers. The City agrees to maintain and to operate its system so as to meet the volumes contracted for by its customers and to supply additional volumes as may be required by the Customer in the future, consistent with the needs of all its customers.

8.3 Capacity Limitations - It is agreed that the City shall have the right to limit future increases in water use, or the peak demands of customers should the usage approach the capacity of the Water Supply System.

8.4 Future Improvements - The City will plan and develop water supply facilities that may become necessary in the future to replace existing facilities or to expand the capacity of its Water Supply System to meet growing demands. The City may require appropriate commitments from its customers prior to proceeding with system improvements.

9. Termination

Either the City or the Customer shall have the right to terminate this agreement by giving at least one year notice of its desire to do so.

10. Term

Subject to the provisions of paragraph 9 of this Agreement, this agreement shall remain in full force and effect for a period of 20 years from the date of its execution, except that either party can request amendment or renegotiation of this agreement not more frequently than on an annual basis.

11. Records Inspection

The City of Anacortes shall maintain and make available for inspection at reasonable times all records pertaining to the water system. These records shall be maintained for a minimum 3-year period.

12. Addresses

All notices and billing required hereunder shall be sent to the following addresses: SKAGIT COUNTY P.U.D. No. 1
1415 Freeway Drive
Mt. Vernon, WA 98273

13. APPLICABLE LAW

THIS AGREEMENT & ALL DISPUTES ARISING THEREUNDER SHALL BE GOVERNED BY WASHINGTON STATE LAW.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

THE CITY OF ANACORTES

By: James Rice
Mayor

ATTEST:

George E. Peterson
City Clerk

NAME OF CUSTOMER

By: James P. Kirkpatrick
Public Utility District No. 1 of Skagi
James P. Kirkpatrick, General Manager

ATTEST:

George W. Petersen
George W. Petersen, Auditor

EXHIBIT A

Dated _____ _____

Water Supply Agreement between the City of Anacortes and _____Skagit P.U.D._____.

Approved Metered Service Connections:

	Location	Size	Description
1.	Lefeber Bulb Farm	10"	Turbine
	Lefeber Bulb Farm	2"	Turbine
2.	Bennett Road	8"	Rockwell Turbine
3.	Fredonia Grange	8"	Hersey
	Fredonia Grange	4"	Hersey
	Fredonia Grange	1"	Hersey
4.	Reservation Road	2"	Rockwell
5.	Sharpe's Corner (East Register)	3"	Hersey
	Sharpe's Corner (West Register)	3/4"	Hersey
6.	Foote's Market	3"	Rockwell
7.	Bridgeway Restaurant	3"	Rockwell Compound

EXHIBIT B

Dated April 1, 1989

Water Supply Agreement between the City of Anacortes and Skagit P.U.D.

1. Water Charges:

Capital Cost	$ 856.00	/Month
Fixed Oper. Cost (1989 Estimate)	$ 2,337.00	/Month
Variable Oper. Cost (1989 Estimate)	$ 83.36	/Million Gallons

2. Committed Water Volume:

Annual: 65 million gallons

3. Water Pressure:

EXHIBIT C

AMENDMENT NO. 1

This Amendment, entered into this 1st day of April, 1989 replaces and supercedes Exhibit B and prior amendments to the Water Supply Agreement entered into April 1, 1988 between the City of Anacortes and Skagit P.U.D.

1. Water Charges:

- Capital Cost (4/1/89 - 4/1/92)	$ 856.00 /month
- Fixed Oper. Cost (Est. 4/1/89 to 4/1/90)	$ 2,337.00 /month
- Variable Oper. Cost (Est. 4/1/89 to 4/1/90)	$ 83.36 /million gallons
- Annual Billing Variance Adjustment (for prior calendar year)	$ 770.39 /Reimburse to City

2. Committed Water Volume:

Annual: 65 million gallons

3. Water Pressure:

IN WITNESS WHEREOF, the parties hereto have executed this Contract Amendment as of the day and year first abovewritten.

Name of Customer:

By: James P. Kirkpatrick
PUD No. 1 of Skagit County
James P. Kirkpatrick, General Manager

Attest: George W. Petersen
George W. Petersen, Auditor

The City of Anacortes

By: James Rice
Mayor

Attest: George L. Petersen
City Clerk

RESOLUTION NO. 1046

A RESOLUTION AUTHORIZING EXECUTION OF AN AMENDMENT TO WATER CONTRACT, BY AND BETWEEN THE CITY OF ANACORTES AND P.U.D. #1 OF SKAGIT COUNTY

WHEREAS, the existing contract by and between the City of Anacortes and P.U.D. #1 of Skagit County, as amended, establishes the cost of water sold by the City of Anacortes, and

WHEREAS, the City of Anacortes and P.U.D. #1 of Skagit County have agreed upon new rates to be charged, now, therefore

IT IS HEREBY RESOLVED by the City Council of the City of Anacortes that that certain amendment to water contract by and between the City of Anacortes, a municipal corporation, and P.U.D. #1 of Skagit County shall be in all respects ratified and approved and the Mayor and City Clerk-Treasurer are hereby authorized and directed to execute said amendment to water contract.

PASSED AND APPROVED this 1st day of May, 1989.

CITY OF ANACORTES, WASHINGTON

By _____
James Rice, Mayor

ATTEST:

_____
George Khtaian, City Clerk

(CORPORATE SEAL)

EXHIBIT C

AMENDMENT NO. 6

This Amendment, entered into this 1st day of April, 1994, replaces and supercedes Exhibit B and prior amendments to the Water Supply Agreement entered into April 1, 1989, between the City of Anacortes and Skagit P.U.D.

1. Water Charges:

• Capital Cost	$1,342.00/month
• Fixed Oper. Cost (Est. 4/1/94 to 4/1/95)	$2,522.00/month
• Variable Oper. Cost (Est. 4/1/94 to 4/1/95)	$111.04/million gallons
• Annual Billing Variance Adjustment (for prior calendar year)	$3,398.05/Reimburse to City of Anacortes

2. Committed Water Volume:

Annual: 65 million gallons

3. Water Pressure:

120 psi

IN WITNESS WHEREOF, the parties hereto have executed this Contract Amendment as of the day and year first above written.

Name of Customer:
PUD No. 1 of Skagit County

By: James P. Kirkpatrick
James P. Kirkpatrick, General Manager

Attest: _____
Mark Fredlund, Treasurer

The City of Anacortes

By: W. Dan Mapes

Attest: George K. Thomas

LETTER OF UNDERSTANDING

This agreement is made and entered into by and between the CITY OF ANACORTES, a municipal corporation, hereinafter referred to as City, and PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, a municipal corporation, hereinafter referred to as District.

WITNESSETH:

Parties hereto for and in consideration of mutual covenants contained herein hereby agree as follows:

1. City agrees to allow, for use of District, a 16-inch water connection off the City of Anacortes pipeline in the approximate location east of Bradshaw Road and State Route 536 for the purpose of providing domestic, commercial, industrial and emergency water supplies.

2. A meter, meter vault, meter bypass, check valve assembly and all other related appurtenances shall be installed at a service connection and said meter and appurtenances shall be owned and maintained by the City of Anacortes.

3. The District shall maintain, at its expense, all connecting pipeline, valves, pressure reducing valves and other related appurtenances beyond the City service connection and meter installation. City shall be responsible to schedule any testing and maintenance of the meter and appurtenances and shall use all reasonable efforts to schedule said testing, maintenance, and any service interruptions relative to said service connection.

4. The purpose of this agreement is to provide adequate supplies of potable water for fire protection and industrial development in the vicinity of the Port of Skagit County Regional Airport and Industrial Park Development. It is understood and agreed that the current requirements of the District and the amount of water which the City contemplates providing will not exceed 1 million gallons of water per day. The City can in no way guarantee a supply of water in excess of this figure nor assume any liability or obligation for delivery of such excess water to the District. It is agreed that the District shall not undertake to sell or deliver increased quantities of water beyond this commitment without first procuring the agreement and consent of the City. The agreement and consent of the City is a condition precedent to its obligation or liability to furnish to the District for such purposes. The City agrees to furnish additional water if it has additional water available and if the parties can mutually agree upon revised rates.

5. The District agrees to save and hold City harmless from and indemnify the City against any damages, claims, actions at law, suits and equity which occur as a result of this agreement, except as to any claims or damages occasioned solely by the negligence of the City, for which City will indemnify and hold District harmless in the same manner.

6. The District agrees to design and construct the service connection, meter vault, meter installation, and related pipe and appurtenances under City supervision. The City retains the right to review, modify and approve all plans and specifications for the service connection and meter installation. In addition, the District agrees to reimburse the City for all costs incurred in the review of the plans and specifications and inspection and supervision of the installation. Reimbursement will include all normal costs plus overhead.

7. The term of this agreement is concurrent with the City of Anacortes-Skagit PUD No. 1 Master Water Contract. The District agrees to pay for water use in accordance with current rate structure in effect.

PUBLIC UTILITY DISTRICT NO. 1
OF SKAGIT COUNTY, WASHINGTON

BY James P. Kuffel
Dated this 31st day of MARCH, 1987

CITY OF ANACORTES

BY James Rice
Dated this 7th day of April, 1987

ATTEST:

BY George K. Stavis

LETTER OF UNDERSTANDING

This Agreement made and entered into by and between the CITY OF ANACORTES, a municipal corporation, hereinafter called "City" and PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, a municipal corporation, hereinafter referred to as "District".

WITNESSETH:

Parties hereto for and in consideration of the mutual covenants contained herein, hereby agree as follows:

1. City agrees to provide for the use of District an 8" water connection off the City of Anacortes pipeline in the approximate location of Avon for the purpose of providing an emergency, standy water supply for use in the event of critical drops in the level of Judy Reservoir. District shall notify City of anticipated critical drops in Judy Reservoir and keep the City advised as to status on a ~~daily~~ regular basis during critical periods. City will make all turnons and turnoffs at the request of District. Whenever reasonably possible, District shall provide City with 24 hours advance notice of turnons and turnoffs.

2. A meter, meter vault and other related appurtenances shall be installed at the service connection and said meter and appurtenances shall be owned and maintained by the City of Anacortes.

3. District shall maintain, at its expense, all connecting pipelines, valves, pressure reducing valves and other related appurtenances beyond City's service connection and meter installation. City shall be responsible to schedule any testing and maintenance and shall use all reasonable efforts to schedule said testing and maintenance and any service interruptions relative to said service connection.

4. The purpose of this Agreement is to provide an emergency standby water supply and not to provide additional water for general use of the Public Utility District. This Agreement shall not obligate the City of Anacortes to provide water and the City of Anacortes shall not be liable for its failure to do so. Provision of said service connection or actual delivery of water shall not obligate the City of Anacortes as to any future delivery of water.

5. This Agreement may be cancelled upon thirty days written notice by either party.

6. District agrees to save and hold City harmless from and indemnify the City against any damages, claims, actions at law, suits and equity which occur as a result of this Agreement, except as to any claims or damages occasioned solely by the negligence of the City, for which City will indemnify and hold harmless District in the same manner.

7. District agrees to reimburse City for the costs of making the service connection and supplying the meter and related piping and appurtenances. In addition, District agrees to pay for water use in accordance with the rate structure attached hereto and marked Exhibit A, and by this reference made a part hereof.

8. The prevailing party shall be entitled to a reasonable attorney fee and costs in any litigation which occurs between the parties hereto.

DATED this 19th day of June, 1986.

SKAGIT COUNTY PUBLIC UTILITY DISTRICT NO. 1

By _____

CITY OF ANACORTES

By _____
James Rice, Mayor

ATTEST:

_____
George Khtaian, City Clerk Treasurer

BEFORE THE BOARD OF COUNTY COMMISSIONERS OF

93051800?0 SKAGIT COUNTY, WASHINGTON

IN THE MATTER OF THE APPLICATION OF	)	ORDER GRANTING APPLICATION
PUBLIC UTILITY DISTRICT #1 OF SKAGIT COUNTY	)	FOR FRANCHISE
FOR A FRANCHISE OVER CERTAIN ROADS	)	NO. 14720 ~~00552~~
IN SKAGIT COUNTY, WASHINGTON	)	

PUBLIC UTILITY DISTRICT #1 OF SKAGIT COUNTY (District), a Municipal Corporation, having applied for a fifty year franchise to construct, erect, alter, improve, renew, replace, repair, operate and maintain a utility system across and along certain roads in Skagit County, Washington, and said application having come on regularly to be heard on the 20th day of January, 1993, at the hour of 1:30 P.M. o'clock, and notice of this hearing having been duly published on the 30th day of December, 1992, and on the 6th day of January, 1993, in the Skagit Argus, a newspaper published in Skagit County having county-wide circulation, and it appearing to the Board that notice of said application and hearing thereon has been given as required by law, and that it is in the public interest to grant the franchise, and the Board having considered said application and being advised in the premises.

The utility system referred to in this franchise is limited to and described as follows:

ALL UTILITIES AS AUTHORIZED BY TITLE 54 RCW.

NOW, THEREFORE, IT IS HEREBY ORDERED that the right, privilege, authority and non-exclusive franchise be, and the same are hereby given and granted to **PUBLIC UTILITY DISTRICT #1**, its successors and assigns, hereinafter referred to as the grantee, for a period of fify years from and after the date of the entry of this order, to construct, alter, improve, renew, replace, repair, operate and maintain a utility system with all convenient appurtenances to said system across and along other County highways, roads, streets, avenues, alleys, and public ways within the boundaries of Skagit County as now laid out, platted, or dedicated and all the County highways, roads, street, avenues, alleys, and public ways that may hereafter be laid out, platted or dedicated, lying outside of any incorporated town or city, and being situated in the sections, townships and ranges, as follows:

This Franchise is granted upon the following express terms and conditions, to-wit:

1. <u>District Given Authority to Enter Upon County Roads:</u>

That said District, its successors and assigns, shall have the right and authority to enter upon the above-mentioned County roads and rights-of-way as designated hereinbefore for the purpose of constructing its utility system and all convenient

appurtenances thereto as described hereinbefore and for altering, improving, renewing, replacing and repairing said utility system and appurtenances.

2. Construction Approved by County Engineer:

All construction and installation work along or across the above-mentioned County roads or rights-of-way outside of the corporate limits of any incorporated town shall be subject to the County permit process and shall pass the inspection of the County Engineer, and shall conform to all applicable State and Federal minimum standards, codes, or regulations. The County may, from time to time, upon reasonable notice, require the removal and replacement of the District utility system if it is in the public interest to do so. The County Engineer may also require the removal of an abandoned installation if necessary to protect the public interest. Such removal or replacement shall be at the sole expense of the District and performed with due diligence by the District.

3. Plans, Specifications and Maps:

Prior to commencement of construction of said utility system or appurtenances, District shall first file with the County Engineer its application for permit to do such work, together with plans and specifications, in duplicate, showing the position and location of said utility system and appurtenances sought to be constructed at that time showing their relative position to existing roads and rights-of-way upon plans drawn to scale hereinafter collectively referred to as the "map of definite location."

The utility system and appurtenances shall be laid in exact conformity with said map of definite location, except in instances in which deviation may be allowed thereafter in writing by the

County Engineer pursuant to application by District. The plans and specifications shall specify the class and type of material and equipment to be used, manner of excavation, construction, installation, backfill, erection of temporary structures, erection of permanent structures, and shall conform to the latest edition of Washington State Department of Transportation Standard Specifications for Road and Bridge Construction. All signing and traffic control devices shall be submitted in the plan and shall conform to the manual on Uniform Traffic Control Devices. No such construction shall be commenced without the District first securing a written permit from the County Engineer, including approval endorsed on one set of plans and specifications returned to the District. All such work shall be subject to the approval of and shall pass the inspection of the County Engineer.

The District and the County recognize that it is in the best interest of the public not to duplicate inspection costs. Therefore, the parties agree to take all reasonable steps to cooperate and coordinate engineering and inspection services and costs. In the event the County becomes concerned relative to the inspection of a particular project, the following procedure may be implemented:

1. The County shall notify the District in writing setting forth the concerns of the County.

2. The District shall respond to the County's concerns in writing within two (2) working days.

3. In the event the parties cannot agree to a solution, the County may choose to assign an inspector to the project.

4. Restoration Guaranteed by Bond:

In any work which requires breaking of soil of County roads and rights-of-way subject to this Franchise for the purpose of constructing and maintaining the said utility system and appurtenances, the District shall be governed by and conform to the

general rules adopted by the officers charged with the supervision and care of such County roads, rights-of-way, and other County property; and the District at its own expense and with due diligence shall complete the work for which the soil has been broken and forthwith replace the work and make good the County road and/or rights-of-way, and that the same be left in as good condition as before the work commenced, without leaving any interference to public travel as a result of said construction and with the same grade as before construction or the grade required by the County Engineer; provided, however, that except in the case of emergencies involving the disruption of service or immediate threats to life or property, no such breaking of the soil on County roads and rights-of-way shall be done prior to the obtaining of permit issued by the County Engineer. The District will notify the County in writing within two (2) working days of any emergency work within the County rights-of-way. The expense of necessary road working signs during such work will be borne by the District.

All construction shall be done in a manner that minimizes interference with the use of the road. Applications for such a permit shall be accompanied by specifications for the restoration of the County road and/or rights-of-way to the same condition as it was in prior to such breaking based upon the most current State of Washington Department of Transportation specifications, and such specifications must be approved by the County Engineer before such breaking of the soil is commenced.

Skagit County may require confirmation of the District's contractors' appropriate performance bonds. The County Engineer may at any time do, order, or have done, any and all work that he considers necessary to restore to the same condition as it was prior to such breaking/work, any such County road and/or rights-of-way left by the District which, upon demand, shall pay to the County all costs of such work.

5. Utility Location Preference:

All construction of said utility system and appurtenances, service, repair, or relocation of the same, performed along or across the County roads and/or rights-of-way subject to this Agreement, shall be done in a manner neither to interfere unreasonably with the construction and maintenance of other utilities, lines, public or private, drainage ditches and structures, irrigation ditches and structures, located therein, nor with the grading or improvement of such County roads, rights-of-way, or other County property. The owners of all utilities, public or private, installed in such County roads and/or rights-of-way prior in time to the utility system and facilities of the District shall have preference as to the positioning and location of such utilities so installed with respect to the District. Such preference shall continue in the event of the necessity of relocating or changing the grade of any such County road or rights-of-way. The County will cooperate with the District regarding separation of utilities as required by Department of Health regulations.

6. Minimum Interference with Public Travel:

All work done under this Franchise shall be done in a thorough and workmanlike manner. In the installation of the utility system and the opening of trenches and the tunneling under County roads and/or rights-of-way, the District shall leave such trenches, ditches and tunnels in such a way as to interfere as little as possible with public travel and shall take all due and necessary precautions to guard the same, so that damage or injury shall not occur or arise by reason of such work.

In the event of an emergency requiring immediate action by District for the protection of its facilities or the persons or property, District may take such action and give such notice to the

County Engineer's office or the County Sheriff's office as is reasonable and practicable under the circumstances.

7. County May Change and Improve Roads Without Liability:

Skagit County, in entering into this Franchise, does not waive any rights it now has or may hereafter acquire with respect to County roads and/or rights-of-way and this Franchise shall not be construed to deprive the County of any powers, rights or privileges which it now has, or may hereafter acquire, to regulate the use or control of any County roads and/or rights-of-way covered by this Agreement.

The laying, construction, operation and maintenance of the District's utility system and facilities authorized by this Franchise shall not preclude Skagit County, its agents or its contractors from blasting, contiguous to the said system facilities of the District provided that the District shall be given at least fifteen (15) calendar days notice except in the case of emergencies. The parties recognize that it is in both their interests to be involved in each other's projects that are within this Franchise.

8. Relocation of Utility:

If at any time Skagit County shall improve or change any County road and/or rights-of-way subject to this Franchise by grading or regrading, planking or paving the same, changing the grade, altering, changing, repairing or relocating the same or by constructing drainage facilities, or in the event that such County road and/or rights-of-way subject to this Franchise shall become a primary state highway as provided by law, the District upon written notice from the County Engineer, or the Director of Highways, shall at its sole expense and with due diligence, change the location or readjust the utility system so that the same shall not interfere

with such County work and so that said utility system and appurtenances shall conform to such new grades or routes as may be established. Substantial relocation projects that will require specific budget consideration are typically included in the County 6-year plan in order to give the District sufficient time to include the item in their planning.

All work to be performed by the District under this section shall be subject to the direction and approval, and shall pass the inspection of the County Engineer.

9. Location of Public Utility District #1:

The address of the Public Utility District #1.

P. O. Box 1436
Mount Vernon, WA 98273-2492

Any notification required to be given to the District may be given to the address above stated, provided that the District may from time to time notify said County in writing of a change of address to which notifications are to be sent.

10. Reference Monuments and Markers:

Before any work is performed under this Franchise which may affect any existing monuments or markers of any nature relating to subdivisions, plats, roads and all other surveys, the District shall reference all such monuments and markers. The reference points shall be so located that they will not be disturbed during the District's operations under this Franchise. The method of referencing these monuments or other points to be referenced shall be approved by the County Engineer. The replacement of all such monuments or markers disturbed during construction shall be made as expeditiously as conditions permit and as directed by the County Engineer. The cost of monuments or other markers lost, destroyed or disturbed, and the expense of replacement by approved monuments, shall be borne by the District.

11. Vacation of County Roads:

If, at any time, Skagit County shall vacate any County road and/or rights-of-way which are subject to the rights granted by this Franchise and said vacation shall be for the purpose of acquiring the fee or other property interest in said road and/or rights-of-way for the use of Skagit County, in either its proprietary or governmental capacity, then the Board of County Commissioners shall given written notification to the District not later than ten working days in advance of any hearing on any proposed vacation. At the vacation hearing, the County shall consider such evidence as is submitted relating to the economic benefit or detriment of the vacation to the District in determining whether or not the County will retain a utility easement upon agreement by the District to pay the additional costs incurred by the County as a result of retaining the utility easement. In the event the County shall elect to vacate a County road and does not retain an easement for utilities, the District, upon reasonable notice by the County, shall remove, relocate, improve or protect its water system and appurtenances as is required and at its own expense.

12. District to Indemnify County:

The District, by acceptance of the privileges granted hereunder, does hereby agree to defend, indemnify and hold harmless Skagit County from all claims, actions, suits, liability, costs, expenses, or damages of every kind and description, including investigation costs, court costs, and attorney's fees which may occur to or be suffered or claimed by any person or persons, corporation or property arising out of or in any way connected to the construction, operation and maintenance of District's said utility system and appurtenances. In case that suit or action is brought against Skagit County for damages arising out of or by

reason of the above-mentioned causes, the District will, upon prompt notice of any such claims, actions and suits without limitation, defend the same at its sole cost and expense and will have the right to appeal any judgment rendered therein. The District will fully satisfy and pay any judgment rendered against Skagit County for which it has agreed to protect and save Skagit County harmless hereunder within ninety (90) days after said action or suit shall have been finally terminated.

Acceptance by the County of any work performed by the District at the time of completion shall not be grounds for avoidance of this covenant.

13. Franchise Not Exclusive:

This Franchise shall not be deemed to be an exclusive franchise. It shall in no manner prohibit Skagit County from granting other franchises of a like nature or franchises for other public or private utilities under, along, across, over and upon any of the County roads and/or rights-of-way subject to this Franchise, and shall in no way prevent or prohibit Skagit County from constructing, altering, maintaining, using or vacating any of said roads and/or rights-of-way, drainage structures or facilities, irrigation structures or facilities, or any other County property, or affect its jurisdiction over them or any part of them with full power to make all necessary changes, relocations, repairs, maintenance, etc., the same as the County may deem fit.

14. Provisions Bind Successors:

All the provisions, conditions, regulations and requirements herein contained shall be binding upon the successors and assigns of the Grantee, and all privileges, as well as all obligations and liabilities of the Grantee shall inure to its

successors and assigns equally as if they were specifically mentioned wherever the Grantee is mentioned.

15. Consent of County Prior to Transfer:

Neither this Franchise nor any interest herein shall be sold, transferred or assigned without the previous consent in writing of the Board of County Commissioners of Skagit County. However, such notice is not required in regard to any mortgage by Grantee to the trustee for its bond holders under its first mortgage indenture. Any sale, transfer or assignment of this Franchise in violation of this section shall automatically terminate said Franchise.

SECTION 16 DELETED

17. Use of County Standards:

In preparing plans and specifications for the installation of said utility system along or across County roads and rights-of-way, the District shall use as a guide the standards and specifications set forth in the Washington State Department of Transportation standards and as established by the County Engineer.

18. Revocation for Non-Compliance:

If the District shall willfully violate or fail, through willful or unreasonable neglect, to comply with any of the provisions of this Franchise for thirty (30) days after receipt of written notice from the Board of County Commissioners, then said Board shall have the right to declare District's forfeiture of all rights hereunder and to declare this Franchise terminated and no further in force or effect thereafter.

19. Modifications:

Both parties reserve the right at any time upon sixty (60) days' written notice to the other party, to change, amend, modify, or amplify any of the provisions of conditions herein enumerated to conform to any state statute or departmental order or County regulation, relating to the public welfare, health, safety or highway regulations, as may hereafter be enacted, adopted or promulgated.

20. Severability:

If any section, subsection, sentence, clause or phrase of this Franchise is for any reason held illegal, invalid or unconstitutional by the decision of any court or regulatory body of competent jurisdiction, such decision shall not affect the validity of the remaining portions hereof. The parties hereby declare that they would have entered into this Franchise and each section, subsection, sentence, clause and phrase hereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared illegal, invalid or unconstitutional. The invalidity or any portion of this Franchise shall not abate, reduce or otherwise affect any consideration or other obligation required of the District or any grant of right by the County.

21. Insurance:

At the time of executing this Franchise, the District is insured through an industry self insurance plan administrated by Pacific Underwriters. Skagit County shall be given thirty (30) days' written notice prior to cancellation, expiration or any material changes of the insuring agreements. In the event of such material changes, the District will provide the County with

assurance that the District has minimum coverage or equivalent as follows:

Bodily Injury Liability Including Automobile Liability	$5,000,000.00 each occurrence
Property Damage Liability Including Automobile Property Damage	$1,000,000.00 each occurrence

22. Force Majeure:

The District shall not be deemed in default of any provisions of this Franchise or subjected to any penalty hereunder where performance or compliance is prevented by acts of God, civil emergencies, natural disasters or other such circumstances beyond the District's reasonable control.

23. Grantee to File Acceptance:

The full acceptance of this Franchise and all its terms and conditions within thirty (30) days from the date of execution by the Skagit County Board of Commissioners by _____ in writing is to be filed with the Clerk of the Board of County Commissioners of said County and shall be a condition precedent to its taking effect and, unless the Franchise is accepted within such time, this grant shall be null and void.

DATED at Mount Vernon, Washington, this 20th day of January, 1993.

BOARD OF COUNTY COMMISSIONERS
SKAGIT COUNTY, WASHINGTON

ROBERT HART, CHAIRMAN

HARVEY WOLDEN, COMMISSIONER

ROBBY ROBINSON, COMMISSIONER

APPROVED AS TO FORM:

Skagit County Prosecuting Attorney

APPROVED AS TO INDEMNIFICATION LANGUAGE:

Skagit County Risk Manager

ATTEST: Connie Carter
Connie Carter
Clerk of the Board

The undersigned hereby accepts all the rights and privileges of the above-granted Franchise subject to all the terms, conditions, stipulations and obligations contained herein.

PUBLIC UTILITY DISTRICT #1
OF SKAGIT COUNTY

COMMISSIONER

COMMISSIONER

COMMISSIONER

APPROVED AS TO FORM
GILBERT & MEYER, INC., P.S.

ATTORNEY FOR PUD #1 OF SKAGIT COUNTY

DATED this 16 day of December, 1992.

JERRY McINTURFF
SKAGIT COUNTY AUDITOR
'93 MAY 18 P2:13
FILED
RECORDED
REQUEST OF Public Works

ENTERED and EXECUTED copy delivered to the Grantee this 20th day of January, 1993.

CONNIE CARTER, Clerk of the Board

9305180070

BK 1192PG0525

CITY OF ANACORTES AND
PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
AGREEMENT REGARDING SKAGIT REGIONAL WATER SUPPLY SYSTEM

THIS AGREEMENT is entered into by the City of Anacortes (City) and Public Utility District No. 1 of Skagit County, Washington (PUD) for the continuation of reliable public water systems within Skagit County.

Section 1. RECITALS.

1.1 The City and PUD are parties to a Water Supply Agreement dated April 1, 1989, and last amended April 1, 1992 (Supply Agreement). The Supply Agreement provides, in part, for:

1.1.1 Connection of the public water systems of City and PUD;

1.1.2 Supply of water by City to PUD for use throughout PUD's existing service area;

1.1.3 Rates and charges for service by City to PUD; and

1.1.4 Other matters affecting the rights and responsibilities in operation and maintenance of the City and PUD water supply systems.

1.2 An adequate and safe water supply for Skagit County is necessary to current and future residents, and vital to the comprehensive plans of City, County and other local governments.

1.3 The State of Washington (State), County, tribes and public water purveyors have participated in the past preparation, maintenance and revision of a Coordinated Water System Plan (CWSP) for Fidalgo Island. The initial CWSP was prepared in 1985, and was revised in 1993 for the entire County. The CWSP is a management plan and program under Chapter 70.116 RCW and Chapter 246-293 WAC.

1.4 Cooperative development, operation and maintenance of waterworks and facilities minimizes costs and is in the best interest of the citizens of the County.

1.5 The CWSP identifies current and future needs of local governments in Skagit County, and the process for establishing a cooperative regional water supply system.

1.6 City and PUD have the necessary water rights and facilities, as identified in the CWSP, with capability and capacity to meet public water supply needs of Skagit County. However, there is a need to plan for additional water supply for Skagit County. The City and PUD have maintained interties between their systems prior to and after January 1, 1991. Further interties to facilitate development of the regional water supply system may be necessary in the future.

1.7 City and PUD acknowledge their rights and obligations under the Growth Management Act to coordinate land use and water supply planning.

1.8 City and PUD recognize the benefits of a regional water system that allows the conjunctive use of surface and groundwater and better manages and protects the area's water resources.

1.9 This Agreement Regarding Skagit Regional Water Supply System (Agreement) provides for the cooperation of City and PUD in the development of regional solutions for long range water supply needs for the fifty-year planning period (through 2040).

Section 2. INTENT.

2.1 It is the intent of the parties to cooperate in the development of additional waterworks and facilities that would form a Skagit Regional Water Supply System. The City and PUD will work cooperatively in the development of additional or expanded water resources and systems for distribution within Skagit County. Absent further agreement, the City and PUD will maintain present service areas, and their customers will continue to enjoy the present level of supply and service.

2.2 This Agreement provides a framework for development of each new joint facility. Each joint facility not specifically addressed by this Agreement shall be addressed by amendment to this Agreement. The specific intent of this Agreement is to make provisions for a standardized method to expand the Skagit Regional Water Supply System to meet the public water supply needs, and to establish a basis for agreement between the City and PUD for financing, ownership, construction and operation of new joint facilities required for the Skagit Regional Water Supply System.

2.3 It is the further intent of the parties that this agreement be incorporated into the Skagit County CWSP.

Section 3. REGIONAL WATER SYSTEM AND SERVICE AREA.

3.1 "Skagit Regional Water Supply System" (System) shall mean:

3.1.1 Those facilities of the City and PUD supplying water to the service area of the Skagit Regional Water Supply System.

3.2 "Service area of the Skagit Regional Supply System" shall mean the City's and PUD's Designated Water Supply Service Areas identified in the CWSP.

If it is in the best interests of both parties to change their present service areas, they may do so by mutual agreement and by amendment to this Agreement, all subject to applicable CWSP process.

3.3 "Facilities" and "Waterworks" shall mean those designated intake, treatment, pumping, storage, transmission and distribution plants or systems within the City and PUD public water systems as specifically identified in this Agreement, or amendments hereto.

Section 4. WATER SUPPLY - CAPACITY RIGHTS.

4.1 Capacity Rights. Each party shall retain its existing capacity rights in the Regional Water Supply System. Each party may, by mutual agreement, purchase regional capacity in planned improvements to the Regional Water Supply System. Any changes in these capacity rights shall be recognized by an amendment to this Agreement.

Any intertie agreement developed pursuant to this Agreement shall provide for a change of point or place of use only, and not a transfer or relinquishment of rights of the holder.

4.2 Additional Agreement Parties. Other agencies may purchase water or contract for other rights from the Regional Water Supply System, or become a party to this Agreement for future projects, by mutual agreement of the City and PUD.

4.3 Wholesaling Water. The City or PUD may wholesale water delivered through the Regional Water Supply System transmission system to areas outside of the City and PUD's respective Service Areas, so long as the other party's capacity rights are not negatively impacted.

4.4 Additional Facilities. Projected needs will be identified by both parties based on the party's designated service areas. As five or more years may be needed to bring major new capabilities on-line, five-year and ten-year forecasts are required, and must be updated whenever either party becomes aware of any significant change in the forecast demand. These will be discussed jointly as they arise, and reviewed at a Semiannual Meeting between City and PUD.

Planning for additional facilities will commence, unless otherwise agreed to in writing, no later than the date at which any party's demand reaches 85 percent of that party's capacity rights or when the five-year forecast exceeds the capacity. A schedule acceptable to both will be agreed upon to provide sufficient lead time for construction and expansion of the required facilities, and be incorporated as part of the necessary amendment to this Agreement.

4.5 Quality. The objective of the parties is to maintain the quality of the water in the Regional Water Supply System at or above the quality required by State or Federal drinking water standards. The City and PUD staff will meet periodically to exchange information and to help ensure that water quality and operational issues are addressed. The results of these meetings will be reviewed at a Semiannual Meeting.

4.6 Financing. Financing plans for specific projects are to be addressed by amendments to this Agreement, or by separate agreement of the parties to the project. Financial participation in existing and additional facilities may, by mutual agreement, be based on each party's projected need for each facility, and may be based on designated capacity rights.

4.7 Further Agreement Regarding Capacity Rights. The actual, five-year, and ten-year projected water needs of each party will be reviewed at a Semiannual Meeting. It is recognized that a party may have water capacity in excess of projected immediate needs. In the event a party is unable to meet its needs either solely or by joint facility development, the parties agree to meet and negotiate regarding lease rights, further water sales, or other methods to address System demands. Terms shall be on a mutually agreed basis that will cover the costs and investment of the party in facilities or rights covered by such further agreement. These costs may be included as a fixed and/or a variable charge on the water actually used. This further agreement shall terminate upon availability of capacity from additional facilities unless agreed upon by the parties in a further agreement or an amendment to this Agreement.

4.8 Cost of Service Charge. The parties will by mutual agreement establish rates and charges for System facilities. In establishing rates and charges, the parties will consider capital costs, fixed and variable operating costs, minimum fixed

charges, in lieu municipal service charges, and variable costs based on quantity of water delivered.

4.8.1 Capital Cost. Those costs incurred for Capacity Rights and planned capital expenses. Capital Costs are allocated based on designated capacity and may be financed by any lawful basis. The minimum cost will include an allocation for renewal and replacement based on designated capacity rights and the design life of joint facilities.

4.8.2 Fixed or Minimum Operating Cost. The cost of labor, supervision, utilities, services, taxes, insurance and all other expenses required to operate and maintain the system other than those items included under Variable Operating Cost.

4.8.3 Variable Operating Cost. Those costs directly proportionate to the volume of water produced, including chemicals, electric power, and other costs required to meet customer and System needs.

4.8.4 In Lieu Services. Those charges, imposed in lieu of municipal utility taxes, to provide for general governmental services. In lieu service charges shall be applied at a level not to exceed 5% to fixed and variable operating costs and to capital costs. However, if the PUD finances its share of the capital costs set out in a capital improvement program no in lieu tax will be charged to the PUD for this portion of the capital improvement program.

4.8.5 Accounting.

4.8.5.1 The capital cost System facilities shall include the cost of construction, and be documented in accordance with an accredited accounting system mutually acceptable to the parties.

4.8.5.2 Fixed and variable operating costs for System shall include costs as recorded and documented in accordance with the accounting that are directly attributable to the operation and maintenance of the System. The City and PUD will continue separate accounting for operation and maintenance costs for the facilities for which they are responsible. A standardized accounting procedure will be developed as far as practical to assess and credit cost among systems and record the net exchange of water on a monthly basis. Carry-over of credit for water delivered by either party may be allowed under mutually agreed conditions. However, all credits must be balanced by the end of a contract year.

4.8.5.3 Debt service for each party shall be addressed in financing plans for specific projects. See Section 4.6.

4.8.6 Billing. The parties will mutually agree on a method for accounts, billing and collection.

Section 5. ADMINISTRATIVE, LEGAL AND OTHER PROVISIONS.

5.1 Meetings.

5.1.1 The parties will hold joint meetings to review the status of this Agreement, Agreement amendments, further or associated agreements, as well as other issues of mutual interest or concern.

5.1.2 At least two joint meetings shall be held semiannually (Semiannual Meeting), to be scheduled by mutual agreement in the last week of March and September of each year. The purpose of the Semiannual Meetings are to review past activity and to propose efforts that may lead to further amendments to this Agreement. All forecasts of requirements will be reviewed at the meetings. The City and the PUD shall have representatives of their management and legislative authority attend the Semiannual Meetings. These will generally include the Mayor and one or more City Council Members, the General Manager and one or more PUD Commissioners. If other agencies become parties to this Agreement, they will provide for attendance of similarly qualified officials at the Semiannual Meetings.

5.2 Staff and Reporting. The coordination of this Agreement will be performed by the regular staff of the parties, with the addition of any non-staff people either party may care to include. These people will interchange information as often by meeting, teleconference, or other means they may choose. The purpose is to keep the joint projects moving forward in an efficient, cost-effective manner and to prevent any accumulation of misunderstanding. A monthly progress report shall be prepared by the party most active at that time and edited by the other until both are satisfied. Any further details will be included in amendments to the Agreement or in further agreements.

5.3 Schedule. At their first meeting, the staff of both parties involved in the coordination will prepare and publish a schedule and plan to facilitate the day-by-day operation of this Agreement. They may modify their schedule and plan as they wish within the limits of this Agreement, as long as both parties agree and publish the revised schedule and plan. Their work shall be reviewed at a Semiannual Meeting.

5.4 Other Efforts. Other means of recognizing and dealing with joint problems may be developed by mutual amendment.

5.5 Term. This Agreement shall remain in full force until the earlier of termination by mutual agreement, or adoption of a revised CWSP. Any party may request amendment to this Agreement at any time. Re-negotiation of this Agreement may be requested by any party for consideration at a Semiannual Meeting.

5.6 No Third Party Beneficiaries. The Agreement is for the benefit of the City and PUD only, to provide a framework for the development of System facilities. There are no third-party beneficiaries to this Agreement.

5.7 Compliance - Permits - Authority. Facilities that may be developed under this Agreement may be subject to preexisting rights, permits or approvals of the parties. Nothing in this Agreement constitutes a waiver of either party's rights, permits or authority to water, water use, or utility facilities. However, by this Agreement the parties reaffirm their commitment to the process for public water system coordination and planning.

Section 6. SUPPLY AGREEMENT.

6.1 The Supply Agreement shall remain in force and effect until such time as amended or modified pursuant to amendment to this Agreement or other agreement. In the event of conflict, the Supply Agreement shall govern and be preemptive of terms in this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their proper Officers on the 27th day of April, 1993.

City of Anacortes

L.S.

By: Doyle E Geer

Attest:

By: George L. Adams
City Clerk

Approved As to Form:

By:
City Attorney

Public Utility District No. 1 of Skagit County

Lee D. Bode
Lee D. Bode, Commission President

Al Littlefield
Al Littlefield, Commission Vice President

Jones Atterberry
Jones Atterberry, Commission Secretary

Attest:

James P. Kirkpatrick
James P. Kirkpatrick, General Manager

FIRST AMENDMENT TO THE REGIONAL WATER SUPPLY AGREEMENT BY AND BETWEEN THE CITY OF ANACORTES AND PUBLIC UTILITY DISTRICT NUMBER ONE OF SKAGIT COUNTY

RECITALS

1. The City agrees to the District's proposal to hookup a 12-inch line to the City Water Treatment Plant. This hookup will be known as "Riverbend Inter-tie".

2. The District agrees that in an emergency the District will make best efforts to supply the City with a minimum of 2mg per day of domestic water with a credit against water sales to the District. The City will pay the cost of PUD water meter.

   The District's computer water flow analysis indicates that the District could deliver up to 3mg per day through the inter-tie that is proposed. The City acknowledges that the District would be able to deliver water to them for about a 24-hour basis under those conditions and that over a long-term basis the District may not be able to deliver 3mg, but may have to cut back to 2 mg per day.

   The City acknowledges that District water could be discharged into their "wet well" or would require a City supplied booster pump to accommodate the City's line pressure.

3. The District agrees to pay the cost of the City water meter on the line. This water meter would be to meter the water delivered to the District. The District agrees to minimum water flows in exchange for a cost effective meter installation.

4. The District agrees to pay its pro rata share of the cost of a proposed 24-inch inter-tie. The District's pro rata share would be determined as its equitable part of its wholesale water supply agreement with the City. This inter-tie would be installed in the future on the north side of the two Skagit River bridges, being Interstate 5 and Old Highway 99 and connect to the District's 18-inch water transmission line that presently lies within the road right-of-way on Burlington Boulevard, also known as Old Highway 99. The 18-inch line would connect to the City's transmission line in the Avon area. This hookup will be known as "Avon No. 2 Inter-tie".

5. The District agrees to take that amount of water through the proposed future 24-inch inter-tie necessary to maintain water quality within the 24-inch inter-tie line.

   With the advent of the 12-inch inter-tie the 24-inch inter-tie would have a lesser importance to the District.

6. The District acknowledges that the City may not be able to commit to any fixed amount of water being available to the District through the proposed 12-inch inter-tie on the Riverbend Road and the proposed 24-inch inter-tie to be located north of the Skagit River bridges. The City has concern about capacity capabilities when the Skagit River has high level of Nephelometric Turbidity Units (NTU's).

   The present District supply connections or inter-ties, also known as the Lefeber Inter-tie, Fredonia Inter-tie, and the Fidalgo Island supply points are not to be determined as interruptible supplies with regard to water supply.

7. The City agrees to use its best faith efforts to increase the total amount of water available to the District.

8. The City recognizes that the District utilizes chloramines for final disinfectant of it's treated water. Chloramines can be detrimental to marine life. In addition, extra precautions for people on kidney dialysis machines must be taken.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their proper Officers on the 4th day of May, 1993.

City of Anacortes

By: Doyle E. Geer

Attest:

By: Joyce K. Thomas
City Clerk

Approved As to Form:

By: Ian L. Munce for
City Attorney

Public Utility District No. 1 of Skagit County

Lee D. Bode
Lee D. Bode, Commission President

Al Littlefield
Al Littlefield, Commission Vice President

Jones E. Atterberry
Jones Atterberry, Commission Secretary

Attest:

James P. Kirkpatrick
James P. Kirkpatrick, General Manager

WATER CONTRACT
WITH SAMISH FARMS WATER ASSOCIATION

THIS CONTRACT, entered into as of the 30th day of April, 1996, by and between Public Utility District No. 1 of Skagit County, Washington, a Municipal Corporation, (hereinafter referred to as the District) and Samish Farms Water Association, a voluntary non-profit association organized and existing under the laws of the State of Washington, whose address is P.O. Box 102, Bow, Washington, 98232, (hereinafter called the Association).

WITNESSETH: That the parties hereto do mutually agree as follows:

1. SCOPE AND TERM OF CONTRACT

Subject to the terms and conditions hereinafter set forth, the District agrees to sell at wholesale and deliver to the Association for resale, and the Association agrees to buy, water for rural, domestic, commercial and industrial purposes for a period not to exceed twenty-five years from the date of execution of this contract. The contract may be extended at the option of either party with the consent of the other for additional three-year periods upon written notice to this effect received ninety (90) days prior to the expiration of the Contract period.

2. AMOUNT OF WATER

The District agrees to furnish the Association with its full requirements for water which exist now or which may exist in the future; provided, however, that such water requirements shall not be in excess of the capacity of facilities and available water supply of the District to render such water service; and in any event not to exceed 300 gallons per minute (gpm) at the delivery point during peak usage hours, defined as between 8:00 a.m. and 11:00 a.m. and between 4:00 p.m. and 6:00 p.m., AND 350 gpm at the delivery point during periods other than peak hours. The total withdrawal per calendar month shall not exceed 1,100,000 cubic feet. Notwithstanding the foregoing, it is understood and agreed by the and between the parties hereto that the District must furnish a minimum of 810,000 cubic feet of water per calendar month, if demanded by the Association, subject to the District's water conservation program and curtailment requirements established in the District's current Water System Plan.

For and in consideration of this increase in capacity over the amount allowed in the previous Contract between the Parties, the Association agrees to pay a System Development Fee (SDF) to the District for each new service connection added to the

Association's water system after the effective date of this Contract (there are 420 service connections on the Association's water system per the Association's records as of the effective date of this Contract); each SDF shall be based on eighty percent (80%) of the SDF for the size of the new meter added per the District's SDF fee schedule in effect on the date the service is requested and shall be paid by the Association to the District within thirty (30) days of the date the service connection is requested; AND the Association agrees to participate in financing the replacement of the District's existing 8-inch waterline with a 12-inch ductile iron waterline on Cook Road between Old Highway 99 and Pulver Road, a distance of approximately one (1) mile; the Association's financial participation in the replacement cost shall be limited to the difference in material cost between 8-inch and 12-inch ductile iron pipe for the full length of the replacement, based on the cost of materials at the time the waterline is replaced, unless the Association pays the District within 30 days of the execution of this Contract, in which case the cost shall be limited to $27,086.00. The District agrees to use all reasonable means to complete the upgrading of the Cook Road waterline prior to the end of the year 2000. The District agrees that if the upgrading of the Cook Road waterline is not completed by December 31, 2000, that the District will refund such dedicated funds paid by the Association for the upgrade plus interest at the rate of five percent (5%) per year. The Association reserves the right to accept or leave the funds with the District for the upgrading of the Cook Road waterline; HOWEVER, withdrawal of such funds does not relieve the Association from participating in the Cook Road waterline upgrade when it is ultimately performed per the foregoing terms.

Should the water requirements of the Association exceed the amounts indicated in this Section of the Contract, the District reserves the right to determine what, if any, additional facilities it will elect to install to satisfy the excess requirements. The terms and conditions for water supply beyond the maximum amount indicated above will be the subject of further negotiations between the parties.

3. RATES AND CHARGES

For all water furnished under this Contract, the Association agrees to pay the District as follows:

1. The Association's minimum quantity shall be 100,000 cubic feet per month.

2. The District shall compute the cost using ninety percent (90%) of the Commercial/Industrial/Municipal water rate a per its current rate schedule.

The parties of this Contract mutually agree that during the period of this Contract the District may review its rate structure and make changes in its rates and charges.

The District will endeavor to notify the Association not less than ten (10) days prior to any public hearing(s) related to increase(s) in rates and charges, and will provide written notice to the Association of the adoption of such changes not less than one hundred twenty (120) days prior to the effective date of such change(s).

Payment for said charges shall be made within ten days of the billing date thereof, which billing date is fixed as of the first of the month, and, if payment is not made after 30 days, the District may elect to charge interest on the unpaid account and, if payment is not made after 90 days, the District may, upon written notice to the Association, discontinue service until payment is received in full.

Should the Association, in the conduct of its business, require additional service from the District such as reading of meters, billing and collecting, and other services in connection with the management and operation of the Association's water facilities, such services may, if the Association elects, be negotiated by the parties and shall be reduced to writing as a supplement contract between the parties. It is specifically understood by and between the parties hereto that the Association may contract for these services with any other entity other than the District, if the Association so elects.

4. POINT OF DELIVERY AND METERING

The District agrees to make delivery of water at a point known as Jack Smith's corner, located in Section 16, Township 35 North, Range 3, East of the Willamette Meridian, Skagit County, Washington. Water shall be measured by suitable metering equipment of standard manufacture, to be installed by the Association and approved by the District and maintained, calibrated and read by the District at its expense. If additional points of delivery or additional metering facilities are required by mutual agreement of the parties to be required, such additional facilities will be the subject of further negotiations between the parties and implemented only upon supplemental written agreement.

5. FACILITIES OF THE ASSOCIATION AND THE DISTRICT

The District shall use reasonable diligence to provide a regular and uninterrupted supply of water to the Association at a minimum pressure of 40 psi, but shall not be liable for damages, breach of contract or otherwise for failure, suspension, diminution or other variations of service, unless such damages or breach of contract are due to the intentional act or omission of the District. The Association agrees that it will provide the maximum utilization of its water facilities. The Association further agrees that, should the pressure at the point of delivery become less than 40 pounds per square inch due to actions or demands of the Association, it will provide and maintain at its own expense additional storage facilities, regulating valves and other facilities required to protect the system pressures of the District. The District agrees that should the pressure at the point of delivery become less than 40 pounds per square inch due to actions or demands other than of the Association, the District will provide and maintain such facilities as are required to provide at least the minimum pressure stated herein. To assure continuity of service to its other customers, and to enable the District to intelligently plan for meeting future water requirements, the District reserves the right to review and approve the plans and specifications of such facilities, or project plans if construction is by force account, which the Association may install, and such major additions and extensions thereof as may be undertaken by the Association. In order for the District to plan for its own facilities, the Association agrees to furnish to the District one copy of the Association's detailed plans and specifications for the Association's water system.

6. CHANGE IN VOLUME OR CHARACTER OF LOAD

Reasonable notice shall be given to the District by the Association respecting any material change proposed in volume of water required or characteristics of utility service.

7. LIABILITY OF THE PARTIES

Title to all facilities beyond the discharge side of the water meter at the point of delivery shall be vested in and remain with the Association, which shall be responsible for loss or damage to such facilities, unless such damage is caused by the intentional act or omission of the District, in which case damages shall be apportioned accordingly.

The District, a municipal corporation organized under Title 54, Revised Code of Washington, is bound by the rights, powers and duties contained in that statute, and

the Association, as a water customer, agrees to be bound by such rules and regulations as may be promulgated by the District pursuant to such authority.

In case suit or any other action, including arbitration or mediation, is commenced to enforce any one or more of the provisions in this Contract, whether said provisions be expressed or implied, the prevailing party shall be awarded its reasonable attorney's fees and costs. Venue for all court action shall be vested in Superior Court for Skagit County.

8. ASSIGNABILITY OF CONTRACT

The parties acknowledge that the Association has borrowed construction funds from the Farm Home Administration of the United States Department of Agriculture, and has given or will give a first mortgage securing said loan upon the proposed water system and all assets. In the event of the Association's default upon said loan, this contract is and shall be assignable to said Mortgagee or its assigns and the District shall and will continue to perform hereunder so long as the Purchaser shall abide by the terms hereof.

9. This Contract supersedes the previous Contract between the District and the Association, dated October 31, 1977, and its amendments.

IN WITNESS WHEREOF the parties have hereunto affixed their signatures this day and date just above written.

PUBLIC UTILITY DISTRICT No. 1 of
Skagit County, Washington

Al Littlefield, Commissioner

Jones E. Atterberry, Commissioner

Lee D. Bode, Commissioner

SAMISH FARMS
WATER ASSOCIATION, INC.

Mike Collins, President

Robert Ratfield, Vice President

Jan Brown, Secretary-Treasurer

Appved 7/5/08

WATER CONTRACT

NORTH FIR ISLAND WATER ASSOCIATION

THIS CONTRACT, entered into as of the 5TH day of July, 1983, by and between Public Utility District No. 1 of Skagit County, Washington, a Municipal Corporation, (hereinafter referred to as the District), and North Fir Island Water Association, a voluntary non-profit association organized and existing under the laws of the State of Washington, whose address is 1544 Skagit City Road, Mount Vernon, Washington, (hereinafter called the Association).

WITNESSETH: That the parties hereto do mutually agree as follows:

1. SCOPE AND TERM OF CONTRACT

Subject to the terms and conditions hereinafter set forth, the District agrees to sell at wholesale and deliver to the Association for resale, and the Association agrees to buy water for rural, domestic, commercial, and industrial purposes for a period not to exceed twenty-five years at the option of either party with the consent of the other for additional three-year periods upon written notice to this effect received ninety (90) days prior to the expiration of the Contract period.

2. AMOUNT OF WATER

The District agrees to furnish the Association with its full requirements for water which exist now or which may exist in the future; provided, however, that such water requirements shall not be in excess of the capacity of present facilities and available water supply of the District to render such water service; and in any event not to exceed 125 gallons per minute at the delivery point. Should the water requirements of the Association exceed this amount, the District reserves the right to determine what, if any, additional facilities it will elect to install to satisfy the excess requirements. The terms and conditions for water supply beyond the maximum amount indicated above will be the subject of further negotiations between the parties.

3. RATES AND CHARGES

For all water furnished under this Contract, the Association agrees to pay the District as follows:

1. The Association's minimum quantity shall be 26,000 cubic feet per month.

2. The District shall compute the cost of 26,000 cubic feet per month using the regular water rate as per its current rate schedule. That dollar amount shall be the minimum monthly rate.

3. All water furnished in excess of 26,000 cubic feet per month shall carry a charge per 100 cubic feet equivalent to the last step in the District's regular rate schedule.

The parties of this Contract mutually agree that during the period of this Contract, the District may review its rate structure and make such changes in its rates and charges as follows:

1. As may be required by State Laws.

2. May be necessary to carry out the obligations of its bond resolutions.

3. May be necessary to make the business of District profitable, or

4. To conform to the resolutions of its Board of Commissioners.

5. When there is a rate increase in general for District customers.

Ninety days written notice to the Association will be required if the District elects to exercise this option.

Payment for said charges shall be made within ten days of the billing date thereof, which billing date is fixed as of the 1st of the month; and, if payment is not made, the District may elect to terminate this Contract and discontinue service upon written notice to the Association, whereupon all charges become due and payable at once.

Should the Association, in the conduct of its business, require additional service from the District such as reading of meters, billing and collecting, and other services in connection with the management and operation of the Association's water facilities, such services shall be negotiated by the parties and shall be reduced to writing as a supplement contract between the parties.

4. POINT OF DELIVERY AND METERING

The District agrees to make delivery of water at a point approximately 2,213 feet north and 15 feet west of centerline of Fir Island Road as measured along centerline of Skagit City Road on Fir Island, Skagit County, Washington. Water shall be measured by suitable metering equipment of standard manufacture to be installed by the Association and approved by the District and maintained, calibrated, and read by the District at its expense. If additional points of delivery or additional metering facilities are required in the discretion

of the District, such additional facilities will be the subject of further negotiations between the parties and agreed to in writing.

5. FACILITIES OF THE ASSOCIATION AND THE DISTRICT

The District shall use reasonable diligence to provide a regular and uninterrupted supply of water to the Association, but shall not be liable for damages, breach of contract or otherwise for failure, suspension, diminution or other variations of service occasioned by any causes beyond the control of the District. The Association agrees that it will provide the maximum utilization of its water facilities. The Association further agrees that, should the pressure at the point of delivery become less than 40 pounds per square inch, it will provide and maintain at its own expense additional storage facilities, regulating valves and other facilities required to protect the system pressures of the District. To assure continuity of service to its other customers, and to enable the District to intelligently plan for meeting future water requirements, the District reserves the right to review and approve the plans and specifications of such facilities, or project plans, if construction is by force account, which the Association may install, and such major additions and extensions thereof as may be undertaken by the Association. In order for the District to plan for its own facilities, the Association agrees to furnish to the District one copy of the Association's detailed plans and specifications for the Association's water system.

6. CHANGE IN VOLUME OR CHARACTER OF LOAD

Reasonable notice shall be given to the District by the Association respecting any material change proposed in volume water required or characteristics of utility service.

7. LIABILITY OF THE PARTIES

Title to all facilities beyond (but not including) the water meter shall be vested and remain in the Association, which shall be responsible for loss or damage to such facilities.

The District, a Municipal Corporation, organized under Remington's Revised Statutes, Sec. 11605, is bound by the rights, powers, and duties contained in that statute; and the Association, as a water customer, agrees to be bound by such rules and regulations as may be promulgated by the District pursuant to such authority.

IN WITNESS WHEREOF the parties have hereunto affixed their signatures this day and date just above written.

PUBLIC UTILITY DISTRICT No. 1 of
Skagit County, Washington

By H. W. Beckman
Commissioner

By E. C. Vanderhyde
Commissioner

By [illegible]
Commissioner

NORTH FIR ISLAND WATER ASSOCIATION

By [illegible]
President

By Gary T. Stewart
Secretary

ADDENDUM NO. 1 TO THE AGREEMENT
BETWEEN THE SKAGIT PUBLIC UTILITY DISTRICT
AND NORTH FIR ISLAND WATER ASSOCIATION

At the request of Skagit Public Utility District, an addendum is made to the agreement between Skagit Public Utility District and North Fir Island Water Association. The purpose of the addendum is to facilitate the District's newly adopted rate design and allow North Fir Island Water Association relief from existing contract language pertaining to rates. The addendum is a rewrite of Item Three, Subsection Two in the current agreement. The rewritten section is as follows:

3. RATES AND CHARGES

For all water furnished under this Contract, the Association agrees to pay the District as follows:

1. The Association's minimum quantity shall be 26,000 cubic feet per month.

2. The District shall compute the cost of water using 90% of the Commercial/Industrial/Municipal water rate as per its current rate schedule.

This addendum supersedes Item Three, Subsection Items 1, 2 and 3 of the existing agreement.

The changes made by this addendum to Item Three Rates and Charges, does not change or invalidate any other conditions, covenants, or other addendums of this agreement.

Dated this 27th day of January, 1993.

NORTH FIR ISLAND WATER ASSOCIATION

BY: _____
President

_____
Secretary

SKAGIT PUBLIC UTILITY DISTRICT

BY: _____
Commissioner

_____
Commissioner

_____
Commissioner

Return: Public Utility District No. 1 of Skagit County
PO Box 1436
Mount Vernon WA 98273

Orig for recording to Jim 9/12/08 / Jim give me a recorded copy

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
INDUSTRIAL WATER SERVICE AGREEMENT

SIERRA PACIFIC INDUSTRIES

This Agreement is entered into this 11th day of SEPTEMBER, 2008, between Public Utility District No. 1 of Skagit County, a municipal corporation of the State of Washington, hereinafter referred to as the "District" and Sierra Pacific Industries, a California corporation, or its successor or assigns, hereinafter referred to as the "Customer."

The Customer is entering into this agreement to secure water service for its electric co-generation facility located in the BayView Ridge Urban Growth Area of Skagit County, Washington. The electric co-generation facility is located on property in the NE ¼ of the SW ¼ of Section 9, Township 34 North, Range 3 East, W. M. under Assessor's Tax Numbers 340309-0-001-0007, 4108-010-009-0003 and Parcel Numbers P21232, P73479 respectively, as shown on the attached map "Exhibit "A". The District owns and operates a water supply system and has capacity rights in the Skagit Regional Water System and is willing to supply water according to the following terms and conditions of this Agreement.

Quantity and Delivery
The Customer has estimated that it will require quantities and pressures of water at 80 to 100 pounds per square inch (psi) and in amounts of a "maximum" continuous flow rate of 217-234 gallons per minute (gpm), an "average" continuous flow rate of 159-176 gpm, with an anticipated maximum quantity of water equal to 81,000,000 gallons per calendar year.

Supply and Capacity Limitations
This agreement between the District and the Customer is to supply water to the Customer's existing co-generation facility. In this regard, the Customer agrees not to increase its operations, to add new facilities, or to extend its service in a manner that would increase its service requirements by more than ten percent (10%) without the prior approval of the District. Water service, under this Agreement, is exclusively to the existing co-generation facility and does not include service to adjoining facilities or properties and specifically does not include the 1½-inch service to the lumber facilities.

The District agrees to maintain and to operate this system so as to meet the volumes contracted for by its customers and to supply additional volumes as may be required by the Customer, consistent with the needs of all District customers. The Customer agrees to the following:

1. Conservation
   The Customer agrees to implement specified conservation measures as adopted by the District in accordance with State of Washington guidelines and regulations.

2. Capacity Limitations
   It is agreed that the District shall have the right to limit water use or the peak demands of the Customer should the usage approach the capacity of the District Supply System. The Customer will make every reasonable attempt to conserve water.

Metering

The volume of water delivered to the Customer shall be measured by metering equipment. The meter(s) will be owned and maintained by the District. It may be tested by the District periodically, to assure its continuing accuracy and conformance to the standards of measurement and service accepted in the industry. The Customer has the right to be notified ahead of time and be present at any tests. Water service may be interrupted during this time.

The size and type of meter shall be determined by the District. An undersized or oversized meter shall not be allowed. The size of meter shall be selected based on the sizing requirements of the most recently adopted IAPMO Uniform Plumbing Code, AWWA Standards C700 & C702, to have an annual usage of not more than fifty percent (50%) of the safe maximum operating capacity of the meter per year and, if the proposed use generally has a pattern of continuous flow (a relatively consistent flow for 6 hours or more), to flow not more than 50% of the safe maximum operating capacity of the meter during such periods of continuous flow.

Based on the customers projected flow rates listed in the "Quantity and Delivery" section of this agreement and District criteria, the size and type of meter shall be a 4-inch compound meter.

The Customer shall be responsible for paying all costs associated with installing the metered water service to the District water system.

System Development Fee

The Customer shall pay a System Development Fee based on the size of meter installed. The current System Development Fee for a 4-inch compound meter is $58,500.00.

Heavy Industrial Rate

The Customer will qualify for a Heavy Industrial rate provided the rolling average demand during a 12 month period is equal to or greater than 6.25 million gallons per month (8,355 hundred cubic feet). If the 12 month rolling average demand is less than 6.25 million gallons, then the Customer's rate per hundred cubic feet will be the commercial rate identified within the

most current water policy manual, but no less than the monthly minimum charge as identified in the Minimum Charge section of this agreement.

All water delivered will be for the exclusive and beneficial use of the Customer and the Customer agrees to exercise reasonable diligence in preventing waste of the resource.

Consumption Charges:

Rates and charges are based upon the cost elements of Section 2.2.2 of the District's Water Policy Manual that require consideration for production, treatment, storing, and delivery of the water. Also, indirect, supervisory and administrative, general expenses, taxes, interest and principal payments, and allocation for renewal and replacement of facilities when required are to be considered.

The cost of production and treatment expenses for the Customer's area of service is the cost of water purchased from the City of Anacortes by the District and is established per a contract with the City. This is referenced as the Anacortes Water Supply Agreement. The Anacortes Water Supply Agreement is currently amended annually for changes in variable and fixed costs, and approximately in three year increments in capital costs. The District will pass along these costs to Customer now and at any time they change in the future. The current cost computes to $0.6666 cents per 100 cubic feet based on the District's contracted allocation of 485 million gallons annually.

Other costs of the District are the District's storage, delivery, taxes, indirect general administration cost and associated facilities and debt. This cost is calculated to be $0.8334 per hundred cubic feet. This cost will be reevaluated each time the District has a general rate adjustment.

The District currently bills in units of hundred cubic feet. The combined cost of production and treatment of $0.6666 per hundred cubic feet and the cost of storage, delivery, taxes, indirect general administration, and other of $0.8334 equate to a current total cost of $1.45 per hundred cubic feet.

Minimum Charge

The City of Anacortes Water Supply Agreement currently contains various charges referenced within the agreement, which are passed on to the District. Based upon Customer's usage projections, the District has committed 81 million gallons annually, within its projected purchase of 485 million total annual gallons from the City of Anacortes. In order to protect the District, a minimum monthly charge is hereby established, regardless of the amount of water used, and will continue until the Anacortes Water Supply Agreement costs are modified or this agreement is terminated. The current calculated monthly minimum charge is $4,656.22.

Surcharge

The City of Anacortes Water Supply Agreement currently contains penalty provisions if the District exceeds its annual allotted commitment of 485 million gallons. If the District exceeds its annual allotment and Customer exceeds 81 million gallons, the District will pass along to Customer the penalty amount applicable to its units over 81 million gallons. The current penalty

amount is established at $1.45 per hundred cubic feet and will replace the $0.6666 per hundred cubic feet segment of the consumption charge (or its modified amount in future adjustments established as the District's cost for water purchases from the City of Anacortes). The penalty will be applied to all units over 81 million gallons where the District receives a penalty for exceeding the District's annual allotment.

Modification

The parties of this contract mutually agree that during the period of this Contract, the District may review its rate structure and make changes in its rates and charges. The Customer may request a change in its anticipated maximum usage per calendar year during the modification period as established within the City of Anacortes Water Supply Agreement with the District.

Billing

The District shall read the Customer's meter(s) each month, calculate charges, and issue a bill to the Customer for this service. The bill shall identify the consumption of metered water delivered to the Customer during the month and the corresponding costs. If the register is damaged in any way that prevents an accurate reading, the District shall estimate the amount of consumption and bill for such. Customer will notify the District if the delivery system is in need of District attention. Customer agrees to pay for all such estimated consumption. Payment is due in accordance with the standard District service policies.

Cross Connection Control

The Customer agrees to install and to maintain a backflow prevention assembly approved for installation in Washington State on the water service(s) as may be required by the District and State/federal health authorities. The type and model of assembly(ies) necessary must be approved by the District.

Quality of Water

The District will operate and maintain the District's distribution system in order to supply water for municipal and industrial purposes that meet the minimum water quality standards of the Washington State Department of Health.

The District shall not be liable to the Customer for failure to meet the drinking water quality standards for reasons that are outside the control of the District. The Customer shall hold the District harmless from any water quality related claim for damages by third parties served by the Customer, to the extent that the claim arises out of the Customer's negligence.

Initially the source of water will be the City of Anacortes. The District reserves the right to serve the premise from a different or supplemental source of water.

Disinfection/Fluoridation

The customer recognizes that all water will contain chlorinous compounds which are dangerous to all aquatic life, as well as fluoride which may be added in the future. pH levels and other parameters may vary. The Customer shall pursue with reasonable diligence the protection of aquatic life onsite and offsite of the Customer's development for all water discharged into the

environment and, upon failure to do so, shall hold the District harmless from any damages arising therefrom.

Continuity of Service

The District and the Customer agree the service is to be continuous until this agreement is terminated. During this period of time, the District shall use reasonable diligence to provide regular and uninterrupted service to the Customer's approved delivery or discharge point(s), but shall not be liable to the Customer for damages, breach of contract, or any other claim relating to interruption of service or curtailment of supply for any cause. These causes could include, but are not limited to, Acts of God, sabotage, war, fire, floods, earthquakes, or other catastrophes, labor disputes, failure or breakdown of the Water Supply System. The Customer shall further hold the District harmless from any claim for damages related to continuity of service by third parties, and/or those served by the Customer, to the extent that the claim arises out of Customer's negligence.

Conflicts

To the extent that there is any inconsistency between the provisions of this agreement, any exhibit incorporated as part of this agreement, or subsequent amendments and other rules and regulations of the District, the provisions of this agreement shall control.

Assignment

Rights and responsibilities under this Agreement may be assigned in part or in whole by Customer with the written consent of the District. Such consent shall not be unreasonably withheld.

Term and Termination

This Agreement shall remain in full force so long as the District's duly enacted conditions of service are met and/or until terminated by either party. Either party may terminate this agreement by providing written notice of the intention to terminate at least 60 days prior to termination. Such termination will be effective upon the expiration of the 60 day notice period, unless otherwise agreed by both.

If this Agreement is terminated by the Customer, the remainder of the committed Capital Costs to be billed to the District by the City of Anacortes for the allotted amount committed for Customer by the District shall be due and payable within 30 days of termination.

The monthly capital committed portion attributable to Sierra Pacific is $3,204.25 until December 31, 2010, and shall be adjusted according to future amendments to the Water Supply Agreement between the District and the City of Anacortes.

Applicable Law

This Agreement and all disputes arising hereunder shall be governed by Washington State Law. Venue shall be in a court of jurisdiction within Skagit County, Washington.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as to the day and year first above written.

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY

By: _____
David L. Johnson, P.E., General Manager

ATTEST:
Kim A. Carpenter

SIERRA PACIFIC INDUSTRIES

By: Curt Adcock
Curt Adcock, Division Manager

ATTEST:
Jennifer Lyn Fryman

STATE OF WASHINGTON
COUNTY OF SKAGIT

I certify that I know or have satisfactory evidence that **David Johnson** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the **General Manager of Public Utility District No. 1 of Skagit County**, Washington, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

Date: 9/11/08

KIM A. CARPENTER NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 8-09-09

Kim A. Carpenter
Notary Public in and for the State of Washington
My appointment expires: 08/09/09

STATE OF WASHINGTON
COUNTY OF SKAGIT

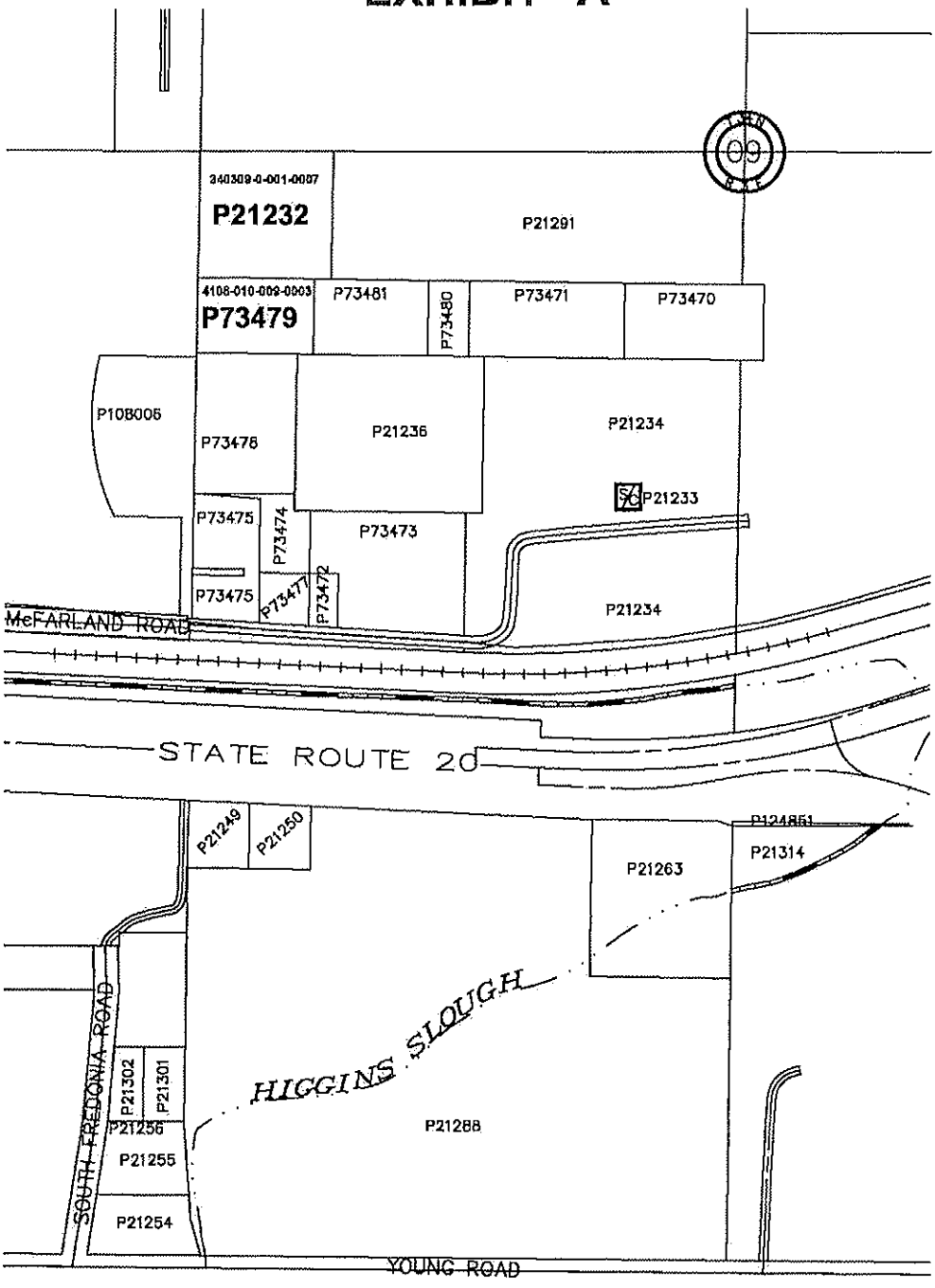
I certify that I know or have satisfactory evidence that **Curt Adcock** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the **Division Manager of Sierra Pacific Industries** to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

Date: 9/9/08

JENNIFER LYN FRYMAN NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 8-24-2011

Jennifer Lyn Fryman
Notary Public in and for the State of Washington
My appointment expires: 8/24/11

EXHIBIT "A"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McFARLAND ROAD
STATE ROUTE 20
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P21263
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SOUTH FREDONIA ROAD
P21302
P21301
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P21255
P21254
HIGGINS SLOUGH
P21288
YOUNG ROAD

APPENDIX E

2013 CULTUS MOUNTAIN WATERSHED MANAGEMENT PLAN

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Cultus Mountain
Watershed Management Plan

Public Utility District No. 1 of Skagit County
1415 Freeway Drive
P.O. Box 1436
Mount Vernon, WA 98273
(360) 424-7104
Skagitpud.org

August 2013

Skagit PUD
PUBLIC UTILITY DISTRICT

Cultus Mountain
Watershed Management Plan

Public Utility District No. 1 of Skagit County
1415 Freeway Drive
P.O. Box 1436
Mount Vernon, WA 98273
(360) 424-7104
Skagitpud.org

Approved
Department of Health
Office of Drinking Water
Jennifer Kropack
Regional Planner
8/27/13
Date

RECEIVED
AUG 21 2013
DEPARTMENT OF HEALTH
NW DRINKING WATER

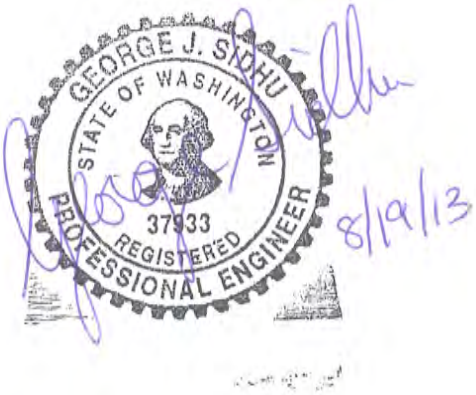
August 2013

CERTIFICATE OF ENGINEER

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY

CULTUS MOUNTAIN WATERSHED MANAGEMENT PLAN

The technical material and data contained in the report were prepared under the supervision and direction of the undersigned, whose seal as professional engineer licensed to practice as such, is affixed below.



George Sidhu, P.E.
Engineering Manager

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2010 SKAGIT RIVER WATERSHED CONTROL PLAN AND

2004 TABLE OF CONTENTS

Anacortes Water Comprehensive Plan Technical Memorandum

Date: **November 22, 2010**

Subject: **Watershed Control Plan Update**

To: **File**

From: **Eric Habermeyer and Jeff Hansen, HDR**

This technical memorandum presents an update to the City of Anacortes' (City) Watershed Control Plan (WCP).

1. Purpose of Watershed Control Plan

The Washington Department of Health (DOH) is responsible for the regulation and protection of our State's drinking water sources. Compliance with DOH regulatory standards is achieved using a variety of methods, depending on the type of water source involved and the current and projected demand on the water system. In systems where the primary source is surface water, such as a river, the source may be susceptible to contamination from a variety of sources throughout the watershed. In an effort to address this issue, DOH requires a Watershed Control Program to be implemented to minimize the risk posed by these potential sources of contamination.

The City initially developed its WCP in 2004, to meet the following objectives:

- to describe the watershed;
- maintain an up-to-date land use inventory;
- identify potential sources of contamination;
- describe watershed control measures;
- evaluate water quality trends and monitoring practices;
- evaluate treatment operations;
- evaluate the risks associated with potential sources of contamination;
- describe planned public education and outreach programs;
- summarize existing emergency spill response and contingency plans; and

- provide recommendations for future watershed program improvements.

To meet requirements in WAC 246-290-135, systems must update their watershed control plans every six years as part of updating Water Comprehensive Plans.

This 2010 Watershed Control Plan Update (WCP Update) has been developed to document and summarize changes in the watershed, activities conducted by the City to manage and protect water quality of this source, and planned efforts to continue protecting the City's Skagit River supply.

2. Update Approach

This WCP Update was prepared as part of the 2010 City's Water Comprehensive Plan. This update was developed by reviewing available data and information from the City. In addition, Washington State Department of Ecology's (DOE) Facility/Site Identification Database was used to develop the potential point source contaminant inventory.

3. Watershed Description

The term "watershed" can be defined in a variety of ways depending on the application and context. The Washington Administrative Code defines the term, in relation to the regulation of drinking water, as "the region or area that ultimately drains into a surface water source that is diverted for drinking water supply; and affects the physical, chemical, microbiological, and radiological quality of the source." In the case of the Skagit River Watershed, this definition encompasses an extensive area and involves multiple jurisdictions. For the purpose of regulation at the local level, this definition creates an impractical implementation area that covers thousands of square miles and extends into Canada. It was therefore necessary to more narrowly define the area to be considered in the WCP and in this update document.

The watershed was defined in the 2004 WCP using computer-based watershed delineation tools and elevation data from the U.S. Geological Survey. No data were available for the portion of the watershed that extends into Canada, and since this area is outside of state and local jurisdiction, it was not included. The Skagit River Watershed is comprised of Water Resource Inventory Areas 3 and 4, as defined by the Washington Departments of Ecology , Natural Resources, and Fish and Wildlife in 1970.

The City's WCP program area includes approximately 80 square miles within the Skagit River Watershed located in western Skagit County. The program area is mostly contained within Water Resource Inventory Area 3, the Lower Skagit-Samish Basin. Rolling foothills and floodplains characterize the terrain. Natural vegetation includes species such as western hemlock, western red cedar, red alder, and Douglas fir. Land use is dominated by forestry and agriculture. The municipalities of Burlington, Concrete, Hamilton, Lyman, Mount Vernon, and Sedro-Woolley are located in the program area. The primary population centers are Burlington, Mount Vernon and Sedro-Woolley.

Figure 1 depicts the program area location. Additional detail is provided in the 2004 WCP. The program area delineation has not changed from that presented in the 2004 WCP.

4 Source Description

The City owns and operates a regional water treatment plant located near Mount Vernon on the east bank of the Skagit River. The plant was constructed and placed in operation in 1971. The City's water system serves Anacortes, La Conner, Oak Harbor, the Tesoro and Shell Oil Refineries, the Swinomish Indian Reservation, portions of the PUD service area, and numerous other industrial customers. The supply for the City's water treatment plant is from the Skagit River, where there is an intake providing water to the City and other jurisdictions.

5 Water Quality

Skagit County currently monitors water quality within the watershed at 41 permanent locations. Each site in the monitoring program is visited every two weeks where dissolved oxygen, temperature, pH, turbidity, conductivity, salinity, and fecal coliform are measured, with additional samples collected for total nitrogen, ammonia, nitrate, nitrite, total phosphorus and total suspended solids on a quarterly basis.

Table 1 presents a comparison of water quality data collected in recent years at Site 29 - Skagit River at River Bend Road and Site 30 – Skagit River at Cape Horn Road. These site locations are identified on Figure 1.

Table 1 Water Quality Data for Two Monitoring Sites on the Skagit River

Water Quality Parameter	Unit	Skagit River at River Bend Road Site #29	Skagit River at Cape Horn Road Site #30
		2003 – 2009 Average	2002 – 2006 Average
Fecal Coliform	cfu	33	10
Ammonia-N	mg/L	0.06	0.02
Nitrate/Nitrite-N	mg/L	0.08	0.09
Oxygen	mg/L	11.10	11.31
pH	pH unit	7.32	7.29
Suspended Solids	mg/L	30	28
Temperature	°C	9.1	8.5
Total Phosphorous	mg/L	0.06	0.07
Turbidity	NTU	19.70	13.22

6. Land Use

Land use in the program area is dominated by agriculture. The majority of land is privately owned; public lands are located primarily within the city limits of municipalities.

Skagit County is required to plan land use and zoning under the State's Growth Management Act. Land located within the program area and outside the city limits of municipalities is subject to regulation under the Skagit County Comprehensive Plan, land use and zoning regulations. Incorporated cities within the program area have individual comprehensive plans to regulate land use and zoning within city limits.

Sources of potential water supply source contamination within the program area are of paramount concern in the development and implementation of the WCP. To that end, a list of Potential Contaminant Sources (PCSs) was developed for use in the 2004 WCP. The PCS list is comprised of parcels within the program area where the current land use designation is one considered to pose a threat to water quality in the Skagit River.

Three aggregate groups of PCSs were created for use in the 2004 WCP:

- **Agriculture**, including cropland, pasture, and orchards
- **Commercial/Industrial**, including manufacturing, retail, construction, mining and other resource production
- **Transportation**, including associated parking and maintenance facilities

These PCS groups were developed by grouping activities associated with land use designations from the Skagit County Comprehensive Plan, which are assigned to individual parcels by the Skagit County Assessor's Office. Table 2 describes the types of contaminants associated with these activity groups. Figure 1 depicts the location and extents of each of these designations throughout the program area.

Table 2 Activities and Contaminants Associated with PCS Groups

PCS Group	Activities	Contaminants
Agriculture	Fertilizers/herbicides/pesticides Contained animal feeding operations Lagoons and liquid waste Irrigation/erosion of natural deposits	Organic Inorganic Trihalomethanes Microbial
Commercial/Industrial	Fabrication/manufacturing Synthetics/plastic production Chemical/petroleum processing Wastewater discharge	Organic Inorganic Trihalomethanes Microbial Radionuclides
Transportation	Maintenance/fueling areas Stormwater runoff Hazardous materials transport	Organic Inorganic Trihalomethanes

In addition, facilities regulated by DOE were considered potential sources of contamination. DOE is tasked with administration and enforcement of the National Pollution Discharge Elimination System (NPDES) in our State. Authorized by the federal Clean Water Act, the NPDES permit program regulates point sources that discharge pollutants into waters of the United States. DOE regulates these and other types of sites that pose a potential threat to the environment. DOE regulated sites located within the program area (as of a November 2010 review of DOE data) are listed in Table 3. Figure 1 shows the location and type of each site.

Within the program area, there are 189 potential point sources of contamination. This is significantly more than the 95 potential point sources identified within the same area as part of the 2004 WCP. The difference is likely due to changes in how DOE tracks and stores facility information. Many of these facilities are close to or within the Cities of Burlington and Mt Vernon.

According to DOE, there are 66 underground storage tanks within the program area and 18 leaking underground storage tanks. These sites could contaminate groundwater in the area and have the potential to affect the water quality at the source.

Sites that handle or generate hazardous waste also present potential for surface and groundwater contamination. The type of contamination that could occur is specific to each location and the materials being handled.

Additionally, contamination can occur due to accidental discharges or spills from or on major roadways and other structures. An inventory of such potential sources of contamination is provided in the 2004 WCP, and has not materially changed since it was initially developed.

7. Watershed Control Program Strategies

In the case of the Skagit River Watershed and the program area defined in this document, obtaining or maintaining complete control of all potential contaminant sources is impossible due to the wide variety of land owners and uses present. In this situation, the goal of the WCP is not to control all potential contaminant sources, but to minimize the risk of potential contamination and the impact on the public drinking water supply if contamination does occur.

The City identified the following program strategies in the 2004 WCP. These strategies remain valid today, and the City plans to implement them as resources (both monetarily and in terms of staff time) allow during the six-year planning horizon.

7.1 Public Education

The most effective way to minimize the risk of source supply contamination in the program area is to educate the public about this risk. Land owners and users within the program area are most likely to cause an accidental spill; they are most likely to be the first point of contact with emergency management agencies by reporting a spill; and they are most able to prevent accidents through conscientious management of potential sources of contamination. The 2004 WCP contains specific education activities the City plans to implement in the future.

7.2 Emergency Notification

Once an accidental spill occurs or a peak flow event becomes imminent, the focus of the WCP is to facilitate an appropriate response to protect the public drinking water supply. Timely notification of key personnel at the state and local levels is essential in this situation. Travel times of contaminants to the City or PUD water intakes can be very short and will necessitate a prompt response to protect the public drinking water supply. Notification protocols are outlined in the 2004 WCP.

7.3 DOE Permit Holder Notification

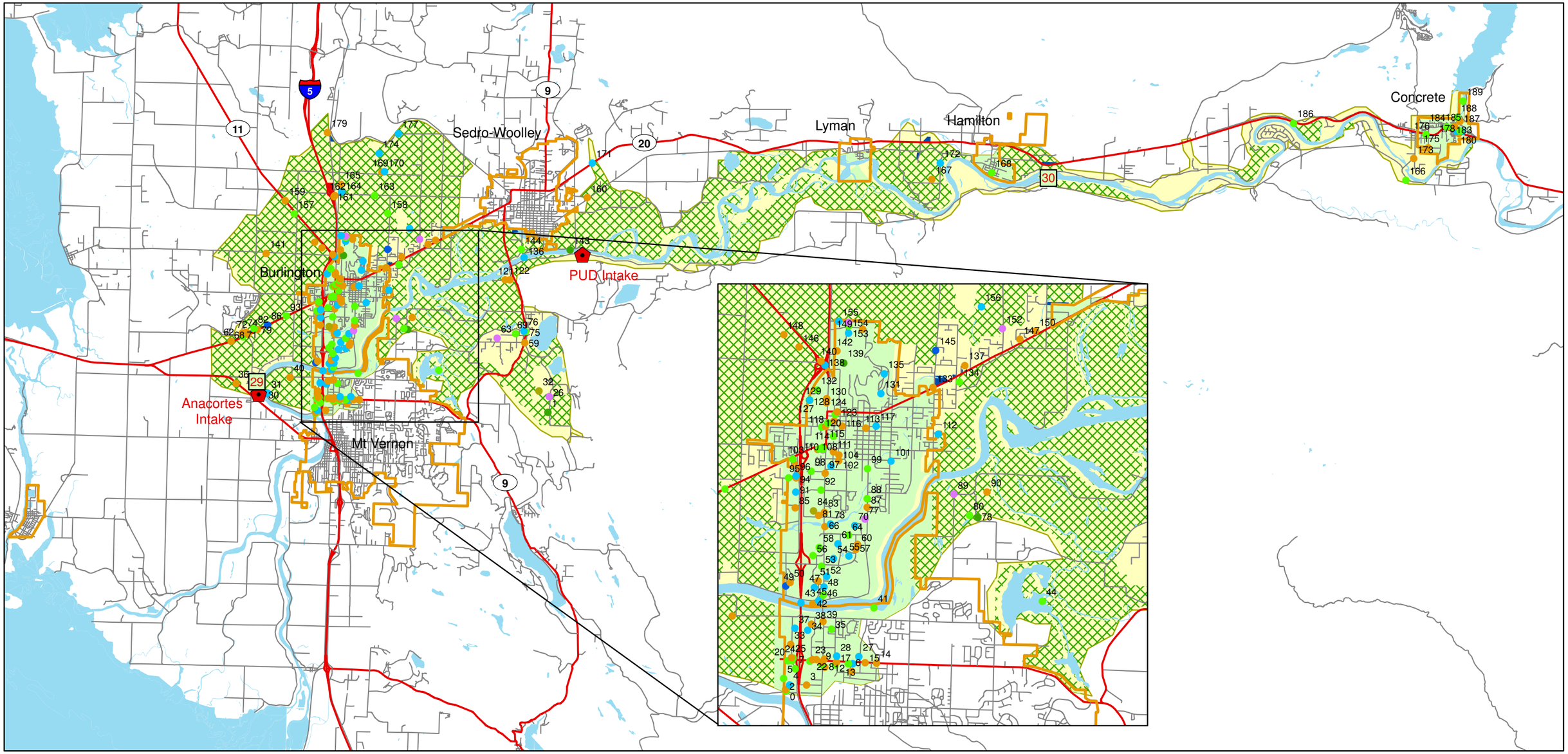
This involves contacting individuals listed as holders of the environmental permits issued by DOE within the program area to describe and explain the WCP and explain to permit holders what they should do in the event of an accidental contaminant discharge. The City will evaluate the feasibility and cost of implementing this measure within the next six years.

7.4 Interlocal Agreements

Implementation of the WCP is dependent upon coordination among municipalities within the program area. The first step in fostering this coordination is to initiate communication with the governments of Burlington, Concrete, Hamilton, Lyman, Mount Vernon, Sedro-Woolley and Skagit County, as well as emergency management agencies, law enforcement, and other parties. The City will consider entering into Memoranda of Agreement with such entities.

7.5 Cooperation

The key to success of this WCP is the development of cooperation among state and local agencies, municipalities in the program area, the City and the PUD. These parties must be made aware of the WCP and their active, on-going role in its implementation. Potential coordination activities are identified in the 2004 WCP. The City will implement these measures as resources allow.



Legend

DOE Facility Category

- Hazardous Waste
- Ecology Action Site
- Spills
- Toxics
- Waste to Resource
- Water Quality
- Water Reservoir

ProgramArea

30 Skagit Co Monitoring Site

- CityLimits
- Roads
- Highway
- Waterbody
- Transportation
- Industrial
- City
- Agriculture

Note:
See Table 3 for listing of potential contaminant sources

Figure 1
Watershed Control Program Area
Inventory of Potential Contaminant Sources
November 2010
City of Anacortes

N

0 6,250 12,500 25,000
Feet

Table 3 Potential Contaminant Sources

FID	DOE Facility ID	Site name	Type of Point Source	Ecology program
0	349764	Aqua Jet Enterprises	Revised Site Visit Program	Toxics
1	7488656	Leclair Dairy Waste Pond	Dam Site	Ecology Action Site
2	1838	Farrells Auto Wrecking	Revised Site Visit Program	Hazardous Waste
3	32542885	Dallys Auto Body	Hazardous Waste Generator	Hazardous Waste
4	97994478	Skagit County Public Utility 1	Emergency/Haz Chem Rpt TIER2	Water Quality
5	36682659	Freeway Drive Texaco	Haz Waste Management Activity	Toxics
6	39874293	Draper Valley Farms Mt Vernon	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
			Industrial IP	Toxics
			Industrial SW GP	Toxics
7	14995166	Fuel Express	Underground Storage Tank	Toxics
			Enforcement Final	Hazardous Waste
			LUST Facility	Hazardous Waste
8	23834	Sherwin Williams Co 8252	Hazardous Waste Generator	Hazardous Waste
9	49355844	Top Auto Inc Mt Vernon	Underground Storage Tank	Toxics
10	45759235	Nelson Distributing	Emergency/Haz Chem Rpt TIER2	Toxics
11	1456761	Skagit Valley Herald	Emergency/Haz Chem Rpt TIER2	Water Quality
12	17285127	Washington Cheese Co	Emergency/Haz Chem Rpt TIER2	Toxics
13	61364131	Dari Marketing Services	Underground Storage Tank	Toxics
14	36453625	Rental Service Corporation 566	Haz Waste Management Activity	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Water Quality
15	8191655	Island Construction Mt Vernon	Non Enforcement Final	Hazardous Waste
			401CZM Project Site	Water Quality
16	86757962	U Save Oil Co Inc Mt Vernon	LUST Facility	Hazardous Waste
			State Cleanup Site	
17	2678	Unocal Mt Vernon Bulk Fuel	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
18	65436525	Tosco Corporation Site 25630731148	Underground Storage Tank	Toxics
			Haz Waste Management Activity	Toxics
19	2659	Mt Vernon Gasoline Spill	Independent Cleanup	Toxics
20	22941236	Kwik n Kleen Carwash & Foodmart	Underground Storage Tank	Toxics
21	717314	Safeway Fuel Mt Vernon	Underground Storage Tank	Hazardous Waste
22	50528846	Hawleys Automotive	Underground Storage Tank	Hazardous Waste
23	69264124	Mt Vernon Exxon 262	LUST Facility	Hazardous Waste
24	9977921	Lowes HIW 035	Hazardous Waste Generator	Toxics
25	5820586	Kwick n Kleen	Enforcement Final	Hazardous Waste
26	8396488	Leclair Farms Mt Vernon	Dairy	Waste to Resource
27	23526	Aquatechnex Beaver Lake	AP Aquatic Plant and Algae Management GP	Water Quality
28	15912	Paulson Commercial Project	Construction SW GP	Water Quality
29	65372773	Northwest Hay Sales	Underground Storage Tank	Toxics
30	79423677	Anacortes WTP	Emergency/Haz Chem Rpt TIER2	Water Quality
31	3730	Anacortes Water Treatment Plant	Water Treatment Plant GP	Water Quality
32	5108482	Beaver Lake Quarry	Sand and Gravel GP	Spills
33	44421189	NC Machinery Co Mt Vernon	Haz Waste Management Activity	Hazardous Waste
			Underground Storage Tank	Hazardous Waste
34	11478272	Walmart 2596	Hazardous Waste Generator	Water Quality
35	5581542	Gary Minton Property	Underground Storage Tank	Toxics
36	38531157	WA WSU Mt Vernon Res & Ext Unit	State Cleanup Site	Hazardous Waste
			Hazardous Waste Generator	Toxics
			Haz Waste Management Activity	Toxics
			Industrial SW GP	Toxics
			Underground Storage Tank	Toxics
37	16107	Walmart Supercenter 2596	Hazardous Waste Generator	Water Quality
38	23590	Sherwin Williams 1729	Hazardous Waste Generator	Hazardous Waste
39	65248552	Valley Oldsmobile Cadillac	Underground Storage Tank	Hazardous Waste
40	61467836	Earl Hanson	Hazardous Waste Generator	Hazardous Waste
41	5235055	Hoag Road Dike	401CZM Project Site	Toxics
			Construction SW GP	Water Quality
			Non Enforcement Final	Water Quality
42	8610624	Fibres International Inc 4th Ave	Storage & Handling	Hazardous Waste
			Industrial SW GP	Hazardous Waste
43	6569	Gateway Storage Park	Construction SW GP	Water Quality
44	66456218	USA Petroleum Sta 188	LUST Facility	Toxics
			Hazardous Waste Generator	Hazardous Waste
45	2235552	Cascade Ready Mix Garl	Underground Storage Tank	Water Quality
			Industrial IP	Ecology Action Site
46	48157755	Burlington Ford New Holland Inc Burlington	Emergency/Haz Chem Rpt TIER2	Toxics
47	6417564	Home Depot 8561	Hazardous Waste Generator	Water Quality
48	5327890	Mutual Materials Co Mt Vernon	Emergency/Haz Chem Rpt TIER2	Water Quality
49	4236	PR Burlington Properties	Construction SW GP	Water Reservoir
50	82363767	Foothills Pontiac Buick Toyota	Underground Storage Tank	Hazardous Waste
51	51752151	Arco 5955	Underground Storage Tank	Hazardous Waste
52	3036	Cascade Concrete Industries	Sand and Gravel GP	Water Quality
53	77426355	USA Petroleum 290	Emergency/Haz Chem Rpt TIER2	Toxics
			LUST Facility	Toxics
			Underground Storage Tank	Hazardous Waste
54	21276226	Sears Unit 2389/6170	Hazardous Waste Generator	Water Quality
55	4737	Hopper Road Business Park	Construction SW GP	Water Quality
56	96826483	Costco Wholesale 662	Haz Waste Management Activity	Toxics
			Underground Storage Tank	
			Voluntary Cleanup Sites	
57	64937476	UPS Burlington	LUST Facility	Hazardous Waste
			State Cleanup Site	Toxics
58	6874060	Larrys Auto & Truck Parts Inc	Recycling	Toxics
			Industrial SW GP	Water Quality
			Revised Site Visit Program	Toxics
			Storage & Handling	Hazardous Waste
59	73997864	Country Convenience Clear Lake	Underground Storage Tank	Hazardous Waste
			Enforcement Final	Hazardous Waste
			LUST Facility	Hazardous Waste
60	8427430	Advanced H20 LLC	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
61	1993	Tudor Site Commercial	Construction SW GP	Water Quality
62	2667	Olympic Pipe Line Co Allen Station	Hazardous Waste Generator	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Waste to Resource
			Oil Facility Contingency Plan	Water Quality
			State Cleanup Site	Water Quality
63	16100	Johnson Dairy Farm	Energy Recovery	Waste to Resource
64	68744675	Commercial Aircraft Interiors	Emergency/Haz Chem Rpt TIER2	Toxics
			Hazardous Waste Generator	Toxics
65	36345693	Cargill Animal Nutrition	Emergency/Haz Chem Rpt TIER2	Toxics
			Industrial SW GP	Water Quality
			Toxics Release Inventory	Water Quality
66	311283	His Place Community Church	State Cleanup Site	Hazardous Waste
67	5332714	National Frozen Foods Mt Vernon	Emergency/Haz Chem Rpt TIER2	Toxics
68	31426711	Transmart Petroleum Avon Bulk Pant	LUST Facility	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Hazardous Waste
			State Cleanup Site	Hazardous Waste
			Underground Storage Tank	Hazardous Waste
			Hazardous Waste Generator	Toxics
69	46858985	Clear Lake Elementary School	Emergency/Haz Chem Rpt TIER2	Toxics
70	7226	DS Waters	Haz Waste Management Activity	Water Quality
71	59973687	Olympic Pipe Line Co Bayview Terminal	Hazardous Waste Generator	Toxics
			Oil Facility Contingency Plan	Hazardous Waste
72	85862767	Edco Inc	Industrial SW GP	Hazardous Waste
73	10532	Burlington Regional Stormwater Facilty	Construction SW GP	Water Quality
74	78427782	UAP Distribution Inc	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
75	65722165	Valley Freightliner	Haz Waste Management Activity	Toxics
			Industrial SW GP	Toxics
76	704301	Jansma Construction Inc	Recycling	Water Quality
77	7036275	Northwest Farm Foods Coop	Emergency/Haz Chem Rpt TIER2	Waste to Resource
			Industrial IP	Ecology Action Site
			Industrial IP	Water Quality
78	7739758	De Vries Dairy LP	Dairy	Ecology Action Site
79	4481712	Martin Commercial Fueling Inc	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
80	83839671	Alice Devries	Underground Storage Tank	Toxics
			LUST Facility	
81	42536776	Chevron Station 207730	Haz Waste Management Activity	Hazardous Waste
			Underground Storage Tank	Water Quality
82	56197864	Wilbur Ellis Co Mt Vernon	Emergency/Haz Chem Rpt TIER2	Toxics
83	29974694	Skagit Farmers Supply Burlington 1260	Underground Storage Tank	Hazardous Waste
84	95774849	Skagit Farmers Supply Burlington 1276	Emergency/Haz Chem Rpt TIER2	Spills
85	57726192	Fisher Sons Inc	Hazardous Waste Generator	Hazardous Waste
86	8574870	Draper Valley Farms Burlington	Emergency/Haz Chem Rpt TIER2	Water Reservoir
87	54933375	Skagit River Steel & Recycling Inc	Underground Storage Tank	Hazardous Waste
			Energy Recovery	Toxics
			Industrial SW GP	Hazardous Waste
88	8009	Dynes Farm Inc	Enforcement Final	Toxics
89	8277655	Nookachamps Wetlands Mitigation Bank	Non Enforcement Final	Waste to Resource
			401CZM Mitigation Site	Toxics
90	9353808	Devries Dairy Waste Pond	Dam Site	Hazardous Waste
91	13700	Goldenrod Tenancy in Common	Construction SW GP	Water Quality
92	3438911	Target Store 0696	Hazardous Waste Generator	Toxics
93	65239992	1303 Village	LUST Facility	Toxics
			Underground Storage Tank	Toxics
94	4814477	Burlington Cardlock	Underground Storage Tank	Hazardous Waste
95	2671	PSC Skagit SVC	Underground Storage Tank	Toxics
96	22184	Site Plan for Re Carpet	Construction SW GP	Water Quality
97	12229	Fred Meyer/Fuel Stop 024	Underground Storage Tank	Hazardous Waste
98	23005	Skagit Transmission Lila Lane	Moderate Risk Waste	Toxics
99	35336572	Helena Chemical Co Burlington	Emergency/Haz Chem Rpt TIER2	Toxics
100	14458	NW Plus Credit Union - Burlington Site	Construction SW GP	Water Quality
101	5855	32 Lot Helgesen Residential Plat	Construction SW GP	Water Quality
102	2978184	Fibrex Corp	Industrial SW GP	Hazardous Waste
			Industrial IP	Water Quality
103	42487926	Arco 6194	Underground Storage Tank	Toxics
			LUST Facility	Waste to Resource
104	77927419	Fibrex Corporation	Toxics Release Inventory	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Toxics
			Hazardous Waste Generator	Hazardous Waste
			Toxics Release Inventory	Toxics
105	4477949	North Sound Marine Inc	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
106	23836	Burlington Walgreens	Construction SW GP	Waste to Resource
107	82249852	Gull Industries Inc 294	LUST Facility	Toxics
			Voluntary Cleanup Sites	
108	53793776	Burlington Bulk Plant 296	LUST Facility	Hazardous Waste
			Enforcement Final	Spills
109	69895318	WA DOT Burlington Rio Vista	Underground Storage Tank	Toxics
110	77756314	Texaco Station 121367	Haz Waste Management Activity	Toxics
			Hazardous Waste Generator	Toxics
			Underground Storage Tank	Toxics
111	14636279	Americold Corp Burlington	Emergency/Haz Chem Rpt TIER2	Toxics
			Industrial SW GP	Toxics
112	6460019	Raspberry Ridge Apartment Property	State Cleanup Site	Water Quality
113	85527746	Burlington Edison School Dist	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
114	6043070	Ajax Inc	Revised Site Visit Program	Toxics
115	25786278	Skagit Big Mini Mart 1	Underground Storage Tank	Hazardous Waste
116	74486678	Glow Cleaners	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
117	7656	City of Burlington	Municipal SW Phase II Western WA GP	Water Quality
118	25796697	Burlington Wash Rack	LUST Facility	Toxics
119	93515752	WA Parks Northwest Region HQ	Haz Waste Management Activity	Hazardous Waste
120	46849498	Hexcel Corp	Hazardous Waste Generator	Toxics
121	8851127	Clear Lake Compactor Site	Moderate Risk Waste	Hazardous Waste
			Energy Recovery	Hazardous Waste
			Recycling	Toxics
122	9160169	WA AGR Skagit 2	Hazardous Waste Generator	Hazardous Waste
123	4535542	Skagit County Public Works Avon St	Underground Storage Tank	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Hazardous Waste
			LUST Facility	Waste to Resource
			State Cleanup Site	Water Quality
124	5448177	Burlington Edison Sd 100 Auxiliary Svc	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
			Haz Waste Management Activity	Waste to Resource
125	27561372	Burlington Edison Bus Garage	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
126	55536418	Pacific Pride Andis Road	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
127	58128843	Roberts Co Inc	Emergency/Haz Chem Rpt TIER2	Toxics
128	84563866	Hearth Trends Inc	Emergency/Haz Chem Rpt TIER2	Toxics
129	97418151	Lakeside Industries Burlington	Emergency/Haz Chem Rpt TIER2	Water Quality
130	73449299	Burlington Bulk Plant	LUST Facility	Hazardous Waste
131	11671	Plat of Bendtsen Heights	Construction SW GP	Water Quality
132	8659899	Buffalo Industries	Energy Recovery	Toxics
133	9631174	Raspberry Ridge II	State Cleanup Site	Hazardous Waste
134	66314669	Whatcom Drums	Emergency/Haz Chem Rpt TIER2	Toxics
135	21296	Burlington Hill Condominium	Construction SW GP	Water Quality
136	6665	Sedro Woolley STP	Municipal IP	Water Quality
			Biosolids	Toxics
137	69293456	Holiday Market	Underground Storage Tank	Hazardous Waste
138	15235	WSDOT SR 11 ChuckAnut	Construction SW GP	Water Quality
139	1777686	Skagit Transit	Emergency/Haz Chem Rpt TIER2	Ecology Action Site
140	17669878	WA DOT Burlington Chuckanut	Underground Storage Tank	Hazardous Waste
141	13786924	Double k Farms Inc Burlington	Underground Storage Tank	Hazardous Waste
142	74815578	Puget Propane Burlington	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
143	4428338	Sid Top Dairy	Dairy	Ecology Action Site
144	17866918	Arts Auto Wrecking	Industrial SW GP	Toxics
			Revised Site Visit Program	Water Quality
145	6437826	Wolters Dairy LLC	Dairy	Water Reservoir
146	20311	Watson Properties Commercial Dev	Construction SW GP	Hazardous Waste
147	7816417	Sams Stop & Go	Underground Storage Tank	Hazardous Waste
			LUST Facility	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Water Quality
			Municipal IP	Waste to Resource
148	5019	Tri County Truss Inc	Industrial SW GP	Hazardous Waste
149	649974	PSE Skagit Service Center	Hazardous Waste Generator	Water Quality
150	35686153	United General Hospital	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
151	19239	North Hill Resources	Sand and Gravel GP	Hazardous Waste
152	5737459	De Boer Dairy LLC	Dairy	Waste to Resource
153	7236178	Skagit Farmers Supply II	Underground Storage Tank	Toxics
154	8358774	Pacific Woodtech Corporation	Hazardous Waste Generator	Waste to Resource
			Hazardous Waste Planner	Toxics
155	7472943	Douwe Dykstra Dairy	Dairy	Water Quality
			Composting	Ecology Action Site
156	5033	Dual State Investments	Sand and Gravel GP	Water Quality
157	92443888	Double K Farms Inc	Underground Storage Tank	Toxics
158	31347735	Dans Dairy	Dairy	Toxics
159	57492751	Sakuma Brothers Processing Inc	Underground Storage Tank	Hazardous Waste
			Emergency/Haz Chem Rpt TIER2	Water Quality
			Industrial IP	Hazardous Waste
160	8017804	Harris Property Auto Recyling	State Cleanup Site	Hazardous Waste
161	35788228	Sun Energy Services LLC	Underground Storage Tank	Hazardous Waste
162	54732941	Skagit Cardlock Systems UST 5218	LUST Facility	Hazardous Waste
			Underground Storage Tank	Toxics
163	3794013	Twogates Reg Holsteins	Dairy	Toxics
			Non Enforcement Final	Hazardous Waste
164	4348	WA DOT SR11 I5	Construction SW GP	Water Quality
			Industrial SW GP	Hazardous Waste
165	316236	Lagerwood Farms Inc	Dairy	Hazardous Waste
166	48556819	Concrete Shop	Underground Storage Tank	Toxics
			Enforcement Final	Water Quality
167	3122006	Branshel Farm	Dairy	Hazardous Waste
168	77671279	Hamilton Log Yard	Emergency/Haz Chem Rpt TIER2	Toxics
169	5376956	CSR Associated Butler Pit	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
170	11591	Cemex Butler Pit	Sand and Gravel GP	Water Quality
171	5561833	Nielsen Brothers Inc	Enforcement Final	Water Quality
172	6510	Cockreham Island	Enforcement Final	Water Quality
173	90279462	Skagit County Public Works Concrete	Emergency/Haz Chem Rpt TIER2	Hazardous Waste
174	9586	Concrete Northwest Peterson	Sand and Gravel GP	Water Quality
175	76238174	Concrete School District 11	Underground Storage Tank	Hazardous Waste
176	46574748	Loggers Landing	Underground Storage Tank	Toxics
177	3098	Concrete Northwest Butler Pit	Sand and Gravel GP	Water Quality
			Sand and Gravel GP	Ecology Action Site
178	74176417	Skagit Cardlock Systems UST 11238	Underground Storage Tank	Hazardous Waste
179	34593771	Fast Break Operations	Underground Storage Tank	Hazardous Waste
180	7356	Town of Concrete WTP Improvements	Construction SW GP	Water Quality
			Biosolids	Toxics
181	8085730	Concrete STP	Enforcement Final	Water Quality
			Municipal IP	Waste to Resource
182	57962132	PSE Upper Baker Generating Sta	Haz Waste Management Activity	Toxics
183	9333187	GTE Northwest Incorporated 6634	Voluntary Cleanup Sites	Toxics
184	61443811	Philips Corner Rich or Dale Philips	Emergency/Haz Chem Rpt TIER2	Toxics
185	43943216	Texaco Station Peterson	Underground Storage Tank	Hazardous Waste
186	44711491	Grandy Creek Grocery	Underground Storage Tank	Toxics
187	91913661	PSE Lower Baker Switchyard	Independent Cleanup	Hazardous Waste
188	9410484	PSE Upper Baker River Generation	Emergency/Haz Chem Rpt TIER2	Toxics
189	8529946	PSE Lower Baker Dam	Non Enforcement Final	Toxics

Draft Report for:

City of Anacortes

Public Utility District #1
Of Skagit County

Skagit River
Watershed Control Plan

March 2004

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3 – Watershed Control Program

APPENDIX G

WATER POLICY MANUAL

Skagit County Public Utility District No. 1

Water Policy Manual

January 10, 2005

SKAGIT COUNTY PUBLIC UTILITY DISTRICT NO. 1
WATER POLICY MANUAL

JANUARY 2005

Prepared by:

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This copy of the Public Utility District No. 1 of Skagit County Water Policy Manual is for representative purposes only; all information contained in the manual, including dates and numerical references, are subject to change.

Contact the Engineering Department at (360) 424-7104 for the most current information.

Contents

4.0 Water Rates, Fees, and Deposits

5.0 Water Resources and Environmental Policy

6.0 Water Extension Policies

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Definitions

Abandoned Water Service – A water service that for a period of 10 or more consecutive years: has been disconnected, whose account has been terminated, meter has been removed, or that has shown no water use.

Applicant - Any individual person, firm, or organization who requests service(s) from the District. Once the work applied for is complete, the Applicant normally transitions to being a Customer.

Backflow – 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.

Commission – The Board of Commissioners of Public Utility District No. 1 of Skagit County, Washington.

Connection – A physical attachment to the District's water system for the purpose of allowing water service.

Consumption Charge – A charge levied by the District for water usage under one of the District's rate schedules.

Critical Areas – Areas defined by the Skagit County Comprehensive Plan as Critical Areas under the Growth Management Act.

Cross Connection - Any actual or potential physical connection between a public water system or the consumer's water system and any source of non-potable liquid, solid, or gas that could contaminate the potable water supply by backflow.

Customer – Any individual person, firm, or organization that purchases water; or is legally responsible for the purchase or payment for water from the District.

CWSP – Skagit County Coordinated Water System Plan

Deduct Service – Water service for the sole purpose of determining the amount of water not delivered to the sanitary sewer from the Customer's premises.

Detector Check Meter – A meter that registers usage on a fire service, but does not measure the quantity of usage (e.g. used to register use of a customer's fire protection system)

Disconnection of Service – Turn-off of an existing water service by the District for failure of a Customer to meet one or more of the District's terms of service.

District - Public Utility District No. 1 of Skagit County

DOH – Washington State Department of Health

Double Check Detector Meter – A water meter, typically on a fire sprinkler system, that registers minor usage of water, but not the total quantity of use (during a fire suppression event) through a Customer's fire protection system.

Extension – Additions to the District's water mains and/or related distribution facilities, for the purpose of providing water service at properties not previously served by a District-owned water main.

General Manager – The General Manager of Public Utility District #1 of Skagit County

Gridding – Installation of water mains connecting to each other from different directions, for the purpose of allowing redundancy in the event of shutting down a main; improving fire flows or other hydraulic conditions; etc.

Group A Water System – A Group A water system is defined in WAC 246-290-020 as a public water system: with 15 or more service connections used by year-round residents for 180 or more days within a calendar year, regardless of the number of people; or regularly serving at least 25 year-round (i.e. more than 180 days per year) residents, or that provides service opportunity to 25 or more of the same nonresidential people for 180 or more days within a calendar year, or that serves 25 or more different people each day for 60 or more days within a calendar year, or that serves 25 or more of the same people each day for 60 or more days but less than 180 days within a calendar year, or that serves 1,000 or more people for two consecutive days within a calendar year. (See Section 7.2.1)

Group B Water System – A Group B water system is defined in WAC 246-290-020 as a public water system that does not meet the definition of a Group A water system. (See Section 7.2.2)

Installation Charge – The charge levied by the District and payable by an Applicant for installing all or a portion of that Applicant's water service from the distribution main to the Applicant's private water service line.

Irrigation Meter – A meter installed solely for the purpose of metering irrigation water to a Customer's premises.

Latecomers' Agreement – A written agreement providing for reimbursement of a portion of the costs of an extension to the financier of the extension, repaid by new Applicants fronting and connecting to the extension, repaid via the District.

Latecomer's Fee – A reimbursement, paid by an Applicant for a new water service, of a portion of the costs of an extension to the financier of that extension, usually based on the front footage of the Applicant's property.

Limited Access Lot – A parcel of land that does not front a road, but gains access to that road by means of an easement over adjacent contiguous lots that do front the road.

LUD – Local Utility District

Meter Charge – A charge levied by the District on a regular basis (e.g. monthly or bimonthly) for water service during a particular time period, irrespective of consumption during the time period covered.

Meter Installation Charge – See Connection Charge

Point of Delivery – That point where the customer's water pipe is connected to the District's distribution system or transmission system (typically at the District's meter).

Refund Agreement – See Latecomer's Agreement

Rural – Rural lands are all lands which are not within an urban growth area and are not designated as natural resource lands having long term commercial significance for production of agricultural products, timber, or the extraction of minerals.

Satellite Management Agency (SMA) – A person or entity that is approved by DOH to own or operate more than one public water system on a regional or county-wide basis, without the necessity for physical interconnection between such systems.

Satellite Water System (SWS) – A water system which is owned, operated, and/or otherwise served by the District and which has a separate water supply not served regularly from the District's primary source, transmission and distribution network.

Seasonal Recreation Lot – A parcel of land that is used principally for recreational purposes and principally by recreational vehicles during a limited number of months per year.

SEPA – State Environmental Policy Act

Service Activation Charge – A charge for the establishment and/or setup of an account.

Service Deposit – A deposit by an Applicant when opening a new water service account with the District.

Skagit County Comprehensive Plan – The current edition of Skagit County's comprehensive plan prepared under applicable state law and adopted by the Board of Commissioners of Skagit County.

System Development Fee – A charge levied by the District on an Applicant, representing the Applicant's proportional share of investment in capital facilities that have broad application to the District's water system.

Temporary Water Service – Metered water service provided for use at a specified site on a short-term, temporary basis (Sec. 2.7.1).

Termination of Service – Complete cessation of water service to a Customer at a specific location by the District, normally accompanied by closing of the Customer's account for that water service.

Urban – An urban growth area is an area within which urban growth shall be encouraged and outside of which growth can occur only if it is not urban in nature. The urban growth area is supplied with urban governmental services, and an urban density is targeted to be equal to or higher than four dwelling units per one acre.

Water Service – (1) The availability of District-supplied water at a point of delivery, irrespective of whether the customer actually uses District-supplied water, or

(2) a physical metered connection to the District's water system for the purpose of receiving water.

(3) All pipe and materials, including but not limited to, the tapping saddle, corporation stop, water service piping, meter yoke, meter and meter box connected to the District's distribution main extending to a point of delivery at or on the customer's property where the customer's water service line is connected to the outlet side of the District's water meter in the meter box.

Water Service Installation, Types One through Six – Methods and configurations by which an Applicant may receive water service from the District.

Water Service, Fire Protection – A water service installation that is dedicated to the fire suppression piping of a facility. A "fire protection water service" is prohibited from also providing potable domestic water service.

Water Service, Irrigation – See Irrigation Service.

Watershed – A geographic area that supplies surface water runoff or ground water that feeds any of the District's water sources.

Water System Plan – The most up-to-date edition of the District's comprehensive water system plan which has been approved by the Washington State Department of Health; prepared under Washington Administrative Code Chapter 246-290 or 246-291; and describing the District's water system, operations, and future needs.

Wholesale Water Service – Water service provided to any person, firm, government, or organization for the purpose of resale to that entity's own water Customers.

Section 1
Introduction and Overview

1.1 Purpose

This Manual outlines the policies and procedures to be applied by District staff in providing water service to individual properties served by the District, managing extension and improvement of the District's water distribution facilities, and providing service to satellite water systems owned or operated by the District. Nothing in this Manual shall be interpreted to apply to District actions with regard to provision of electrical or other utility services besides water. A copy of this document shall be available for the public during regular District business hours in the District's office complex located at 1415 Freeway Drive, Mount Vernon, WA 98273.

1.2 Application of Policies and Procedures

In specific instances, the General Manager may, at his/her discretion, waive or modify the application of the policies and procedures described herein, including the application of standard fees and charges, provided that such waiver or modification allows for more effective or efficient achievement of District goals, objectives, and overall policies.

In cases where such waiver or modification involves a significant cost, or where its relationship to existing policies is not clear, the General Manager must report any waivers or modifications to the Board of Commissioners within the next two regularly scheduled meetings of the Board.

If authorized by the Board of Commissioners, specific fees and charges may be adjusted for inflation automatically on an annual basis. Standard fees and charges may be modified/adjusted, and new fees and charges may be levied.

1.3 Revision

These Policies and Procedures codify all previous Resolutions of the District, effective the date of adoption by the Board of Commissioners. These Policies and Procedures may be revised, supplemented, or otherwise modified only by action of the Board of Commissioners; except that in an emergency situation the General Manager may make such reasonable modifications as he/she deems necessary; provided, however, such modifications are reported to and ratified by the Board of Commissioners within the next two regularly scheduled meetings of the Board.

1.4 Conflict

In case of conflict between this Policy and Procedures Manual and the provisions of any resolution of the Board of Commissioners, rate schedule, or special contract, the provisions of the resolution, rate schedule, or special contract shall apply.

1.5 Saving Clause

If any clause, sentence, paragraph, section, or portion of these Policies and Procedures, for any reason shall be adjudged invalid by a court of competent jurisdiction, such judgment shall not affect, impair, or invalidate the remainder.

1.6 Related Policies

1.6.1 Water System Plan

The District has prepared, and the Washington Department of Health has approved, a Water System Plan (Plan) for the District's service area. This Plan projects service area needs over a 20-year time frame. The District's capital improvement program and incremental extensions and improvements to the District's system must be consistent with the Plan, as updated from time to time, whether they are carried out by the District or a third party.

Decisions on system extension, pipeline capacity, gridding, etc. will be guided by the Plan. The District's General Manager will, at his/her discretion, determine the extent to which capital improvements are for the purposes of transmission or other general system needs; which are for the purposes of distribution within an area of the District; and which are for the sole benefit of a single subdivision or development. When new developments are proposed, the District may require the Developer to dedicate permanent utility easements for installation of water pipelines and other facilities in order to facilitate construction of the overall District system in accordance with the Plan. The District's share of the cost of new facilities will be determined by this Manual and by the General Manager.

1.6.2 Skagit County Comprehensive Plan

The District's function is not to plan land uses within its boundaries, but to respond to land uses planned for the urban and rural areas of Skagit County under the applicable land use plan of Skagit County or the respective cities. The District's facilities, their encumbrances and their impact on the community will not be used as tools for implementing changes in the character or timing of planned land uses.

1.7 Overview of PUD Organization

A description of the PUD organization is provided in attached Figure 1-1.

1.8 Funds and Fund Accounts

The District is classified as a special purpose district and as a stand-alone governmental entity. Governmental accounting systems are established on a fund basis. As defined as a governmental entity in the utility business, the governmental accounting profession defines our utility as a Proprietary Fund and further defines the utility as an Enterprise Fund. Enterprise Funds are governmental classifications used to account for operations that are financed and operated in a manner similar to private business enterprises. An Enterprise Fund has the intent of providing

goods or services to the general public on a continuing basis and the costs are primarily recovered through user charges.

For management and administrative purposes, the District has established specific funds dedicated for tracking cash activities and balances in the following District functional areas:

1.8.1 Revenue Fund

Skagit County Washington, Public Utility District No. 1 Revenue Fund

Commonly referred to as the "Revenue Fund" or "General Fund." This fund receives all income, revenues, receipts, and profits derived by the District plus any proceeds from the sale, lease, or disposition of any properties or facilities of the District. The funds in this account are used for the purpose of operation and maintenance, repairs, renewals and replacements, and constructing additions, extensions, improvements, and principal and interest on bonds. The Major Capital Fund is a sub-fund of the Revenue Fund for anticipated major expenditures.

1.8.2 System Development Fund

This account is comprised of funds received from new services based on the cost of existing and future capital improvements to serve customers. The funds are restricted by the Commissioners of the District and used for growth related or capacity related projects.

1.8.3 Consumer Deposit Fund

This account is the accumulated outstanding deposits received from customers as a condition for service. The funds are returned to customers by application to their account if a satisfactory payment record is maintained.

1.8.4 Water Revenue Bond Funds

Revenue bond funds are derived from District revenues and are set aside to be used solely for the purpose of paying principal and interest on bonds. Sometimes, the District also sets aside funds to a Reserve Account within the Bond Funds as additional security for bond payments.

1.8.5 Local Utility District Bond Funds

Local Utility District Bond Funds are received from special assessments against properties that benefit from the installation of District facilities. The LUD Bond Funds are used for principal and interest on bonds.

1.8.6 Construction and Grant Funds

Construction funds are most commonly obtained from the issuance of bonds and the proceeds are restricted for the use as stated in bond covenants. They are usually used for large projects. Grant funds are usually obtained from federal or state government and are also dedicated to specific projects and are typically large construction projects.

Section 2
General Terms, Conditions, and Policies

2.1 General Provision

2.1.1 Scope

Section 2 of this Water Code provides the General Terms, Conditions, and Policies for furnishing and receiving water service. These terms, conditions, and policies are a part of all oral or written proposals, offers, agreements, and contracts for furnishing and receiving water service relating to the District.

2.2 Water Service Policies

2.2.1 General

Consistent with sound business judgment, the District shall undertake to the fullest extent to furnish water to all inhabitants of the County who are in need of a potable water supply.

The District will provide water service to undeveloped lots/parcels only after receipt of written notice or building permit from the local government with land use jurisdiction that the undeveloped lot/parcel is consistent with the jurisdiction's land use plan. (1350)

Water service requests for livestock watering and/or agricultural purposes may be allowed per Section 2.3.4. Such service shall not be converted to residential, commercial and/or industrial use without the prior approval of the District, which shall require the lot/parcel owner(s) to submit to the District a copy of the approved building permit for the proposed new use, issued by the local government having land use jurisdiction. Such building permit shall be considered warranty that the conversion is in compliance with the jurisdiction's approved land use plan. (1350)

The District shall execute an Agriculture Irrigation water service Agreement or Water Service Contract with an Applicant for each one-inch (1") or larger irrigation service. The contract will outline the duties of the District to provide water and the duties of the Applicant in the use of the water, including a clause stating that if problems arise relating to District water source capacity or hydraulics, that water for irrigation or other non-domestic demands may be limited or discontinued, as required by the District. Water use for irrigation is recommended during, and may be limited to, "off-peak" hours of 10:00 p.m. to 5:00 a.m. each day, or such hours as the District may prescribe. (1714, 1937)

2.2.2 Wholesale Water Service (383)

The District will, upon request, assist and aid local water districts and municipalities when practical.

The District will provide water supply at cost to a local municipality desiring additional or supplemental supply.

District cost for providing water supply consists of:

- Production costs and expenses at the source.
- Costs and expenses of treating, storing and delivering the water from the source of supply to the point of delivery or meter of the utilizing system.)
- Expenses incident to operating and maintaining the facilities dedicated to such services, including an equitable allocation of indirect, supervisory and administrative, and general expense.
- Taxes or payments in lieu of taxes.
- Interest and principal payments on the indebtedness of the District properly assignable to the facilities dedicated to such service. (383)
- Allocation for renewal and replacement of the facilities when required and to pay for facility improvements. (383)

2.2.3 Special Contracts for Services (545)

The Manager shall have the right, with the approval of the Commission, to fix special rates and enter into special contracts where service conditions are extraordinary and the existing rates cannot equitably be applied, provided that all such special contracts or rates shall be consistent with principles set forth in Sections 2.2.1 and 2.2.2, and that service provided by special contract shall be made available only if excess capacity in the District's distribution and source of supply facilities is available.

The District shall not sell or furnish water for the purposes of resale, except by special contract as directed and approved by the Commission.

2.2.4 Owner/Agent Agreement (aka Application and Agreement for Services: Landlords and Tenants)

The District will allow tenants to assume sole financial responsibility for water service provided they have completed the necessary District requirements for initiation of service as stated in 2.4.3. If the tenant has not initiated service and there is evidence that the service is in use, the Landlord shall be responsible and the service is subject to immediate shut-off unless such landlord has signed an agreement as indicated in this subsection.

If a tenant has not terminated service and is the responsible party by previously initiating service, the District will only terminate service for the following reasons:

- The tenant is not meeting the requirements and conditions of the District to continue service. In this case, the District will initiate termination.
- The tenant requests termination of service.

- The landlord signs an order to terminate because the tenant has not requested termination of service and no longer is a tenant of the premises, or the landlord needs the service off to protect the premises and to repair or maintain the premises. The District will not terminate service for non-payment of rent to the landlord as RCW 59.18.300 does not allow landlords to terminate utilities for non payment of rents.
- A new tenant has indicated they are now new renters and meet the District's requirements for initiation of service. In this case, the District will terminate service in the name of the previous tenant and immediately activate service with the new tenant.

  If the Landlord wishes to remain the sole financial responsible party and not allow tenants to assume financial responsibility, the District will accommodate such request.

  As allowed in this subsection, a contract may be entered into by any owner of rental property for the provision of uninterrupted service to such property between tenancies. The owner agrees to pay for water service charges during this period and until a tenant assumes responsibility for water service under these policies.

2.2.5 Movement and Relocation of Water Services (1668-95)

A Customer may have a water service relocated at their expense subject to standard District installation requirements. The water service that is relocated shall be restricted to relocation on the same lot or parcel that it originally served. The Customer shall be required to pay additional system development fees if the water service with meter is increased in size. Refer to Section 4.2 for the system development fee formula. The water service taken out of service due to relocation, if left in place, shall require a system development fee at the current applicable level if reactivated. The District may permit the movement and relocation of water services under the following conditions: (867)

- When the continuation of a service at its present location appears unlikely to serve any useful purpose in the future or presents a hardship to the Customer, and
- When the proposed future location is on the District's water system where adequate water mains exist to properly serve the Customer requirements at that location, and (867)
- When an amount equal to the estimated cost of removal and relocation is paid prior to relocation work and the work is authorized by a signed job order: the estimated cost shall be equivalent to a Type One or Type Two connection charge or a higher estimated amount, whichever is deemed sufficient by the District, and
- If the proposed future location is on a pipeline on which a Latecomer's Agreement is in force, an amount equal to the refund will be paid in addition to conditions listed above.

After all work has been completed, all conditions satisfied, and all accounting completed, the Customer shall be billed for additional costs incurred over the payment(s), or

refunded any unused balance. A service once removed under these conditions shall be considered nonexistent at the place from which it was removed. (867)

2.2.6 Illegal Use of Water (1876-99)

Withdrawal of District water from a non-metered connection, standpipe, or fire hydrant without a written water use contract with the District is prohibited. Illegal use will be assessed at minimum, a basic charge equivalent to a monthly 4-inch meter charge for each month of use. Extended illegal use and consumption charges will be based on the District's estimate of use at the current consumption charge.

2.3 Installation of Water Service (1350)

2.3.1 Water Service Availability (1350)

Water service cannot be provided unless water lines with sufficient supply are available and the location of the site where service is to be installed is contiguous to a water main, unless otherwise allowed within this Water Code per line extension requirements (see Section 6). For accuracy and record keeping purposes, for the Applicant must provide building plans for cross connection review, site plans, and onsite sewer system disposal plans. The site of the service installation must have an address assigned by the county or municipality.

2.3.2 Meter Box Installation (1350)

It is necessary to install the meter box at proper grade in order to make it level with existing or future sidewalk, driveways, or lawns. The property owner must have the correct grade established, located, and marked for the benefit of the District service installation crew.

2.3.3 Installation in Unimproved Areas (1350)

It is not desirable from a security position to install water services in unimproved areas, and in the event such a request is made, it will be necessary for the applicant to present all applicable permits and/or approvals issued by the appropriate government agency or agencies. See Sections 6.2.6, 6.5.6 and 6.6.7 for a listing of possible approvals to obtain.

2.3.4 Other Uses (1350)

Service for the purpose of watering livestock or other animals or for irrigation purposes may be allowed if the applicant provides an address from the local authorizing authority and meets other District criteria.

2.3.5 Installation Timing (1350)

The application for water service and payment of fees thereof, implies the applicant is requesting the service be installed as soon as possible. The District will turn on or install the service(s) or meter(s) as soon as the District's schedule allows after the Applicant has completed the service application and paid all applicable fees and charges.

2.4 Activating, Disconnecting, Reactivating and Terminating Service (1668, 1261)

2.4.1 Service Order or Contract

- Each Applicant desiring water service may make verbal or written application and may be required to sign an application form or contract prior to service connection. Application for water service will be made at the District's office complex located at 1415 Freeway Drive, Mount Vernon.
- At the time of application, each Applicant shall be informed of the fees and charges for obtaining service(s). (Service Activation Charge, See Appendix A, Table A-9) Any claimed or actual failure by the District to inform the Applicant shall not, however, relieve the Applicant of any such fees or charges.
- Large industrial or commercial contracts shall contain such provisions and stipulations as may be necessary or desirable to protect the interests of both the District and Applicant.

2.4.2 Agreement

By acceptance of service, each Applicant agrees to be subject to all current and subsequently revised District policies, rates, charges, service requirements and regulations, with or without a written application or contract.

The Applicant agrees that the District shall have the right to shut off the water service, with or without notice, for (1) repairs, extensions of the water line, (2) non-payment of water bills, or (3) any operating condition requiring suspension of service, and that the District shall not be responsible for any damage due to stoppage or interruption of the water supply.

2.4.3 Initiation of Service

Service will be initiated when the Applicant has met all District requirements and submitted:

- Proper application and a demonstration of credit sufficient for reasonable assurance that service bills and fees will be paid.
- Valid service and mailing address(es).

- Payments as required on delinquent accounts.
- Payment of applicable deposits and other fees.

The District will turn on or install the service(s) or meter(s) as soon as the District's schedule allows after the Applicant has completed the service application and paid all applicable fees and charges.

2.4.4 Separate Service for Each Lot, Property, or Dwelling or Establishment

Each lot, property, dwelling or establishment is required to have a separate water service, EXCEPT as provided for in this subsection and Section 2.7, Temporary Water Service.

- Each multi-family residential structure may be served by either a common meter or individual meters for each unit, at the option of the property owner and approval of the District.
- Multifamily structures, commercial, industrial, institutional, or governmental Customers with facilities occupying multiple lots or structures under a single ownership may be served by either a common meter or individual meter for each structure, at the option of the owner and approval of the District.
- Multi-tenant commercial, industrial, institutional, or governmental properties or structures may be served by either a common meter or an individual meter for each tenant, at the option of the owner and approval of the District.
- A common meter may be used to provide water service to the main residence and an accessory dwelling unit if they conform to applicable zoning and applicable Skagit County and/or city regulations.
- One meter may be used to provide water service to separate, non-rented, and primarily non-commercial structures on the same property, if they conform to applicable zoning and applicable Skagit County and/or city regulations.

If common metering is used, the Applicant shall be responsible for the entire billing.

Customers shall not provide water to any additional dwelling(s) without the prior written approval of the General Manager.

2.4.5 Multiple Meters

When a Customer's service requires application of more than one rate schedule, one meter will be installed for each applied schedule. Each meter will be billed separately unless otherwise specified in a special contract.

2.4.6 Meter Removal for Unused Connections (1285)

The District may remove the meter on water service connections unused for a period of one year. At such time as the customer requests renewal of service within one year, the

District shall replace the meter for the existing turn on/reconnection fee (Table A-8). At such time as the customer requests renewal of service after one year, the District shall replace the meter for the existing renewal of service fee (Table A-8). If the District should determine that the existing service is unusable, the necessary restorations shall be made and the cost of replacement paid by the customer authorizing renewal of the service. This cost shall be based on time and material not to exceed the existing "Type 1" New Service Installation Fee. For meters larger than 1", the cost shall be based on a time and materials basis. Meter Types are defined in Section 3; fees are addressed in Appendix A, Table A-8.

2.4.7 Disconnection of Service (1285)

- Service may be disconnected for good cause, including (but not limited to):
  - Violation of service requirements or regulations, rate schedules, contracts or plumbing codes.
  - Failure to pay fees or deposits.
  - Theft or illegal diversion of water.
  - Customer system leaks of which the District becomes aware and which cause or may result in significant water loss and/or property damage.
  - No one assumes responsibility for service.
  - Failure to pay water charges when due.
  - Failure to meet cross-connection control, installation and maintenance requirements.
  - Use of water in a manner which is seriously detrimental to the service being rendered to other Customers as further described in Section 2.5.3.
  - Indiscriminant use of water that has or may have a detrimental effect on wetlands of significance, as determined by Skagit County, and/or the failure to neutralize discharged water for the protection of aquatic life in the receiving water.
- Service will not be disconnected for non-payment of bill without written NOTICE. (Ref. Sect. 3.3.4) The nature of the notice required and the period of time before disconnection for other than non-payment shall be reasonable under the particular circumstances with special consideration for the potential dangers to life and property.
- After disconnection occurs (for other than non-payment), information concerning such action and the process for reconnection of service will be mailed to the billing address provided by the Customer.
- The disconnection of service for any cause shall not release the Customer from the obligation to pay for water received, fees owed, and charges specified in this Manual or in any existing contract.

- Disconnection During Appeal: (Ref. Sect. 2.8)

  At the District's discretion, disconnection of service may be by locking meter isolation valves or physical disconnection as the District may choose.

2.4.8 Turn On/Reconnection of Disconnected Service (1285)

When service is disconnected for noncompliance with service requirements or regulations, nonpayment or fraudulent use, the service will not be reactivated until the situation is corrected to the District's satisfaction.

Before turn on/reconnection, the Customer will be advised of current charges for service turn on/reconnection. (See Appendix A, Table A-9)

Only authorized District personnel may initiate and turn on/reconnect service to a water service connection. Appropriate charges, as specified in Appendix A, for turning on or reconnecting service will be assessed as applicable.

2.4.9 Termination of Service by a Customer

Except as may be otherwise provided for by a special contract or agreement with the District, when a change of occupancy or of legal responsibility takes place for water service to any premise being served by the District, the Customer may terminate service by notification: in person, by telephone or in writing to the District within a reasonable time prior to such change. The outgoing Customer may be held responsible for all service supplied to the date notification is received by the District. The District reserves the right to read the meter(s) for a final bill and such reading(s) may be adjusted for consumption, if any, used by subsequent Customer(s). The final reading may be estimated by mutual consent of the Customer and the District. Under some circumstances the District may, at its option, require written authorization from the Customer paying for water service before terminating such water service.

2.4.10 Reactivating Abandoned Service (1668-95)

Water service can be reactivated in cases where water service to a dwelling, establishment, or parcel has been abandoned. An abandoned service is considered by the District to be nonexistent. In such cases, the Customer requesting reactivation of an abandoned service shall be required to pay the current applicable system development fee and reactivation of abandoned service charge as indicated in Appendix A, Table A-9. An exception to the system development fee requirement may be made if the reactivated service is to serve the original intact dwelling or establishment; provided the original dwelling or establishment is continuing in the same scope and mode of activity as customarily served by the District when the service was previously active.

2.5 Service and Equipment Requirements

2.5.1 Customer Facilities

- Plumbing and Equipment: The Customer shall install, own, and maintain all plumbing and equipment beyond the point of delivery, except meters and special facilities installed or furnished by the District. The Customer's plumbing is to conform to:
  - ♦ District's service requirements and regulations.
  - ♦ Municipal, county, and state requirements.
  - ♦ Accepted modern standards as set forth in the Uniform Plumbing Code.

2.5.2 Responsibility for Maintenance

The District is responsible for maintaining its facilities and equipment to the point of delivery. The Customer owns and maintains equipment beyond the point of delivery. (See Section 2.5.1)

2.5.3 Safeguard of District Facilities

The Customer shall provide space for, and exercise proper care to protect any of the District's facilities on the Customer's premises. This shall include meters and other facilities installed by and remaining the property of the District. Any person knowingly and maliciously damaging or tampering with District meters and other equipment, reconnecting a previously disconnected meter for the purpose of restoring utility service or tampering with any District equipment with the intent of defrauding or illegally diverting utility service shall be subject to prosecution by the District in accordance with Chapter 9A.56 RCW (Theft and Robbery) In addition, in the event of unauthorized connection, and loss or damage to the District's property, the District may collect from the Customer the charge for estimated unmetered water, the cost of facility repairs and replacement including the time and expense of District personnel, administrative costs, attorneys' fees, and other costs authorized or awarded. This charge will be in addition to the charge for estimated unmetered water.

- The District may refuse or disconnect service to Customers when conditions are known by the District to be defective or out of compliance with codes, regulations or requirements. The District is not liable for loss or damage to persons or property resulting from defects or negligence of others:
  - ♦ By the Customer beyond the point of delivery, or
  - ♦ In the Customer's installation, facilities, or equipment.

- When an individual's action might endanger District property or interrupt water service, prearrangements can be made for a crew or service personnel to stand by. Cost for this service may be charged to the responsible party.

Should loss or damage occur to District property, the responsible party may be charged for repair or replacement cost, administrative time and expense, and estimated loss of unmetered water. However, if a District employee is at the site and approves the method and work, the charge to the Customer may be modified or waived.

2.5.4 Access to Premises (1744)

- The Customer is to provide District representatives with safe, clear access and entry to Customer premises for service related work. The District's facilities must remain unobstructed and accessible at all reasonable times so the District may:
  - Install, inspect, maintain, or remove District equipment or plumbing.
  - Read, connect, disconnect, or inspect metering devices.
  - Inspect Customer owned cross-connection control devices.
  - Inspect all water facilities on the premises for cross-connections. At any time a cross-connection is discovered and it is not immediately remedied by the Customer, the District reserves the right to immediately terminate water service to the Customer until such cross-connection is removed or protected by an approved Backflow Prevention Assembly as required by the District. Such inspection shall not make the District responsible for guaranteeing the absence of cross-connections.
- For locked Customer premises where District equipment is located, the Customer will allow District access with its own lock and key.
- The Customer shall provide space and protection for District facilities on the Customer's premises, including meters, touch pads on outside walls and other equipment installed by and belonging to the District.
- Although the Customer is responsible at all times for maintaining Customer-owned equipment, the District may inspect Customer equipment before or after service connection.

However, such inspection, or lack of inspection, shall not be construed as placing upon the District any responsibility for the condition, or maintenance of the Customer's plumbing, nor does it guarantee the absence of cross-connections in the Customer's service.

2.5.5 Cross Connection Control

The District's responsibilities include protecting the entire water system from actual and potential contamination. Present state and federal regulations require that there shall be no cross-connection between a system furnishing potable water and a system furnishing non-potable water. The Customer shall install cross-connection control assemblies when deemed necessary or when required by the District. The entire cost of the installation shall be the responsibility of the Customer, and any assemblies shall remain its ownership

and its responsibility. District representatives may make inspection of such assemblies periodically. It shall be the Customer's responsibility at all times to maintain its cross-connection control assemblies in a fully functioning condition. All Department of Health (DOH) requirements must be satisfied

The installation and maintenance of any cross-connection that could endanger any water supply of the District is prohibited. Existing or future water service to any premises will not be allowed to exist by the District if a cross connection control assembly required by the Department of Health or by the District is not documented in writing to be permanently installed, maintained, and tested annually. Water service will be discontinued to any consumer that refuses admittance of District personnel to their premises for the purpose of cross connection control. Water service will not be restored until such conditions or defects are documented to be correct. The Customer shall pay District expenses incurred to enforce these provisions before water service is restored. (1744-97)

The control or elimination of cross connections shall be in accordance with the provisions of the WAC 246-290-490 or subsequent updates. The policies, procedure, and criteria for determining appropriate levels of protections shall be in accordance with the accepted procedures and practices defined in Cross Connection Control Manual-Pacific Northwest Section - American Waterworks Association, 6th Edition, or any superseding edition and Manual of Cross Connection Control–Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, current edition. Policies will be interpreted and carried out by a State-certified cross connection control specialist or backflow assembly tester, whichever applies. All cross connection control assemblies must comply with State DOH requirements. (1744-97)

2.5.6 System Disturbances

Water service shall not be utilized in such a manner as to cause severe disturbances or pressure fluctuations to other Customers of the District. If any Customer uses equipment that is detrimental to the service of other Customers of the District, the District may require the Customer to install, at his own expense, equipment to control such disturbances or fluctuations.

2.5.7 Interruption of Service

- It is the District's intent to provide adequate and continuous service with minimum interruption. However, the District:
  - does not guarantee against occasional curtailment or failure of water service;
  - shall not be liable for resulting injury, loss, or damage; and
  - shall not be considered in breach of contract for temporary interruption of service.
- Repairs or improvements to facilities requiring temporary service interruption will be expedited and timed to minimize Customer inconvenience. When possible, a preceding notice will be mailed to the Customer, or left at the service address in a visible location, in advance of the service interruption.

- If the Customer's water service fails, the Customer shall endeavor to determine if the cause is on the District's side or the Customer's side of the meter.

When the District responds to a Customer call after service hours, and the problem is found to be with Customer equipment, the Customer will be notified and will be responsible for repairs.

2.5.8 District Representation by Employees (1626)

No inspector, agent, or employee of the District may ask, demand, receive or accept any personal compensation for any service rendered to water consumers or other persons, in connection with supplying or furnishing water by the District. No promise, agreement, or representation of any employee or agent of the District with reference to the furnishing of water shall be binding on the District unless the same shall be in writing signed by the General Manager or authorized agents.

2.6 District Facilities and Standpipes for Water Withdrawal for Agricultural Applications (1714-96)

2.6.1 District Facilities (1714-96)

The District may make facilities available to an agricultural community sponsor who shall be responsible for the monthly meter charge and all water withdrawals from District facilities. The District may accept the sponsor, contingent on the extent of representation and benefit to the agricultural industry. Sponsorship may be revoked at any time if the District deems it to be in its best interest. The District will not make District facilities available to multiple sponsors.

2.6.2 Backflow/Fill Pipe Responsibility (1714-96)

The agricultural sponsor shall be responsible for backflow (cross connection) incidents from District facilities and standpipes. District policy requires a fill pipe be attached to the tank receiving water from the standpipe. There shall be an air gap between the end of the fill pipe and the top of the tank being filled. The air gap shall be a minimum of twice the diameter of the fill pipe size, not less than one inch. This method of backflow protection or an alternate method approved in writing by the District will be a continuing requirement. District inspection of each tank and filling conveyance for conformance with Washington State regulations regarding backflow potential on an annual basis is required. Violations can be cause for immediate revocation.

2.6.3 Maintenance (1714-96)

Beyond the meter, the agricultural community sponsor shall be responsible for standpipe maintenance and backflow device testing costs.

2.6.4 Installation of Additional Facilities to Meet Agricultural Needs (1714-96)

The District may find that it is necessary to install additional facilities to meet agricultural needs. Installation of additional facilities shall require approval of the District's General Manager, and shall be on such terms as are reasonable at the time of installation.

2.7 Temporary Water Service

2.7.1 Short-term Water Service

At the District's discretion, temporary water service may be provided to accommodate special needs for water at a fixed site on a short-term basis (e.g. on-site needs for construction activities or summer irrigation). Temporary water service may be provided from a fire hydrant or flushing assembly at a location specifically designated for this purpose by the District. Short-term water service may be authorized for a period not exceeding three (3) months at a time. Upon expiration of the initial 3-month period, a Customer may request an extension of temporary service for one additional 3-month period. No more than one extension will be granted, unless authorized by the General Manager.

Procedures for authorizing short-term use shall be as follows:

- When an Applicant desires to use a fire hydrant for short-term water service at a fixed site, the following procedures apply:
  - The Applicant shall obtain a Hydrant Use Permit from the District and retain a copy at the site accessing the hydrant or flushing assembly.
  - Metering is required for this type of use. The Applicant shall obtain a fire hydrant meter from the District for use at that location. The Applicant will be charged for use of the meter and for actual water used, based on the appropriate District Rate Schedule in Appendix A.
  - The Applicant shall utilize only the hydrant or flushing assembly specifically designated by the Hydrant Use Permit.
  - The Applicant shall obtain a placard from the District that indicates a Hydrant Use Permit has been obtained. At any time a hydrant is being used, the Applicant shall display this placard in a prominent position clearly visible from the street. The Applicant shall not provide this placard to any other person.
- When an Applicant desires to use a fire hydrant for short-duration purposes at a fixed site (i.e. not exceeding three days), or for intermittent use by a mobile water tank (e.g. tanks on hydro seeding or public works maintenance vehicles), the procedures from paragraph (a) above shall apply, PLUS the Customer shall utilize a backflow-prevention device approved by the District. As a condition of obtaining a Hydrant Use Permit, the Applicant shall permit District inspection of equipment to be used, to ensure backflow-prevention assemblies are adequate.

2.7.2 Temporary Water Service for Relatives of District Customers Occupying Temporary Housing on the Same Lot or Property (1511-90)

Section 2.4.4 indicates that a separate metered service connection is required for each dwelling. There are cases wherein the need for domestic water to a second dwelling on the same lot and/or property may be required on a temporary basis; e.g., temporary housing for parents or in-laws, dependent relatives, etc.

The District will consider variances to the separate meter requirement and allow a single meter for two residences on a single lot, in conjunction with written approval or Special Use Permits for the temporary dwelling approved by the appropriate County or City planning department.

If the appropriate agency approves the application for placement of a temporary mobile home for relatives, the District will permit two dwellings to be served from one metered service. At such time as the Applicant's relative or the Applicant is no longer living in the temporary dwelling, the variance allowing two dwellings on one metered service will no longer be allowed and service to the temporary dwelling must be disconnected.

Applications for a variance to allow two dwellings to be served by one metered service will require a copy of the written authorization from the agency that issued said permit.

Any variance issued under the authority of this subsection will require approval of the General Manager, and the Applicant will be required to enter into a written agreement acknowledging this District variance is temporary.

2.7.3 Fire Hydrant Use

No person shall operate or tamper with a fire hydrant connected to the District's water system, without the express written approval of the District or, in the case of an emergency threatening life or property, the approval of an authorized representative of the appropriate fire department. In addition to the penalty established in Section 2.2.6, any person violating this provision shall pay for basic charge equivalent to a 4-inch monthly charge for each month of use and the amount of water used, as estimated by the District and based on the applicable rate schedule.

Water Services for Fire Protection (179)

- A water service for fire protection must be fitted with such fixtures only as are needed for fire protection and entirely disconnected from those used for other purposes. In no case shall any tap be made upon any pipe used for fire service purposes or any tank connected therewith, nor shall the use of any water be permitted through any fire service nor through any pipe, tanks, or other fixtures therewith connected, for any purpose except for extinguishing fire on the premises.
- The full cost of installing fire protection lines including service from the mains must be borne by the Customer.
- Rates for fire protection services are provided in Appendix A.

- No charge will be made for water used from fire protection service in extinguishing fire on the premises, if the owner or occupant of premises where such fire occurs gives written notice to the office of the General Manager within 10 days from the time of such fire and is attested to by a representative of the government having fire jurisdiction.
- In event the General Manager determines that a Customer having a fire protection service may be using water from same in violation of paragraph (a) of this Section, a double check detector meter shall be installed on the fire-service line, without prior notice being given the Customer.
- Should experience subsequent to such installation show that no water was being used in violation of paragraph (a) of this section, (either through no use being registered on the double check detector meter after installation or no increased use being registered on the regular meter after the fire line was metered) then the District shall make no charge for such installation and charges for fire protection service shall continue on the basis of paragraph (c) above as long as no use is registered.
- Should experience subsequent to the installation of the double check detector meter indicate that water was being used in violation of paragraph (a) of this section, then the District shall charge the Customer for the cost of such installation and a meter charge for at least two meter reading cycles for each month of use.
- In event that the procedure outlined in the third paragraph of subsection (e) above takes place, the Customer will become liable for appropriate water charges to compensate the District for the estimated quantity of water used during the period when paragraph (a) of this section was being violated.

No Guarantee for Fire Protection

Notwithstanding all other provisions for fire protection, or for other metered service, including water furnished to any fire hydrant or other equipment used, or which may be used for fire protection purposes, it is understood that the District cannot guarantee any minimum quantities of water or pressure of the water to be furnished for fire protection or water service, and the District shall not be liable in any manner for any loss or claim by reason of the quantity of water, or pressure of the same furnished for fire protection.

2.8 Dispute Resolution

2.8.1 Appearance before Commission

Any Customer or other person who believes that he/she has been wrongfully treated by a decision of the District related to:

- Termination of the delivery of water service or disconnection of the Customer; or
- Refusal to deliver water service (i.e., not connect the Customer); or
- Require the Customer to pay for water service previously delivered (i.e., transfer an outstanding balance to a new water account); or

- Require the Customer to make periodic payments in specific amounts to pay for water service previously delivered as a condition of receiving water service (i.e., require a payment plan); or
- Require the Customer to provide security as a condition of receiving water (i.e., require a security deposit); or,
- Require the Customer to pay a fee or penalty; (e.g., reconnection fee, account service fee, etc.);
- or other issues as may be presented;

may have that decision reviewed by the District's Board of Commissioners.

Binding Decision

The decision of the Commissioners shall be a final decision of the District.

Appearance Request

A request for an appearance before the Commission must be made a minimum of eight (8) business days prior to the desired Commission meeting by the Customer or by someone with legal authority to act on the Customer's behalf. Each appearance request should include a description of both the decision to be reviewed and the relief requested. If the description and relief warrant, the District may require that the request be in writing. The Customer's request must be directed to the Board of Commissioners, General Manager or Executive Assistant at the District's office complex located at 1415 Freeway Drive, Mount Vernon.

Appearance Date

The General Manager will set the date for the appearance within ten (10) business days after the hearing request is received by General Manager. Unless otherwise indicated, the hearing will be held at the District's Mount Vernon office.

District's Action Stayed Pending Receipt of Request for Appearance

If a Customer:

- Contacts the District within eight (8) business days after receiving notification, whether written or oral, of a decision of the District; and
- informs the District that he/she intends to request an appearance before the Commission to review that decision; the District will stay the action which would have been taken unless to do so would cause substantial disproportionate harm to the District or it's customers. The stay will remain in affect for six (6) business days or until receipt of a formal request for an appearance, whichever is earlier. Upon receipt of a formal request for an appearance the District will stay the action through the appearance absent substantial disproportionate harm.

Performance Pending Hearing

All obligations which are not the subject of the dispute to be decided by the Commission shall be performed by the District and/or the Customer. This shall include, in the case of a dispute over amounts to be paid, the payment of all non-disputed amounts.

Failure to Appear

If a Customer fails to appear before the Commission within thirty (30) minutes after the time set for the appearance, the Customer will be in default, and the Commission shall decide the disputed matter in favor of the District. If the Customer fails to appear, the Customer's request for another appearance will not be granted unless the failure to appear was caused by an emergency or because of the occurrence of an unforeseeable circumstance or event, which shall be determined by the General Manager. In such case, the subsequent appearance must be held within ten (10) business days of the original hearing.

Continuances

Any request for a continuance shall be made to the General Manager, which shall grant such a continuance only in the case of an emergency or because of the occurrence of an unforeseeable circumstance or event.

Representation

A Customer may represent himself/herself or may be represented by an attorney, relative, friend, or any person other than a District employee. If the Customer is to be represented by an attorney, the Customer must inform the District of that fact at the time the request for an appearance is delivered to the District, or if the services of an attorney are procured later, then as soon as such representation is arranged.

Evidence

The Commission may consider evidence which will assist the Commission in reaching a decision and may give effect to the rules of privileged communications (e.g., attorney/client privilege, husband/wife privilege, etc.) under the law. Information that is irrelevant and unduly repetitious may be excluded. Documentary evidence may be received in the form of copies or excerpts. Each party shall have the right to ask questions of persons who make statements at the appearance.

Legal Authority

The Commission shall apply as the first source of law District Resolutions, Code and Regulations. If District authority fails to adequately address the situation, the Commission shall resolve the issue(s) based upon the legal authority and reasoning available, including that found in the state and federal constitutions, statutes, and court decisions.

Review of District Action

If the dispute involves a question of whether the Customer is indebted to the District, the District must establish the Customer's obligation by a preponderance of the evidence. If the dispute involves a question of whether a District decision is inconsistent with the regulations of the District, the Customer must establish by clear cogent and convincing evidence that the District action is unreasonable and in disregard of facts and circumstances.

Section 3
Metering and Billing Procedures

3.1 Metering (1876-99)

3.1.1 Methods of Installation For New Metered Water Service Connections (1878-99)

All new meter installations shall incorporate remote read meters. Six (6) installation procedures are described below. Their respective water service fees are addressed in Section 4 and Appendix A. *(1878-99)*

Type One (1878-99)

Under a Type One installation, District will tap the water main, provide and install the service piping, meter with remote read device, and meter box and associated appurtenances. *(1878-99)*

Type Two (1878-99)

Under a Type Two installation, the water service line has been installed to the meter box location at the Applicant's property line as part of a water main extension by the developer/contractor and included in the water main extension cost. The District will provide and install the meter with remote read device, meter box and associated appurtenances. *(1878-99)*

Type Three (1878-99)

Under a Type Three installation, the water service line, meter box, and associated appurtenances, less the meter, have been installed to the Applicant's property line by the developer / contractor as part of a water main extension and included in the main extension cost. The District provides and installs the meter. *(1878-99)*

Type Four (1878-99)

Under a Type Four installation, the water service line, meter with remote read device, meter box, and associated appurtenances have been installed to the Applicant's property line as part of a water main extension by the customer/developer and included in the main extension cost. *(1878-99)*

Type Five

Under a Type Five installation, a deduct service, consisting of water service line, meter with remote read device, meter box and associated appurtenances, will be installed downstream from and in series with the domestic service to a dwelling or structure. A

deduct service is intended and available for irrigation of minor landscaping and other incidental uses that will not enter the local sanitary sewer system, and shall not be larger than the adjoining meter. The deduct service may be installed concurrently with or after a Type One through Type Four domestic service, and may be used for the purpose of metering water use that may not be discharged into the public sewer system (reducing the sewer bill accordingly).

Type Six

Under a Type Six installation, District will tap a water main larger than 12 inches and less than or equal to 18 inches, other than concrete cylinder pipelines, provide and install the service piping, meter with remote read device, and meter box and associated appurtenances.

Other General Requirements relating to Type One through Type Six metered water services

- "Appurtenances", relating to Type One through Type Six water services above, do not include pressure regulating or cross-connection control assemblies on the customer side (downstream) of the meter assembly.
- For services other than a single family residence, applicants will be required to provide to the District a complete list of fixtures with their respective equivalent fixture unit values and a meter size determined by the applicant's licensed plumber, architect or engineer, as outlined by following the current adopted Uniform Plumbing Code.*(1878-99)*
- The District requires the installed water meter to meet the peak water demand. The District may approve an alternative means to meet the peak water demand. The required water meter size to be installed will depend on the peak flow requirement and the water pressure of the water main that will supply the metered water service. *(1878-99)*
- Because hydraulic limitations can restrict the District's ability to provide water for a service connection, the District reserves the right to limit the size of the water service to be installed. This determination will be based on hydraulic considerations of the water main that will supply the metered water service. *(1878-99)*
- The District shall execute a water service contract for each new non-deduct irrigation service(s), outlining the duties of the District to provide water and the duties of the applicant in the use of the water, including a clause such that if problems arise related to water system source capacity or hydraulics, water for irrigation or other non-domestic demands can be limited or discontinued. Water for irrigation is recommended during, and may be limited to, "off peak" hours of 10:00 p.m. to 5:00 a.m. each day, or such hours as the District may prescribe.
- All charges, fees and expenses charged by local, State or federal agencies to the District to fulfill an Applicant's service application shall be added to the cost of the Type One service installation.

- All service connections to the District system shall be billed according to the appropriate rate schedule in Appendix A. (1876-99)
- Special meters may be installed on any account when the nature of the Applicant's equipment and operation so indicates for correct rate schedule application and/or Applicant service improvement.

Metered Services for Irrigation (1878-99)

Either of two types of irrigation services may be utilized: deduct (Type Five) or non-deduct (Types One through Four). These meter Types are described above. (1878-99)

3.1.2 Standpipe, Flushing Assembly or Fire Hydrant Use

Water use from fire hydrants, flushing assemblies or standpipes requires use of a fire hydrant meter. Additional details are provided in Sections 2.6, 2.7.3 and 4.1.5.

3.2 Billing

3.2.1 Meter Reading (1876-99)

- Meters will be read on monthly or bimonthly cycles at the District's option.

  Double check or reduced pressure detector meters will be read monthly.

  The District may alter or reroute its meter reading and billing cycle dates when such alteration or rerouting is in the best interest of the District.
- Opening or closing readings may be prorated.

3.2.2 Mailing and Notification

The District will send bills and notices by first class mail. Bills will be sent to the mailing address furnished by the Applicant. An Applicant/Customer who does not provide a proper mailing address or a means of receiving mail, may be subject to disconnection. Failure to receive a bill or notice will not release the Customer from the obligation to pay for services provided.

3.2.3 Issuance of Bills

Bills will be issued monthly or bimonthly, depending on the reading cycle and assigned payment plan, and generally will be based on exact meter readings. Bills may be estimated when:

- Meter is not accessible to meter reader;
- Meter is under snow or water;
- Meter malfunctions;
- Other circumstances beyond District control interfere with meter reading.

In the event that bills are estimated, an adjustment will be made at the time of the next regular billing that is based on an actual meter reading if available.

3.3 Procedures for Collecting Past Due Accounts (1814-98)

3.3.1 Water Bills (1814-98)

Each water bill shall include a billing date. The date will be the date the bill is mailed to the customer of record. Each bill will have a past due date. The past due date shall be eighteen (18) calendar days beyond the bill date. (1814-98)

3.3.2 Delinquent Notices (1814-98)

Delinquent bills shall be mailed to any customer of record that does not make payment of their water bill on or before the past due date shown on their water bill. Delinquent notices shall be mailed to the customer of record fourteen (14) calendar days after the past due date. The delinquent notice will allow the delinquent customer of record seven (7) calendar days to make payment. (1814-98)

3.3.3 Late Charge

In order to recoup a portion of the cost associated with collecting delinquent bills, a late payment charge at the rate of $5.00 or two percent (2%) per month, whichever is greater, will be applied to a customer's bill for all unpaid balances fourteen (14) calendar days beyond the bill due date.

3.3.4 Final Notice (1814-98)

Final notices shall be mailed to customers of record notifying the Customer that their water service will be disconnected if payment is not received. The final notice shall be mailed one (1) working day after pay by date specified on the delinquent notice. The final notice will allow the customer of record five (5) working days to make payment. The District reserves the right to deviate from this schedule, however the sequence of events shall remain the same. (1814-98)

3.3.5 Turn On/Reconnection Charges (1814-98)

Water services that are disconnected will be levied a charge for turn on/reconnection. Turn on/reconnection charges will vary based on the time and day the turn on/reconnection is completed:

- between the hours of 8:00 a.m. through 3:00 p.m. Monday through Friday excluding holidays;
- outside the above hours Monday through Friday or on Saturday; or
- Sundays and Holidays

Turn on/Reconnection charges for these situations shall be as indicated in Appendix A, Table A-9. Water services that are disconnected shall require the past due bill to be paid in full prior to turn on/reconnection. (1814-98)

3.3.6 Collection in the Field

Should a Customer choose to pay the District's meter reader in the field at the time of disconnection, there will be a collection charge for this service, provided that payment is made prior to disconnection of the service. If the service has already been disconnected, the turn on/reconnection provisions of Section 3.3.5 above shall apply. The charge for Collection in the Field is provided in Appendix A, Table A-9.

3.3.7 Hardship or Extenuating Circumstances (1814-98)

The General Manager or Commercial Department employees are authorized to grant extensions or accept partial payments for water services for extenuating circumstances or hardship cases. Extensions may be granted on a case-by-case basis. Extensions or partial payments will not be automatic and may only be granted if requested as outlined in the past due notice. Extensions or partial payments shall generally not exceed thirty (30) days in duration. Complete payment for extensions allowed under this clause shall generally be made in full no later than thirty (30) days after the pay by date as specified in Section 3.3.4. A Customer's failure to make payment within the extension period may result in disconnection of the Customer's water service without further notification. (1814-98)

3.3.8 Minimum Balances (1814-98)

Balances due or credit balances of less than One Dollar ($1.00) for each Customer no longer on service will be adjusted to a $0.00 balance due/credit balance. (1814-98)

3.3.9 Transfer of Previous Unpaid Accounts

The District may transfer to any existing or new water service any unpaid charges for service previously rendered to the same Customer at any other location within the District's service area. Such transferred balance shall be considered part of the Customer's current obligation to the District as though the previous unpaid balance had been incurred at the present service address. The District may permit arrangement for payment of such transferred balance under the guidelines of Section 3.3.**7**.

If it is determined that a Customer has an outstanding balance from a previous account with the District and is receiving Benefit of Service through a different account with the District, but not in the Customer's name, the outstanding balance may be transferred to the active account.

If it is determined that a Customer has an outstanding balance from a previous account with the District is eligible to receive a refund through a different account with the

District, whether or not in the Customer's name, the outstanding balance may be deducted from the pending refund.

3.4 Unduly High Water Bills (1440)

3.4.1 Conditions (1440)

The policy for adjusting unduly high water bills is subject to the following conditions: (1440)

- Where the Customer, upon becoming aware or being made aware of the water loss, takes immediate steps to correct the faulty plumbing and/or equipment causing the loss. (1440)
- Where the District is informed by the Customer that the problem has been corrected so that investigation, meter readings and records can be made reflecting the action and the effects thereof taken by the Customer and the dates of such action. (1440)

3.4.2 Adjustment Procedure (1440)

Such conditions having been satisfied, it shall be in order for the District to adjust the Customers' water bills as follows: (1440)

- Once the District has documentation i.e., receipts, photographs etc. that the leak has been repaired by the Customer, and/or the repair has been confirmed by the District, adjustments will be made;
  - If the consumption indicated on the high water bill exceeds the average consumption of the previous two years billing of the same period by 50%, the Customer shall be eligible for an adjusted water bill.
  - The adjusted water bill will be 1.5 times that of the average of the last two years' billings for the same period. In the absence of two years' billing history, the adjustment will be based on the previous year's billing for the same billing period. In the absence of one year's billing history, the adjustment will be based on the average of the previous two normal billing periods.
- Adjustments will not be made for more than one billing period of excessive use within a twelve month period.
- The District reserves the right to accept or deny any requests for adjustment. (1440)

3.5 Adjusting Customer's Water Bills Due to Loss by Leakage Due to a Declared Disaster Beyond the Customer's Control (1512-90)

It is recognized there may be cases that are dependent upon nature and totally beyond the Customer's control: e.g., floods that inundate an area for durations longer than two days. (1512-

90). When the federal or State government declares an area as a disaster area, the District's policy will be: (1512-90)

- When a Customer's meter(s) cannot be accessed on a normal reading day cycle, the Customer will be invoiced for the meter charge only (no consumption charges); further, the Customer's bill will reflect any consumption charge for that period on his subsequent bill when the District's meter reader can gain normal access to the meter. (1512-90)
- Should a Customer incur damage to his water piping system on the Customer's side of the meter, due to or during the event, the District will adjust the Customer's water loss as follows: (1512-90)
  - Where the cost of the excess water is not equal to more than the Customer's average consumption charge over the previous two (2) meter readings, the Customer will be charged the average of the previous two (2) billings for each billing period missed and no further adjustment will be made. (1512-90)
  - When the excess water amounts to more than the average of the previous two (2) meter readings, the District will adjust the consumption charge to the average of the previous two (2) billings. (1512-90)
  - In the event that bills are estimated, an adjustment will be made at the time of the next regular billing that is based on an actual reading.
- Once the Customer learns of the water loss, the Customer must take immediate steps to correct the faulty plumbing, equipment or pipe causing the loss. This requirement is predicated on the event subsiding sufficiently to access the problem area. (1512-90)

  The Customer must inform the District that the problem has been corrected so that investigation, meter readings and records can be made reflecting the problem, action taken to correct the problem and the dates of such action. (1512-90)

Section 4
Water Rates, Fees, and Deposits

4.1 Rates (1876-99)

4.1.1 General Provision

The District has rate schedules for particular types of services provided. A summary of these charges is provided in Appendix "A". In case of conflict between the provisions of any rate schedule or special contract and this Water Code, the provisions of the rate schedule or special contract shall apply. Rates shall be charged from the date the meter is installed and activated.

Tables A-1 and A-2 in Appendix "A" indicate the standard meter and consumption rates for the majority of District water service Customers.

Meter charges and consumption charges are covered through the upstream domestic service meter charges and are not applicable to a deduct (Type 5) meter, as defined in Section 3.1.1. Deduct meters are to be charged a deduct meter reading fee, per Table A-9, Appendix "A".

4.1.2 Wholesale/Special Contract Customers (1876-99)

- The rates and charges for Wholesale/Special Contract Customers described in Section 2.2.2 and 2.2.3 shall be as specified in their contracts with the District. The District shall compute their billings utilizing the monthly meter charge as specified in Appendix "A", Table A-1 and consumption charges as specified in Appendix "A", Table A-2 for <u>All Others,</u> unless otherwise specifically provided for in a written contract with the District.
- The District shall give the Wholesale/Special Contract Customers written notice of a rate increase. The billings utilizing this rate increase for this class of Customer shall conform to the notification requirements of each contract.

4.1.3 Private Fire System (1876-99)

- Automatic Sprinkler Equipment/Privately Owned Fire Protection Facilities

  A monthly charge for standby service for automatic sprinkler equipment/privately owned fire protection facilities connected to the water system shall be calculated per inch of nominal pipe diameter of the Customer's pipe at the point that such pipe connects to the District-owned facilities. Such charges shall be billed in advance. Automatic Sprinkler Equipment/Privately Owned Fire Protection Facilities rates are provided in Appendix "A", Table A-3.

If a detector check meter registers water for non-emergency use, the Customer will be assessed a 5/8-inch meter Monthly Basic Fixed Charge per Appendix "A", Rates, Fees and Charges and Deposits Table A-1, for at least two meter reading cycles for each month of non-emergency use. Any water for non-emergency use shall be billed per Appendix "A", Rates, Fees and Charges and Deposits, Table A-2, Consumption Charges "All Others". (1876-99)

4.1.4 Potlatch System Water Rates (1862-99)

The District has determined that the water rates established for Potlatch should include those amounts necessary to cover the additional costs and expenses associated with the unique nature of the Potlatch System. (1862-99)

Water rates have been developed specifically for the Potlatch System (1862-99) and are provided in Appendix "A", Table A-5.

4.1.5 Fire Hydrant Meter Water Rates

Water consumed through fire hydrant meters shall be charged a monthly fire hydrant meter use charge and a consumption charge based on water actually consumed. Rates are indicated in Appendix "A", Table A-4.

4.2 System Development Fees

4.2.1 Basis for System Development Fee

The District has limited capacity to serve additional Customers without increased infrastructure. The system development funds are utilized to help offset additional infrastructure costs needed to meet the additional load created by increased demand on the system, and replacement costs. System development funds are intended to be used for improvements that benefit major portions of the service area of a District water system, and their use requires approval of the District's Board of Commissioners.

System development fees are calculated based on the benefit of both existing capacity and projected future capacity improvements to the District's water systems over a given period of time. The current system development fee schedule is based on the factors and costs indicated.

4.2.2 Weighting Factors for Meters

The District has determined that the American Water Works Association (AWWA) has established in Standards C-700 and C-702 the safe maximum operating capacity for displacement and compound water meters, and that the safe maximum operating capacity of such water meters of various sizes are related to the following proportional weighting factors:

Meter Size	Weighting Factor
5/8-inch	1
3/4-inch	1.5
1-inch	2.5
1 1/2-inch	5
2-inch	8
3-inch	16
4-inch	25
6-inch	50
8-inch	80

4.2.3 Policies for Calculating System Development Fees

The System Development Fee for a 5/8-inch meter shall be the unit basis of System Development Fees for all meters.

The System Development Fees for positive displacement meters ranging from 5/8-inch to and including 1-1/2-inch and compound meters ranging from 2-inch to and including 8-inch shall be based on the System Development Fee for a 5/8-inch meter multiplied by the weighting factor for that meter, charged as follows:

Meter Size	Weighting Factor	System Development Fee*	
		Current	**Effective 04/15/11**
5/8	1	$ 2,880.00	**$ 3,365.00**
3/4-inch	1.5	$ 4,320.00	**$ 5,050.00**
1-inch	2.5	$ 7,200.00	**$ 8,415.00**
1 1/2-inch	5	$ 14,400.00	**$ 16,825.00**
2-inch	8	$ 23,040.00	**$ 26,920.00**
3-inch	16	$ 46,080.00	**$ 53,840.00**
4-inch	25	$ 72,000.00	**$ 84,125.00**
6-inch	50	$144,000.00	**$168,250.00**
8-inch	80	$230,400.00	**$269,200.00**

*See Section 4.2.4 Water Contracts

The System Development Fees for types and sizes of meters other than the positive displacement and compound meters listed above shall be based on the System Development Fee for a 5/8-inch meter multiplied by a weighting factor for that meter. The weighting factor shall be based on the safe maximum operating capacity established in the most current AWWA Standards for that meter.

Each meter serving other than a single family residence shall be selected: (1) based on the sizing requirements of the most recently adopted International Association of Plumbing and Mechanical Officials (IAPMO) Uniform Plumbing Code, (2) to flow not more than the safe maximum operating capacity of the meter per AWWA Standards, and (3), if the proposed use generally has a pattern of continuous flow (a relatively consistent flow for 6 hours or more), to flow not more than 50% of the safe maximum operating capacity of the meter during such periods of continuous flow.

The District does not guarantee that the safe maximum operating capacity or continuous flow capacity of a meter, or any rate of flow will be available from the District's water system. System capacities, water rights, hydraulics, environmental factors, or other issues may limit the amount of flow available through any meter at any given time. It is a core value of the District to maintain an adequate level of service to existing customers. The District reserves the right to limit any customer's use when that use has or will have an adverse impact to the District's obligations and responsibilities.

Additional System Development Fees in excess of those listed above may be incurred by the Customer when the Customer's use exceeds the flow rates and/or usage listed in a Water Contract (see Section 4.2.4 Water Contracts).

The System Development Fees per meter size are also indicated in Appendix "A" Table A-6.

4.2.4 Water Contracts

The District shall execute a Water Contract for each new meter with a weighting factor of 8 or more (2-inch and larger), or each group of meters (regardless of size) whose weighting factors sum 8 or more, each meter hereinafter termed "contract meter". The Customer's projected flow rates and usage for each contract meter shall be listed in the Water Contract. If a Customer's use through any contract meter exceeds the listed flow rates and/or usage, the District reserves the right to require the Customer to modify the use to those listed in the Water Contract. If the Customer has not modified the use through that meter(s) to those listed in the Water Contract within 120 days of the notice requesting the modification of use, the Contract will be amended in writing and the Customer will be responsible for any mitigation deemed necessary. Mitigation shall be determined by the District, and may include, but is not limited to, additional charges and/or water system improvements including all associated costs.

Any existing non-"contract meter" purchased on or after November 1, 1999 will become a contract meter, subject to all Water Contract requirements, if additional meters are purchased to serve the same property or lot and the summed weighting factors of all meters is 8 or more, a Water Contract will be required.

These provisions apply only to meters purchased on or after November 1, 1999. Water services in existence on October 31, 1999 will not be subject to these provisions, unless said meter(s) is upsized or removed and its System Development Fee value applied to a new meter(s).

The District does not guarantee that the safe maximum operating capacity or continuous flow capacity of a meter, or any rate of flow will be available from the District's water system. System capacities, water rights, hydraulics, environmental factors, or other issues may limit the amount of flow available through any meter at any given time. It is a core value of the District to maintain an adequate level of service to existing customers. The District reserves the right to limit any customer's use when that use has or will have an adverse impact to the District's obligations and responsibilities.

The District may provide water service to two separate types of real estate: first, a tract of real estate, comprised of one or more parcels in the records of the Skagit County Assessor, but certifiable to be one "property" of record according to the deed and, second, a portion of such a legal "property" of record, having its own describable boundaries and requiring its own source of water separate from the balance of the "property", often affected by a lease from the property owner. Based on this:

- if multiple contract meters serve a single "property" (a single tract of land not affected by a lease), the System Development Fee shall be charged as indicated in the Water Contract; and

- if multiple contract meters serve a single "lot" (a single tract of land affected by a lease, perhaps within a larger "property"), the System Development Fee shall be charged in the same manner as for a "property", but shall only account for the meters serving the specific "lot" on the "property".

The District retains the final decision of what constitutes a "property" or "lot". In both cases, the Water Contract shall define the Customer's allowable flow rates and usage through the contract meter(s).

4.2.5 System Development Fees for Satellite Systems (1937-01)

System Development Fees developed specifically for future LUDs or satellite systems that are not anticipated to connect to the Judy Reservoir System or be conveyed water via the District's Water Supply Agreement with the City of Anacortes, shall be subject to only the "General Plant" portion of the System Development Fee structures, providing required criteria has been met for obtaining water service. The General Plant portion charged shall account for annual construction cost index increases and shall be multiplied by the appropriate weighting factor for the meter selected; Appendix "A", Table A-6.

4.2.6 Annual Adjustments to System Development Fee Schedule

The District anticipates an incremental fee increase adjustment of $485.00 in the 5/8-inch meter size effective April 15, 2012 (subject to review by the Commission). Fees for other meter sizes are incrementally determined using a multiplier upon the 5/8-inch rounded meter fee. The fee shall be rounded to the nearest $5.00 increment.

4.2.7 Adjustments for Upsizing, Downsizing or Combining Water Services

If the meter of a water service is increased in size, the Customer shall pay a System Development Fee equal to the difference between the original meter and the new larger meter, both fees being based on the System Development Fee schedule in effect at the time of the upsizing.

Should a Customer request that a smaller meter be installed to serve their dwelling or establishment, refunds of System Development Funds shall not be made. In turn, the same water service Customer can have the meter size increased up to and equivalent to pre-existing water meter size for a period of ten (10) years after the date of down-sizing the water meter without being required to pay additional System Development Fees.

If a Customer has one or more water services serving the same parcel or lot and requests the removal of one or more of the water meters and the installation of one or more new meters, the System Development Fee of the removed meter(s) shall be applied towards the System Development Fee of the new meter(s), all fees being based on the System Development Fee schedule in effect at the time of request. If the System Development Fee(s) of the new meter(s) exceeds the System Development Fees of the removed meter(s), the Customer shall pay the difference. If the System Development Fee(s) of the removed meter(s) exceeds the System Development Fees of the new meter(s), no refund will be made.

4.2.8 Miscellaneous

If a water service is abandoned, left in place at the District's discretion during a water service relocation, or otherwise abandoned from service, an Applicant shall pay the full System Development Fee and associated costs upon reactivation of the service.

4.3 Connection Charges for New Metered Water Services (1878-99)

All new meter installations shall be levied a connection charge (meter installation charge) per the fee schedule in Appendix "A", Table A-8, for the same six (6) water service installation Types as described in Section 3.1.1. (1878-99)

Installation fees for water service installations involving tapping a water distribution pipeline larger than 18 inches or any concrete cylinder water pipeline will be on a time and material basis, and not less than a Type Six installation fee

The Type Five deduct service may be installed concurrently with or after the domestic service, and shall be charged according to the fee schedule for a Type Two, Type Three or Type Four water service, depending on the extent of installation.

4.4 Other Fees (1872-99)

A fee will be charged for any financial instrument which does not clear the financial institution (e.g. NSF checks, ACH returns, closed accounts) see Appendix "A", Table A-9.

4.5 Service Deposits (1660-95)

4.5.1 Applicants (1660-95)

Applicants for a water service that are not simply transferring from an existing District service obligated in their name to another District service, may be required to provide a service deposit or show sufficient proof of a satisfactory credit history or rating from Experian Information Solutions with a minimum credit score of 580. Indication of a satisfactory credit history is defined as a credit reference from a utility indicating a 12-month satisfactory payment history. The District shall have sole discretion in determining the acceptability of the credit reference and the satisfactory analysis thereof. (1660-95)

4.5.2 Existing Customers (1660-95)

Existing Customers with an unsatisfactory payment history with the District may be required to provide a service deposit as a condition of continuing to receive water service. (1660-95)

Customers applying for the installation of a new water service that includes the payment of a system development fee and/or meter installation charge, shall be waived from the requirements of a service deposit and activation fee or payment history as the Customer has demonstrated financial capacity to the District. This waiver is conditioned on the provision that the Customer does not have a previous unsatisfactory payment history with the District. (1660-95)

4.5.3 Basis for Deposit (1660-95)

The service deposit amount for a residential 5/8-inch metered service shall be based on two times the two-month average billing, rounded up to the nearest $5.00 increment; as determined from time to time when water rates are adjusted. Larger meter service deposits are to be incrementally adjusted based on multipliers or final fee indicated in Appendix "A", Table A-10. (1660-95)

4.5.4 Unusual or Exceptional Cases (1660-95)

Service deposits may be required and/or increased in unusual or exceptional cases where management deems it necessary in order to adequately protect the District. (1660-95)

In extremely rare instances, the District may waive service deposit and credit reference requirements if, in the judgment of the District, there is substantial indication of minimal

District exposure to loss. An example of this modification would be to serve a governmental entity such as a city or county. (1660-95)

Service deposits or sufficient proof of a satisfactory credit history shall be received at the time of application Non-compliance with the arrangements is cause for disconnection from service. In the event of a disconnection, a reconnection charge in the amount established per District rates, fees, charges and deposits will be assessed. See Appendix "A", Table A-9 (1660-95)

4.5.5 Refund (1660-95)

When a Customer with a service deposit leaves service, the District will refund the service deposit less the amount of unpaid bills. Refund checks will not be distributed until all necessary internal processing is completed. (1660-95)

A Customer continuing service with the District will have the service deposit applied to their account when the Customer obtains a twenty-four (24) month payment history acceptable to the District. (1660-95)

In the event a Customer first gives a service deposit and then later provides an acceptable credit history, the District may then either refund the deposit or apply the deposit to the Customer's account. (1660-95)

4.5.6 Unpaid Bills (1660-95)

The District may submit to an Attorney or collection agency a request for collection of any unpaid bills after District collection attempts have failed, including unpaid bills remaining after the service deposit has been applied (1660-95). Upon assignment of an account by the District for collection, collection fees will be added to the balance owed. The fee to be added will be one hundred percent (100%) of the account balance when the balance of the account is less than or equal to $75.00 or the fee to be added will be fifty percent (50%) of the amount of the assigned account when the balance of the account is in excess of $75.00.

Any unpaid bills may be assigned to any other active accounts of the Customer per Section 3.3.9.

A request for service by the Customer may require payment of any unpaid bills prior to service activation.

Section 5
Water Resources and Environmental Policy

5.1 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources (1730-96)

A Memorandum of Agreement has been established regarding use of Skagit River Basin Water Resources for instream and out of stream purposes. (1730-96)

5.1.1 Parties to the Agreement (1730-96)

The Parties to the Agreement include:

City of Anacortes (1730-96)
Public Utility District No. 1 of Skagit County (1730-96)
Skagit County (1730-96)
Upper Skagit Indian Tribe (1730-96)
Swinomish Indian Tribal Community (1730-96)
Sauk-Suiattle Indian Tribe (1730-96)
Washington State (1730-96)
Department of Ecology (1730-96)
Department of Fish and Wildlife (1730-96)

5.1.2 Agreement Purpose (1730-96)

The Agreement is designed to achieve the following purposes:

- Ensure the establishment of instream flows to protect fisheries resources, and mitigate any interference with such established flows; (1730-96)
- Provide a mechanism for the coordinated management of water resources in areas described by the Skagit County Coordinated Water System Plan (CWSP), Regional Supplement, July 1993 to meet the out-of stream needs of the Swinomish Indian Tribal Community, Upper Skagit River Tribe, and Sauk-Suiattle Indian Tribe, local governments, and public water purveyors within Skagit County; (1730-96)
- Avoid litigation of adjudication of water resources within the Skagit River Basin between the Parties to this Agreement; (1730-96)
- Assist in expediting the Department of Ecology's water right decision-making within the CWSP service area; and (1730-96)
- Modify the CWSP to conform to this Agreement and to incorporate this Agreement into the Joint Operating Agreement between the City of Anacortes and the District. (1730-96)

5.2 Watersheds and Critical Areas (634)

5.2.1 Management and Protection

The District will participate in watershed and Critical Areas planning and management affecting District water supply in collaboration with other local, State, and tribal governments. Watershed delineation is based upon Washington State Water Resource Inventory Areas (WRIAs), local designations, and/or Critical Areas identified in the Skagit County Comprehensive Plan.

The District will take specific steps to protect and manage watersheds and Critical Areas important to District water resources, including: acquiring property, entering into cooperative agreements with land owners and agencies, working with Skagit County to ensure that land use regulations, critical area designations, and ordinances adequately protect water supply and other local, State, or tribal environmental management strategies.

5.2.2 Cultus Mountain Watershed (634)

The District has established Cultus Mountain Watershed as the watershed for the present domestic water use of its customers. (634)

5.3 Wetlands and Floodplains Protection (1554-92)

The District will prohibit water service hookups to undeveloped lots or parcels where private construction would disturb wetlands of significance or any area within the 100 year flood plain or its associated water ways inside the Big Lake LUD boundaries. Applicants will be required to provide Skagit County approval before water service will be provided to proposed structures within the boundaries of the USDA Rural Development-funded Big Lake LUD to ensure these are not located within or will not impact wetlands of significance or 100 year floodplains, or in conflict with federal, State, and county laws (1554-92)

5.4 State Environmental Policy Act (SEPA) (1628-94)

The District will use the SEPA Procedures in Appendix B in the planning and execution of construction, maintenance and repair of District facilities. (1628-94)Whenever there is a question as to whether proceeding under the District's SEPA Procedures fully meets the requirements and intent of SEPA, such matter will be called immediately to the attention of the General Manager and the Commission. The General Manager and the Commission shall determine whether adherence to the SEPA Procedures meets the requirements and intent of SEPA. (1628-94)

The Commission reserves the right, prior to staff making a formal submission to the Department of Ecology, to amplify, restrict or rule upon any such item or items in making a decision as to whether the SEPA requirements are being met, (1628-94)

It is the policy and intent of the District to fully meet all provisions of SEPA even though situations may develop which are not delineated in the District's SEPA Procedures. (1628-94)

Section 6
Water Extension Policies

6.1 Introduction

6.1.1 General Provisions

The District will provide facilities for the distribution of water within its service areas in accordance with approved land use plans, policies or other regulatory requirements governing service provisions. Extension of a system to serve additional applicants, customers, properties, tracts, or subdivisions will normally be paid for by the parties that are benefited.

An Applicant for an extension will normally be responsible for financing the entire cost of an extension. Costs include new facilities, replacement of existing system components when necessary for making the extension or improvement, and upgrades to meet requirements such as fire flow, which are associated with the Applicant's project. Up-sizing water system components are outlined in Appendix C.3.1.

All water facilities must be located on property owned by the District, public rights-of-way, or dedicated easements. All water facilities must be transferred to the District's ownership for operation, maintenance, and service responsibilities, and will be subject to maintenance bonding requirements. The point of District ownership shall end at the meter, private fire system gate valve or hydrant gate valve, unless otherwise indicated on Bill of Sale to the District.

6.1.2 Application of Policies and Procedures

In specific instances, the General Manager may, at his/her discretion, waive or modify the application of the policies and procedures described herein, including the application of standard fees and charges, provided that such waiver or modification allows for more effective or efficient attainment of District goals, objectives, and overall policies. Conditions for waiver or modification of the application of these policies and procedures are contained in Section 1.2 of this Water Code.

6.1.3 Standards and Specifications

Water system extensions, improvements, or new facilities must be constructed in accordance with the District requirements provided in this Section and the System Extension Design Criteria included in Appendix C It is the responsibility of the Applicant to ensure that the most current standards and specifications are used.

These standards and specifications have been developed as professional, technical guidelines for guiding system design and installation. The General Manager may modify these to maintain consistency with changing technology and industry standards.

Additionally, the General Manager may waive strict application of the standards and specifications in certain instances, provided that the resulting design or construction is approved by the District, and remains consistent with the goals and objectives expressed in this Manual.

6.1.4 System Extension Ownership (1626)

All water lines and appurtenances shall be designed and installed to District requirements. They shall be and remain exclusive property of the District for future operation, maintenance and service responsibilities, with the exception of fire hydrants as specified in Appendix C, Paragraph C.10. The point of District ownership shall end at the meter, at the property line for a private fire system or the hydrant gate valve, unless otherwise stated on the Bill of Sale to the District. (1626)

6.2 Administrative Procedures for Initiating System Extension

6.2.1 Plan Approval Required

The District must approve all plans for extensions, improvements, or additions to water facilities prior to their construction.

6.2.2 Application

Applicants using the District's application format shall make requests for extension or improvement of a District water system to serve newly developed and/or existing properties. Each application shall contain a legal description of the property to be served (or a map showing the area) and be accompanied by two (2) copies of preliminary plans, showing the location of all water lines, hydrants, and valves needed to serve the area.

Plans of sewers, buried wire service, other utilities, street design and final plat shall also be furnished to illustrate the relationships of other facilities to water pipe plant. Water pipeline survey stationing shall be referenced to roadway centerline or right-of-way line. Water lines that are to be installed in areas where finished grades do not exist or where the finished grades may be realigned shall have final grades established prior to installation. Grade and alignment stakes shall be required for the water plant installation. (1626) See Appendix "C."

Developments or projects that are to be phased shall be shown in their entire concept prior to approval of any phase, so the District can be assured that adequate design criteria are established. (1626)

It is recommended that applicants schedule a meeting with District Engineering staff to discuss the proposed project prior to completion of the application.

6.2.3 District Review

The District will review the application and associated plans. The District will recover its cost of plan review from the Applicant when the project proceeds.

The District will notify the Applicant of the feasibility of the service requested, conditions for construction, and any additional facilities (e.g. water source, storage, booster stations, water main upgrades, telemetry, etc.) that may be required as a result of the proposed extension/development. Additional special requirements such as cross connection control assemblies will also be specified. The District will develop and provide to the Applicant a cost estimate of District charges on the project.

If fire protection facilities are required, the location and minimum capacity of the facilities shall be as specified by the appropriate Fire Marshal.

At the District's option, District staff may provide engineering design services for private line extensions when installation is performed by the District. The Applicant shall be charged for such services; the estimated cost of design shall be collected prior to the District commencing design work.

6.2.4 Work/Job Order Authorization Agreement

If an Applicant decides to proceed with a project, the Applicant shall then execute a Work/Job Order Authorization Agreement with the District, which will specify the terms and conditions of the extension or system improvement in accordance with the District's standards. Work/Job Order Authorization agreements must be signed by both the Applicant and an authorized District employee.

6.2.5 Submittal of Plans and Specifications

At the time the Work/Job Order Authorization Agreement is submitted, the Applicant shall submit two (2) sets of detailed plans and specifications to the District for review, potential revision and acceptance. All drawings and specifications shall be prepared per (Appendix C) double checking WSP and Appendix F & C and must be stamped by a registered Professional Engineer licensed in the State of Washington.

The Applicant shall furnish a minimum of two (2) corrected final design sets of water plant plans and specifications to the District Engineering Manager prior to the start of construction. (1626)

As the project construction progresses, any deviations from originally accepted plans and specifications must be presented by the Design Engineer to the District for review in advance, and must be accepted by the District in writing prior to commencement of the revised work. The District may require updated plans of the accepted deviation(s).

6.2.6 Permits, Easements, and Approvals

The applicant or their representative shall obtain all permits in the District's name as required by law prior to commencement of work. These could include, but not be limited to, permits by the governing City or Skagit County, Washington State Department of Health, Washington State Department of Ecology, Diking Districts, Drainage Districts, game and fish agencies, Highway Department, Department of Natural Resources, State land agencies, gas or oil pipeline companies, railroads, etc. The City or County Fire Marshall having jurisdiction over the site of the proposed improvement must review and approve the fire protection facilities as well. Copies of all permits and/or approvals shall be furnished to the District prior to commencement of work. All rights in the improvements shall be granted to or transferred to the District prior to final acceptance by the District Board of Commissioners. (1626)

The project designer shall verify and comply with all submittal requirements with the permitting agencies.

All plant not located on public dedicated rights-of-way shall be on easements dedicated to the District, per Sections 6.5.6 and/or 6.6.7.

6.3 Financing (1626)

6.3.1 Local Utility District Formation (1626)

Property owners within a defined area may petition the District Commissioners to extend water mains to their properties, and/or provide other facilities, by formation of a Local Utility District (LUD). All construction, engineering, administrative costs, attorney and consultant fees, feasibility studies, title reports, costs of easements, permits, environmental reports, and shoreline permits and other related costs are a part of the LUD costs. If this method is used, benefited properties will be assessed as provided by law. (1626)

6.3.2 Charge-in-Lieu of Assessment

If a property is to be served by an improvement financed by an LUD but that property was not included within the LUD boundaries nor charged any proportional assessment as were other properties within the LUD boundaries, the Commission may require a charge be levied against such property in lieu of an assessment. The charge-in-lieu of assessment will generally be calculated in the same manner as the other assessments within the respective LUD and will generally not be less than the assessment of any similar property within the LUD boundary; however, the Commission shall determine the exact scope of each charge-in-lieu of assessment.

6.3.3 District Financed Water Plant (1626)

When a water pipeline extension to properties not previously abutting a District pipeline is constructed with District funds, each Applicant connecting to the extension following completion of the construction shall be required to share in the cost of the original construction. Fees shall be collected until all final construction costs have been recovered. See Section 6.8.3 for calculation of fees. (1626)

6.4 System Extension Design

6.4.1 Responsibility (1626)

Water plant plans and specifications shall be prepared by the District's Engineering staff or a private registered professional engineer to the current design standards of the District. The designer shall consult with the District's Engineering Manager or designee to determine requirements and criteria. Should the Applicant want the District to prepare the plans and specifications, the District will determine if the existing workload will allow adequate time for the District's Engineering staff to perform the task and the District's construction forces to install the water facilities. The Applicant shall be charged for the costs incurred for this work. Installation specifications shall include those of the Washington State Standard Specifications for Road, Bridge and Municipal Construction, modifications and other requirements set by the District. The plans shall identify water pipe plant in bold, and all other existing and proposed utilities on the drawing in normal-tones. (1626)

6.4.2 General Policy (1626)

The design standards, requirements and procedures identified in Appendix C are the minimum allowable by the District for any and all water improvement projects, whether designed by the District or by a private engineering firm/agency. Design standards help to ensure uniformity of cost and final product. (1626)

Quality project design is a goal of the District. Although these standards are intended to apply to physical development within the District, the standards do not apply for all situations. Additionally, compliance with these standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for competent work by design professionals. The District may, at its sole discretion for any reasons, require more stringent requirements than would normally be required under these standards. (1626)

Waiver of specific design criteria indicated herein must be requested in writing and may be approved only by the District's General Manager or Engineering Manager. The decision to grant, deny or modify the standards will be based upon evidence that the request can meet the following criteria: (1626)

- The change will achieve the intended result in comparable or superior design and a better quality of improvement; (1626)
- The change will not adversely affect safety and/or operation; and (1626)
- The change will not adversely affect maintainability. (1626)

6.4.3 Gridding

The District may require gridding of water mains in order to satisfy pressure, fire flow, water quality, and system hydraulic requirements. In addition, gridding may be required to promote system reliability. The determination of gridding requirements shall be at the sole discretion of the District. In determining whether gridding is required, the following factors shall be considered:

- Topographical constraints;
- Effects of gridding on system hydraulics;
- Projected future development in the area, based on the applicable land use plan, as updated from time to time, municipal comprehensive plans if applicable, the District's Water System Plan, and other available information.

6.4.4 Pressure Testing (1626)

All new plant shall be hydrostatic pressure tested as specified in the WSDOT Standard Specifications Exceptions to this requirement must be recommended in writing by the District's Engineering Manager and approved in writing by the District's General Manager. The waterline installer will provide all testing equipment. The final testing performed by other than District personnel shall be in the presence of the District's inspector. (1626)

6.4.5 Disinfection (1626)

Before being placed into service, all new water mains and repaired portions of or extensions to existing mains shall be chlorinated, and a satisfactory bacteriological report shall be provided to the District. Disinfection procedures are detailed in the WSDOT Standard Specifications. (1626)

The waterline installer shall be responsible for disposal of treated water flushed from mains and shall neutralize the disinfection solution for protection of aquatic life in the receiving water before disposal into any natural drainage channel. The Applicant shall be responsible for disposing of disinfection solution to the satisfaction of State and local authorities. (1626)

6.4.6 Fireflow Not Altered by Sprinkler Systems

The District encourages residential fire protection sprinkling systems. However, such systems will not be a basis for altering the District's design standards.

6.5 Water System Improvements Installed For Applicant by District/District's Contractor (1626)

6.5.1 Project Estimate (1626)

Upon application, the District will provide to the Applicant a written estimate for the installation of water lines and appurtenances. If the Applicant and the District agree to proceed with the project, the Applicant shall make a deposit in advance to the District of the estimated cost of installing the water lines designed by the District's Engineering Department. Costs shall include, but not be limited to, material, labor, equipment, engineering, overhead, and right-of-way costs. Permits, easements, environmental and related reports will be obtained by the District, and any fees levied shall be paid by the Applicant. (1626)

Payment of the deposit may be made in two installments. The first payment (deposit) shall include, but not be limited to, the estimated cost of materials, engineering, right-of-way cost, permits, easements, and environmental and related reports. Project estimates are subject to change. The second deposit shall be made when the District is in a position to reasonably forecast when it will begin actual on-site construction. The second deposit shall be the balance of the estimated cost as described in this section. The District shall contact the Applicant, or his financier as directed, and request the balance of the estimated cost. After all work has been completed, all conditions satisfied, and all accounting completed, the Applicant shall be billed for additional costs incurred over the payment(s), or refunded any unused balance. The District reserves the right to terminate water service or sale of any new service if final billing is not paid within 30 days of receipt. (1626)

If an Applicant cancels a project after the first payment is paid, the Applicant shall be required to pay District costs incurred through the date the written project termination is received by the District. District termination costs may include specialty items if these items cannot be returned to the vendor. Re-stocking charges shall be applied to the Applicant's account. Specialty items that cannot be returned shall become property of the Applicant. District-incurred charges shall be deducted from the deposit and the balance refunded. If the charge is greater than the deposit, the Applicant shall be billed for the difference. (1626)

Estimates are subject to change prior to acceptance of payment. If the District is required to revise the design of a project, the District will charge the Applicant the cost of those additional revisions. (1626)

6.5.2 Contracts with District (1626)

Contractors working for the District must enter into a contract with the District for the work involved. The District will prepare or supervise preparation of the contract documents. (1626)

6.5.3 Tapping of Mains (1626)

All taps made to the existing main shall be made by District crews or under direct observation by qualified District personnel. Payment shall be made in advance for this work. (1626)

6.5.4 Contractor Insurance Requirements (1626)

Specific contractor insurance requirements are identified in Public Liability and Property Damage Insurance, of the WSDOT Standard Specifications. Substitute District for State and General Manager for Secretary in the above specifications. The Contractor shall forward to the General Manager a Certification by the Contractor that a policy, or endorsement to an existing policy, satisfying all the requirements set forth above has been obtained from a particular insurance company and is in effect prior to commencing work on the project. (1626). The contractor shall obtain and keep in force during the term of the contract and until 30 days after the Physical Completion date, unless otherwise indicated below, the following insurance with companies or through sources approved by the State Insurance Commissioner pursuant to Chapter 48.05, RCW.

6.5.5 Contract Bond

The successful bidder shall provide an executed contract bond for the full contract amount. This contract bond shall:

1. Be on a District-furnished form;

2. Be signed by an approved surety (or sureties) that:

    a. Is registered with the Washington State Insurance Commissioner, and

    b. Appears on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner,

3. Be conditioned upon the faithful performance of the contract by the Contractor within the prescribed time; and

4. Guarantee that the surety shall indemnify, defend, and protect the District against any claim of direct or indirect loss resulting from the failure:

    a. Of the Contractor (or any of the employees, subcontractors, or lower tier subcontractors of the Contractor) to faithfully perform the contract, or

    b. Of the Contractor (or the subcontractors or lower tier subcontractors of the Contractor) to pay all laborers, mechanics, subcontractors, lower tier subcontractors, materialperson, or any other person who provides supplies or provisions for carrying out the work.

The District may require sureties or surety companies on the contract bond to appear and qualify themselves. Whenever the District deems the surety or sureties to be inadequate, it may, upon written demand, require the Contractor to furnish additional surety to cover any remaining work. Until the added surety is furnished, payments on the contract will stop.

6.5.6 Guarantees

The contractor shall be responsible for correcting all defects in workmanship and materials incurred within one year (365 days) after the date of final acceptance of the project. When corrections of defects are made, the Contractor shall be responsible for correcting all defects in workmanship and/or materials in the corrected Work for one year after acceptance of the correction by the District. The Contractor shall commence remedying such defects within seven (7) days of receipt of notice of discovery thereof from the District and shall complete such Work within a reasonable time. In emergencies, where damage may result from delay or where loss of service may result, such corrections may be made by the District, in which case the cost shall be borne by the Contractor. In the event the Contractor does not complete corrections within a reasonable time, the Work shall be otherwise accomplished and the cost of same shall be paid by the Contractor.

The Contractor shall be liable for any costs, losses, expenses, or damages, including consequential damages, suffered by the District resulting from defects in the Contractor's Work including but not limited to costs, labor, materials, equipment and administration incurred by the District in making emergency repairs of such defective Work and associated costs of engineering, inspection, and supervision by the District or Engineer. The Contractor shall defend, indemnify and hold the District harmless from any and all claims which may be made against the District as a result of Contractor's defective Work.

6.5.7 Licenses (1626)

Contractors installing water plant for the District or the Applicant shall be licensed and bonded in the State of Washington. A copy of the installing entity's contractor's license shall be forwarded to the District prior to installation of the water plant. (1626)

6.5.8 Easements and Rights-of-Way (1626)

All plant not to be located on public dedicated rights-of-way shall be on easements dedicated to the District, either shown on the plat, an instrument acceptable to the District, or on the District's "Water Pipeline Easement" form. Easements shall be a minimum of twenty feet in width (with exceptions for special topographic conditions or other District requirements). An easement may coincide with another utility easement, except all sanitary sewer lines must be ten feet or more from water lines and other utilities a minimum of five feet. Water lines shall be located no closer than five feet from the edge of easement areas. (1626)

6.5.9 Applicant Advance Payment (1626)

The District will provide an estimate based on costs for tie-ins to existing District plant and for District inspection and administration of the work performed by other than the District forces. The Applicant must request these estimates a minimum of thirty (30) days in advance of the need for the cost figures. The Applicant shall make an advance payment in the amount of the estimate(s) before any work is started. Estimates are subject to change and the District reserves the right to terminate water service or sale of any new service, if advance payments are not made within sixty (60) days of the quotation. After all work, conditions and accounting are completed, the Applicant shall be billed for additional costs incurred beyond the advance payment(s) amount or refunded any unused balance.

6.5.10 Indemnify, Defend and Save Harmless (1626)

A contractor working for the District shall agree to indemnify and defend and to save the District harmless from any and all claims or liability for damages arising from acts done under the contract. Before commencing work the Contractor shall furnish the District certificates of his comprehensive general and automobile liability and property damage insurance, in limits acceptable to the District, protecting against all claims for personal injury or property damage, including coverage for underground collapse and explosion damage, arising during the course of the performance of said contract.

6.6 Water System Improvements Installed by Applicant (1626)

6.6.1 Progress Requirement (1626)

The requirements listed in the sections below are to be complied with, completed and satisfied before any water plant construction is started: (1626)

- District Plan Approval (Section 6.2.1)
- Work/Job Order Authorization Agreement (6.2.4)
- Permits, Easements and Approvals (6.2.6)
- System Extension Design (Section 6.4 and Appendix C)
- Written Estimate for Plan Review and Construction Inspections (Section 6.6.2)
- Acceptable Contractor (6.6.3)
- Applicant Damage Agreement (6.6.5)
- Materials Submittal Requirement (6.6.6)
- Easements and Rights-of-Way (6.6.7)
- Applicant Advance Payment (6.6.8)
- Contractor Insurance Requirements (6.6.9)
- Licenses (Section 6.6.10), and
- Indemnify, Defend and Save Harmless (Section 6.6.11)

Additional requirements not listed may also be necessary.

6.6.2 Written Estimate for District Review, Construction and Inspection Services (1626)

Upon request, the District will provide to an Applicant a written estimate for the installation of water lines and appurtenances. If the Applicant and the District agree to proceed with the project, the Applicant shall pay in advance to the District the estimated cost of installing the water lines designed by the Applicants Engineer. Costs shall include, but not be limited to, material, labor, equipment rental, engineering, overhead, and right-of-way costs. (1626)

6.6.3 Acceptable Contractor

Any Contractor installing a line extension(s) for an Applicant must be a licensed contractor in the State of Washington and accepted by the District.

"Acceptance" of a Contractor by the District means that the Contractor has met certain minimum criteria relating to past performance, experience, or apparent ability to successfully perform the work required; it shall not be deemed to create or impose any warranty upon the District as to the said contractor or its workmanship, nor shall such acceptance relieve the applicant or the contractor of their responsibility to comply in all respects with District policies and specifications.

6.6.4 Tapping of Mains (1626)

All taps made to the existing main shall be made by District crews or under direct observation of qualified District personnel. Payment shall be made in advance for this work. (1626)

6.6.5 Applicant Damage Agreement (1626)

The Applicant shall sign and return an “Applicant’s Damage Agreement” form furnished by the District that guarantees payment to the District for costs of repairs to District plant damaged by activities of the Applicant or its contractor(s) in the construction of the improvement. The agreement requires the Applicant to certify that the final grade will be established throughout the construction area of the development and the water plant will be installed to design grades. The Applicant shall agree to accept financial responsibility to relocate affected water plant vertically and horizontally if grades are not as accepted by the District. (1626)

6.6.6 Materials Submittal Requirement (1626)

Prior to construction, the Applicant or the contractor installing the water system improvements shall submit a list of all brands, sizes, types, grades and standards of materials to be used in the water plant. All pipe, fittings, valves and appurtenances shall be manufactured to AWWA standards and accepted by the District. The District may

reject certain brands at its discretion. The District will provide acceptance, and/or comment by letter. (1626)

6.6.7 Easements and Rights-of-Way (1626)

All plant not to be located on public dedicated rights-of-way shall be on easements dedicated to the District, either shown on the plat, an instrument acceptable to the District, or on the District's "Water Pipeline Easement" form. Easements shall be a minimum of twenty feet in width (with exceptions for special topographic conditions or other District requirements). An easement may coincide with another utility easement, except all sanitary sewer lines must be ten feet or more from water lines and other utilities a minimum of five feet. Water lines shall be located no closer than five feet from the edge of easement areas. (1626)

6.6.8 Applicant Advance Payment (1626)

The District will provide an estimate based on costs for tie-ins to existing District plant and for District inspection and administration of the work performed by other than the District forces. The Applicant must request these estimates a minimum of thirty (30) days in advance of the need for the cost figures. The Applicant shall make an advance payment in the amount of the estimate(s) before any work is started. Estimates are subject to change, and the District reserves the right to terminate water service or sale of any new service, if advance payments are not made within sixty (60) days of the estimate. After all work, conditions and accounting are completed, the Applicant shall be billed for additional costs incurred beyond the advance payment(s) amount or refunded any unused balance. (1626)

6.6.9 Contractor Insurance Requirements (1626)

Specific contractor insurance requirements are identified in Public Liability and Property Damage Insurance, of the WSDOT Standard Specifications. Substitute District for State and General Manager for Secretary. Certification by the Contractor that a policy or endorsement to an existing policy satisfying all the requirements set forth above has been obtained from a particular insurance company and is in effect shall be forwarded to the General Manager prior to commencing work on the project. (1626)

6.6.10 Licenses (1626)

Contractors working for the District or the Applicant installing water plant shall be licensed and bonded in the State of Washington. A copy of the installing entity's contractor's license shall be forwarded to the District prior to installation of the water plant. (1626)

6.6.11 Indemnify, Defend and Save Harmless

A contractor working for the Applicant shall agree to indemnify and defend and to save the District harmless from any and all claims or liability for damages arising from acts

done under the contract. Before commencing work the contractor shall furnish the District certificates of his comprehensive general and automobile liability and property damage insurance, in limits acceptable to the District, protecting against all claims for personal injury or property damage, including coverage for underground collapse and explosion damage, arising during the course of the performance of said contract.

6.7 Construction Requirements and Procedures

6.7.1 Construction Procedures (1626)

The District hereby adopts with the approval of this code the Washington State Department of Transportation/American Public Works Association Standard Specifications for Road, Bridge, and Municipal Construction, including the APWA Supplement (most current issue). All construction work on plant or facilities to become final property of the District shall be as specified in the Standard Specifications unless superseded or specifically amended by special conditions within the project specifications that are accepted by the District. (1626)

The accepted construction plans and specifications shall be followed. No deviations will be allowed without request for change and acceptance received from the design engineer and District's Engineering Manager. The District reserves the right to order changes in the event of conditions or circumstances discovered during construction. Such changes could result from the ability or care shown by the Contractor, natural and man-made conditions, or any other reason. (1626)

There shall be extreme care in checking and cleaning all pipe and fittings of dirt, debris and/or any foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal plant installed when it is to be left for any period of time; including lunch breaks, coffee breaks and overnight. Pipe and fittings shall be washed before installation if contaminated by dust, smoke, exhaust or any other material. Material contaminated by petroleum products or questionable chemicals shall be rejected. No trench water shall be allowed to enter installed plant. (1626)

6.7.2 District Involvement and Inspection (1626)

There shall be a pre-construction conference with the District a minimum of 48 hours prior to start of construction. (1626)

A District Inspector must be present for all work on water pipe plant if work is to be conducted by someone other then District personnel. The District may refuse acceptance of any such plant installed without District inspection. The District shall be notified a minimum of two full working days in advance of a firm starting date and time to arrange for and schedule the inspector. Work must proceed in a continuous manner. If there are breaks in construction, there must be two working days notice before beginning again. Inspection costs shall be borne by the Applicant. (1626)

6.7.3 Tapping of Mains

All taps made to the existing main shall be made by District crews or a specialized contractor acceptable to the District. Payment shall be made in advance for this work. (1626)

6.7.4 District Access

During the period of construction, Applicant and its contractor(s) shall provide access to District personnel (including personnel on contract to the District) as necessary, to ensure compliance with District requirements.

6.8 Requirements Prior to Final Connection to Existing System

6.8.1 Progress Requirement

Requirements in the following Sections shall be completed to the District's satisfaction before full and final connection to the District system will be permitted: (1626)

- District Involvement and Inspection (6.7.2)
- Disinfection (6.4.5)
- Pressure Test (6.4.4)
- Bond(s) (6.8.2)
- Final Acceptance (6.8.7)

6.8.2 Acceptance and Bonds

The project must be accepted and all required permits issued by the appropriate county or municipal agencies. All necessary bonds must be furnished to those agencies; the Applicant must also provide a one-year maintenance bond to the District for the new water plant. All agreements with the Public Utility District must be signed before water services may be installed. (1626-94)

A maintenance bond, irrevocable letter of credit, deposit in lieu of maintenance bond, or cash bond for the water plant installed by other than District personnel shall be furnished to the District for projects of $10,000 or less, the bond shall be not less than 50% of the full installed value of the water plant. For projects ranging from $10,001 to $25,000, the bond shall be not less than 40% of the full installed value of the water plant. For projects in excess of $25,001, the bond shall not be less than 25% of the full installed value of the water plant. Bonding requirement for Governmental entities may be in the form of an Inter-Local Agreement (see below). The bond shall be effective for a period of one year from the date of the acceptance of water plant by the District Commissioners. This acceptance request shall not be prepared and dated until after satisfaction of all conditions listed herein. The purpose of the bond shall be to guarantee payment to the District for costs of repairs that become necessary during the first year of operation. Further, the

bond shall guarantee payment for replacement of any or all of the plant if it is determined failure is excessive and the plant cannot be relied upon for long, trouble-free life. The District shall be sole judge of the adequate performance of such plant. (1626)

A Maintenance Agreement for Governmental Agencies may be approved by the District's General Manager in lieu of a one-year maintenance bond. (1748-97) A sample form is attached in Appendix C-14).

6.8.3 Latecomer Provisions (1626)

Each new pipeline extension built and paid for by an Applicant will be eligible for a Latecomer's Agreement, allowing for reimbursement of installation costs of that extension during the first ten years after the date of acceptance by the District or date of completion by the District or when the property to which the pipeline was intended to serve is sold. The reimbursement will be on a front footage basis. The cost per foot of the extension is established at the time of the original installation. Each new Applicant connecting to that extension within the first ten years after completion of the extension will be required to share in the cost of the original construction. Prior to connection, the new Applicant shall pay to the District, in addition to other applicable charges, a latecomer fee equal to the front footage of the pipeline abutting the new Applicant's property multiplied by one of the following footage charges: (1626)

- For pipelines eight inches in diameter and smaller: one-half the actual cost per foot of the extension, including fire hydrants. (1626)
- For pipelines larger than eight inches in diameter: one-half the average cost per foot for typical 8-inch diameter water extensions in the water system for the calendar year the oversized main was installed. The cost of the 8-inch water pipeline shall be all-inclusive, e.g., includes fittings, fire hydrants, backfill materials and surface restoration. The average cost per foot, for the calendar year 2003, is established at $29.17. The cost per foot for pipe installed during ensuing years will be adjusted by the District Treasurer to incorporate inflation as established in the Consumer Price Indexes "Seattle Area" (2003=100) published by the Bureau of Labor Statistics, U.S. Department of Labor. (1626)
- Water mains that do not have opposing sides for water service connections may be eligible for a slightly modified latecomers formula that accounts for the total limited front footage available on both sides of the new pipeline. (1626)

If at a later date an Applicant connects a new main pipeline off the side of this original extension, the later Applicant shall pay either:

- a perpendicular connection will be based on a 100-foot lot multiplied by the footage cost, or
- a horizontal run the basis of one-half the front footage of the water main abutting the Customer's property multiplied by footage cost, whichever is greater.

There shall be no latecomer fees for any main extensions continuing off the end of the original extension. The effective start date for the term of the Latecomers Agreement is the date of acceptance of the installation by the District Commissioners. No waivers shall be permitted, unless authorized in writing by the beneficiary of the refund. (1626)

Latecomer refunds cannot exceed the cost of the original installation. (1626)

The District shall reimburse to the original Applicant any Latecomer's fees collected.

6.8.4 Record Drawings

Upon completion of a project, one set of revised top quality photo Mylar record drawings, or one set of paper record drawings and specifications, and an additional compact disc (CD) containing record drawings in a read-only digital format compatible with the District's current computerized design system (AutoCAD.DWG format; not .PLT format), shall be provided to the District at the Applicant's expense. The digital information shall be archived so that all x-references, including the title block and border, are a permanent part of the drawing. Record drawing plans shall be compiled from a final marked-up set of construction drawings marked "As-Built", shall show all new water facilities and related appurtenances and, at a minimum, shall include the true locations of all mains, valves, hydrants, and fittings giving sizes and types of each, including distances of mains from property lines and right-of-way centerlines.

A registered Professional Engineer licensed in the State of Washington must stamp and sign all drawings and specifications. If the registered Professional Engineer is responsible for the inspection of the construction then he/she is required to stamp the record drawings.

6.8.5 Temporary Connection (1626)

Final connection to existing District plant may not be permitted until after acceptance by the District of all installation. A small tubing connection (3/4-inch to maximum of 2-inch size) may be made from District plant to supply water for line filling, pressure testing, disinfection and disinfection water removal. An approved reduced-pressure backflow prevention assembly shall be installed in the temporary supply line. (1626)

6.8.6 Transfer of Ownership (1626)

The Applicant shall deliver to the District a Bill of Sale or acceptable form, transferring the ownership of all pipe plant within the development to the Public Utility District. The Bill of Sale shall describe lengths and sizes of plant, and the location in general terms such as the name of the plat. In addition, there shall be an itemization of all installed costs of water pipe plant broken down as to descriptions of material, size and lengths of each type of pipe with unit or lump sum costs for each type, including fittings. The cost itemization shall include a breakdown of the material, labor, construction equipment, engineering, and sales taxes. Water service materials and costs (and meters if installed by

the Applicant), must be listed separately. Include all private engineers fees involved with water plant work. The Bill of Sale shall not include fees paid to the District. (1626)

Fire hydrant assemblies (tee, valve, connecting pipe, valve casing and cover, hydrant, blocking and installation) and costs are to be listed separately.

6.8.7 Final Acceptance

Upon completion of construction, Applicants or their contractors shall notify the District and request a final inspection for acceptance of the project. Upon completion of the following items, the District staff shall present to the District Board of Commissioners a Request for Acceptance for their action:

- The water main has been installed according to the approved plans and specifications;
- Pressure and bacteriological tests have been passed;
- All permit conditions have been satisfied;
- All extension policy conditions have been fully satisfied;
- All fees, deposits and payments required by the District and other entities have been paid;
- All easements recorded at the county or shown on the face of the final plat map;
- All necessary bonding in place; and
- The following items are delivered to the District:
  - Copy of all executed bond and easement documents;
  - Stamped Mylar and paper Record Drawings that reflect as-built conditions;
  - Digital copy of water plan Record Drawings and
  - "Bill of Sale" accepted by the District.

The date of acceptance by the District Commissioners will begin the period of warranty. Final acceptance shall not constitute acceptance of any unpaid for, unauthorized, defective, omitted, or non-conforming work or materials. Final acceptance shall not prevent the District from requiring the applicant to pay for, remove, replace, dispose, or add work or materials or prevent the District from recovering damages for any work or materials or lack thereof.

6.8.8 Final Connection

The Applicant shall complete the final connection to the District system prior to acceptance by the District. All connecting pipe and fittings shall be sterilized as required in Section 6.4.5 and shall be maintained clean and uncontaminated. Qualified District personnel shall supervise system flushing. (1626)

6.9 Extension Policies for Specific Conditions

6.9.1 Water Service Requirements for Developments Serving Four or Fewer Parcels (lot or tract) (1566-92)

A line extension may be waived for a land division under the following conditions: (1566-92)

- The parcel to be developed must front (be adjacent to and contiguous with) a District water main; (1566-92)
- The development will create no more than four (4) new parcels. The Applicant will submit a drawing of the proposed development to be considered; (1566-92)
- The prevailing fire protection authority will not require a fire hydrant or similar device beyond the first parcel fronting the waterline; (1566-92)
- The District has determined through its own analysis that the future possibility and need for extending a water line through the development to provide a gridded system or to extend beyond the development by way of a line extension is extremely limited. Physical barriers such as major transportation corridors (railroad tracks, limited access high-capacity thoroughfares, etc.), steep terrain, and bodies of water were considered; (1566-92)
- Zoning will prohibit further subdivision of the new parcels at the time of development. Further subdivision or subdivision of the parcels at any time in the future may require a line extension. The District and other authorities will evaluate provisions for future line extension/gridding. Any development that applies for a variance shall be required to provide an easement to the District that would provide sufficient right-of-way for a water line in the future to traverse through the development; and (1566-92)
- Those developments satisfying all of the above conditions will be considered by the District's General Manager. The General Manager may allow the meters to be set at the beginning of the roadway access. A line extension fronting some or all lots may be required. The District may deem it necessary to require a variety of conditions for approval of services hereunder. The ultimate District proposal will be based upon the District’s best judgment considering all relevant factors. (1566-92)
- A statement of District requirements will appear on the recorded plat. (1566-92)

  Upon satisfaction of all District requirements, the District, upon payment of the prevailing fees, will place separate water meters serving each parcel. The District's responsibility will terminate at the water meter. (1566-92)

  If an entity allows further subdivision, this action will trigger the District’s requirements for a water line installation to serve the property that was granted the waiver, and the associated costs will be born by the property owner who initiated further development. (1566-92)

6.9.2 Installation of Water Services to Serve Property with Limited Access

If a water main extension to a limited access lot(s) demonstrates no future benefit to the District system as determined by the District, the District may allow a water service to be installed at the street right-of-way line to serve the limited access lot. This type of water service installation requires District Manager approval and the water service shall be installed within the limited access lot's easement frontage for ingress and egress.

6.9.3 Policy for Water Main, and Water Service Installations in Mobile Home Courts and/or Trailer Parks (1498)

Each mobile home lot will be required to have a separate water meter and pay a System Development Fee. (1498)

Expansions to mobile home courts and/or trailer parks will require review and acceptance by the District. (1498)

This policy may not apply to seasonal recreation lots.

6.9.4 Consistency with Skagit County Comprehensive Plan (1559-92)

The District will provide water service to undeveloped lots/parcels in rural areas, and only after receipt of notice from the County that the undeveloped lot/parcel is consistent with the County's Comprehensive Plan and that a building permit will be issued upon notice of water availability by the District. (1559-92)

Water service requests for livestock watering and/or agricultural purposes may be allowed. Service provided for this purpose shall not be converted to domestic, commercial, or industrial use without the parcel or property owners submitting to the District an approved building permit issued by Skagit County. The approved building permit will be considered warranty that the improvement is in compliance with the approved Skagit County Comprehensive Plan. Failure to provide such a permit may be grounds for discontinuation of water service. (1559-92)

Section 7
Satellite System Management

7.1 Background

Public Utility District No. 1 of Skagit County (District) functions as the primary Satellite Management Agency (SMA) for Skagit County per the Skagit County Coordinated Water System Plan (CWSP) Regional Supplement. The District provides satellite service inside Skagit County (and outside the County in limited cases) to all areas not already designated as the service area of another State-approved water utility. The District's goal as SMA is to maximize water availability and maintain satisfactory water quality, as well as to assist other public water systems (water systems serving 2 or more service connections) with technical and administrative tasks. The District runs a Satellite System Program, operating both large and small District-owned systems, assisting troubled and failing water systems, and providing other water systems by contract with various services. By operating more than one water system, economies of scale make it possible for the District to employ qualified personnel, provide good system management and operation, and meet the stringent standards required by the Safe Drinking Water Act.

The regulations and liability associated with providing adequate water service are becoming too complex, restrictive and expensive for many communities, homeowner associations and individually-owned utilities. Small public water systems are often unwilling or unable to develop and sustain the operating revenues that will finance needed capital improvements and operational/maintenance activities in a manner that is affordable to their customers, nor the Operating and Capital Cash Reserves required by the State to meet the test of financial viability. It is not the District's intent to take over all small public water systems in Skagit County, but rather to support them in cooperation with the Skagit County Health Department (SCH). The District appreciates the pride many system owners display and believes they should continue service so long as their product meets drinking water quality standards and their physical water system meets DOH/SCH requirements.

This Satellite Management Program is fashioned to allow some flexibility of service to water systems to best accommodate their particular needs. In addition, the District's eligibility for State and federal funding assistance and its ability to issue bonds helps to assure reliable and high quality service at minimum cost for District-owned systems.

Many water systems may be operating well and producing good quality water, but need help with monitoring or the cost of supplies; Support Assistance may be the best for them. Other water systems may not want to stay in operation or, because of inability to meet water quality requirements, may be forced by the courts to turn their system over to someone else; Ownership Service may be their best option. New systems may be served by Ownership, Management and Operation, or Contract Service by the District.

This outline of the District's Satellite System Management Program provides customers with the philosophy, objectives, and procedures associated with available services.

7.2 Types of Satellite Water Systems

7.2.1 Group A Water System

A Group A water system is defined in WAC 246-290-020 as a public water system: with 15 or more service connections used by year-round residents for 180 or more days within a calendar year, regardless of the number of people; or regularly serving at least 25 year-round (i.e. more than 180 days per year) residents, or that provides service opportunity to 25 or more of the same nonresidential people for 180 or more days within a calendar year, or that serves 25 or more different people each day for 60 or more days within a calendar year, or that serves 25 or more of the same people each day for 60 or more days but less than 180 days within a calendar year, or that serves 1,000 or more people for two consecutive days within a calendar year.

7.2.2 Group B Water System

Group B water system is defined in WAC 246-290-020 as a public water system that does not meet the definition of a Group A water system.

7.2.3 Types of Satellite Service

The Satellite System Program provides four primary options of services for water systems:

- Ownership Service: Ownership and operation of the remote water system by the District.
- Management and Operation Service: Management and operation of the remote public water system by the District for the system owner, or
- Contract Service: Delegation by the District of the system management and operation to the system owner or a third party; this option still requires the SMA to ensure that all functions of the system comply with applicable regulations.
- Support Assistance: Support to existing viable systems for technical, professional or special services by the District.

These options are designed to respond to the needs of differing water systems and to support a program of reliable water system operation throughout the County. Decisions on establishing a level of service will depend on CWSP Guidelines, direction from the County or State Health Departments, individual system needs, plans for improvement and growth pressures, as well as the ability of the District to provide the desired services in a cost-effective manner. Each situation will be carefully examined by the District with the Applicant interested in Satellite System service or support.

Existing systems that do not meet water quality standards would benefit the most from Ownership Service. The District may be required to assume specific regulatory liabilities for systems that transfer ownership; the interests of all District customers will be

considered before any such transfer. The District will provide Ownership Service only for those systems that comply with its minimum water quality, construction and reliability standards. Systems initially failing to meet these standards must either be brought up to standards or pay the cash equivalent of such an upgrade prior to transfer of ownership, in accordance with this Satellite System Program policy. Different construction and reliability standards will be assigned to Group A and Group B systems as appropriate.

Systems requesting assistance must provide unrestricted access of system facilities to District staff. All system facilities must be on system-owned property or located on legal rights-of-way or easements.

The District uses the following procedures in evaluating requests for either remote service (either Ownership, Management & Operation or Contract Service) or Support Assistance. There are some common steps in each process regardless of which option is requested.

1. Initial contact between the Applicant and the District: the Applicant can discuss needs of the water system and receive a copy of District policies and procedures pertaining to Applicant's requests. The Applicant may contact the District on its own or by SCH or DOH referral.

2. Applicant's written request: this initiates the District's formal evaluation of the system's needs, capabilities and deficiencies. The Applicant's request should include specific data and background information on the system using the Small System Survey forms in Appendix G (also found in the Comprehensive Water System Plan).

3. District procedures: The District will inform the Applicant of the procedures required for service or support.

4. A detailed flow chart is included in Appendix H (also found in the Satellite Management Program, of the District's Comprehensive Water System Plan).

The District's Point of Contact for initiating SMA service is the Engineering Department at the District's office complex located at 1415 Freeway Drive, Mount Vernon WA 98273.

7.3 Ownership service

7.3.1 Policy

- Applicants adjacent to or within another established public water system's designated service area will be referred to that water system for Ownership service before the District will accept a request for Ownership service from the applicant (see Figure 6A). If the adjacent water system denies the applicant service, the applicant may apply for Ownership service from the District.

- Ownership Service can be provided for both Group A and Group B public water systems. Typically the District will own and operate all new satellite Group A public water systems proposed within its satellite service area, and. consider service to any existing public water system with water quality or infrastructure deficiencies regardless of the size of the water system. The District will typically not own Group B public water systems. Instead:

  - the District will typically waiver SMA service to all two (2) connection Group B public water systems;
  - the District will review potential for SMA management and operation (M&O) service to new Group B public water systems with more than two (2) connections. In general, the District will not provide M&O service to Group B water systems; and
  - Unique exceptions will be considered on the recommendation of a governmental agency or the system owner.

- The District considers a new system to be feasible based on the balance of its projected revenues to active service count, projected rate of growth to buildout, and operational requirements. An economic viability assessment will be performed on each system to be considered for ownership service. Ownership systems which are likely to be considered financially feasible include, but are not limited to:

  - those inside or within 1/2-mile of a UGA or rural village served by the District; or
  - those where a District water main is anticipated to be within 1⁄2-mile of the system within 20 years of the date the system begins operation.

In all cases, land use regulations shall govern the creation of new developments and determine the density therein.

- Ownership Service requires transfer of ownership and operational responsibilities from either a new or existing water system to the District. The District shall assume complete responsibility for the water system following transfer.
- The Applicant is subject to all District written policies and Resolutions, including but not limited to rates and fees, design and construction standards and line extension policies.
- The Applicant is responsible for all costs of upgrade and transfer of system ownership to the District. The District will assist the Applicant in obtaining funding. The District will not make cash payments to acquire an existing or new system. Transfer of ownership will occur at no cost to the District.
- Water systems that have been certified per WAC 246-290 as being designed and constructed in accordance with District, SCH and Washington State Department of Health (DOH) standards shall be considered “certified”; all other systems shall be considered “uncertified”. Certified and Uncertified systems shall follow the respective Review and Approval Procedures indicated below to implement the Ownership Service option. For Uncertified systems, this shall include survey and

evaluation of the system and completion of all upgrades to minimum District standards prior to transfer of ownership to the District.

- The District reserves the right to contract any or all of the survey and evaluation procedures and/or the final design of a water system to a professional other than the District who, in the mutual judgment of the District and SCH, is qualified.

7.3.2 Review and Approval Procedures

- Certified Existing Systems
  - Systems that are certified per WAC 246-290 to meet District, SCH and DOH standards for design and construction will not be subject to the survey, evaluation and upgrade process.
  - Systems that may desire Ownership Service by the District or connection to another District system at some future date should meet the following requirements during design and construction:
    - Design and install the system per the District's current urban design standards or rural design standards, as the District considers appropriate. See Appendix "C".
    - Coordinate inspection of construction of the new system with the District.
    - Prior to transfer of ownership to the District, have the system designer certify per WAC 246-290 that the system has been constructed per the approved design and that it meets District, SCH and DOH standards.
  - Transfer of water system ownership to the District shall follow the procedures outlined in paragraph 7.3.2.b (8) below.
- Uncertified Existing Systems
  - For "uncertified" systems, a preliminary survey will be conducted by the District to establish the existing status of the water system. See Appendix G. The District may require a preliminary deposit prior to conducting the survey. The deposit will be applied toward the final cost of improvements tallied at the completion of work. If the Applicant withdraws the request for service for any reason at any time during the process, the District will retain a portion or all of the deposit to help cover costs.
  - Based on the data collected from this survey, the District will estimate the costs for required improvements and routine operation and maintenance (O&M).
  - A meeting or other appropriate method will be used to review the survey data and preliminary cost estimate with the Applicant. The Applicant may either withdraw the request for Ownership Service or continue the process by authorizing the District to prepare an engineering evaluation to more accurately determine the work and costs required to improve the system to and maintain the system at required standards.

- The District engineering evaluation shall include a detailed analysis of the system's operation, required capital improvements and projected O&M costs. The applicant must possess water rights adequate to supply the project, and these water rights must be transferred to the District.

- It will also contain a preliminary financing plan for improvements based on:
  - Minimum improvements required to meet water quality, construction and reliability standards;
  - Required improvements to upgrade the system to District standards;
  - Additional improvements for storage, metering and fire flow (if not already required).

- After review of the engineering evaluation with the Applicant, the Applicant may withdraw the request for Ownership Service or, with assistance from the District, pursue required improvements to the water system. Improvements required to meet minimum District standards, particularly those associated with water quality, safety and reliability, shall be completed prior to transfer of ownership. Less critical improvements may, at the District's option, be deferred until normal repair or replacement occurs.

- Improvement may be financed by the Applicant through rate surcharges, customer assessments, system development charges, and/or District-arranged financing. District-arranged financing may include State and/or federal grants, Local Utility District (LUD) bonds or other similar arrangements.

- If necessary and found to be economically feasible, the District Commissioners may require the formation of an LUD in accordance with RCW 54. Once an LUD is formed and improvements completed, ownership of specified facilities, equipment and data shall be transferred to the District.

- After completion of the improvements, the Applicant and the District shall pursue transfer of ownership. The District's attorney will establish the appropriate authorization and legal instruments for the transfer of system ownership to the District. The items required for transfer or ownership may include, but are not limited to:
  - Bill of Sale
  - Title Report and Property Deeds
  - Assignment of Easement and Franchises
  - New Easements, if required
  - Assignment of Water Rights
  - Authorization to Collect Rates and Fees
  - Hold Harmless Agreement
  - List of Owners, Customers and Service and Mailing Addresses
  - Maps, Records, Equipment Manuals and Data
  - Other information

■ New Systems

- Levels of Ownership Service. Service can be provided to a Satellite System through several scenarios, depending on whether the system will "stand alone" permanently or has potential for connecting to an existing District system ("temporary stand-alone"), and whether fire protection will be required for the development by the Fire Marshal in that jurisdiction. The District will own and operate the remote system in either case.

- Permanent Stand-Alone System. A "permanent stand-alone system" is a remote system which is so far removed from another District system that there is no possibility of future connection/intertie. The permanent system shall be designed and built to meet or exceed District requirements as outlined in Appendix I and "Ownership System Design Standards" (7.3.2.c(4), below.

- Temporary Stand-Alone System. A "temporary stand-alone system" is a remote system which is more than 1/2-mile from a District water main and has a strong potential for hook-up within 20 years of the date the remote system starts operation. The system can be developed in one of two ways:

  - Completed to match current standards of the adjacent District system, allowing the eventual tie-in and integration into the adjacent District system without major modification of the remote system; or

  - Completed to minimum stand-alone standards with the written agreement of the developer that all or portions of the remote system will be upgraded to meet or exceed the standards of the adjacent District system at some future date prior to tie-in to the adjacent District system; selection of this option requires the developer to provide to the District the equivalent cash value of the intended future upgrade at the time the District accepts the system. The equivalent cash value shall be based on the District's estimated cost of the upgrade; present worth is subject to negotiation between the developer and the District.

  NOTE: Even though it will eventually be integrated into the adjacent District system, a Temporary Stand-Alone System must by definition be designed and constructed as a complete system to provide all the necessary service to its customers until such time as it is connected to the adjacent system. See "Ownership System Design Standards", 7.3.2.c(4) below.

- Ownership System Design Standards. Each Ownership System shall be designed by a Professional Engineer registered in the State of Washington and shall follow the sizing guidelines provided by the Washington State Department of Health. Each Ownership System shall be designed according to the District design standards, Appendix C of the Water Code. See also Appendix I. Specific material and construction requirements and standard details are available in Section 4.4 and Appendix F of the 2001 Comprehensive Water System Plan.

7.3.3 Rates and Charges

Rates and charges for District owned and operated satellite public water systems shall conform to existing schedules of rates and charges in Appendix A, or to new District rates and charges developed specifically for a water system (or systems). (1895-00)

7.4 Management and Operation Service

7.4.1 Policy

The District will not typically provide management and operation (M&O) service to a water system. In those cases when M&O service is provided, it will be under the terms of an SMA M&O service agreement. Each such "Satellite Service Agreement" will address:

- Detailed description of the area served and owners' names, including a single point of contact regarding the Satellite Water System (SWS);
- Background leading to SWS formation and the District's involvement;
- Terms, including:
  - ♦ construction/improvement and ownership of the water system by the SWS, per that system's or per State and County Health Department standards, whichever is greater, at the cost of the SWS;
  - ♦ operation of the water system by the District (or a designated third party agreeable to both the SWS and the SMA, as delegated by the SMA) per State and County Health Department standards at the cost of the SWS;
    - if operated by a third party, a compliance inspection of the water system by the SMA, at the cost of the SWS, to be performed at least annually; the SWS shall correct any deficiencies within a stated timeframe agreed between the SWS and SMA; the SMA shall correct any deficiencies not corrected in the timeframe specified and bill the SWS for such work;
  - ♦ payment of charges by the SWS to the SMA for operation, scheduled inspections, administrative management, water quality sampling/testing, and/or all other work performed by the SMA; waiver of lien rights; method of recovering any delinquent SMA billings from SWS; and
  - ♦ future expansion of the SWS.
- Hold harmless clause;
- Duration of the agreement (until the SWS is abandoned or connects to another District water system);
- Other factors deemed necessary; and
- Signatures of District and SWS representatives, notarized as required.

7.4.2 Rates and Charges for Management and Operation Services

- For management and operation services, water rates and charges shall be subject to negotiation between the District and the SWS and ratification by the District Commission;
- Any compliance inspection fee shall be calculated and charged on a case by case basis to recover District labor and vehicle expenses; and
- Any fee for water quality testing shall be set by the General Manager on a case by case basis to recover the laboratory costs and District labor and vehicle expenses.

7.5 Contract service

7.5.1 Policy

The District may offer contract services to any water system to which the District has waived SMA service and/or does not have an SMA relationship. The District and such water system shall agree to scope of services and compensation by written contract prior to the District providing any contract services. The contract should include the same basic elements as indicated above for a Satellite Service Agreement.

7.5.2 Rates and Charges for Contract Services

- For contract services, water rates and charges shall be subject to negotiation between the District and the water system and ratification by the District Commission;
- Any compliance inspection fee shall be calculated and charged on a case by case basis to recover District labor and vehicle expenses; and
- Any fee for water quality testing shall be set by the General Manager on a case by case basis to recover the laboratory costs and District labor and vehicle expenses.

7.6 Support Assistance Service

7.6.1 Policy

- The Support Assistance program provides general assistance for improving water service within the District's satellite service area. The intent of the program is to allow small water systems to remain independent and operate at reasonable expenditure levels. The District is willing to evaluate any form of assistance to help a water system improve its level of service. Primarily, the program is designed to support smaller water systems on a limited or non-recurring basis.
- "Limited" Support Assistance can include, but is not limited to:
  - ♦ Leadership and support to small utilities to ensure their views are considered in formulating local and state regulatory actions.
  - ♦ Opportunities for operator training and information system support;

- Administration of programs for joint purchasing of equipment and supplies to achieve economies of scale (public agencies only);
- Other information resources.

- "Non-recurring" Support Assistance can include, but is not limited to:
  - Loan of equipment or supplies to a system to handle a special circumstance (public agencies only, except that the District may support a privately-owned utility in case(s) of emergency, in the interest of public health and safety);
  - Providing engineering/or technical expertise to a system that lacks necessary staff for certain tasks (public agencies only);
  - Providing financial management/grant procurement assistance.

7.6.2 Review and Approval Procedures

- The Applicant shall first establish the utility's eligibility for support and the scope of the service(s) desired.
- The District shall provide an estimate of cost(s) for the service(s) requested.
- The District and the Applicant shall execute a written agreement or formal contract that specifies the exact responsibilities (staffing, equipment, supplies, etc.) and charges for the service(s) that the District will provide. This process will be expedited in case(s) of emergency.

Appendix A
Rates, Fees, Charges and Deposits

Table A-1
Monthly Basic Fixed Charge

Meter Size	Effective 01/01/08	Effective 03/01/09	**Effective 01/01/10**
5/8-inch	$ 16.40	$ 16.90	**$ 17.40**
¾-inch	16.40	16.90	**17.40**
1-inch	27.40	28.20	**29.05**
1 ½-inch	54.50	56.15	**57.85**
2-inch	87.10	89.70	**92.40**
3-inch	163.25	168.15	**173.20**
4-inch	271.90	280.05	**288.45**
6-inch	543.75	560.05	**576.85**
8-inch	869.85	895.95	**922.85**

Notes

- Total rate includes the sum of Table A-1 (as applicable) and Table A-2 below.
- These rates apply to all customers except: A) those described in Section 4.1.2 (Wholesale or Special Contract Customers) of the main document; and B) those described in Tables A-3, A-4, and A-5.

Table A-2
Consumption Charges

	Effective 01/01/08	Effective 03/01/09	**Effective 01/01/10**
Single Family & Duplex with Individual Meters			
0-3 ccf	$1.81 per ccf	$1.86 per ccf	**$1.92 per ccf**
4-100 ccf	2.84 per ccf	2.93 per ccf	**3.02 per ccf**
101-Excess	1.66 per ccf	1.71 per ccf	**1.76 per ccf**
All Others: Except those described in Tables A-3 and A-5			
0-3 ccf	$2.84 per ccf	$2.93 per ccf	**$3.02 per ccf**
4-100 ccf	2.84 per ccf	2.93 per ccf	**3.02 per ccf**
101-Excess	1.66 per ccf	1.71 per ccf	**1.76 per ccf**

Notes:

- The District bills in hundred cubic feet increments (ccf). One hundred cubic feet (1 ccf) equals 748 gallons.
- Total rate includes the sum of Table A-1 (as applicable) and Table A-2.
- These rates apply to all customers except: A) those described in Section 4.1.2 (Wholesale or Special Contract Customers) of the main document; and B) those described in Tables A-3 and A-5.

Table A-3
Monthly Basic Charges-Private Fire Systems
(Automatic Sprinkler Equipment)

Private Fire System Based Upon Inch Size	Effective 01/01/08	Effective 03/01/09	**Effective 01/01/10**
1-inch	$ 2.75	$ 2.85	**$ 2.95**
2-inch	5.50	5.65	**5.80**
3-inch	8.30	8.55	**8.80**
4-inch	11.00	11.35	**11.70**
6-inch	16.55	17.05	**17.55**
8-inch	22.05	22.70	**23.40**
10-inch	27.60	28.45	**29.30**
12-inch	33.10	34.10	**35.10**

Monthly Basic Charges-Private Fire Systems
(Other than Automatic Sprinkler Systems)

Privately Owned Fire System	$27.55	$28.40	**$29.25**

Note:

- Charges to be computed on a monthly basis

Table A-4
Fire Hydrant Use Charge

Monthly Basic Charge			$25.00 per month
Monthly Consumption Charges:	Effective 01/01/08	Effective 03/01/09	**Effective 01/01/10**
0-3 ccf	$2.84 per ccf	$2.93 per ccf	**$3.02**
4-100 ccf	2.84 per ccf	2.93 per ccf	**3.02**
101-Excess	1.66 per ccf	1.71 per ccf	**1.76**

Same as All Others (Table A-2)

Table A-5
Potlatch Water System Charges

	Effective 01/01/08	Effective 03/01/09	**Effective 01/01/10**
Monthly Basic Charge	$58.99	$60.76	**$62.58**
Monthly Consumption Charges	$10.00 per ccf	$10.30 per ccf	**$10.61 per ccf**

Note:

- The District bills in hundred cubic feet increments (ccf). One hundred cubic feet equals 748 gallons.

Table A-6
System Development Fees Summary – 5/8 to 8-inch Meter

Meter Size	Weighting Factor	Current Fee	**Effective 04/15/11**
5/8-inch	1	$ 2,880.00*	**$ 3,365.00**
3/4-inch	1.5	$ 4,320.00*	**$ 5,050.00**
1-inch	2.5	$ 7,200.00*	**$ 8,415.00**
1-1/2-inch	5	$ 14,400.00*	**$ 16,825.00**
2-inch	8	$ 23,040.00*	**$ 26,920.00**
3-inch	16	$ 46,080.00*	**$ 53,840.00**
4-inch	25	$ 72,000.00*	**$ 84,125.00**
6-inch	50	$144,000.00*	**$168,250.00**
8-inch	80	$230,400.00*	**$269,200.00**
10-inch	115.0	$331,200.00*	**$386,975.00**
Satellite Systems		General Plant portion of System Development Fee structure*	

Notes:

*Refer to Section 4.2 for further System Development Fee and Water Contract information.

*System Development Fees developed specifically for future LUDs or satellite systems, such as Potlatch Beach LUD No. 23, Skagit View Village LUD No. 27 and Marblemount LUD No. 28, that are not anticipated to connect to the Judy Reservoir System or conveyed water via the District's Water Supply Agreement with the City of Anacortes, shall be subject to only the "General Plant" portion of the System Development Fee structures, providing required criteria has been met for obtaining water service. The General Plant portion charged shall account for annual construction cost index increases and shall be multiplied by the appropriate weighting factor for the meter selected.

*Fees are based upon the cost of a 5/8-inch meter ($2,880 ($3,365 effective 04/15/11) x meter capacity weighting factor). The weighting factor is based upon the safe maximum operating capacity for displacement and compound water meters as identified in the American Water Works Association C-700 and C-702 standards.

The District anticipates an incremental fee increase adjustment of $485.00 in the 5/8-inch meter size effective April 15, 2012 (subject to review by the Commission). Fees for other meter sizes are incrementally determined using a multiplier upon the 5/8-inch rounded meter fee. The fee shall be rounded to the nearest $5.00 increment.

Table A-7

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Table A-8
Installation Charges

Connection Charge Type	Meter Size	Charge
Type One	5/8-inch	$1,280
Type One	3/4-inch	$1,335
Type One	1-inch	$1,360
Type Two	5/8-inch	$ 515
Type Two	3/4-inch	$ 575
Type Two	1-inch	$ 600
Type Three	5/8-inch	$ 320
Type Three	3/4-inch	$ 375
Type Three	1-inch	$ 375
Type Four	(Varies)	Part of Water Main Extension Cost
Type Five (Deduct)	5/8-inch	$ 515
Type Five (Deduct)	3/4-inch	$ 575
Type Five (Deduct)	1-inch	$ 600
Type Six	5/8-inch	$1,940
Type Six	3/4-inch	$1,995
Type Six	1-inch	$2,020
Renewal of Service (meter only) within one year	5/8-inch, 3/4-inch and 1-inch	$ 50
Renewal of Service (meter only) after one year	5/8-inch, 3/4-inch and 1-inch	Type Three Charge
Renewal of Service (complete service)	5/8-inch, 3/4-inch and 1-inch	Time and Materials, not to exceed Type One Installation Charge
Renewal of Service (complete service)	Larger than 1-inch	Time and Materials
Type One, Two, Three, Four and and Six	1 ½-inch and Larger	Time and Materials

Table A-9
Miscellaneous Charges

		Current Charges	*Effective 04/01/10
1	Service Activation Charge	$ 10.00	***$20.00**
2	Deduct Meter – Monthly Basic Fixed Charge		$2.55
3	Financial Instrument Charge (NSF, ACH return, closed account, etc.)		$25.00
4	Turn On/Reconnection (8 AM to 3 PM, M-F, excluding Holidays)	$ 35.00	***$50.00**
5	Consequent Turn On/Reconnection (8 AM to 3 PM, M-F, excluding Holidays) within a 12-month period		***$160.00**
6	Turn On/Reconnection (After 3 PM, M-F, or on Saturday)	$ 90.00	***$160.00**
7	Turn On/Reconnection (Sundays and Holidays)	$120.00	***$190.00**
8	Late Fee – A late payment charge of $5 or 2% per month, whichever is greater, applied to unpaid balances 14 calendar days beyond bill due date		***$5 or 2% Per Month**
9	Collection in the Field (prior to disconnection of service) 8 AM to 3 PM, M-F		$15.00
10	Reactivation of abandoned service, Type I		Type I Charge
11	Reactivation of abandoned service for larger than 1", plus associated service charges, fees, permits, expenses from other local, state or federal agencies		Actual Cost
12	Water Service Installations Involving Connection to a Water Pipeline Larger than 18", or Any Concrete Cylinder Water Pipeline		Actual Cost
13	Temporary Connection Charge (Installation/Removal)		Actual Cost
14	Crew/Serviceman Standby (Customer Request)		Actual Cost
15	Damage from Addition of New Equipment		Actual Cost
16	Damage to District Property		Actual Cost (unless shown below)
17	Cut Lock Charge	$ 25.00	***$200.00**
18	Meter Yoke Replacement Charge	$100.00	***$300.00**
19	Satellite System Compliance Inspection Charge		Actual Cost
20	Satellite System Water Quality Testing Charge		Actual Cost

Note: *****Charges in **bold** text will become effective April 1, 2010

Table A-10
Service Deposits

Meter Size	Deposit Amount
5/8" or ¾" Residential	$135.00
1" Residential	$200.00
Greater than 1" Residential	$250.00

Note:

- Commercial and larger metered service deposits are to be calculated based on two times the two month average billing as determined from time to time when water rates are adjusted or increased or when customer applies for service. In unusual or exceptional cases where management deems it necessary in order to adequately protect the District, the District may exceed the amounts indicated.

Appendix B
State Environmental Policy Act Procedures

I. OBJECTIVES

A. The State Environmental Policy Act of 1971, (SEPA), being RCW Chapter 43.21C, has been enacted to:

1. Declare a State policy which will encourage productive and enjoyable harmony between people and their environment;
2. Promote efforts which will prevent or eliminate damage to the environment and biosphere;
3. Stimulate human health and welfare;
4. Enrich the understanding of the ecological systems and natural resources important to the state and nation.

B. The Act authorizes and directs all branches of governments of this State, including State agencies, municipal and public corporations and counties to:

1. Use a systematic, interdisciplinary approach, ensuring integrated use of natural/social sciences and environmental design arts in planning/decision making on actions having a potential environmental impact;
2. Identify and develop methods and procedures, in consultation with the Department of Ecology and the Ecological Commission, to ensure appropriate consideration of environmental amenities and values, along with economic and technical considerations in decision making;
3. Consult with, and obtain comments from, any environmentally related public agency with respect to any environmental impact involved.
4. Prepare a detailed statement for inclusion with every recommendation or report on proposals for legislation and other major actions significantly affecting the quality of the environment, which outlines:
    a. The environmental impact of the proposed action;
    b. Unavoidable adverse environmental effects of the proposed action;
    c. Alternatives to the proposed action;
    d. Relationships between short-term uses of the environment and maintenance/enhancement of long-term productivity;
    e. Any irreversible and irretrievable resource commitments of the proposed action;
5. Make available to the Governor, the Department of Ecology, the Ecological Commission, and the public, copies of the Environmental

Statement and comments/view of environmentally related appropriate federal, provincial, state, and local agencies;

6. Provide copies of environmental statements and comments/views to accompany the proposal through the existing agency review processes;

7. Study and develop appropriate alternatives in cases involving resource-use conflicts;

8. Recognize worldwide environmental problems, and, where consistent with State policy, support measures to maximize international cooperation in preventing a decline in quality of the world's environment;

9. Make information on environmental restoration, maintenance and enhancement available to others;

10. Initiate and use ecological information in the planning and development of natural resource-oriented projects.

C. In keeping with the full purpose and intent of the law and in response to the foregoing directives, the following guidelines and procedures governing legislative enactment based on policy decisions by the Board of Commissioners, shall be followed. It is the intent of the Commission that any action of this District shall be evaluated in the sense of being either major/significant or minor/insignificant as related to environmental impact. The procedures dealing with threshold determinations and beyond are based on the District being Lead Agency. For those proposals where the District is not the Lead Agency, the District shall comply with the adopted procedures of the Lead Agency.

II. INCORPORATION OF SEPA RULES

Chapter 197-11 of the Washington Administrative Code (WAC) was established as the SEPA Rules, effective April 4, 1984. The SEPA Rules were established to provide uniform requirements for compliance with SEPA, and are hereby incorporated by reference into these District SEPA Procedures, as clarified herein. The District's SEPA Procedures, the SEPA Rules (WAC 197-11) and SEPA (43.21C RCW) must be read together as a whole in order to comply with the spirit and letter of the law.

III. DEFINITIONS

In addition to the definitions provided in the SEPA Rules (WAC 197-11-700 series), the following definitions are provided to clarify District-specific items:

Building: A facility which is regularly occupied or houses personal property (e.g., a dwelling unit, office facility, water treatment plant, etc.). Includes underground utilities to five feet outside the footprint of the building.

Impoundment: A storage facility for untreated water, usually man-made with some form earthen or concrete dam(s), and inlet and/or outlet piping for the water.

Right-of-Way: A narrow band of property with legal title or easement for a specific purpose(s), usually for transportation and/or utility access (such as telecommunication and electrical wires or water/sewer piping).

Storage Tank: A structure for the storage of liquid, such as potable water; usually above ground; usually constructed of steel or concrete, with a roof.

Structure: A facility which is not regularly occupied nor houses personal property (e.g.: storage tank, booster pump facility, etc.). Includes underground utilities to five feet outside the footprint of the structure.

Water Plant: Water system components, usually below ground level, including but not limited to water transmission and distribution lines, fittings, valves, control valve facilities, water service meters, fire hydrants, etc., but not structures or buildings.

IV. LEAD AGENCY

The "Lead Agency" is the agency responsible for SEPA compliance for a particular proposal. When the District initiates a proposal, it is the Lead Agency for that proposal. If the District shares in the implementation of a proposal, it must mutually agree in writing with the other implementing party on which agency will be the Lead Agency. If the other party is a private party, the District will be the Lead Agency. State agencies will automatically be Lead Agency for proposals listed in 197-11-938 WAC, including impoundments of 40 or more acres of surface area (Department of Ecology).

V. TIMING OF SEPA PROPOSALS

The District shall prepare its threshold determination, and environmental impact statement (EIS) if required, at the earliest possible point in the planning and decision making process, when the principal features of a proposal and its environmental impacts can be reasonably identified. For most proposals, this should occur at the conceptual stage rather than the final detailed design stage. See the attached project timeline for a relative scale of when SEPA should be addressed. For its own proposals, the District may extend the time limits prescribed in the SEPA Rules (197-11-055 WAC).

VI SEPA APPLICABILITY

A. The District shall consider SEPA on all proposals except those which are categorically exempt. The following actions, which may be routinely undertaken by the District, are categorically exempt from threshold determination and EIS requirements per 197-11-800 WAC.

1. Construction of an office, commercial, service or storage building or structure with 4,000 SF of gross floor area and with associated parking facilities for 20 automobiles.
2. Construction and/or installation of commercial on-premises signs.
3. Installation of hydrological measuring devices regardless of whether or not on lands covered by water.

4. Repair, remodeling, maintenance and minor alteration of District structures, buildings and water plant involving no material expansion or changes in use beyond that previously existing; special provisions apply to areas covered wholly or in part by water.

5. Appropriation of water (including exemption of hydraulics permit, shoreline permit and building permit) in the amount of not more than 50 cfs of surface water for irrigation purposes; and not more than 1 cfs of surface water, or 2,250 gpm of groundwater, for any purpose.

6. Purchase or acquisition of any right to real property; the sales, transfer or exchange of any publicly-owned real property, but only if not subject to an authorized public use; the lease of real property when the use of the property for the term of the lease will remain essentially the same as the existing use, or when the use is otherwise exempt from SEPA.

7. Enforcement and inspections, including the abatement of hazards to public health and safety.

8. Administrative, fiscal and personnel activities of the District (197-11-800 (13) WAC).

9. Local Utility Districts, unless such formation includes in its proposal the construction of such facilities not exempt from SEPA.

10. All storm water, water and sewer facilities, lines equipment, hookups, appurtenances including, utilizing or related to lines 8-inch or less in diameter.

11. All electrical facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of 55,000 volts or less; and the overbuilding of existing distribution lines (55,000 volts or less) with transmission lines (more than 55,000 volts); and the undergrounding of all electric facilities, lines, equipment or appurtenances.

12. All developments within the confines of any existing electric substation, impoundment, storage tank, pump station or well, not including additional appropriations of water.

13. Periodic use of chemical or mechanical means to maintain District right-of-way in its design condition; chemicals shall be as approved by Washington State Department of Agriculture and applied by licensed personnel; chemicals shall not be applied in watersheds controlled for drinking water quality.

14. Actions during an emergency to avoid imminent threat to public health and safety or to prevent serious environmental degradation (197-11-880 WAC).

15. The construction or installation of minor surveillance and control systems and temporary traffic controls and detours.

16. All communication lines, including cable TV, but not including communication towers or relay stations.

17. Watershed restoration projects. Actions pertaining to watershed restoration projects as defined in RCW 89.08.460(2) are exempt, provided, they implement a watershed restoration plan which has been reviewed under SEPA (RCW 89.08.460(1)).

18. Personal wireless service facilities.

(a) The siting of personal wireless service facilities are exempt if the facility:

(i) Is a microcell and is to be attached to an existing structure that is not a residence or school and does not contain a residence or a school;

(ii) Includes personal wireless service antennas, other than a microcell, and is to be attached to an existing structure (that may be an existing tower) that is not a residence or school and does not contain a residence or school, and the existing structure to which it is to be attached is located in a commercial, industrial, manufacturing, forest, or agriculture zone; or

(iii) Involves constructing a personal wireless service tower less than sixty feet in height that is located in a commercial, industrial, manufacturing, forest, or agricultural zone.

(b) For the purposes of this subsection:

(i) "Personal wireless services" means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services, as defined by federal laws and regulations.

(ii) "Personal wireless service facilities" means facilities for the provision of personal wireless services.

(iii) "Microcell" means a wireless communication facility consisting of an antenna that is either:

(A) Four feet in height and with an area of not more than five hundred eighty square inches; or

(B) If a tubular antenna, no more than four inches in diameter and no more than six feet in length.

(C) This exemption does not apply to projects within a critical area designated under GMA (RCW 36.70A.060).

B. The above categorical exemptions, numbered 1 through 18, shall not apply in areas designated by a city or Skagit County as an "environmentally sensitive area". Critical Areas: Wetlands, Flood Hazard Areas, Aquifer Recharge Areas, Geo Hazard Areas, Fish & Wildlife Habitat.

VII. THRESHOLD DETERMINATION

A. General

A threshold determination is required for any proposal which meets the definition of "action" (197-11-704 WAC) and is not categorically exempt. The District's "responsible official" shall make the determination, using the process indicated in 197-11-330 WAC, usually assisted by an Environmental Checklist. The determination shall be documented as either a Determination of Non-significance (DNS) or a Determination of Significance (DS), and shall be made as soon as practical after the agency has developed or is presented with a proposal.

The threshold determination shall not balance whether the beneficial aspects of a proposal outweighs its adverse impacts, but rather shall consider whether a proposal has any probable significant adverse environmental impacts under the SEPA Rules and these Procedures.

B. Designation of Responsible Official

The "responsible official" ensures the District's SEPA Procedures are followed, and issues the threshold determination and supervises the development of the EIS, if required. The responsible official will be the General Manager, or a District staff member one management level below the General Manager, and/or a professional engineer.

C. Environmental Checklist

1. A private applicant or a member of the District staff will prepare an Environmental Checklist for each proposed action which is not categorically exempt, using the form provided in Section IX of these Procedures. If practical, the Checklist should be prepared by a staff member other than the responsible official. The following resources should be used, at a minimum, in developing the Checklist:

   - District Water System Plan
   - Appropriate City or County Comprehensive Plan
   - Appropriate City or County Zoning Map(s)
   - Skagit County Shoreline Management Master Program
   - USDA/Soil Conservation Service Soil Survey of Skagit County, WA
   - National Wetlands Inventory Map(s)
   - Information from other public and private utilities

For water system improvements, the Checklist shall at a minimum address chlorinated water in terms of its use for disinfection and its disposal. Proposals for new water tanks shall address detention requirements for both stormwater runoff and tank overflow/draining conditions.

The Checklist will have attached at least a Project Site Map and a Wetlands Map, even if no wetlands are within 200 feet of the proposed site(s).

2. The completed Checklist shall assist the responsible official in making a threshold determination. A checklist is not required if the District has decided that an EIS must be prepared for the proposal.

D. Determination of Nonsignificance (197-11-340 WAC)

1. If the responsible official determines that there will be no probable significant adverse impact from a proposal, the responsible official shall issue a DNS using the form in Section IX of these Procedures.

2. If the District adopts another environmental document in support of a DNS, the Notice of Adoption and the DNS shall be combined or attached to each other. The Notice of Adoption form can be found in Section IX of these Procedures.

3. Comment Period

   a. Waterline Proposals. The District will not require, but may at its sole discretion opt for, a 15-day comment period for waterline-related proposals only, regardless of their size, except where the proposal involves:

      (1) Another agency with SEPA jurisdiction;

      (2) Demolition of any structure or building not exempted by 197-11-800(2)(f) or -880 WAC;

      (3) Issuance of clearing or grading permits not exempted by Part Nine of the SEPA Rules; or

      (4) A DNS under 197-11-350(2), -350(3) or -360(4) WAC.

   Waterlines larger than 8-inches in diameter are becoming routine installations by the District; the WSDOT APWA Standard Specifications and AWWA's standards for installation, to which the District adheres, address how the District is to deal with potentially hazardous materials and therefore mitigates environmental impacts during construction, which is normally the time of greatest potential for adverse environmental impacts for waterlines.

   Larger waterlines (18-inch diameter and over) of significant length and waterlines incidental to other non-categorically exempt work will normally have comment periods.

   b. Other Proposals. All proposals for which the District is Lead Agency, other than those exempted by subsection 3a. above will have a 15-day comment period. The District will not act on any proposal until the due date for receipt of comments has lapsed and the responsible official has determined that no further threshold action is required.

4. Mitigated DNS. If a proposal is modified/clarified after the Checklist is prepared but before the threshold determination is made, the responsible official may issue a Mitigated DNS (MDNS), including such conditions that would mitigate any probable adverse environmental impacts made possible by the original proposal. See also 197-11-350 WAC.

5. Each completed DNS and its Environmental Checklist shall be filed in the proposal's construction order file at the District office.

E. Determination of Significance (197-11-360 WAC)

1. If the responsible official determines that a proposal may have a probable adverse environmental impact, the responsible official shall prepare and issue a DS using the form provided in Section IX of these Procedures. Examples of proposals which may be considered major or significant are:

   a. New or revised impoundment structures that are not categorically exempt;

   b. Overhead power lines, when designed for 115,000 volts or more, if in excess of one-half mile in length;

   c. Electric substations with installed capacity of 5,000 kVA or more and not part of an industrial development;

   d. Electric switching stations, when occupying an area of one-fourth acre or more;

   e. Potable or septic water treatment facilities, with net increase in design capacity of 15 million gallons per day or more.

2. If the District adopts another environmental document in support of a DS, a Notice of Adoption and the DS shall be combined or attached to each other. The Notice of Adoption form can be found in Section IX of these Procedures.

3. The responsible official shall commence scoping for the EIS by circulating copies of the DS to the applicant (if other than the District), agencies with jurisdiction and expertise (if any), affected tribes, and the public, per the public notice procedures in the following section. Scoping is not required if the District is adopting another environmental document for the EIS or is preparing a Supplemental EIS.

4. The District shall be guided by Part Four of the SEPA Rules in its preparation and issuance of an EIS.

F. Public Notice

The District shall inform the public and other agencies that an environmental document is being prepared or is available and that public hearing, if any, will be held by publishing notice in a newspaper of general circulation in the county, city or general area where the proposal is located. The District may also opt to post the property, for site specific proposals.

G. Threshold Determination Distribution List

1. The responsible official shall ensure the threshold determination and Environmental Checklist if prepared, are distributed at a minimum to the following:

a. WA State Department of Ecology Environmental Review Section;

b. WA State Department of Health, Drinking Water Division;

c. Skagit County Department of Planning and Community Development (if outside the corporate limits of a city);

d. City Planning Director (if within an Urban Growth Area);

e. Local tribes (Skagit System Cooperative if in the Skagit River basin or its tributaries), Upper Skagit, Samish; and

f. Applicant (if other than the District).

2. Other agencies to receive copies for particular proposals might include:

a. WA State Department of Fish and Wildlife (if within 200 feet of any surface water course or wetland);

b. U.S. Forest Service (if in a federally-regulated watershed used for potable water);

c. WA State Department of Natural Resources (if within a state-regulated watershed used for potable water);

d. WA State Department of Transportation (if crossing a State Right-of-Way);

e. Other public or private utilities (if the proposal could potentially impact their service).

H. Appeals

1. Administrative appeals and appeals to a local legislative body shall not be allowed under these Procedures.

2. Judicial appeals shall follow the requirements of RCW 43.21C.060, RCW 43.21C.075, RCW 43.21C.080 and 197-11-680 WAC.

VIII. NOTICE OF ACTION (RCW 43.21C.080)

A. The responsible official shall file a Notice of Action using the forms at the end of these Procedures, for all proposals with a comment period and all waterline proposals 18 inches in diameter and larger. The "action" addressed by the Notice of Action is not the SEPA threshold determination, but the Resolution (or motion) by the District's Board of Commissioners approving the project scope and budget and authorizing the District staff or design consultant to proceed.

B. The Notice of Action shall be:

1. Published on same day of each week for two consecutive weeks in a legal newspaper of general circulation in the area where the property which is subject of the action is located;

2. Filed with the Department of Ecology at the following address prior to the date of the second newspaper publication:

Environmental Review Section
Attention: Barbara Ritchie
Department of Ecology
PO Box 47600
Olympia WA 98504-7600

3. Except for non-project actions, posted in a conspicuous manner on the property upon which the project is to be constructed. As an alternative to posting, the Notice may be mailed to the last recorded real property owners as shown on the records of the County Treasurer, who share a common boundary line with the property upon which the project is proposed through United States mail, first class, postage prepaid.

C. The Notice of Action shall indicate that a common boundary line with the property upon which the project is proposed through United States mail, first class, postage prepaid.

(ii) Posting of the notice in a conspicuous manner on the property upon which the project is to be constructed.

(2) (a) Except as otherwise provided in RCW 43.21C.075(5)(a), any action to set aside, enjoin, review, or otherwise challenge any such governmental action or subsequent governmental action for which notice is given as provided in these procedures on grounds of noncompliance with the provisions of this chapter shall be commenced within twenty-one days from the date of last newspaper publication of the notice pursuant to these procedures or be barred.

IX. SEPA FORMS

The following attached forms shall be used by appropriate District staff for SEPA actions:

A. Environmental Checklist
B. Determination of Non-Significance
C. Determination of Significance
D. Notice of Adoption
E. Notice of Action

Appendix C
Water System Design Criteria

C.1 Minimum Design Standards

C.1.1 Introduction

The following design standards are the minimum allowable by the District for any and all water improvement projects, whether designed by the District or by another engineering firm/agency. The intent is that all projects be designed to the same standard to ensure uniformity of final product and of cost to the financier. The sections that follow indicate incorporated standards, DOH and District approval requirements, and general, urban and rural design standards. Standard material and installation specifications (for construction contracts) are included in District's Water System Plan.

Good design of projects is a goal of the District. Although these standards are intended to apply to physical development within the District, the standards may not apply for all situations. Compliance with these standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for, competent work by design professionals. The District may at its sole discretion for any reason place more stringent requirements on a project than would normally be required under these standards.

Waiver of specific design criteria indicated in this Plan must be requested in writing and may be approved only by the District's General Manager. The decision to grant, deny or modify the standards will be based upon evidence that the request can meet the following criteria:

a. The change will achieve the intended result in a comparable or even superior design and a better quality of improvement; and

b. The change will not adversely affect safety and/or operation; and

c. The change will not adversely affect maintainability.

C.1.2 Incorporation of Other Standards

The latest edition of the existing standards listed below is hereby incorporated by reference, as modified herein:

- Minimum Design Standards, Chapter IV, Regional Supplement, Skagit County Coordinated Water System Plan
- Standard Specifications for Road, Bridge and Municipal Construction (WSDOT/APWA) including APWA Supplement

- Standards of the American Water Works Association
- IAPMO Uniform Plumbing Code and Installation Standards
- ICBO Uniform Building Code
- International Building Code
- Water System Design Manual, Washington State Department of Health
- Recommended Standards for Water Works, Great Lakes - Upper Mississippi River Board of State Sanitary Engineers
- Cross Connection Control Requirements, AWWA Pacific Northwest Section

C.2 Design Standards

The following standards apply to all areas served by the District, regardless of local government or land use policies. In cases of conflict between the standards and any District regulation, the District regulations shall govern.

C.2.1 Ownership

All water lines and appurtenances when accepted shall be and remain the exclusive property of the District for future operation, maintenance and service responsibilities. The point of District ownership and responsibility shall end at the meter or detector check valve, unless otherwise stated in the District's letter of final acceptance. District ownership and responsibility for double check valves and double check detector backflow assemblies shall end at the gate valve on the water main at the point the fire service line is connected (on easements on private property) or at the property line (on public rights-of-way).

C.2.2 Design Responsibility

Water plant plans and specifications shall be prepared under the supervision of and signed by a professional engineer registered in the state of Washington, and shall comply with the design standards of the District. Plans shall indicate new water plant in bold, existing water plant in normal weight, and all other utilities in half-tones, all on one drawing. The designer shall confirm design requirements and criteria with the District's Engineering Department. The District may develop plans and specifications for a customer as the District's workload allows. For design by a private engineer, the Applicant shall deliver a copy of the final design, acceptable to the District, to the District prior to commencement of work, then a photocopy mylar and compact disk (CD) of the final record drawings to the District upon completion of work.

C.2.3 Design Review and Approval

Per WAC 246-290-110 and -120, the designer of any new water system, water system extension, or improvement to be accepted by the District must submit a project report and

construction documents (plans and specifications) to competent authority for review and approval.

C.2.3.1 Distribution Improvements

a. Per WAC 246-290-125(1), the following types of projects are not required to receive approval of DOH prior to installation:

   1. Installation of valves, fittings and meters, including backflow prevention assemblies;
   2. Installation of hydrants under WAC 246-290-230;
   3. Repair of a system component or replacement with a component of similar capacity and materials in accordance with the original design; and
   4. Maintenance or painting of surfaces not contacting potable water.

b. Per the approval of the District's Water System Plan by DOH, the District is authorized to construct new distribution mains (or replace existing with new mains of larger capacity) for its own water systems without prior approval of DOH, PROVIDED the District maintains a copy of the completed ***Construction Completion Report*** on file for each project. The ***Report*** forms are found as Figure 4-2 Design Standard in the DOH Water System Design Manual.

c. For each distribution improvement indicated in paragraphs a. and b. above, the District shall ensure:

   1. the project is designed per the District's design criteria, whether designed in-house or by a consultant; and
   2. the project is completed per District's standard construction specifications, whether installed by in-house staff or a private contractor.

C.2.3.2 Distribution-Related Improvements

Per the approval of the District's Water System Plan by DOH, the District is authorized to review and approve distribution-related improvements (water plant facilities appurtenant to distribution mains) for its own water systems, including but not limited to: booster pump stations, distribution reservoirs (tanks), transmission pipelines, repainting of potable water facilities, etc. but **not** including source or treatment facilities.

For each distribution-related improvement project approved by the District, the District shall:

- have a professional engineer (licensed in Washington state, on District staff, separate from the designer) review the project reports and construction documents for each such distribution-related improvement, and complete an ***Engineering Design Report*** form for such project's file;
- have a professional engineer (licensed in Washington state, on District staff, separate from the design engineer) complete a ***Construction Completion Report For***

Submittal Exception Process for each such project. Submit a copy of the ***Report*** to DOH for each project that includes new storage tanks or booster pump stations; and

- when necessary, submit a revised Water Facility Inventory (WFI) to DOH per WAC 246-290-100.

The ***Engineering Design Report*** and ***Construction Completion Report For Submittal Exception Process*** forms are found as Figures 4-3 and 4-4 in Design Standards in the DOH Water System Design Manual.

C.2.3.3 Source of Supply and Treatment Improvements

The District shall submit to DOH for review and approval a project report and construction documents for each District project relating to source of supply or treatment facilities.

C.2.4 Added Source of Supply Considerations

Source water and facilities for District water systems shall conform to the requirements of DOH. The District will pay special attention to:

- Surface Water/GWI: water rights, water quality, water quantity, instream flow requirements, treatment system, and watershed control/wellhead protection (GWI).
- Groundwater: water rights, water quality, water quantity, geologic study showing confining layers and relation to neighboring wells, pump test(s), treatment system, and wellhead protection. Wells to serve the District's water systems shall be drilled and cased and shall be in conformance with WAC 173-160 and RCW 18.104. Casings shall be vented and shall include a port and tubing for checking static water level.

The District reserves the right to place additional requirements on source development to ensure adequate water quality.

C.2.5 Urban vs. Rural Standards

The majority of these design criteria apply to both urban and rural areas of the District's service areas. These design standards may specify different criteria for specific facilities in urban and rural areas. Urban design standards shall apply to District water systems within City limits, urban growth areas and rural villages per adopted Skagit County Comprehensive Plan(s). Rural design standards shall apply to all areas outside City limits, urban growth areas and rural villages per adopted Skagit County Comprehensive Plan(s). Exceptions to downgrade from these urban/rural criteria require the written approval of the General Manager of the District; the District reserves the right to coordinate such exceptions with County and city agencies.

C.3 Water Distribution Mains

C.3.1 Pipe Sizing

All main extensions and replacements shall be sized by the District based on District hydraulic and pressure requirements, using domestic and fire demands which may be reasonably expected over the life of the pipe, to comply with the District's basic water policy outlined in this section. Final approval of water pipe sizing shall rest solely with the District. In all cases, pipe size shall meet Washington State Department of Health (DOH) minimum standards. (1626)

All elements of the District's system shall be sized: (1626)

a. to provide a minimum of 30 psi and preferably 40 psi, during peak hourly design flow conditions, at every service connection (meter) in the projected pressure zone; or (1626)

b. to provide at least 20 psi, during fire flow and peak hourly design flow conditions, at every service connection in the projected pressure zone (fire flow shall be as required by the Fire Marshal having jurisdiction); or (1626)

c. to flow water no faster than 10 fps in ferrous pipe and 8 fps in non-ferrous pipe under the conditions stated in conditions (a) and (b) above,

whichever is more stringent. (1626)

The District, the Applicant for new service, or existing Customer requesting increase in service capacity, shall provide such line extensions and/or replacements required to satisfy its flow and velocity requirements and/or minimum pipe size as delineated in this Section. The District reserves the right to increase the pipe diameter for present or future needs of the District. The District will make this determination. If the District chooses to implement this option, the District may pay the difference in cost between the Applicant's flow requirements and/or minimum pipe size as delineated in this Section.. The financing method and approval of increased pipe sizes will require Commission approval. (1626)

Urban Area. Water mains shall be a minimum of 8-inches in diameter, unless otherwise hydraulically justified and approved by the District. Water mains shall be sized to provide the fire flow required by the Fire Marshal having jurisdiction, but not less than the values indicated in Table C-1. Fire flow velocities and pressures will normally govern pipe sizing, rather than domestic flow requirements. The use of buried 3-inch pipe is not authorized as it has minimal installed-cost benefit over 4-inch pipe.

Rural Area. Water mains shall be sized as hydraulically justified based on source pressure, future gridding, peak hour demands, fire flow (if required by the Fire Marshal) and flushing requirements, with a minimum size of 2-inches in diameter. The use of buried 3-inch pipe is not authorized as it has minimal installed-cost benefit over 4-inch pipe.

C.3.2 Materials (1626)

The District's minimum pipe standard is AWWA C151 Thickness Class 50 ductile iron pipe with push-on gasketed joints. All ductile iron pipe installed in soil shall be encased in 8-mil thick polyethylene per ANSI/AWWA C105/A21.5 prior to backfill. Should soil testing determine that the surrounding soils are corrosive, or that stray electrical current is present, the District may determine that AWWA C-900 PVC or C-906 HDPE will be required. Buried PVC mains shall use gasketed joints wherever practical. HDPE mains shall be flanged or butt-welded. Solvent-welded PVC slip joints shall be minimized; where used, solvent welds shall comply with manufacturer's installation requirements. Pipe used above grade or in vaults shall be Thickness Class 53 ductile iron, brass, or Schedule 80 PVC; PVC shall be joined with Ford PAK-JOINTs unless otherwise approved by the District. Tracer wire shall be used over all water mains and water service lines. Tracer wire shall be No. 10 solid copper wire and shall be brought up in each valve box, water service box and connected at all tees, crosses and service saddles. (1626)

PVC and HDPE pipe shall not be used in soils with existence of or potential for hydrocarbon contamination. Ductile iron pipe used in such soils shall use gaskets of Viton or Fluorel, or other FPM gaskets acceptable to the District.

All mains 4-inches in diameter and larger shall be at least Thickness Class 50 ductile iron, unless otherwise allowed; flanged iron pipe shall be of at least Thickness Class 53. PVC mains 4-inches in diameter and larger where allowed shall be AWWA C-900 PVC Pressure Class 200 (DR 14). All mains 2-inches in diameter shall be at least pressure rated 200 psi (SDR21) PVC or 200 psi HDPE. Ductile iron fittings shall be used on all water mains 4-inch and larger; 2-inch water mains shall use FORD Pak-Joint connectors and brass fittings.

Should a District project be paid for in part with federal funds or financed with federal funds, federal specifications may supersede the District standard for pipe materials. The federal requirements will not be considered precedent-setting and will not be applicable to non-federal funded or financed projects. The remaining provisions of this Code shall not be affected. (1626)

C.3.3 System Layout

Water pipe shall be designed to lie in a public road right-of-way, or if not available, on a dedicated, recorded ingress-egress utility easement. Permanent easements shall be a minimum of 20 feet in width. Pipe shall be designed for maximum trench depth of 48 inches and an average depth to top of pipe of about 3 feet. All pipe shall maintain a positive or negative slope between respective high and low points in the waterline; high points shall be fitted with air-vacuum release assemblies and low points shall be fitted with flushing assemblies as determined necessary by the District. All layout by private consultants shall be coordinated with and reviewed by the District for conformance with these and other requirements prior to issuance of final construction documents.

C.3.4 Length of Water Main Installation Requirements (1626)

C.3.4.1 Rural Unplatted Areas

In "rural unplatted" areas the water line shall be extended one length of pipe beyond the structure of the residence or the structure of the commercial establishment. (1410)."

C.3.4.2 Urban Areas and Rural Platted Areas

The Applicant will be required to install pipe across its entire front footage of its lot/land in urban growth, city and platted areas. When more than one dwelling or establishment is to be served by a water main, and a public road, street, or private roadway provides access to the dwellings or establishments, the District will require a water main to be installed in front of the dwellings or establishments to the far edge of the property being served.

C.4 Water Services (1626)

C.4.1 General

All water services shall be metered. To obtain a meter, the Applicant must apply for and pay all fees associated with a water service prior to installation of the meter. Fees include, but are not limited to, water service/meter installation fee, system development fee, customer deposit, and latecomer's fee (if applicable). All fees shall be based on the current schedule for each fee in effect at the time of payment. Meter size shall be based on Uniform Plumbing Code fixture count criteria. Costs associated with waterline extension(s)/replacement(s) must also be paid in full prior to installation of a water service on the waterline.

The minimum meter size available shall be a 5/8-inch meter. Meters shall be sized per the most current Uniform Plumbing Code/International Plumbing Code. (1626)

C.4.2 Domestic Water Services

Water mains constructed in platted areas shall include the installation of water service lines to common or individual lot corners. New services in nonplatted areas may be located by the Applicant. Water service installation shall include all materials indicated on the appropriate standard detail. Service lines that are part of a water main extension shall be installed concurrently with the water main installation. Services shall be connected to the water mains and extended to the Applicant's lot line, with a tailpiece extended above the ground, prior to pressure and bacteriological testing of the water main, if applicable. A meter box shall not be installed until frontage grades are established and all water service fees are paid. The cost of service lines installed as part of a water main extension shall be borne by the Applicant as part of the water main installation cost.

C.4.3 Irrigation Water Services

Designers of each new large irrigation system shall submit Blaney-Criddle Water Balance calculations and other data required to justify demands to the District for review before the new irrigation service is approved and installed. The new irrigation customer shall complete an Irrigation Agreement with the District as a condition of service.

C.4.4 Water Service Lines.

Service lines for 1-inch or smaller water services will normally be 1-inch polyethylene pipe, rated for 200 psi service, with a copper tracer wire. Service lines in soils with potential for or existence of hydrocarbons shall use 1-inch diameter Type K soft copper pipe, with compression fittings suitable for Type K copper pipe for 1-inch and smaller water services.

One and one-half inch and two inch services shall use 200 psi polyethylene pipe or Schedule 80 PVC on short side and less than 20'-0" in length (PUD note: this should be shown on details. They can be revised when changes are made). Service lines in soils with potential for or existence of hydrocarbons serving 1-1/2 and 2-inch water services shall use 2-inch diameter soft type K copper pipe. Three inch and larger services shall use class 53 ductile iron pipe. (1626)

Water service lines within platted areas shall be installed across streets and to common lot corner locations concurrent with the water main installation. The service lines will be connected to the pipelines and extended to lot lines with a tailpiece extended above the ground. Meter boxes shall not be installed until lot frontage grades are established and water service actually applied for. Water service stubouts to property corners shall be in place prior to pressure and bacteriological testing of the water main. Water service stubouts from the water line to the property corner(s) shall be part of the pipe installation cost to be borne by the Applicant. (1626)

Water services should not exceed 300 feet from the meter to the point of use, in order to maintain adequate pressure. Services over 300 feet in length are permitted, however, the District cannot assure adequate pressure for these services. In areas where static pressures are low or the service line will be unusually long, the District/Applicant should consider upsizing the service line to minimize frictional pressure losses and water velocity. (1626)

C.4.5 Meter Costs (1626)

An Applicant must apply and pay for a water service with meter prior to installation of the meter. In addition to the metered service cost, new water services are required to pay a System Development Fee to the District (See Appendix A, Table A-6). The Applicant will be required to pay the System Development Fee and applicable meter installation fee as required by the regulation(s) in effect at the time a water meter is paid for. Water meters and related appurtenances will be installed by the District, the District's contractor, or by the Developer's contractor under District supervision. (1626)

C.4.6 Pressure Reducing Valves at Water Services (1626)

The Applicant may (PUD Note) install pressure-reducing valves on water services when static line pressures exceed 80 psi. At the Applicant's request, the District will calculate or measure the water pressure at the Applicant's point of delivery as an aid to determining whether a reducing valve is required. Pressure reducing valves, when required, shall be installed and maintained by the Applicant. Pressure reducing valves are not to be installed in the meter box. (1626)

C.5 Control Valve Stations

A control valve station (pressure reducing, pressure sustaining, etc.) shall be installed at the interface between pressure zones; the District shall select the final location of each control valve station. Control valves shall be sized based on anticipated fireflows at projected peak hour demand conditions. If the receiving pressure zone contains a storage reservoir, the control valve station shall contain a single control valve with slow-acting pilot; if the receiving pressure zone contains no storage reservoir, the control valve station shall contain duplex control valves (6x2, 8x3, etc.) and a pressure relief valve. Control valve stations shall normally be on a bypass to the main waterline, shall be located below grade in a concrete vault, and shall include a mainline meter. The pressure relief valve shall discharge visibly above grade to a catch basin or other appropriate structure and drain away to a non-environmentally sensitive area.

On high pressure transmission lines, a pressure and/or flow control valve, and a pressure relief valve for high volume connections, shall be installed between the transmission line and the customer's water service/distribution line connection.

C.6 Mainline Meters

Mainline meters shall be located along transmission lines, between pressure zones, and at urban growth area boundaries to record the transfer of water between areas. Each mainline meter station shall normally be below grade in a concrete vault. The station shall include the meter and a test tee. The meter shall be located in-line, with uninterrupted flow upstream and downstream as recommended by the manufacturer, and shall be sized for maximum projected demands during the life of the meter. The mainline meter shall also, if required by the District, have a waterline bypass around the meter vault.

C.7 Backflow Prevention

The District is responsible for protecting its water systems from actual and potential contamination. Current State and federal laws prohibit any cross-connection, actual or potential, between a system furnishing potable water and a system furnishing non-potable water. The District's Construction Department shall ensure the prevention of back flow using cross-connection control assemblies is in conjunction with Cross Connection requirements listed in Section 2.5.5. Cross-connection control assemblies shall be installed by the Applicant when deemed necessary by the District or when required. The entire cost of the installation shall be borne by the customer and shall remain the Applicant's ownership and responsibility. Annual

testing of such assemblies shall be made by a Washington State Certified Backflow Assembly Tester. The District shall receive the original test results document. Each customer shall maintain its cross-connection control assembly(ies) in a fully functioning condition. All DOH and District conditions shall be satisfied as a condition of District water service.

C.8 Storage (Tanks)

The District's goal is to provide standby storage in each local area of at least 800 gallons per service. This is equivalent to two days of peak residential use and four times the residential planning figure of 200 gpsd. Storage shall include operational storage, equalization storage, standby storage and fire storage, as required, and shall be sized for the projected number of services in the water system, or area of the water system to be served by the storage, over the water system's useful life. Each developer with a substantial project requiring new storage facilities as part of the project shall be responsible for the storage capacity for the project; the District may elect to increase the capacity of a new reservoir(s) and bear the incremental increase in cost. Each new storage reservoir shall incorporate the following essential design considerations:

1. Design each reservoir per the most current version of AWWA tank design standards (D-100, Welded Steel Tanks; D-103, Bolted Steel Tanks; D-110, Wire Wound Circular Prestressed-Concrete Water Tanks), using the pseudodynamic effective mass procedure. Cast-in-place concrete reservoirs shall be designed per ACI 318, Building Code Requirements for Reinforced Concrete and Circular Concrete Tanks without Prestressing, Portland Cement Association. All reservoirs shall be designed for wind speed of 120 mph, seismic zone 3, and roof live load of 125 psf. Design the reservoir foundation based on the recommendations of a geotechnical engineer, including soil bearing, drainage, settlement potential and stability of the soils under design seismic conditions.
2. Design each reservoir with adequate freeboard. Freeboard shall be measured from the high water level (top of the overflow pipe) to the top of the reservoir wall, and shall be sized to allow for sloshing of the reservoir in an overflow condition, including for water treatment plant clarifiers and filter units, to ensure that walls and roof structures will not be adversely affected during the design seismic event.
3. Measure reservoir capacity from the normal operating hi-pool level (a point 12-inches below the overflow elevation) to the low water level (at the top of the outlet pipe or silt stop, whichever is higher).
4. Cover each reservoir and fit with water-tight, insect proof hatch(es), manway(s) and atmospheric vent(s). Furnish each vent with woven stainless steel insect screen, minimum 24 ga., secured gap-free with stainless steel straps; roof slope shall be minimum 1/4-inch per foot.
5. Furnish each reservoir with lightning arrestor(s) and electrical grounding, as appropriate.
6. Furnish separate floor penetrations for inlet, outlet, overflow, and drain piping. Locate all floor penetrations within 5 feet of the reservoir wall. Design the floor to slope to the outlet and drain pipes, with the high point near the center of the reservoir floor.

7. Fit all inlet, outlet and drain piping with flanged isolation gate valves to permit isolating the reservoir from the water system. Locate reservoir isolation gate valves five (5) feet outside the reservoir foundation line.
8. Specify all underground piping penetrating the reservoir floor to be of welded Schedule 40 SS304 stainless steel to five (5) feet outside the reservoir foundation line; use of restrained joint or flanged Class 53 ductile iron or welded steel as material alternatives requires prior written authorization by the District. Fit all pipelines penetrating through steel floor decking with reinforcing rings welded to the pipeline and floor. Fit all penetrating pipelines through concrete flooring with water stops welded to each pipe, centered within the concrete floor slab. Fit inlet and overflow piping with flanges approximately one foot above the reservoir floor. Design drain and outlet lines to be flush with the reservoir floor.
9. All reservoir pipes passing more than one (1) foot beyond the reservoir foundation shall be connected to outside piping with restrained joint flexible connectors (EBAA double ball Flex-Tend or approved equal). Locate each flexible connector outside the reservoir foundation, starting at the flanged pipeline or valve.
10. Lay out the outlet pipeline with a minimum of fittings to flow directly to the distribution system, with a minimum of fittings. Fit the outlet with an externally weighted or spring-loaded check valve to prevent inadvertent filling of the reservoir through the outlet. On reservoirs fed by gravity (not a pump system), the inlet line shall be fitted with an altitude valve (one-way delayed opening); connect the altitude valve sensing line to the outlet line (upstream of the check valve) or the drain line (upstream of the gate valve). For pumped systems, provide no control valve on the reservoir inlet line. Locate any inlet altitude valve and outlet check valve in a vault outside the reservoir foundation. Drain the vault to daylight.
11. Fit the outlet with a removable 6-inch high silt stop inside the reservoir.
12. Size the drain to empty the full contents of the reservoir without causing damage to the water distribution system or inducing erosion at the drainage outlet. Lay out the reservoir drain line(s) to drain to daylight to a County-approved stormwater detention facility or, if approved, directly to storm sewers, sanitary sewers, or overflow pond. Each reservoir drain line connection shall contain at least a 12-inch air gap and such devices as are required to prevent animals and insects from entering the reservoir drain system.
13. Overflow piping shall each be sized with the hydraulic capacity to discharge 125 percent of maximum inflow capacity. Air vent(s) shall each be sized with the pneumatic capacity to discharge 125 percent of maximum inflow capacity and 125 percent of the maximum drainage rate.
14. Inlet and overflow pipe risers within the reservoir may be of ductile iron, PVC or painted steel. Inlet piping shall extend from the inlet flange approximately 2/3 of the reservoir height and shall be fitted with an 45° angled nozzle to assist circulation within the reservoir. Overflow piping shall be fitted with a flare on top. Support all inlet and overflow pipes with suitable bracing or struts from the adjacent reservoir wall.
15. Fit all painted reservoirs with drain plate, scuppers and downspouts, or other suitable rainwater “streak protection”.

16. All interior bracing, fittings and fasteners shall be of SS316 stainless steel. Interior ladder shall be of SS316 stainless steel or 300#-rated fiberglass. Exterior ladder and all exterior fittings shall be G-60 hot-dipped galvanized and painted.
17. Locate a sample tap on the reservoir side of the outlet check valve.
18. Coat steel reservoirs with interior coatings of an NSF-approved epoxy paint (TNEMEC Pota-Pox or equal) and exterior coatings of a polyurethane paint (TNEMEC or equal). Provide cast-in-place concrete reservoirs with an interior coating of NSF-approved waterproof material to prevent water migration through the concrete.
19. Locate an alarm system on the reservoir site for high level and low level conditions, annunciating through a suitable SCADA communication system to District Operations personnel. Provide a pressure transducer on the reservoir side of the drain valve (or the outlet check valve) and a float switch at the overflow pipe, each connected to the SCADA system.
20. Provide local level indication as part of the SCADA system and, if required by the District, provide a pressure gauge measured in "feet".
21. Provide BEST brand padlocks on all roof access hatches, vents, ladder guards, and fence gates to prevent unauthorized entry and/or vandalism. All locks shall be keyed to match the District's factory registered keying system.
22. Provide the District safe, legal permanent access to the reservoir site, including but not limited to: roads of adequate width, grade and condition for District construction equipment, keys to private gates or space for District locks in series, and ingress-egress-utility easements for vehicle access, pipelines and related utilities to support the reservoir site.
23. Provide deeded title for the reservoir site to the District; a dedicated permanent easement may by acceptable if segregation of the reservoir site lot would create a substandard parent lot.
24. Specify leakage testing, cleaning and disinfection per AWWA standards. The District will provide specific direction for each individual reservoir project.
25. Provide specific details and construction specifications per Appendix F of the District's Water System Plan, unless otherwise modified by the District.

C.9 Pump Stations

1. Size pump systems serving an area with reservoir storage to refill the reservoir(s), in 72 hours while meeting maximum day demands; the District has found that its maximum day demands are approximately 75 percent of its peak hour demands. Size pump systems serving an area without storage to provide at least peak hour demands.
2. Base maximum day demands and peak hour demands on the buildout of the area to be served, as determined by the District in coordination with the local land use authority.
3. Design all District pump stations to include the following items, as a minimum:
   a. Minimum 4-inch reinforced concrete floor (2,500 psi minimum 28-day strength). Provide cast-in-place reinforced concrete inertia block for each pump, minimum 18-inches high

above finished floor. Provide looped ferrule threaded inserts for securing each pump to base.

b. Floor drain with grate, properly plumbed away from the building to daylight or an approved storm sewer system. Size floor drain to be a minimum of 6-inch diameter.

c. Separate rooms for electrical and pump equipment, with exterior access to each.

d. Interior and exterior paint, color and number of coats per District selection.

e. Lockable doors (hollow metal doors and frames; BEST cylinder, core and keyway to match existing District factory registered key system).

f. Standing seam metal roofing material approved by District, over plywood sheathing system acceptable to roofing manufacturer; minimum 24-inch overhang all four sides.

g. Adequate pump house venting (eaves, wall dampers, doors, etc.).

h. Commercial wiring installed per National Electric Code (NFPA 70).

i. Thermostat-controlled wall heater, 1500W minimum, (no heat lamps) in each room.

j. Suitable interior and exterior lighting. Interior lighting shall be suitable for damp location, with hand switch in respective room. Exterior lighting to be operable by photocell, with override switch inside pumphouse.

k. Manual electrical power transfer switch (in electrical room) and emergency power wiring box (exterior, near power entrance); auxiliary suction and discharge connections for a portable pump, if approved by the District.

l. All interior and underslab water piping shall be sized for potential buildout of the area to be served.

m. Interior piping: 4-inch and larger of minimum Class 53 ductile iron with ductile iron fittings; 2-inch and smaller of Schedule 80 PVC with FORD Pak joints, Type L copper with sweated fittings, or threaded brass with brass fittings. Pump manifold(s) shall be secured. Flexible connections required for pump(s).

n. Pipe and fittings under the floor slab shall be of Class 53 ductile iron, restrained with Grip-Rings or Mega-Lugs. Pipe penetrations through the floor (or wall) shall be sleeved or wrapped with a thin bond breaker (e.g. 1 wrap of #15 roofing felt).

o. Furnish pump(s), plumbed and secured to inertia block. Provide duplex/replacement pump if required by District. Motor(s) shall meet NEMA 12.6C (high efficiency). Booster pumps shall be ANSI end-suction type; Goulds or approved equal. Test pumps through full range of conditions prior to project completion.

p. Provide flanges and valves at pressure tank(s), booster pump(s), etc. to allow removal of equipment.

q. Telemetry-SCADA-Control Systems-See Section C.13

r. Master (source) meter installed within the pump house. Meter must be accurate to 99 percent through full range of flow through the pump system, and provide a 4-20mA signal or pulse output to the SCADA system.

s. Bladder tank(s), if required.

t. On well systems (well casing shall be located outside well house or booster pump station):

- System documentation (restrictive covenant, water right, geologic report, wellhead protection plan, 4 and 72 hour pump tests, etc.)
- Raw water tap in wellhouse installed minimum 6-inches above floor.
- Disinfection/treatment system inside wellhouse, as required.
- Groundwater surface level measurement system.

u. Motor control(s) shall be either solid state reduced voltage starter or variable frequency drive, as selected by the District. Reduced voltage starters for 20 hp and larger pumps shall include a pump algorithm for soft start and stop. For pumps serving a pressure zone with a storage reservoir, a PRV shall be plumbed to allow water to return to the suction pressure zone for fire demands; the associated gate valve may be normally closed, at the District's discretion. There shall also be a valved bypass between pressure zones; the valve shall be normally closed.

v. Skid-mounted pump/pressure tank units may be allowed for temporary service to a small portion of a service area (pressure zone) that will expand within the life of the pump station.

w. Telemetry/SCADA & Control Systems See Section C.13

Comply with additional requirements of Urban and Rural Standards indicated below, as applicable.

1. Minimum Urban Standards. Permanent pump station structures shall be of fully grouted reinforced concrete masonry unit (CMU) construction. Unless otherwise dictated by the building department of the local government having jurisdiction, design the exterior of the building to be split-face CMU, the roof to be wood framed with standing seam metal roofing with matching gutters and downspouts; all colors to be as selected by the District. Mount a W-section monorail and chain-lift trolley within the pump room, above the door, centered over the pump base(s).

2. Minimum Rural Standards. Design permanent pump station structures of insulated 2x6 wood framed construction meeting UBC. Set wall framing on a minimum 3-1/2-inch high concrete curb, integral with the concrete floor slab. Specify pressure treated floor plates. Design exterior sheathing to be at least shop grade T-1-11 plywood, minimum 1/2-inch thickness. Design interior sheathing to be 1/2-inch ACX plywood. Provide gutters and downspouts on front fascia only. All color selection(s) to be by the District.

C.10 Fire Protection

C.10.1 General

Fire protection by fire hydrants and/or other means shall be required as determined by the Fire Marshal for the County or respective City. Spacing of fire hydrants shall be as determined by the Fire Marshal, using Table C-1 as a minimum standard. The cost of each hydrant installation requested by a customer shall be borne totally by that customer.

The cost of each hydrant installation required by the Fire Marshal for a District-sponsored waterline replacement project shall be borne by the District; the cost of each additional hydrant beyond this requested by another party shall be borne by that party. Final ownership of a hydrant shall be transferred to the District, except on private property when not accessible to the public. (1626)

Rural Standards. Fire protection is not required in rural areas except at cluster developments, per Chapter IV of the Skagit County CWSP and Table C-1 above. Tanker-truck-filling hydrants will be installed in rural areas during system upgrade and expansion at major roadway intersections, whenever practical. The distance between tanker truck filling hydrants shall not exceed one mile. More frequent spacing is optional and subject to approval of the General Manager or funding by parties other than the District.

C.10.2 Commercial (1626)

a. Fire protection by fire hydrants and/or other means shall be required as determined by the person designated as "fire chief" for the jurisdiction involved. The District will not allow installation of fire hydrant(s) on water mains wherein the potential demand of the hydrant will exceed safe operating velocities as established in Section C.3.1(c). (1626)

Table C-1
Minimum Fire Flow Design Standards For New And Expanding Water Systems[1]

Land Use Designations Or Densities	Minimum Fire Flow (Gallons Per Minute)	Minimum Duration (Minutes)	Maximum Hydrant Spacing (Feet)
Urban Growth Areas [2]			
Industrial	1500	60	[3]
Commercial	1500	60	[3]
Multi-Family Residential	1500	60	500
Single-Family & Duplex Residential	1000	60	500
Non-Urban Growth Areas			
Commercial / Industrial	1500 [4]	60 [4]	[4]
1 Dwelling Unit Per Lot Less Than 2.5 Acres	500 [5]	30 [5]	900 [5]
1 Dwelling Unit Per Lot 2.5 Acres Or Larger	NONE [5]	NONE [5]	NONE [5], [6]
Natural Resource Lands	NONE [5]	NONE [5]	[5], [6]

[1] The design standards may be amended to reflect changes to Comprehensive Plan land use designations and/or their densities. Proposed amendments will be presented to the Skagit County CWSP WUCC for approval.

[2] These criteria establish a minimum water system design standard. Each water system in an urban growth area must comply with the standards of the local government with jurisdiction. When there are different or conflicting standards, the most stringent standard shall apply. Prior to the issuance of a development permit, the approving authority shall establish fire flow, duration and hydrant spacing requirements.

[3] As determined by the appropriate fire official.

[4] Fire flow for individual buildings or groups of buildings is to be determined by the Skagit County Fire Marshal per Uniform Fire Code Appendix IIIA and the Skagit County Fire Marshal policy on fire flow. The application of lesser or alternative standards shall be in accordance with Section 4.3.5 (Interpretation of Standards).

[5] Fire flow will be required for a Conservation and Reserve Development (CaRD) land division as follows.

CaRD Characteristics	Fire Flow Requirement	
5 or more lots	Option 1:	Fire flow of 500 gpm for 30 minutes with hydrant spacing of 900 ft. or,
	Option 2:	Fire Marshal approved fire prevention water system that provides adequate pressure and flow to support NFPA 13D sprinkler systems is required for all residential dwellings. In addition, if the property is located in an Industrial Forest, Secondary Forest, or Rural Resource designated land the fire protection requirements as listed in Skagit County Code 14.04.190(14)(b)(iii)(b-e) also apply.
4 or fewer lots	None required, unless the property is located in an Industrial Forest, Secondary Forest, or Rural Resource designated land. If the property is located in such designated land the fire protection requirements as listed in Skagit County Code 14.04.190(14)(b)(iii)(b-e) apply. However, NFPA 13D sprinklers are only applicable to residential dwellings.	

As of the effective date of the CWSP, where in-fill development or extension of an existing water system occurs to serve an existing platted lot, the Skagit County Fire Marshal may limit the requirement for fire flow or fire suppression in accordance with Table C-1 to the newly developed lot only. Group B public systems may choose to separate the fire flow from water flow. Separate tank and hydrant(s) location is subject to Skagit County Fire Marshal approval.

(6) Hydrants shall be installed when water lines are installed or replaced and are capable of supplying a tanker truck with a minimum of 500 gallons per minute at a minimum residual pressure of 20 psi. Tanker truck filling hydrants are to be located at major roadway intersections and along roads at a spacing not to exceed one mile to assist in fire protection.

b. Application shall be made by completing and signing a standard application form. (1626)

c. Service charge for new fire protection service connection: (1626)

1. The Applicant shall pay the total installation cost of all fire service lines from the Applicant's point of use to an existing or new District main with adequate capacity to provide the required fire flows. (1626)

2. The Applicant shall pay the cost of the detector check meter plus the cost of installation.

3. Notwithstanding the provisions as contained in these schedules for commercial fire protection service, or for other metered service, including water furnished to any fire hydrant or other equipment used, or which may be used for fire protection service connection, it is understood that the District cannot guarantee any minimum quantities of water or pressure of the water to be furnished to any such hydrants or outlets, and the District shall not be liable in any manner for any loss or claim by reason of the quantity of water, or pressure of the same furnished to such hydrant or outlet. (1626)

C.10.3 Residential (1626)

The installation of fire hydrants in residential areas shall be according to City, County and State regulation. The District will refer to the applicable WAC provisions (WAC 248-57) and/or to the person designated as the "fire chief" to the particular jurisdiction for applicable requirements. The District encourages fire hydrant installation on mains large enough and with adequate supply to provide sufficient fire protection. The District will not allow installation of fire hydrant(s) on water mains wherein the potential demand

of the hydrant will exceed safe operating velocities as established in Section C.1.3(c). (1626)

C.10.4 Interface with Fire Jurisdictions

C.10.4.1 General

The District shall develop and implement a long-term program to ultimately meet the CWSP recommendation for fire hydrants and fire protection devices throughout the district under the following criteria: (draft 1542)

a. New Water line Extensions. New water line extensions to the District's system that are provided for the benefit of new customers, including new "stand alone water systems" that are owned and operated by the District, will include hydrants; (draft 1542)

b. Replacement of Existing District Water Lines. Replacement of the District's existing water lines and water line installed by the District to complete grids and for water quality purposes will include fire hydrants as a part of the District's system upgrade program. (draft 1542)

C.10.4.2 Uniform Policy on Installation of Hydrants

The District will utilize the program outlined in this regulation to implement an equitable and uniform policy consistent with the objectives defined within the CWSP. For each Fire Jurisdiction that has executed a Memoranda of Understanding with the District that conform to this Code, this program will include: (draft 1542)

a. An annual District budget allocation to upgrade or add new fire hydrants with consideration of existing conditions within the various cities and fire districts serviced by the District. (draft 1542)

b. a provision allowing Fire Districts and cities to request the District to upgrade or add new fire hydrants or fire flow on an expedited schedule provided the fire district or city provide the additional funds required to meet the District budget requirements. (draft 1542)

c. a provision allowing the District to annually identify the proposed system upgrades and budget for fire hydrants and request input from the cities and fire districts on prioritizing the location and expenditure of the funds identified for fire protection enhancement. (draft 1542)

d. respective responsibilities between the District fire jurisdictions for the operation and maintenance of fire hydrants and private fire system connected to the District water system.. (draft 1542)

C.10.4.3 Hydrant Standards

a. Hydrant Standard. The hydrant standard shall be as specified by the Skagit County Water System Design Standards developed by the CWSP. (draft 1542)

d. Hydrant Spacing. The hydrant spacing and location shall be as specified by the CWSP and adopted by reference by the District. A city or Fire District may request additional hydrants subject to full payment by the requesting customer or agency. (draft 1542)

e. Public Right-of-Way/Utility Elements. All fire hydrants and detector check valves shall be located on public right-of-way or utility easements unless otherwise approved in writing by the District. (draft 1542)

f. Detector Checks and Gate Valve. The District may require detector check valves or gate valves as a part of a fire hydrant or fire service installation. The cost of such facilities shall be paid by the customer. (draft 1542)

g. Minimum Pressure and Flow/Hydrant Code. The District will not install a new fire hydrant on a water line with inadequate flow or pressure except when the installation is part of a scheduled capital improvement program that anticipates hydraulic improvements. The District will provide pressures and flow availability to color-code hydrants. (draft 1542)

h. There may be circumstances where improvements may furnish a hydrant in an area without the current ability to provide adequate pressure. The District will notify the fire marshal(s) affected thereby and will not be liable for any loss or claim based in whole or in part on the installation. (draft 1542)

C.10.4.4 Hydrants on District-Replaced Water Mains.

a. As a part of the District's water main replacement program, the District will seek to relocate existing hydrants and install new hydrants, to upgrade the District system to meet the CWSP criteria. Installation spacing will be as specified within the CWSP. Should a city or fire district desire additional hydrants over the CWSP minimum requirements at the time of a water line replacement, the District will install additional hydrants, at the agencies written request, provided that the requesting agency reimburses the District for all the material costs necessary for the requested hydrant installation. These costs shall include the hydrants and other necessary appurtenances. (draft 1542)

   The District will notify and coordinate with the fire department or district with jurisdiction before hydrant relocation or new hydrant installation is performed. (draft 1542)

b. Mains without adequate flows or pressures. If the water main being replaced does not have pressures or flows that meet minimum CWSP or Department of Health standards, the District will not install fire hydrants or fire hydrant line tees unless system improvements are scheduled. A replacement water main will be retrofitted to include hydrants per the CWSP spacing when the water main can provide adequate

flows and pressures. Scheduling of retrofitting will be at the discretion of the District. (draft 1542)

C.10.4.5 Upgrading Fire Protection Within The District's Existing System

a. The District may install hydrants on replacement lines and other locations at District discretion for public safety and community needs. Hydrants of this nature will be installed as part of the District's capital improvement plan. (draft 1542)

b. To upgrade facilities to meet CWSP recommendations, District will budget to a specified number of (minimum of one) fire hydrants to each of the fire districts' coverage area each year beginning in the calendar year 2005. The District will budget to add additional (minimum of 3) fire hydrants within each of the cities of Burlington, Mount Vernon, and Sedro-Wool1ey's city limits each calendar year beginning in 2005. If fire departments request fire hydrant installation in addition to the established formula, the requesting fire department's request will be deemed advisory unless the requesting agency pays for the additional fire hydrant installation. (draft 1542)

c. Assigned Operation and Maintenance Responsibilities. Table C-2 below outlines the major tasks and assigned shared responsibilities to maintain and operate the fire hydrants. These responsibilities shall be confirmed in writing prior to the District proceeding with the addition of new hydrants as a part of the system upgrade program or accepting ownership of new hydrants. Fire District/Department and District responsibilities for Operation and Maintenance of fire hydrants shall be as follows unless otherwise agreed to in writing. (draft 1542)

   The District shall be the sole judge of when a hydrant is in satisfactory condition. The District shall not consider hydrants with hose ports only (no pumper port) for replacement, providing the hydrant otherwise is mechanically functional. The District desires input from fire departments, however, will consider the input advisory. (draft 1542)

d. Cost Sharing. The customer will be responsible for the cost of all new installations unless the District has included the cost of the hydrant as a part of the District annual budget process. The city or fire district will be responsible for their share of the cost of implementing the operation and maintenance agreement. (draft 1542)

Table C-2		
Task		**Agency**
A.	Inspection of new installation	Fire Department
B.	Review of installation and type of hydrant, ports, and valves	Fire Department
	Testing and flow pressure	Fire Dept/District
	Operation of tee valve	District
	Private/Building system (Wet and Dry)	Fire Department
C.	Clearing Vegetation and Brush for visibility	Fire Department
D.	Location of Hydrants (per CWSP)	Fire Department
E.	Mechanical maintenance and repair	
	Public Property	District
	Private Property	Hydrant Owner
F.	Regulations (per CWSP)	Fire Dept/District
G.	Painting and coding:	
	Application of paint (initial installation)	Fire Department
	Purchase and specification of paint	Fire Department
	Color and coding	Fire Department
	Repainting fire hydrants	Fire Department
	Numbering	Fire Dept/District
H.	Notification of District's personnel in case of major fires, when hydrants are used for fire fighting training, or testing purposes.	Fire Department
I.	Communication (Emergency alert, system, etc.)	Fire Dept/District
J.	Hydrants that have been damaged or need replaced because of being damaged beyond repair.	District
K.	Notification of hydrants out of service	Fire Dept/District

C.11 Cathodic Protection

Impressed current is commonly used in Skagit County by gas and other utilities to protect their ferrous pipe from corrosion. Unprotected ferrous (iron or steel) water mains adjacent to these protected pipes can deteriorate if sufficient stray current is present. When 5 mV/ft or more of stray electrical current is identified in soil to receive a new ferrous waterline (or where one is already installed), the District will require the waterline to be protected. An acceptable method of protection is to make the waterline electrically continuous (have the lengths of pipe bonded together) in the area of high stray current and bond the waterline to the other utility's pipe. If this is not acceptable to the other utility, a sacrificial anode and test station may be wired to the waterline and the anode installed away from the waterline, approximately 24-inches from the protected pipe. The District will monitor these test stations at least annually. At the District's sole discretion, the ferrous waterline may be replaced with PVC C-900 pressure class 200 (DR 14) pipe for that portion influenced by the stray current (see "Pipe Materials" earlier in this section).

C.12 Security

All District above-ground facilities (pump stations, reservoirs, etc.) shall be secured within a 6-foot high WSDOT Type 1 chain link fence with three strands of barbed wire on supports above the fence and gates. At least one operable "magnate" gate shall be installed per site; a vehicle gate is required for each site with vehicle access.

C.13 Telemetry and Control Systems - General

C.13.1 Description

This section specifies general requirements which are applicable to all process Telemetry/SCADA systems consisting of process sensors, monitoring and control instruments, and accessories required to provide a complete and functional monitoring and control system.

The Control System Integrator (CSI) shall provide, calibrate, and assist in the testing of the complete process Telemetry system. The System Integrator shall also place the completed system in operation including tuning loops and making final adjustments to instruments as required during plant start-up and he shall provide the services of instrument technicians for testing and adjustment activities.

This specification is an extension of, and includes all of the requirements of The WSDOT Standard Specifications and all work shall comply with the applicable sections of the Standard Specifications.

C.13.2 Definitions

a. General: The definitions of terminology used in these specifications shall be defined in ISA Standard S51.1, unless otherwise specified.

b. Solid State: Circuitry or components of type which convey electrons by means of solid material such as crystals for which work on magnetic principles such as ferrite cores. Vacuum tubes, gas tubes, slide wires, stepping motors, or other devices are not acceptable substitutes for solid state components or circuitry.

c. Integrated Circuit: A number of circuit elements inseparably associated on or within a continuous body to perform the function of a circuit.

d. Two-wire Transmitter: A transducer which derives operating power supply from the signal transmission circuit and therefore requires no separate power supply connections. As used in this specification, two-wire transmitter refers to a transmitter which produces a 4 to 20 milliampere current regulated signal in a series circuit with a 24 volt direct current driving potential and a maximum circuit resistance of 600 ohms.

e. Galvanic Isolation: Pertaining to an electrical node having no direct current path to another electrical node. As used in this specification, galvanic isolation refers to a device with electrical inputs and/or outputs which are galvanically isolated from ground, the device case, the process fluid, and any separate power supply terminals, but such inputs and/or outputs are capable of being externally grounded without affecting the characteristics of the devices or providing path for circulation of ground currents.

f. Panel: An instrument support system which may be either a flat surface, a partial enclosure, or a complete enclosure for instruments and other devices used in process

control systems. Panels may provide mechanical protection, electrical isolation, and protection from dust, dirt, and chemical contaminants which may be present in the atmosphere. Panel shall include consoles, cabinets and racks.

g. Data Sheets: Data sheets as used in this specification shall refer to ISA S20.

h. Signal Types: The following types of signals are used in systems specified in this division.

1. Low Level Analog: A signal that has a full output level of 100 millivolts or less. This group includes thermocouples and resistance temperature detectors.
2. Digital Code: Coded information such as that derived from the output of an analog to digital converter or the coded output from a digital computer or other digital transmission terminal. This type includes those cases where direct line driving is utilized and not those cases where the signal is modulated.
3. Pulse Frequency: Counting pulses such as those emitted from speed transmitters.
4. High Level Analog: Signals with full output level greater than 100 millivolts but less than 30 volts, including 4-20 mA transmission.
5. Modulated Signals: Signals emanating from modems or low level audio signals. Normal signal level is plus 4 dBm to minus 22 dBm. Frequency range is 300 to 10,000 hertz.
6. Discrete Events: Dry contact closures monitored by solid state equipment. If the conductors connecting to dry contacts enter enclosures containing power or control circuits and cannot be isolated from such circuits in accordance with NEC Article 725, this signal shall be treated as low voltage control.
7. Low Voltage Control: Contact closures monitored by relays, or control circuits operating at less than 30 volts and 250 milliamperes.
8. High Level Audio Signals: Audio signals exceeding plus 4 dBm, including loud speaker circuits.
9. Radio Frequency Signals: Continuous wave alternating current signals with fundamental frequency greater than 10 kilohertz.

i. Control System Integrator: An organization engaged in the business of detail designing, component purchase, assembly, programming and implementing process control and industrial electronic systems.

C.13.3 Description of System

C.13.3.1 General

The Telemetry and control system shall include the instruments, control devices, programmable controllers, input and output devices, sensors, interfacing devices, cabinets, enclosures and other components indicated and implied by the Drawings and Specifications.

The control system shall be designed, assembled to provide:

a. Control of motor driven pumps, equipment, and processes.
b. Monitoring of operation of motor driven pumps, equipment, and processes.
c. Indication of operating status of motor driven pumps, equipment, and processes

C.13.3.2 Project Specifics

C.13.4 Quality Assurance

C.13.4.1 References

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Districts (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- International Society of Measurement and Control (ISA)

All equipment, materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

C.13.4.2 Systems Responsibility

All Telemetry and industrial electronic systems shall be provided under the supervision of a single Control System Integrator, chosen by the District, which is regularly engaged in the design and installation of such systems of similar scope and complexity.

C.13.4.3 Control System Integrator's Responsibilities

The Control System Integrator shall be responsible for the following equipment and services:

a. Detailed design of control panels. The Integrator shall prepare and use or use CAD files prepared by the Districts SCADA Consultant and complete to provide detailed schematics and scaled design of all components on and in the control panels and determine specific requirements.

b. The design of all interconnecting wiring of control equipment including remote control panels, packaged equipment panels, mechanical equipment with control components, etc.

c. Coordinate with the Developer, SCADA Consultant and the District for specific requirements and locations of raceway penetrations and field wiring in control panels.

d. The Control System Integrator shall supply the Developer and the District with all necessary detailed installation drawings and/or written instruction for installation of all control components and sensing devices for proper system operation.

e. Provide 16 hours in-shop assistance to test the PLC and communications of the two panels.

f. Provide 16 hours on-site assistance for the SCADA Consultant to test and demonstrate system functions.

C.13.4.4 Developer Responsibilities

The Developer will install all field devices (if any), panels, etc. per the System Integrator's direction.

C.13.5 Environmental Conditions

C.13.5.1 General

Equipment shall be modified, if necessary, to make it suitable for operation in the following ambient conditions.

C.13.5.2 All Areas:

Atmospheric contaminants:

Hydrogen sulfide	0.1 mg/1
Chlorine	0.01 mg/1
Ammonia	0.5 mg/1
Dust	50.0 ug/m3

Electromagnetic radiation:

27/500 MHz	10 volts/m

C.13.5.3 Control Room:

Temperature	35 to 95 degrees F
Humidity	20 to 80 percent

C.13.5.4 Pump Rooms

Temperature	35 to 120 degrees F
Humidity	10 to 100 percent

C.13.5.5 Outdoor Field Locations:

Temperature	-10 to 120 degrees F
Humidity	10 to 100 percent

C.13.6 Functional Requirements

C.13.6.1 General

The Telemetry and control system functions required shall be dependent on the hydraulic requirements of the individual system.

C.13.6.2 Drawings

a. General: The Control System Integrator shall develop all shop drawings required for design, fabrication, assembly and installation of the control system. Shop drawings shall include all drawings required in manufacture of specialized components and for assembly and installation of them.

b. Drawings shall be prepared utilizing a computer based drafting program and printed on 11 inch by 17-inch media. Drawings shall have borders and title blocks identifying the project system, revisions to the drawings, and type of drawing. Each revision of a drawing shall carry a date and brief description of the revisions. Diagrams shall carry a date and brief description of the revisions. Diagrams shall carry a uniform and coordinated set of wire numbers and terminal block numbers in compliance with panel work wiring, Section 17110.

c. Elementary Diagrams: The Control System Integrator shall provide elementary diagrams for all discrete loops. Loop diagrams shall be prepared in compliance with ISA S5.4 and shall be provided for all analog loops. Elementary diagrams and loop diagrams shall show circuits and devices of a system. These diagrams shall be arranged to emphasize device elements and their functions as an aid to understanding the operation of a system and maintaining or troubleshooting that system. Elementary and loop diagrams shall also show wire numbers, wire color codes, signal polarities, and terminal block numbers.

d. Panel Fabrication and Arrangements Drawings: The Control System Integrator shall provide arrangement drawings of all panel front-and internal-mounted instruments, switches, devices and equipment indicated. All panel mounting details shall be shown. Outer dimensions of all panels shall be included on the drawing. Deviations from approved arrangements require approval prior to installation.

Arrangement drawings shall be drawn to scale using standard Architectural or Districting scales.

A full set of as constructed drawings shall be provided to the District upon competition of the project in AutoCAD R14 electronic format on a CD unless otherwise approved in writing.

C.14 Products

C.14.1 Materials and Quality

C.14.1.1 General

Material shall be new, free from defects, and of the quality specified. All equipment and materials utilized in the system shall be the products of Manufacturers with at least five (5) years experience in the manufacture of similar equipment. Similar items in the system shall be the products of the same Manufacturer. All equipment shall be of industrial grade and of standard construction, shall be capable of long, reliable, trouble-free service, and shall be specifically intended for control and monitoring of operation of motor-driven pumps and equipment. All equipment shall be of modular design to facilitate interchangeability of parts and to assure ease of servicing.

C.15. Execution

C.15.1 Design and Assembly

The system shall be completely assembled in the shop by the Control System Integrator. All components and equipment shall be prewired to the maximum extent possible.

The Control System Integrator shall be responsible for the coordination and integration of control system with the motor control and other related equipment. The Control System Integrator shall communicate directly with the Manufacturer(s) and Supplier(s) of all related equipment to determine all details of the equipment which may influence or affect the control system. The Control System Integrator shall determine all requirements for and shall cause integration of the control system into a unified operating system. The Control System Integrator shall define all requirements for all interfacing equipment and shall supply all appurtenances, accessories and all such devices which may be required for proper interfacing as part of the control system.

The Control System Integrator shall be responsible to obtain submittal information on equipment supplied by other disciplines and to integrate them into the control system to form a complete working package as outlined by the contract documents. This includes but is not limited to the following list of major pieces of equipment.

C.15.2 Installation

C.15.2.1 General

Installation and testing procedures shall be a specified in these and subsequent sections of this division.

The control system shall be installed in accordance with the installation drawings and instructions prepared by the Control System Integrator.

The control system panels shall not be shipped to the site until a suitable environment is available for installation of the equipment. A suitable environment shall be defined as a covered and heated area to maintain a minimum ambient temperature of 60 degrees F. Prior to shipment, the Control System Integrator shall contact the District for field verification of a suitable environment.

Equipment shall be located so that it is readily accessible for operation and maintenance.

C.15.2.2 Field Equipment

Equipment shall be provided as specified on the drawings such that ports and adjustments are accessible for in-place testing and calibration. Where possible, equipment shall be located between 48 inches and 60 inches above the floor with a maximum of 72 inches to the top of panel, or a permanent work platform. Telemetry equipment shall be mounted for unobstructed access, but mounting shall not obstruct walkways. Equipment shall not be mounted where shock or vibration will impair its operation. Support systems shall not be attached to handrails, process piping or mechanical equipment except for measuring elements and valve positioners. Instruments and cabinets supported directly by concrete or concrete block walls shall be spaced out not less than 5/8 inch by framing channel between instrument and wall.

Steel used for support of equipment shall be hot-dip galvanized after fabrication. Support systems including panels shall be designed in accordance with the UBC for seismic Zone 3 and to prevent deformation greater than 1/8 inch under the attached equipment load and an external load of 200 pounds in any direction.

C.15.2.3 Not Used

C.15.2.4 Signal Connections

Electrical signal connections to equipment shall be made on Intrelec terminal blocks or by locking plug and receptacle assemblies.

C.15.2.5 Tagging

All field instruments shall be labeled with function and instrument number, i.e. (FIT-301/EFFLUENT FLOW METER). Tag shall be 10ga, 316 stainless steel with stamped letters and numbers attached to device with 12ga 316 stainless steel wire.

C.15.3 Tests and Inspections

C.15.3.1 General Requirements

Materials, equipment, and construction included under this specification shall be inspected in accordance with the specifications. Testing shall be performed by the Control System Integrator, in accordance with the Standard Specifications, and this and subsequent sections of this division.

No required test shall be applied without prior notice to the District. Between 20 and 30 days before the commencement of any testing activity, the Control System Integrator shall provide a detailed step-by-step test procedure, complete with forms for the recording of test results, testing equipment used, and identification of the individual performing or, if applicable, witnessing the test.

C.15.3.2 Factory Testing

The completed control system shall be tested in the shop by the Control System Integrator. Testing shall be conducted in two phases. The initial testing shall include, but not be limited to, operation of all input and output (I/O) points, control devices and motor controllers 24 hours per day for a continuous period of at least seven (7) days without failure or interruption.

The initial testing of the control system shall include energizing each discrete input and output and simulating each analog input and output using a loop simulator and calibrator. Circuits not energized shall be tested for continuity. Initial testing of the control system shall be conducted continuously, 24 hours per day, for at least seven (7) days without a failure or interruption.

Upon completion of the initial testing, the Control System Integrator shall conduct testing for inspection by the District. The Control System Integrator shall provide for time, equipment and support in their shop for the Districts consulting engineering to test the functions of the entire control system. All control functions and all status and alarm monitoring and indication will be demonstrated under simulated operating conditions. Simulating equipment shall be provided and wired by the System Integrator the control system for this testing. The Control System Integrator shall revise, modify, and adjust the system as required by the District during the testing period. Testing shall be continued for the time period required by the District to observe and verify any revisions.

C.15.4 Calibration and Start-up

C.15.4.1 Calibration

All components of the control system shall be calibrated by the Control System Integrator after completion of installation. Each component shall be adjusted to be within the Manufacturer's required range and for the specific application.

The Control System Integrator shall calibrate all instruments, indicators, recorders, loops, etc. and complete appropriate test forms provided at the end of this section. Test forms, identifying each instrument to be tested shall be submitted to the District prior to final commissioning.

Components provided by the System Integrator that cannot be properly calibrated or that are found to exceed the Manufacturer's specified range or accuracy shall be removed and replaced at no additional cost to the District.

C.15.4.2 Commissioning

Commissioning shall be accomplished by the Districts Engineering Consultant with the Control System Integrator, with the Owner and/or District present. Commissioning shall include operation and verification of all control components and features of the entire control system.

C.15.5 System Maintenance

The Control System Integrator shall be solely and completely responsible for all hardware maintenance of the system provided by the Integrator from time of start-up to the date of substantial completion of all work under the contract. The Control System Integrator shall correct all deficiencies and defects and make any and all repairs, replacements, modifications, and adjustments as malfunctions or failures occur. The Control System Integrator shall perform all such work required or considered to be required by the District to cause and maintain proper operation of the system and to properly maintain the system.

The Control System Integrator shall make any and all repairs, replacements, modifications and adjustments required to eliminate any and all defects in design, materials and workmanship that are disclosed within the one-year guarantee period. The Control System Integrator shall begin all repairs, replacements, modifications and adjustments within twenty-four (24) hours of notification by telephone by the District and shall complete such repairs, replacements, modifications and adjustments within forty-eight (48) hours of notification. Should the Control System Integrator fail to begin the work within 24 hours or complete the work within 48 hours, the District may proceed to undertake or complete the work. In such event, CSI and its surety shall be liable for all costs incurred by the Owner.

The Control System Integrator shall anticipate that the District may delay acceptance of all work under the contract if, in the judgment of the District, malfunctions or failures in operation of the control system repeatedly occur after start-up. The Control System Integrator shall not be entitled to an extension of time or to any claim for damages because of hindrances, delays or complications caused by or resulting from delay by the District in accepting the work because of malfunctions or failures in operation of the control system.

C.15.6 Operation and Maintenance Training

The Control System Integrator shall conduct specifically organized training sessions in operation and maintenance of the control system for personnel employed by the District. The training sessions shall be conducted to educate and train the personnel in maintenance and operation of all components of the control system. Training shall include, but not be limited to, the following:

a. Preventative maintenance procedures
b. Trouble-shooting
c. Calibration
d. Testing
e. Replacement of components
f. Manual mode operation

At least Two (2) separate training sessions, each at least Four (4) hours in duration, shall be conducted at the District after start-up of the system. The Control System Integrator shall prepare and assemble specific instruction materials for each training session and shall supply such materials to the District at least 14 days prior to the time of the training.

C.15.7 Operation and Maintenance Data

The Control System Integrator shall prepare and assemble detailed operation and maintenance manuals in accordance with the project general requirements. These manuals shall be submitted 14 days prior to training. The manuals shall include, but not be limited to, the following:

a. Preventative maintenance procedures.
b. Trouble-shooting.
c. Calibration.
d. Testing.
e. Replacement of components.
f. System schematics / shop drawings.
g. Record wiring diagrams of cabinet and enclosure contained assemblies.
h. Record wiring diagrams of overall system.

i. Note: Updated system schematics and wiring diagrams shall be included as described in the Shop drawing and Submittal sections of this specification.

j. Catalog data and complete parts list for all equipment and control devices provided by Control System Integrator.

k. Listing of recommended spare parts.

l. Listing of recommended maintenance tools and equipment.

All drawings shall be provided on hard copy and CAD file on CD ROM. CAD drawing files shall be in .dwg 2004 format, bound, with all "xref" links removed.

C.15.8 System Description of Operation and Programming (Not Used)

END OF SECTION

PLC I/O CALIBRATION TEST FORM

ANALOG INPUT MODULE				Page 1 of 3
Project Name: **Panel No.:** _____ **Rack No. and Slot No.:** _____ **Make and Model No.:** _____ **Input:** _____				
Simulate input and measure output with appropriate meter.				
Percent of Range	**Input**	**Expected Register Reading**	**Actual Register Reading**	**Percent Deviation**
Input 1				
0				
50				
100				
Percent Deviation Allowed:				
Input 2				
0				
50				
100				
Percent Deviation Allowed:				
Input 3				
0				
50				
100				
Percent Deviation Allowed:				
Input 4				
0				
50				
100				
Percent Deviation Allowed:				
Input 5				
0				
50				
100				
Percent Deviation Allowed:				

ANALOG INPUT MODULE				Page 2 of 3
Percent of Range	**Input**	**Expected Register Reading**	**Actual Register Reading**	**Percent Deviation**
Input 6				
0				
50				
100				
Percent Deviation Allowed:				
Input 7				
0				
50				
100				
Percent Deviation Allowed:				
Input 8				
0				
50				
100				
Percent Deviation Allowed:				
Input 9				
0				
50				
100				
Percent Deviation Allowed:				
Input 10				
0				
50				
100				
Percent Deviation Allowed:				
Input 11				
0				
50				
100				
Percent Deviation Allowed:				
Input 12				
0				
50				
100				
Percent Deviation Allowed:				

ANALOG INPUT MODULE				Page 3 of 3
Percent of Range	**Input**	**Expected Register Reading**	**Actual Register Reading**	**Percent Deviation**
Input 13				
0				
50				
100				
Percent Deviation Allowed:				
Input 14				
0				
50				
100				
Percent Deviation Allowed:				
Input 15				
0				
50				
100				
Percent Deviation Allowed:				
Input 16				
0				
50				
100				
Percent Deviation Allowed:				

Comments: _____

CERTIFIED: _____ DATE: _____

PLC I/O CALIBRATION TEST FORM

ANALOG OUTPUT MODULE Page 1 of 2

Project Name:

Panel No.: _____

Rack No. and Slot No.: _____

Make and Model No.: _____

Input: _____

Force output point and measure output with appropriate meter.

Percent of Range	Input	Expected Register Reading	Actual Register Reading	Percent Deviation
Output 1				
0				
50				
100				
Percent Deviation Allowed:				
Output 2				
0				
50				
100				
Percent Deviation Allowed:				
Output 3				
0				
50				
100				
Percent Deviation Allowed:				
Output 4				
0				
50				
100				
Percent Deviation Allowed:				

ANALOG OUTPUT MODULE

Comments: _____

_____

CERTIFIED: _____ DATE: _____

FIELD SWITCH CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make and Model No.: _____ **Serial No.:** _____

Input: _____

Range: _____

Set Point(s): _____

Simulate process variable (flow, pressure, temperature, etc.) and set desired set point(s). Run through entire range of switch and calculate deadband.

Set Point	Incr. Input Trip Point	Decr. Input Trip Point	Calc. Deadband	Required Deadband

Comments: _____

CERTIFIED: _____ DATE: _____

TRANSMITTER OR INDICATOR CALIBRATION TEST DATA FORM

Tag No. and Description: _____
Make and Model No.: _____ **Serial No.:** _____
Input: _____
Range: _____

Simulate process variable (flow, pressure, temperature, etc.) and measure output with appropriate meter.

Percent of Range	Input	Expected Register Reading	Actual Register Reading	Percent Deviation
Input 1				
0				
50				
100				
Percent Deviation Allowed:				

Comments: _____

CERTIFIED: _____ DATE: _____

RTD VERIFICATION TEST DATA FORM

Tag No. and Description: _____

Make and Model No.: _____ **Serial No.:** _____

Type: _____

Force output point and measure output with appropriate meter.

Temperature	Expected Output	Actual Output	Percent Deviation

Percent Deviation Allowed:

Comments: _____

CERTIFIED: _____ DATE: _____

VALVE CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make and Model No.: _____ **Serial No.:** _____

Associated Panel/Rack No: _____

Operate valve via PLC control or Jumper and verify operation. Verify limit switch operation if applicable.

Close Operation	**Pass (Y/N)**	**Close Position**	**Pass (Y/N)**

Open Operation	**Pass (Y/N)**	**Open Position**	**Pass (Y/N)**

Limit Switch Operation	**Pass (Y/N)**

Comments: _____

CERTIFIED: _____ DATE: _____

SECTION 16
PANELS

C.16 General

C.16.1 Description

C.16.1.1 Scope

This section specifies requirements for panels, cabinets, consoles, and racks for Telemetry and communication equipment. Additional requirements are specified in sections specifying the various Telemetry and communication systems.

C.16.1.2 Panel Design

Panelboards: Each panel containing 120-volt powered equipment with an aggregate load greater than 1200 watts shall be provided with a panelboard as specified in the Standard Specifications.

Annunciators: Each panel containing alarm points shall be provided with one or more annunciators as specified in section 17120.

Power Supplies: Each panel containing direct current powered instruments or serving as the termination point for transmission loop powered field instruments shall contain direct current power supply system as specified in Section 17130.

C.16.2 Quality Assurance

C.16.2.1 References

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Districts (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- International Society of Measurement and Control (ISA).

All equipment, materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

C.16.3 Submittals

Submit all catalog data in accordance with the Submittals requirements in Section 17010. Show material information and confirm compliance with these specifications.

C.17 Products

C.17.1 Fabrication

C.17.1.1 General

Panel work shall be designed for the seismic requirements of paragraph 17010. 3.02.B. Structures and equipment shall be braced to prevent damage from specified forces. Equipment shall not be required to function properly during periods of seismic disturbance but shall automatically restart following a disturbance.

Cutouts for future equipment shall be blanked off with suitable covers. Instrument tag numbers shall be identified on the panel rear. Nameplates shall identify face-mounted instruments. Instruments shall be mounted in a manner that allows ease of access to components and ease of removal.

Face-mounted instruments that are more than 6 inches deep, weigh more than 10 pounds, or exert more than a 4 ft-lb. moment force on the face of the panel shall be supported underneath at the rear by a 1-inch x 1/8-inch thick steel angle.

Face-mounted equipment shall be flush or semiflush with flat-black escutcheons.

Cabinets less than 60 inches high shall be provided with floor stands to raise the top of the panel to 60 inches above the floor or work platform or, if panel weighs less than 100 pounds and wall space is available, wall mounting may be used in lieu of a floor stand.

C.17.1.2 Indoor, Control Panel

Cabinet shall be a NEMA 250, Type 1 enclosure. Cabinet shall be fabricated from 1/8-inch minimum thickness stretcher leveled sheet steel. Cabinet shall be provided with an interior frame or otherwise formed so as to provide a rigid structure. Rear door (s) shall be hung on removable pin hinges and equipped with vault-type latch capable of accepting

a 3/8 inch-shackle padlock. Three-point latch hardware shall be provided for doors exceeding 30 inches height. Where cabinet width exceeds 36 inches, multiple doors no wider than 24 inches shall be provided.

C.17.2 Not Used

C.17.3 Nameplates

Machine engraved laminated white phenolic nameplates with black lettering shall be provided for panel mounted equipment. Nameplate engraving shall be as specified and shall carry the instrument tag number 3/32-inch minimum size lettering on the bottom line Nameplates shall be attached to the panel with a minimum of two self-tapping 316 stainless steel screws. The Control System Integrator shall modify nameplate wording without additional cost or time if changes are made prior to commencement of engraving.

Machine embossed metallic adhesive labels shall identify tag number if instruments inside panels.

Nameplates shall be attached to panel surfaces, not to instruments.

C.17.4 Interconnection Wiring and Electrical Devices

C.17.4.1 Interconnection Wiring

Power and control wiring shall be single conductor stranded copper NFPA No. 70 Type MTW No. 16 AWG minimum. Wiring for analog signals shall be provided with instruments and run continuously from measuring element to receiving instrument without splices.

Wiring shall be supported independently of terminations by lacing to panel support or by slotted flame retardant plastic wiring channels. Wiring channels shall comply with UL 94, Type V. Wiring channel fill shall not exceed 40 percent.

Wiring and terminals in instrument and relay compartments, control panels, instrument panels, field panels and control stations, as well as connections to mechanical equipment shall have reference number and letter in accordance to the following:

h = Control power hot
n = neutral
g = ground
x = PLC output (number shall correspond to the program input number)
y = PLC output (number shall correspond to the program output number)
ax = PLC signal/analog input (no. shall correspond to the program input number)

120 AC wire	Color
Power	Black
Control	Red
Neutral	White
Ground	Green

24V DC wire	Color
Power supply	Black
Signal (pos)	Red
Control - (+)	Violet
Control - (-)	Gray
Signal ground	Black
Equipment ground	Green
External	Yellow

All control wiring in control panels or other enclosures that is powered from an external source and is not disconnected by the control panel disconnect shall be terminated at a disconnecting terminal block (with energization indicator light upon entering the enclosure. The color of the wire shall then be changed to yellow to identify it as being powered from an external source. Provide identification nameplate on exterior of enclosure to indicate sources of external power.

Wiring shall comply with the requirements of NFPA No. 70 as a minimum. Power and control wiring shall be carried in covered channels separate from low voltage signal circuits. An interior steel barrier shall be provided between AC control devices and the electronic equipment.

Drawings show general layout of devices and associated wiring space. Final panel design will arrange terminals and wiring so field wiring is separate from internal panel wiring.

C.17.5 Terminal Blocks

Terminal blocks shall be strap screw type, minimum .41" width, rated for 600 volts. Each terminal strip shall have a unique identifying alphanumeric code at one end and a vinyl marking strip running the entire length of the terminal strip with a unique number for each terminal. Numbers shall be machine printed and 1/8 inch high. Wire connectors shall be locking fork tongue or ring tongue insulated crimp type terminals. No more than two connections shall be made to one terminal. Connections shall have box type lugs capable of terminating 2 #14 AWG stranded wires. Terminals shall be strip mounted as manufactured by Entrelec or Phoenix Contact.

Fuse terminal blocks shall be hinged disconnect level type with "blown fuse" indicators. Phoenix Contact UK 5 series or equal. Disconnecting terminal blocks shall be knife type with light indicator Phoenix Contact type MTK or equal.

Field connections shall be to separate terminal blocks. Terminal blocks for field termination shall be in a separate part of the panel close to where the field cables enter the panel.

C.17.6 Fuses

Circuits shall be fused. Fuses shall be 1/4 x 1-1/4 inch. Fuses on 120V AC circuits shall be ceramic tube type with 25,000 amperes interrupting capacity at 125 volts and neon blown fuse indicator lamps. Fuses for 24V DC circuits shall be fast acting glass tube type rated 1/8 or 1/10 amp for 4-20 mA loops and 1/2 amp for the power supply to individual instruments. Fuse holders for 120V AC shall be drawout type and molded from melamine plastic.

C.17.7 Surge Protection

Surge protectors shall be provided at panel external terminal blocks for type c, d, e, f, and g signal circuits as defined in paragraph 17010-1.01 B.8, which extend outdoors. Surge protectors shall be Joslyn Model 1663-08, Taylor 1020FA, or equal.

Telephone circuit protectors shall include three-element fail-short gas tubes, Cook Electric type 9X, or approved equal. Protectors shall be rated at 400 Vdc and shall be self-restoring. An external spark gap shall be provided for backup protection in accordance with Underwriters Laboratory 497, 4th Edition.

C.18 Execution

C.18.1 General

Control room cabinets shall be mounted on channel irons sills as specified. Sills shall be leveled so panel structures will not be distorted. Panels shall be shimmed to precise alignment so doors operate without binding. Sealant shall be provided under panels not located in dry control or electrical equipment rooms.

Each panel shall have its record connection and interconnection diagrams mounted behind a piece of plexiglass on the inside of one (or more) door(s).

C.18.2 Coating

Metal surfaces of panels, cabinets, and consoles shall be prepared, prime and finish coated in accordance with Manufacturers Standards.

END OF SECTION

SECTION 19
ANNUNCIATOR SYSTEMS

C.19 General

C.19.1 Description

This section specifies requirements for annunciator systems and annunciator light boxes required to support alarm points. Application requirements are specified in the instrument schedule.

C.19.2 References

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Districts (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- International Society of Measurement and Control (ISA).

All equipment, materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

C.19.3 Submittals

Submit all catalog data in accordance with the Submittals requirements in Section 17010. Show material information and confirm compliance with these specifications.

C.20 Products

C.20.1 Large Case Annunciator Systems. (When Requested)

C.20.1.1 Annunciator Light Boxes

Annunciator light boxes shall contain lamps and structures as specified in Paragraph 17120.2.01.A with logic provide in the PLC. Annunciator light bay shall be Ronan LB2000, or equal

C.21 Execution

Annunciator systems shall be mounted and connected in panels specified in Section 17110. Windows shall be engraved as specified and filled with permanent black ink.

END OF SECTION

SECTION 22
POWER SUPPLY AND CONDITIONING EQUIPMENT

C.22 General

C.22.1 Description

This section specifies requirements for power supply and conditioning equipment required to support the Telemetry and communication systems specified.

C.22.2 References

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Districts (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- International Society of Measurement and Control (ISA).

All equipment, materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

C.22.3 Electrical Supply System

Electric power for Telemetry and communication systems shall be obtained from the site power distribution system. This power is not regulated, wave forms may be distorted, and significant amounts of electrical noise may be present. The Control System Integrator shall provide all necessary power supply and conditioning equipment to provide electrical power of the required voltages and current capacities and of adequate quality to ensure reliable operation of the Telemetry and communication system. Unless

otherwise specified, the Control Systems Integrator shall assume that the power supply for Telemetry systems is 120 volts plus or minus 15 percent, 60 hertz plus of minus 3 hertz, 5 percent maximum total harmonic distortion.

C.22.4 Submittals

Submit all catalog data in accordance with the Submittals requirements in Section 17010. Show material information and confirm compliance with these specifications.

C.23 Products

C.23.1 General

Except for power supply units which form an integral part of an individual piece of equipment, all power supply and conditioning equipment shall comply with UL 1012 and shall be approved by UL, CSA, or FM for the application. All power supply equipment shall be provided in redundant configurations such that failure of a single unit will not disable all or any part of the Telemetry and communication systems. Diode isolation shall be provided for redundant direct current supply units, and the power supply negative output terminal shall be grounded.

C.23.2 Alternating Current (AC) Voltage Regulators

Regulators shall be of the solid-state tap-changing type, insensitive to line frequency variations between 47 and 63 hertz. Ferroresonant units are not acceptable. Output regulation for input voltage variation from 85 to 125 volts shall not exceed 3.3 percent. Output regulation for load variation from 0 to 100 percent shall not exceed 1.0 percent. Response time shall be 1.0 cycles or less. Voltage regulator serving panelboards and control panels shall have a load capacity not less than 200 percent of the connected load. Voltage regulators serving panelboards and control panels shall have a load capacity not less than 125 percent of the connected load. Power loss in the regulator shall not exceed 2 percent of the regulator capacity, and harmonic distortion introduced by the regulator shall not exceed 0.1 percent. Regulator output shall be fully protected against internal faults, external overloads and short circuits. Three-phase units shall be 4 wire, wye-connected and capable of supporting 100 percent unbalanced load. regulators shall be Topaz, or equal.

C.23.3 Noise-Suppression Isolation Transformers

Isolation transformers shall be provided for AC powered Telemetry loads containing solid state circuitry where such is not included within the instrument. Isolation transformers shall be of the triple box shield type. Each coil shall be completely enclosed in a grounded conductive faraday shield, and the overall transformer enclosed in a faraday shield. Common mode noise attenuation between primary and secondary shall exceed 140 dB at 1.0 kHz. Isolation transformer dielectric strength shall be 2500 volts minimum. Isolation transformers serving panelboards and control panels shall have a load capacity not less than 124 percent of the connected load. Power loss is the isolation transformer shall not exceed 2.0 percent of the maximum load rating. Harmonic

distortion introduced by the isolation transformer shall not exceed 0.1 percent. Three-phase units shall be 4-wire, wye-connected and capable of supporting 100 percent unbalanced load. Isolation transformers shall be Topaz, or equal.

C.23.4 Direct-Current Power Supplies

Direct-current supplies for bulk 24-volt nominal Telemetry power shall be convection-cooled switching type. Line regulation shall be 0.4 percent for line variations from 105 to 132 volts, and load regulation shall be 0.4 percent for load variations from 0 to full load. Ripple and noise shall not exceed 100 mV peak-to-peak. Hold-up time at maximum load shall be not less than 15 milliseconds. Efficiency shall be a better than 70 percent. Power supply shall be rated for continuous duty from 0 to 50 degrees C at rated load. Output shall be electronically current limited, and overvoltage crowbar shutdown shall be provided. Power supply output voltage shall be rated 28 volts DC, adjustable plus or minus 5 percent, and shall be set to provide 26.4 volts on the panel direct current bus. Power supplies shall be Power One, or equal.

C.23.5 Uninterruptible Power Supply (UPS)

UPS shall provide continuous duty protection and complete power conditioning. UPS shall consist of a power conditioner, a battery charger, a battery, and inverter, a system control and a surge suppression network. Total harmonic distortion shall be ±5% maximum (from the batteries) or ±2% maximum added to incoming line distortion (from line voltage). UPS shall UL or CSA labeled and shall meet IEEE 587-80 standards. UPS shall provide surge protection for both itself and the load as defined by ANSI C62.41-80 (6000V peak, 500 nanosecond rise time, 100 kHz damped ring wave). UPS shall also meet the following specifications:

When the power line is absent:

Output voltage - 120VAC ± 3%, sinewave.

When the power line is present:

Voltage Regulation
Input voltage range: 120V ± 20%
Output regulation band: +6% to -8% of nominal for all conditions of line and load.
Correction time: 2 cycles maximum.
Common mode noise attenuation: 100dB at 100 kHz.
Normal mode noise attenuation: 70dB at 100 kHz.
Efficiency 93% minimum.
Transfer time: AC line to inverter: 1 or 4 milliseconds selectable.
Inverter to AC line: No interruption
Transfer Points: Power conditioning to inverter: -8% or +6% of nominal voltage.
Inverter to power conditioning -11% or +13% of nominal voltage.
Input Frequency tolerance: ±5%.
Load Power Factor: 0.9 leading to 0.9 lagging, linear load, 0.6 non-linear load.
Operating Temperature: -29 to +40 degrees C.

The UPS shall be TOPAZ Powermaker, or equal.

C.23.6 Backup Power Supply (BPS)

BPS shall provide continuous duty protection and complete power conditioning. BPS shall consist of a power conditioner, a battery charger, a battery, system control and a surge suppression network. The BPS will provide 12VDC and 24VDC with sufficient wattage to run telemetry and associated equipment..

BPS battery charger shall be voltage regulated, current-limited charger with 3 Amps maximum current and typical recharge time of 6 - 12 hours after full discharge. Batteries shall be sealed Gel-cell, maintenance free type.

The BPS shall be provided with relay contacts rated at 32 Volts, 1 Amp for Battery ON and AC ON signals. The BPS will be provided by the Control System Contractor/Developer/Designer using off the shelf equipment.

C.23.7 Surge Protection

Surge arrestors and capacitors shall be provided on the primary winding of isolation transformers supplying power to solid state systems. Surge protectors shall be mounted in a separate, NEMA 1 enclosure adjacent to the transformer and the incoming line passed through this enclosure. Surge arrestors shall be General Electric 9L15EC or equal. Surge capacitors shall be General Electric 9L18B, or equal.

C.24 Execution

C.24.1 General

Power supply and conditioning equipment shall be mounted and connected in compliance with the manufacturer's instructions unless otherwise specified. Line side disconnect switches shall be provided for power supply and conditioning equipment. Line and load side overcurrent protection shall be provided for power supply and conditioning equipment in compliance with NFPA 70. Disconnect switches shall comply with the Standard Specifications.

Small power supply and conditioning equipment may be mounted in the panel served. Larger units shall be mounted adjacent to the equipment served. Where unconditioned power is brought into control panels, it shall be enclosed in metallic raceways within the panel.

Power supply and conditioning equipment larger than 5 KVA load capacity supported from surfaces other than concrete shall be provided with sound isolators. Final raceway connections shall be a flexible conduit in compliance with the Standard Specifications.

Power supply and conditioning equipment not designed for exposed mounting shall be housed in panels in compliance with Section 17110.

END OF SECTION

SECTION 25
MISCELLANEOUS PANEL INSTRUMENTS

C.25 General

C.25.1 Description

This section specifies requirements for miscellaneous panel mounted instruments used to provide process control and interface between the operator and the process.

C.25.2 References

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Districts (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- International Society of Measurement and Control (ISA).

All electrical equipment and materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable Federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of UL examination services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

C.25.3 Submittals

Submit all catalog data in accordance with the Submittals requirements in Section 17010. Show material information and confirm compliance with these specifications.

C.26 Products

C.26.1 Relays

C.26.1.1 Relays For General Purpose

Relays for general purpose use shall have 10 Amp contacts with the appropriate coil voltage for the application. All relays shall have an integral indicating light to show if there is coil voltage present. They shall have an 8-pin/blade base and matching socket. Units shall be Allen-Bradley 700 type HA, HB, Idec RH Series, or equal. Appropriate relay shall be selected based on application from the control wiring diagrams.

C.26.2 Signal Conditioners

The current to current (I/I) converters shall provide an isolated DC output proportional to the DC input while providing complete electrical isolation between the output and input. The device shall plug into a standard 8-pin relay socket which is capable of being mounted either on a flat surface and track. Provide appropriate scaling as required. Units shall be as manufactured by AGM, Wilkerson Instruments, Action Instruments, or equal.

C.27 Execution

C.27.1 Installation

Instruments shall be installed on panel specified in Section 17110.

END OF SECTION

SECTION 28
MEDIUM CAPACITY
PROGRAMMABLE LOGIC CONTROLLERS (PLC)

C.28 General

C.28.1 Description

C.28.1.1 Scope

This section specifies requirements for PLC (s) capable of performing the same function as relays, latching relays, current trips, shift registers, timers, counters, stepping switches, sequences, multiplexers, or solid state logic systems.

C.28.1.2 Work Included

Under this contract the PLC is provided by the Owner. CSI shall install PLC in new enclosure, and provide additional I/O cards where needed.

C.29 Products

C.29.1 Processor Support Components

C.29.1.1 Network Communications

Fiber optic communications shall be accomplished to execute the same above utilizing Phoenix Digital OCM, or equal fiber optic driver. Fiber to serial transceiver.

Communication over phone line shall be accomplished utilizing Data-Linc or Allen/Bradley modems.

C.29.2 Input/ Output System (I/O)

C.29.2.1 General

The system shall consist of individual plug-in input and output modules or cards. Any number of remote discrete and analog I/O points (up to the system capacity) shall be available. I/O system shall be 25% spare of each type of I/O.

C.30 Execution

C.30.1 Installation

Installation shall be in accordance with Section 17110-3.01. The PLC(s) shall be mounted in control panels as shown on the drawings. Wire terminations shall be at

terminal blocks. Power supplies located in instrument panels shall have an isolation transformer and secondary surge protection.

C.30.2 Programming (By Others)

C.30.3 Start-Up

Contractor shall provide on-site start up of the PLC system in accordance with paragraph 17010-3.04 and 1.02B.

C.30.4 Testing

Testing shall be in compliance with paragraph 17010-3.03 and 1.02B.

C.30.5 Training

A minimum of 16 hours of training shall be provided in accordance with paragraph 17010-3.06 to explain the system operation and how the PLC/OIT controls the system.

END OF SECTION

SECTION 31
ETHERNET RADIO MODEMS

C.31 Overview

C.31.1 It is the intent of this section to outline the requirements for radios used only in line-of-site locations. It is not the intent of this section to state that line-of-site conditions can be met at each intended location.

It is the responsibility of the installer to confirm operability within the parameters of this specification section. If these parameters cannot be achieved in the locations outlined in the contract documents, the installer shall notify the control system integrator in writing within 48 hours of discovery of the exception to the specified conditions.

C.32 Unitary responsibility

C.32.1 In order to unify responsibility for proper operation of the Ethernet radio modems, it is the intent of these Specifications that a single supplier (unitary source) shall furnish all components for the radio system.

C.33 General

C.33.1 All Ethernet radio modems shall not require FCC site license. All radio modems shall have FCC type acceptance as per FCC Part 15-Subclass C.

C.33.2 All Ethernet radio modems shall be license-free direct sequence spread spectrum, operating in the 2.416 to 2.462 GHz Spread Spectrum band.

C.33.3 All Ethernet radio modems shall be compatible with IEEE 802.11b specifications.

C.33.4 All Ethernet radio modems will operate at 1-Watt output power and provide a line-of-site (LOS) range of at least 5 miles.

C.33.5 All Ethernet radio modems will communicate at a radio frequency (RF) data rate of 11 MBPS. The RF data rates will automatically scale from 1-11 MPBS to maintain a reliable communication link based upon received signal strength and data quality. RF data rates lower than 1 MBPS will not be acceptable.

C.33.6 All Ethernet radio modems shall be able to operate in the Ethernet point-to-point and multi-point Bridging Mode.

C.33.7 All Ethernet radio modems shall be able to operate in the Access Point Mode.

C.33.8 All Ethernet radio modems shall be able to function in the EtherStation Mode. This is the ability of the radio modem to function as a Client to an Access Point. The radio modem in the EtherStation Mode shall be able to roam between multiple Access Points.

C.33.9 The radio modems shall have digi-repeater capability to extend the operating range of the Ethernet network.

C.33.10 The radio modem shall be user configurable via its internal web server.

C.33.11 All Ethernet radio modems shall support transfer of Ethernet based data in both UDP and Ethernet II formats. All Ethernet protocols, including but not limited to TCP/IP, will be supported.

C.34.12 All Ethernet radio modems will only pass data for the MAC address attached to the wireless Ethernet modems to reduce wireless network traffic.

C.33.13 All Ethernet radio modems will be housed in a single metal, panel mountable, industrial based enclosure. The Ethernet radio modem shall have a 10BaseT RJ-45 connector for Ethernet interfacing.

C.33.14 All Ethernet radio modems shall support the installation of external antennas that can be remotely located at distances up to one hundred (100') feet from the radio modem using factory recommended feedlines.

C.34 Communications data rate

C.34.1 All Ethernet radio modems will use direct sequence spread spectrum modulation at a RF data rate of 11MBPs.

C.34.2 The RF data rate shall automatically scale from 1-11 MBPS to maintain a reliable communication link based upon received signal strength and data quality. RF data rates lower than 1 MBPS will not be acceptable.

C.35 Electrical

C.35.1 Power input shall be 11.0 - 15.0 VDC or 110-240 VAC with optional switching power supply.

C.35.2 Ethernet radio modems shall have the following front panel indicators: PWR-Power (red), TX-Transmit (red), RX-Receive (red), T/E-Test/Error (red), 10BaseT Link (Amber) and Ethernet activity (Green).

C.36 Transmitter

C.36.1 Ethernet radio modem shall have output power of 1-watt maximum (+30 dBm).

C.36.2 All Ethernet radios will have a maximum rise time of 10µsec.

C.37 Receiver

C.37.1 All Ethernet radio modems shall use auto-squelch circuitry that requires no setting from the user.

C.37.2 Sensitivity shall be at least -93dbm @ 8E-2 Frame Error.

C.37.3 Receiver spurious & image rejection shall be > 80dB.

C.37.4 Receiver adjacent channel rejection shall be > 35dB

C.38 OPERATING ENVIRONMENT

C.38.1 Ethernet radio modems shall be rated for NEMA 1 environments.

C.38.2 Ethernet radio modems shall operate over a range of -30o to +60oC.

C.39 MANUFACTURER

C.39.1 The radio modems shall be 802.11b compatible Spread Spectrum wireless Ethernet radio modem as supplied by ESTeem or pre-approved equal.

END OF SECTION

SECTION 40
UHF RADIO MODEMS

C.40 Overview

C.40.1 It is the intent of this section to outline the requirements for radios used only where line-of-site functionality cannot be met. It is not the intent of this section to state that line-of-site conditions can or cannot be met at each intended location.

It is the responsibility of the installer to confirm operability within the parameters of this specification section. If these parameters cannot be achieved in the locations outlined in the contract documents, the installer shall notify the control system integrator in writing within 48 hours of discovery of the exception to the specified conditions.

C.41 Manufacturer

C.41.1. The wireless modems shall be narrow band, licensed UHF radio modems that operate in the

450-470 MHz frequency band as supplied by ESTeem or pre-approved equal.

C.42 Unitary Responsibility

C.42.1. In order to unify responsibility for proper operation of the UHF radio modems, it is the intent of these Specifications that a single supplier (unitary source) shall furnish all components for the radio system.

C.43 General

C.43.1. All radio modems shall be licensed by the FCC for narrow band operation in the 450 to 470 MHz frequency band.

C.43.2. All radio modems shall be compatible for 25 KHz, 12.5 KHz and 6.25 KHz channel spacing.

C.43.3. All radio modems shall be software frequency agile and adjustable locally or remotely using the remote programming feature.

C.43.4. All radio modems will function as a Base, Repeater, or Remote with the same unit. Changing functions shall be accomplished through software programming locally or remotely over the RF link.

C.43.5. All radio modems will be capable of master to master communications. No radio modem in the system will be limited to function only as a repeater or slave to a master radio modem.

C.43.6. All radio modems shall have Digi-Repeating, which will allow the user to route data through a

maximum of three radios to reach a remote radio node. Digi-Repeating will allow any radio in the network to repeat a data packet from another radio modem.

C.43.7. All radio modems functioning as a remote must to able to function as a Digi-Repeater while simultaneously providing data to its attached device.

C.43.8. The Digi-repeater feature shall be transparent to the User's Device.

C.43.9. All radio modems must have a Grouping feature that will allow multiple devices to share access to a single radio modem.

C.43.10. All radio modems will have the PLC protocol emulation contained in the radio modem firmware. Transparent only operation will not be acceptable.

C.43.11. All radio modems shall have received signal strength and data quality available for diagnostics.

C.43.12. All radio modems shall include a software package for setup and diagnostics at no additional cost.

C.43.13. All radio modems shall have remote programming over the radio link. All configuration functions shall be available through remote programming including programming though repeaters.

C.43.14. All radio modems shall have an infrared (IR) port for remote programming without a physical connection to the unit.

C.44 RF Communications

C.44.1. All radio modems shall use 4-level FSK modulation to provide a RF data rate of 19,200 bps when using a 25 KHz channel spacing and 9,600 bps when using a 12.5 KHz channel spacing.

C.44.2. All radio modems shall have a maximum point to point communications turn around time of < 30 msec. + data using the Acknowledge Feature and <15 msec. + data without the Acknowledge Feature.

C.44.3. All radio modems shall utilize Carrier Sensed Multiple Access with Collision Detection (CSMA-CD) transmission protocol.

a. All radio modems shall use Forward Error Correction and 32 Bit Cyclic Redundancy

END OF SECTION

Appendix D
Procedure for Creating Local Utility Districts

D.1 Establishment and Definition

The District may establish and define the boundaries of local assessment districts to be known as Local Utility District (LUD) No. "___" for any one or more of the following: water distribution, for domestic use and irrigation. The LUD shall be under the general supervision and control of the District. The District shall purchase, or otherwise acquire, or construct and equip distribution systems, and provide for extensions and betterments. To finance an LUD, the District may issue local improvement bonds or warrants and may levy and collect special assessments and reassessments on property benefiting from the LUD, to pay for associated costs and expenses. *(442)*

D.2 Improvements and Financing

The District will determine what work shall be done or improvements made at the expense in whole or in part of the property specially benefited by creating an LUD. The District will determine the appropriate approach for financing the project. Financing options include bonds or warrants secured by assessments against the property within the local utility district, or revenue bonds. For revenue bonds, no bonds or warrants shall be issued by the local utility district but assessments shall be levied upon the taxable property on the basis of special benefits up to, but not exceeding the total cost of the improvements. In such cases the entire principal and interest of such assessments shall be paid into a revenue bond fund of the District. *(442)*

D.3 Petition and Resolution

Improvements shall be ordered by Commission resolution upon petition or by District resolution.

D.3.1 Petition

The Commission shall fix a hearing date when a petition signed by ten per cent of the owners of land in the proposed district is filed, asking that a financially and economically feasible plan or improvement be adopted and ordered. At least two weeks public notice will be given for the hearing.

The commission may deny the petition or order the improvement, unless a majority of the owners of lands in the district file prior to twelve o'clock noon of the day of the hearing, with the secretary a petition protesting against the improvement.

D.3.2 District Resolution

The Commission shall adopt a resolution declaring intention of forming an LUD after a *State Environmental Policy Act determination of categorical exemption, determination of*

non-significance, or environmental impact statement has been issued. At least two weeks public notice will be given for a hearing on District intent to form an LUD.

D.4 Establishing the LUD

If, after the hearing, the commission orders the improvement, it may alter the boundaries of the proposed local utility district and prepare and adopt detailed plans of the local improvement, declare the estimated cost, what proportion shall be borne by the local utility district and what proportion, if any, shall be borne by the entire public utility district. *(442)*The District may create a fund to finance the LUD; acquire all lands and other properties; pay all damages; and commence in the name of the public utility district the necessary eminent domain awards, and proceed with the work. The District shall file with the District Treasurer its roll levying special assessments for the amount to be paid by special assessment against the property in the local utility district in proportion to the special benefits to be derived from the improvements. *(442)*

If SEPA review has not yet been performed, the District will conduct SEPA review, and give notice of opportunities for appeal.

D.5 Preliminary Notice

Before approval of the roll, a notice will be published once each week for two consecutive weeks stating: 1) the roll is on file and open to inspection in the office of the secretary, 2) a fixed time not less than fifteen nor more than thirty days from the date of the first publication of the notice within which protests must be filed with the secretary against any assessments, and 3) a time when a hearing shall be held by the commission on the protests. After the hearing, the commission may alter any and all assessments shown on the roll and may by resolution approve it. *If the LUD contains "farm and agricultural land" or "timber land" as defined in RCW 54.16.125, the District will file notice of the LUD formation with the County Assessor and Board of Commissioners.* I

If an assessment is raised, a new notice similar to the first shall be given and a hearing had thereon after which final approval of the roll may be made. Any person aggrieved by the assessments shall perfect an appeal to the superior court of the county within ten days after the approval in the manner now provided for appeals from assessments levied by cities. Engineering office and other expenses necessary or incident to the improvement shall be borne by the public utility district; PROVIDED that when a municipal corporation included in the public utility district already owns or operates a utility of a character like that for which the assessments are levied, then all such engineering and other expenses shall be borne by the local assessment district. *(442)*

D.6 Alterations to Assessments

The District may be responsible for only up to fifty percent of the cost of LUD improvements unless a majority of the electors of the District consent to or ratify a contribution of greater than fifty percent. *(442).*

D.7 Final Notice and Payment

As soon as the assessment roll has been placed in the hands of the District Treasurer for collection, he shall publish a notice in the official newspaper of the County for once each week for two consecutive weeks. Within 15 days after the first publication, notice will be mailed to all property owners that the roll is filed for collection. *If the LUD contains "farm and agricultural land" or "timber land" as defined in RCW 54.16.125, the District will file notice of the LUD formation with the County Assessor and Board of Commissioners*.

Any assessment may be paid within thirty days from the date of the first publication of the Notice without penalty, interest or cost. After thirty days, the remaining unpaid sum may be paid in equal annual installments extending over a period not to exceed twenty years. Interest on the whole amount unpaid at the rate fixed by the resolution shall be due on the due date of the first installment of principal and each year thereafter on the due date of each installment of principal. The first installment shall become due and payable during the thirty-day period succeeding a date one year after the date of first publication of the Treasurer's Notice and annually thereafter each succeeding installment shall become due and payable in like manner. If the whole or any portion of any assessment remains unpaid after the first thirty-day period, interest upon the whole unpaid sum shall be charged at the rate fixed in the resolution, and each year thereafter the installments and interest due upon the whole of the unpaid balance shall be collected. Any installment not paid prior to the expiration of the thirty-day period during which the installment is due and payable shall become delinquent. All delinquent installments shall be subject to a charge for interest at the rate to be determined by the Commission. *(442)*

D.8 Final Notice

Except as herein and otherwise provided, all matters and proceedings relating to the local utility district, the levying and collection of assessments, the issuance and redemption of local improvement warrants and bonds, and the enforcement of local assessment liens, shall be governed by local utility district laws. *(442)*

D.9 LUD Administration

The form of any local utility bond to be issued by the District shall be fixed by resolution. *(442)*

APPENDIX H

MEMORANDUM OF AGREEMENT (MOA)

MEMORANDUM OF AGREEMENT
REGARDING UTILIZATION OF SKAGIT RIVER BASIN WATER RESOURCES FOR INSTREAM AND OUT OF STREAM PURPOSES

I. PURPOSE OF AGREEMENT

A. To ensure the establishment of instream flows to protect fisheries resources, and the mitigation of any interference with such established flows;

B. To provide a mechanism for the coordinated management of water resources in areas described by the Skagit County Coordinated Water System Plan, Regional Supplement, July 1993 ("CWSP") to meet the out-of-stream needs of the Swinomish Indian Tribal Community, Upper Skagit River Tribe, and Sauk-Suiattle Indian Tribe (collectively "the Tribes"), local governments, and public water purveyors within Skagit County;

C. To avoid litigation or adjudication of water resources within the Skagit River Basin between the Parties to this Agreement;

D. To assist in expediting the Department of Ecology's water right decision-making within the CWSP service area;

E. To modify the CWSP to conform to this Agreement and to incorporate this Agreement into the City of Anacortes' and Public Utility District No. 1 of Skagit County's Joint Operating Agreement.

II. PARTIES TO THIS AGREEMENT ("THE PARTIES")

City of Anacortes ("the City")
Public Utility District No. 1 of Skagit County ("PUD")
Skagit County ("the County")
Upper Skagit Indian Tribe
Swinomish Indian Tribal Community
Sauk-Suiattle Indian Tribe
(collectively "the Tribes")
Washington State
Department of Ecology ("Ecology")
Department of Fish and Wildlife ("WDFW")

III. DEFINITIONS

A. Instream Flow - The quantity of flow necessary to maintain sufficient water in a stream to support in harvestable numbers the natural production of food and game fish.

B. Established or establishing instream flows - Instream flows that are established by rule and thus enforceable by law.

C. Out-of-Stream Use - The quantity of water identified for withdrawal from the Skagit River and its tributaries, or from groundwater in continuity with the Skagit River or its tributaries, for use by the City, PUD, and Tribes.

D. Effective Date and Term of Agreement - The Effective Date of this Agreement shall be when the last Party has signed the Agreement and shall continue for 50 years from the effective date.

E. Claims or Adjustments - Existing, recorded, pending, and proposed new water right documents consisting of registered claims, certificates, permits, applications, and proposed changes to such documents related to place of use, point of diversion, and/or authorized instantaneous and annual quantities of water, all of which are specifically identified in Sections IV.B.1.a, IV.B.1.b (1), and IV.C.1.a-d of this MOA.

F. Skagit River Basin - The water resource basin as generally defined by the State of Washington Water Resource Inventory Areas 3 and 4.

G. CWSP - Skagit County Coordinated Water System Plan, Regional Supplement (July 1993).

H. Lower Skagit River Instream Flows - Established instream flows for the segment of the Skagit River below the Skagit River PUD Pipeline Crossing east of Sedro Woolley ("PUD Pipeline Crossing") measured at the existing USGS Station 12200500, near Mt. Vernon.

I. Future claims or adjustments - any claims or adjustments not specifically identified in this MOA.

J. Cultus Mountain Streams Instream Flows - Established instream flows for the Salmon, Turner, Mundt, and Gilligan Creeks located in the general Cultus Mountain area.

K. Ecology Low-Flow Streams: Those streams on Ecology's Surface Water Source Limited (SWSL) list that have been identified to have limitations in available supply as a result of fisheries concerns.

IV. AGREEMENTS

A. The Tribes agree to the following, conditioned upon the other Parties meeting their obligations as outlined in this Agreement, which includes establishing Lower Skagit River Instream Flows as defined in this Agreement, and as jointly or individually recommended by the parties, within the time period established in subsections IV.B.2.c. and IV.C.2.c., unless such time period is extended in the manner described in such sections.

1. To not challenge any Skagit River Basin water rights claims or adjustments, made by the City or PUD within 50 years from the effective date of this Agreement, as long as such claims or adjustments are consistent with this Agreement. An inconsistent claim or adjustment would include, but not be limited to, claims or adjustments other than specifically identified in this Agreement as not subject to Lower Skagit River Instream Flows that in any way interfere with established instream flows.

2. That established Lower Skagit River Instream Flows will constitute the full instream flow agreed to by the Parties for 50 years from the effective date of this Agreement;

3. That any challenges made by the Tribes after the 50-year period of this Agreement will be made only against future claims or adjustments by the City or PUD that are additional to those identified in Sections IV.B.1.a, IV.B.1.b(1), and IV.C.1.a, b, c, and d of this Agreement;

4. To collaborate with the Parties to secure adequate flows for instream and out-of-stream uses for areas identified in the CWSP;

5. To work towards establishing satellite systems as defined in the CWSP with the objectives of reducing groundwater or surface water withdrawals that adversely impact Skagit River Basin Instream Flows, improving water use efficiency, and providing public water delivery to existing and planned communities in Skagit County. A primary objective is to reduce the use of exempt wells in those areas of the County experiencing inadequate instream flows that may be occurring as a result of groundwater withdrawal;

6. To seek funding sources to: contribute towards the development and implementation of long-term watershed management programs; develop a coordinated water delivery system throughout the CWSP service area; and achieve the objectives of this Agreement.

B. The City of Anacortes agrees to the following:

1. The following certificates presently held, pending water right applications, and future claims or adjustments to water rights will be recognized and put to use by the City in accordance with the relative order of priorities set forth below.

   a. City Water Rights Not Subject to Lower Skagit River Instream Flows: 85 cubic feet per second (cfs) (54.94 mgd) as comprised in the following:

      (1) Certificate #C-709 (2/14/1963) which provides 70 cfs (45.24 million gallons per day or mgd) for the "area served by the City of Anacortes Water Supply System".

      (2) Certificate #C-1161 (7/2/1930) which provides 15 cfs (9.70 mgd) for the "City of Anacortes." This Agreement provides for a change in the point of diversion under this right downstream

approximately 1,500 feet to coincide with the existing intake for Certificate #C-709.

b. City water rights subject to Lower Skagit River Instream Flows developed as a condition of this Agreement:

(1) Certificate #C-3959 (9/13/1954) which provides 32.30 cfs (20.88 mgd). This Agreement provides for a change in the point of diversion of Certificate #C-3959 from the original "Ranney Well" Skagit River bed subsurface diversion to coincide with the existing intake for Certificate #C-709.

(2) The following may be subject to results of state-of-the-art instream flow studies, regardless of the date of the application: 1) future rights acquired by the City in excess of those specified in Section IV.B.1.b(1) above for service to parties within or outside the service areas as defined in the CWSP; and 2) future claims or adjustments.

2. The City will participate in identifying instream flow needs through an IFIM instream flow study process. The City and PUD, with consultation from the Tribes, will fund and contract for the IFIM studies, which will apply only to the segment of the Skagit River described in subsection III.H.

a. The City, PUD, and any other parties that desire to assist with financing, will fund and contract for the necessary studies to establish Lower Skagit River Instream Flows. The Tribes and WDFW will provide the fisheries and fisheries habitat management criteria for input into the IFIM study and recommended Skagit River Instream Flows.

b. The Parties to this Agreement will jointly develop the recommended instream flows using the Water Resources Forum process (Instream Flow Policy Working Draft, 8th Draft, Revised May 19, 1993) as a guide. The Tribal IFIM study input criteria will be limited to fisheries and fisheries habitat management and will not include other instream objectives. The Parties will utilize all appropriate methods to establish an agreed upon instream flow for managing the Skagit River below the PUD Pipeline Crossing, including mediation.

c. Schedule.

(1) The City agrees that the following events must occur within two years of the effective date of this Agreement: 1) the necessary Lower Skagit River instream flow studies are completed; 2) the City, PUD, and Tribes agree on the recommended instream flows; and 3) the City, PUD, and Tribes submit jointly recommended instream flows to Ecology, or, if these parties cannot agree in writing, submit the differing recommendations for Lower Skagit River Instream Flows to Ecology for its decision as to what to include in the rule proposal. This two-year schedule may only be

extended by written agreement of the City, PUD, and Tribes. If these parties cannot agree to an extension, the City shall take all necessary actions to ensure that changes to existing water rights documents identified in section IV.B.1. shall not remain or become effective as further described in subsection (3) below. The City may then remove any commitment of water service to the Tribal Reservations identified in subsection IV.B.(3) except as required under a separate contract.

(2) Upon receipt of either the joint or differing recommendations described in subsections IV.B.2.c. and IV.C.2.c., Ecology shall immediately file a Preproposal Statement of Inquiry Code Revision (CR) 101, indicating its intention to adopt the Cultus Mountain Instream Flows and Lower Skagit River Instream Flows. Ecology shall seek to complete formal rulemaking by filing a CR 102 within eighteen (18) months of its receipt of the joint recommendation or deferment described in IV.B.2.c(1) and IV.C.2.c(1), with a goal of adopting final rules within two years of its receipt.

(3) If Lower Skagit River Instream Flows have not been established by the end of two years following Ecology's receipt of the recommendations described in subsection (1), the City, PUD, and Tribes may extend the deadline only by written agreement. If the City, PUD, and Tribes cannot agree to an extension, the City shall immediately request Ecology to rescind any water right change action submitted to Ecology since the Agreement became effective, even if Ecology has taken final action. The City may immediately reapply for the change. The intent of this provision is to secure the Tribes' right to challenge these changes in the event that Lower Skagit River Instream Flows are not established within the specified schedule.

d. In the event that Ecology approves the changes referred to in subsection IV.B.2.c(3) above, the City shall ensure that any water rights documents issued by Ecology that purport to effectuate these changes shall be expressly and clearly conditioned to require compliance with this Agreement. Regardless of whether or not Ecology so conditions the document(s), the City shall, by its own authority, enforce the conditions of this Agreement when using these water rights.

e. The City may, at its option, negotiate with upstream Skagit River dam operators for release of flows to maintain the agreed upon flow levels downstream from the PUD Pipeline Crossing.

3. To guarantee in perpetuity to the Swinomish Indian Tribal Community for non-discriminatory use by all residents within the Swinomish Indian Reservation a water quantity of 2.8 million gallons per day based on demands identified annually and projected for five and twenty years by the Swinomish Indian Tribal Community and based on amendment to the existing wholesale contract with the

Swinomish Tribe. Government-owned and operated uses will be subject to conservation and curtailment programs for both the Reservation and off-Reservation water uses as outlined in Exhibit A, which is incorporated herein. Government-owned and operated economic development on the Reservation, such as the Tribe's marina, gaming facilities, hotels, and similar facilities will be considered services that generate governmental revenue and will receive the second highest priority after residential domestic use. Similar government-owned and operated commercial services within the City's and PUD's service area will receive the same status.

4. The City, including its Public Works Department, agrees not to provide any water service to users or property located within the Swinomish Indian Reservation without the prior written approval of the Swinomish Indian Tribal Community.

5. To assist Ecology in adopting Lower Skagit River Instream Flow rules within the time period set forth in subsection IV.B.2.c..

6. To actively support and provide input at both a policy and technical level to County officials regarding implementation of Section 63 of the Growth Management Act, such that building permits will only be issued if there is an adequate supply of potable water that can be withdrawn from groundwater without adversely impacting instream flows, other than as agreed herein.

7. To actively seek amendment of the CWSP and adoption of County ordinances that: a) require, in lieu of individual wells, connection of new individual/single family homes to public water systems where the proposed development is within the designated service area of existing utilities and timely and reasonable service is available; and b) limits the use of the 5,000 gallons per day exemption in those areas of the County experiencing inadequate Skagit River Basin Instream Flows that may be occurring as a result of groundwater withdrawals.

8. To seek funding sources to contribute: towards the development and implementation of long-term watershed management programs; towards the development of a coordinated water delivery system throughout the CWSP service area; and towards achieving the objectives of this Agreement. This provision does not supersede or in any way affect the City's financial commitment as set forth in Section IV. B.2.

C. The PUD agrees to the following:

1. The following certificates presently held, pending and new water right applications, and future claims or adjustments to water rights will be recognized and put to use by the PUD in accordance with the relative order of priorities set forth below.

a. PUD water rights subject to established Cultus Mountain Instream Flows, but not subject to established Lower Skagit River Instream Flows.

Document No.	Priority Date	Source	Maximum Appropriation cfs	mgd
Claim 9332	Pre-1917	Salmon Creek	1.80	1.16
Certificate 411	10/10/1929	Gilligan Creek	1.50	0.97
Certificate 724	10/30/1963	Gilligan Creek	7.39	4.77
Claim 9333	Pre-1917	Turner Creek	4.30	2.78
Certificate 739	10/30/1963	Turner Creek	6.20	4.01
Certificate 26	9/28/1917	Mundt Creek	2.50	1.62
Certificate 737	10/30/1963	Mundt Creek	8.00	5.17
Certificate 8738	1/16/94	Judy Reservoir	Storage	Storage
Certificate R-673	4/24/1963	Judy Reservoir	Storage	Storage
		Subtotal	31.69	20.48

b. PUD water rights not subject to established Lower Skagit River Instream Flows.

Document No.	Priority Date	Source	Maximum Appropriation cfs	mgd
Certificate 1904	3/26/1953	Sedro Woolley Well	2.00	1.29
Certificate 2107	5/12/1954	Ranney Well	8.90	5.75
Cultus Mountain Water Rights (See Section IV.C. 1 (a))			31.69	20.48
			42.59	27.52

c. Pending and new PUD Cultus Mountain water right applications subject to Cultus Mountain and Lower Skagit River Instream Flows.

The purpose of these pending and new applications is to make full use of the hydraulic capacity of existing collector lines. When the rights listed below are combined with rights Cultus Mountain streams listed in subsections a and b above, the total diversion will not exceed 35.8 mgd.

Document No.	Priority Date	Source	Maximum Appropriation cfs	mgd
18219 (pending)		Salmon Creek	4.00	2.59
25129 (pending)		Gilligan Creek	13.15	8.50
New		Turner Creek	6.60	4.27
New		Mundt Creek	16.06	10.38

d. New application partially not subject to Skagit River Instream Flows for proposed Skagit River pumping plant delivering water to Judy Reservoir.

The PUD's combined capacity of the gravity collector lines that presently supply Judy Reservoir is 55.39 cfs/35.80 mgd. The PUD is dependent on the ability to withdraw water from the streams, river, or combination of river and streams in the amount of 55.39 cfs/35.80 mgd when available. A new application for a water right will be filed on the Skagit River in the amount of 12.80 cfs/8.28 mgd. This application for 12.80 cfs/8.28 mgd, when combined with the water rights listed in subsection IV.C.1.a above (31.69 cfs/20.48 mgd) with the new point of diversion on the Skagit River and the existing Sedro-Woolley Well (2.0 cfs/1.29 mgd) and Ranny Well (8.90 cfs/5.75 mgd), both of which are to be transferred to the new pumping station, will result in a total water right of 55.39 cfs/35.80 mgd. Of this amount, 42.59 cfs/27.52 mgd is not subject to Lower Skagit River Instream Flows, and the remainder is subject to such flows.

e. The instream flows being developed on the Cultus Mountain streams through the completion of an IFIM Study will be recognized as a higher priority than the Cultus Mountain stream: 1) certificates and claims listed in Section IV.C.1.a; 2) pending and new water rights applications listed in Section IV.C.1.c.; and 3) future claims and adjustments.

f. Based on this Agreement, the PUD:

(1) will manage the Cultus Mountain supply to meet the jointly agreed upon Cultus Mountain Instream Flows;

(2) may periodically divert up to 35.80 mgd from the Cultus Mountain streams into Judy Reservoir subject to the Cultus Mountain Instream Flows;

(3) may provide for an additional point of diversion at the PUD Skagit River Pumping Station on each of the water rights listed in subsection IV.C.1.a above;

(4) may transfer the Ranney Well and Sedro Woolley well water right points of diversion to the new PUD Skagit River pumping station; and

(5) may periodically divert a maximum of 35.80 mgd from the Skagit River into Judy Reservoir as an alternate source of supply to the Cultus Mountain system as explained above, with 27.52 mgd of this amount not subject to Skagit River Instream Flows and 8.28 mgd subject to Skagit River Instream Flows; and/or.

(6) The PUD will continue investigations regarding instream flow needs on Salmon, Mundt, Gilligan, and Turner Creeks. Upon completion of these investigations and establishment of instream flows, the PUD will ensure the retroactive application of the instream flows to existing and pending PUD water rights related to Cultus Mountain streams. As a condition of this subordination of water rights, the PUD may: (1) utilize the full hydraulic

capacity of the existing collector lines to Judy Reservoir when water is available in excess of instream flow needs as outlined in IV.C.1.c above, and (2) provide a substitute and augmented supply from the Skagit River to meet the reductions that occur as a result of curtailment of withdrawals from Cultus Mountain streams due to instream flow needs.

g. The Agreement provides for changes to the water right documents identified in Section IV.C.1 herein as an element of this Agreement.

h. Those future claims or adjustments acquired by the PUD for service to parties within or outside the service areas defined in the CWSP, may be subject to results of state-of-the-art instream flow studies.

2. The PUD will participate in identifying instream flow needs through an IFIM instream flow study process. The City and PUD, with consultation from the Tribes, will fund and contract for the IFIM studies, which will apply only to the segment of the Skagit River described in subsection III.H.

a. The City, PUD, and any other parties that desire to assist with financing will fund and contract for the necessary studies to establish Lower Skagit River Instream Flows. The Tribe and WDFW will provide the fisheries and fisheries habitat management criteria for input into the IFIM Study and recommended Lower Skagit River Instream Flows.

b. The Parties will jointly develop the recommended instream flows using the Water Resources Forum process (Instream Flow Policy Working Draft, 8th Draft, Revised May 19, 1993) as a guide. The Tribal IFIM study input criteria will be limited to fisheries and fisheries habitat management and will not include other instream objectives. The Parties will utilize all appropriate methods to establish an agreed upon instream flow for managing the Skagit River below the PUD Pipeline Crossing, including mediation.

c. Schedules.

(1) The PUD agrees that the following events must occur within two years of the effective date of this Agreement: 1) the necessary Skagit River instream flow studies are completed; 2) the City, PUD, and Tribes agree on the recommended instream flows; and 3) the City, PUD, and Tribes submit jointly recommended instream flows to Ecology, or, if these parties cannot agree, in writing submit differing recommendations for Lower Skagit River Instream Flows to Ecology for its decision as to what to include in the rule proposal. This two-year schedule may only be extended by written agreement of the City, PUD, and Tribes. If these parties cannot agree to an extension, the PUD shall take all necessary actions to ensure that changes to existing water rights documents identified in section IV.C.1. shall not remain or become effective as further described in subsection (3) below.

The PUD may then remove any commitment of water service to the Tribal Reservations identified in subsection IV.C.(3) except as required under a separate contract.

(2) Upon receipt of either the joint or differing recommendations described in subsections IV.B.2.c. and IV.C.2.c. Ecology shall immediately file a Preproposal Statement of Inquiry (CR 101), indicating its intent to adopt Cultus Mountain Instream Flows and Lower Skagit River Instream Flows. Ecology shall seek to complete formal rulemaking by filing a CR 102 within eighteen (18) months of its receipt of the joint recommendation or deferment described in IV.B.2.c(1) and IV.C.2.c (1), with a goal of adopting final rules within two years of its receipt.

(3) If Lower Skagit River Instream Flows have not been established by the end of two years following Ecology's receipt of the recommendations described in subsection (1), the City, PUD, and Tribes may extend the deadline only by written agreement. If the City, PUD, and Tribes cannot agree to an extension, the PUD shall immediately request Ecology to rescind any water right change action that is submitted to Ecology since the Agreement became effective even if Ecology has taken final action. The City may immediately reapply for the change. The intent of this provision is to secure the Tribes' right to challenge these changes in the event that Lower Skagit River instrream flows are not established within the specified schedule.

d. In the event that Ecology approves the changes referred to in subsection IV.C.2.c(3) above, the PUD shall ensure that any water rights documents issued by Ecology that purport to effecturate these changes shall be expressly and clearly conditioned to require compliance with this Agreement. Regardless of whether Ecology so conditions the document(s), the PUD shall, by its own authority, enforce the conditions of this Agreement when using these water rights.

e. The PUD may, at its option, negotiate with upstream Skagit River dam operators for release of flows to maintain the agreed upon flow levels downstream from the PUD Pipeline Crossing.

3. To guarantee in perpetuity to the Upper Skagit Indian Tribal Community for non-discriminatory use by all residents within the Bow Hill Indian lands and the Upper Skagit Indian Reservation a water quantity of 0.75 mgd based on demands identified annually and projected for five and twenty years by the Upper Skagit Indian Tribal Community and based on amendment to the existing wholesale contract with the Upper Skagit Tribal Community. Government-owned and operated uses will be subject to conservation and curtailment programs for both the Reservation and off-Reservation water uses as outlined in Exhibit A, which is incorporated herein. Government-owned and operated economic development on the Reservation, such as the Tribe's gaming facilities, hotels, and similar facilities,

will be considered services that generate governmental revenue and will receive the second highest priority after residential domestic use. Similar government-owned and operated commercial services within the City's and PUD's service area will receive the same status.

4. The PUD agrees not to provide any water service to users or property located within the Swinomish Indian Reservation without prior written approval of the Swinomish Indian Tribal Community The PUD agrees not to provide any water service to users or property located on Upper Skagit Reservations or other Indian Lands at Bow Hill without the prior written approval of the Upper Skagit Indian Tribe.

5. To assist Ecology in the adoption of instream flow rules for the Lower Skagit River and Cultus Mountain streams within the time period set forth in subsection IV.C.2.c. of this Agreement.

6. To actively support and provide input at both a policy and technical level to County officials regarding implementation of Section 63 of the Growth Management Act, such that building permits will only be issued if there is an adequate potable supply of water that can be withdrawn from groundwater without impacting instream flows;

7. To actively seek amendment of the CWSP and adoption of County ordinances that require, in lieu of individual wells, connection of new individual/single family homes to public water systems where the proposed development is within the designated service area of existing utilities and timely and reasonable service is available. Also, to limit the use of the 5,000 gallons per day exemption in those areas of the County experiencing inadequate Skagit River Basin Instream Flows that may be occurring as a result of groundwater withdrawals.

8. To seek funding sources to contribute: towards the development and implementation of long-term watershed management programs; towards the development of a coordinated water delivery system throughout the CWSP service area; and towards achieving the objectives of this Agreement. This provision does not supersede or in any way affect the PUD's financial commitment as set forth in Section IV.C.2.

D. The County agrees to the following:

1. To implement Section 63 of the Growth Management Act, such that building permits will only be issued if the parcel is served by a public water system or if there is an adequate supply of potable water that can be withdrawn from groundwater without adversely impacting Skagit River Basin Instream Flows, other than as agreed herein;

2. To actively work with all parties to address the 5000 gallon permit exemption for all public water systems and for all individual water systems in those portions of Skagit County that are impacted by inadequate Skagit River Instream Flows that may be occurring as a result of surface or groundwater diversions. Skagit County

reserves the right to allow exempt wells for single family systems in the Skagit River Basin above the PUD Pipeline Crossing.

3. To seek amendment of the CWSP and related County implementing ordinances to require connection of new individual/single family homes to public water systems to achieve conservation of resources where the proposed development is within the designated service area of existing utilities and timely and reasonable service is available.

4. To assist Ecology in establishing instream flow rules for the Skagit River below the PUD Sedro Woolley Pipeline Crossing, with the goal of establishment within four years from the effective date of this Agreement.

5. To seek the goals of; (1) providing certainty and stability for water supplies for citizens of Skagit County; (2) to secure adequate streamflow for Ecology designated Low Flow Streams during critical periods to meet fisheries needs; (3) to encourage public water suppliers to provide water from the mainstem of the Skagit River for water users near Ecology Low Flow Streams where withdrawals may have direct impacts on in-stream resources; and (4) to evaluate, jointly with other parties, streams for possible designation by Ecology as Low-Flow Streams.

E. Ecology agrees to the following:

1. To process any City or PUD requests for changes identified in this Agreement, and to expressly and clearly condition any documents effectuating changes to existing rights to require compliance with this Agreement. Ecology agrees to seek to the extent possible, to enact all necessary rule and water right changes necessary to implement this Agreement;

2. Upon receipt of either the joint or differing recommendations described in subsections IV.B.2.c. (1) and IV.C.2.c.(1), Ecology shall immediately file a Preproposal Statement of Inquiry (CR 101), indicating its intent to adopt Cultus Mountain Instream Flows and Lower Skagit River Instream Flows. Ecology shall seek to complete formal rulemaking by filing a CR 102 within eighteen (18) months of its receipt of the joint recommendation or deferment described in IV.B.2.c(1) and IV.C.2.c (1), with a goal of adopting final rules within two years of its receipt; and

3. Until the adoption of Lower Skagit River and Cultus Mountain Instream Flows provides a framework for determining the availability of water for future appropriations, no final decisions will be made on any water right permit applications within that portion of the Skagit River Basin which lies within WRIA3 which could affect or be affected by those instream flows.

4. In signing this Agreement, Ecology is only obligated to take those actions set forth in this section and is not obligated by or agreeing to any other specific provisions of this Memorandum of Agreement.

F. The Department of Fish and Wildlife agrees to the following:

1. The Tribe and WDFW will provide the fisheries and fisheries habitat management criteria for input into the IFIM study and recommended Lower Skagit River Instream Flows.

2. WDFW will make a recommendation regarding the adequacy of the jointly developed recommended instream flow for Lower Skagit River Instream Flows to Ecology. WDFW's recommendation decision will be based upon the jointly developed recommendations consistency with the fisheries and fisheries habitat management criteria.

3. In the event that the parties cannot reach an agreement on jointly developed recommended instream flow for Lower Skagit River Instream Flows, WDFW will make a recommendation regarding the differing recommendations for Lower Skagit River Instream Flows to Ecology.

4. WDFW will provide appropriate technical support for developing recommended instream flows for the Cultus Mountain Streams.

5. WDFW is in no way obligated or bound by any other provision of the Memorandum of Agreement, except as outlined in the above four items.

G. All Parties agree to the following:

1. That the long term objective is to develop a comprehensive watershed management plan for the Skagit River Basin designed to manage the use of the water resources to meet both instream and out of stream objectives defined by the City, PUD and Tribes.

   a. To collaborate in investigating all alternatives so as to secure adequate flows to meet instream needs for portions of the Skagit River upstream from the PUD pipeline crossing at Sedro Woolley and out-of-stream needs within the surface areas defined within the CWSP. The Parties will establish a Skagit River Flow Management Committee (SRFMC) comprised, at a minimum, of representatives of signatories to this Agreement. This Committee will investigate alternatives towards securing adequate flows to meet instream and out-of-stream needs, design a study process for the Skagit River, and develop a management and monitoring plan to this end. The Parties anticipate completion of a management plan over a period of two to five years.

   b. To actively attempt to establish by rule, within a period beginning on the effective date of this Agreement and extending for five years, instream flows for the entire Skagit River Basin and its tributaries. The Parties agree to develop funding mechanisms to contribute to investigations that will establish these flows.

2. To reach agreement prior to expanding service areas beyond those identified in the CWSP. Such agreement will be based on evaluations of additional needs existing at the time, and after considering additional needs that may exist after the 50-year term of this Agreement. If the Parties cannot agree, then they may not seek or approve any changes relating to water quantity associated with the expansions of service areas for a period of 50 years from the effective date of this Agreement.

3. A work plan and budget for implementing this Agreement will be developed by the City and PUD in draft form within 60 days of the effective date of this Agreement. An adopted work plan and budget will be prepared by the City and PUD within six months of the effective date of this Agreement.

4. The Skagit River Flow Management Committee (SRFMC) shall be responsible for identifying and recommending studies and management responses, and in guiding the development, review, and approval of Skagit River Watershed Management strategies for the signators to this Agreement related to activities that have a measurable impact on the flow in the Skagit River while taking into consideration previously settled hydroelectric agreements. The objective of the instream flow studies is to establish a recommended flow upstream of the Sedro Woolley pipeline crossing for use in the SRFMC Management Plan. The signators to this Agreement agree to establish written response plans based on monthly climatic and flow criteria to help establish an appropriate management response as generally described below.

5. The parties recognize that there is a possibility that the City's 54.94 mgd and the PUD's 27.52 mgd recognized in this agreement as not subject to the Lower Skagit River Instream Flows may reduce Skagit River flows below the established flows. The attached Water Shortage Response Plan is incorporated by reference into this Agreement, and will be implemented in the event that this occurs.

6. No rights, claims, and adjustments identified in this agreement can be confirmed through this Agreement. Confirmation can only be done through an adjudicative process.

7. WDFW is in no way obligated or bound by any other provision of the Memorandum of Agreement, except as outlined in section IV.F.

V. GENERAL PROVISIONS

A. Duration. The term of this Agreement is 50 years from its effective date. The Agreement may only be amended or modified during the 50-year term by mutual written agreement of all signatories. The Agreement will extend beyond 50 years if all parties agree.

B. Severability. If any provision of this Agreement, or the application thereof to any person or circumstance, is found to be invalid or unenforceable, the remainder of the provisions of this Agreement, or the application of such provision to persons or circumstances other than those as to which it is found to be invalid or unenforceable, as the case may be, shall not be affected thereby.

C. Dispute Resolution. If a dispute arises between two or more parties concerning any provision of this Agreement, or application thereof, any such disputing party may send a written request to the other parties requesting a meeting, to be scheduled within 15 days of the parties' receipt of the request. The parties shall then meet together to discuss the dispute and attempt resolution.

D. Enforcement.

1. Between the City, PUD, and Tribes:

a) Notice of Failure. If any party(ies) ("Notifying Party") believes that another party (ies) is in violation of this Agreement or that a violation is threatened, the Notifying Party shall give written notice ("Notice") to the allegedly violating party (ies) of such violation and demand corrective action sufficient to cure the violation.

b) Failure to Respond. If the allegedly violating party (ies):

1. Fails to cure the violation within 30 days after receipt of the Notice; or

2. Under circumstances where the violation cannot be reasonably cured within the 30-day period, fails to begin curing such violation within the 30-day period; or

3. Fails to continue diligently curing such violation until it is finally cured; the Notifying Party may bring an action as provided in subsection c. of this Section.

c) Actions. The Notifying Party may bring an action at law or in equity in a court of competent jurisdiction: to enforce the terms of this Agreement; to enjoin the violation by temporary or permanent injunction; to recover any damages to which it may be entitled for violation of the terms of this Agreement; and to require restoration of resources (which includes, but is not limited to, water and fisheries) to the condition that existed prior to any such injury.

d) Nature of Remedy. The Notifying Party's rights under this Section apply equally in the event of actual or threatened violations of the terms of this Agreement. The Notifying Party may be entitled to injunctive relief in addition to such other relief, including specific performance of this Agreement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. The remedies described in this paragraph shall be cumulative and shall be in addition to all remedies now or hereafter existing in law or in equity.

e) Enforcement Discretion. Enforcement of the terms of this Agreement shall be at the discretion of each Party entitled to performance, and any forbearance by such party to exercise its rights under this Agreement in the event of any breach of any terms of this Agreement by another party

shall not be deemed or construed to be a waiver, laches, or estoppel of such rights. No delay or omission by a party in the exercise of any right or remedy upon breach shall impair such rights or remedy or be construed as waiver, laches, or estoppel.

2. By the City, PUD, and/or Tribes against Ecology.

a) The City, PUD, and Tribes agree to together take action to ensure, by all appropriate legal means necessary, that Ecology;

1) Does not take final action on any water rights-related applications, claims, or adjustments, submitted by any person or entity, in or in any way affecting the Skagit River basin, whether or not the person or entity is subject to this Agreement, until after Lower Skagit River and Cultus Mountain Instream Flows are established, other than those applications specifically set forth in Section IV E.1 of this Agreement; and

2) Acts expediently to establish Lower Skagit River and Cultus Mountain Instream Flows in order to meet the schedule established in this Agreement.

E. Rights Against Non-Parties. As to non-Parties to this Agreement, the Tribes, by signing this Agreement, in no way diminish, relinquish, or waive their respective legal rights, including but not limited to federal reserved water rights and treaty rights, in any administrative or judicial forum at any time.

F. Successors and Assigns. This Agreement shall be binding on the Parties and on their successors in interest and assigns.

G. No Third Party Beneficiaries. No third party is intended to, or shall have, any rights under this Agreement. The Parties intend that this Agreement be strictly between themselves, and therefore, only the Parties have any right to enforce this Agreement or any provision of this Agreement.

H. No Release of Third Parties. This Agreement is not intended by the Parties to act, nor shall it act, to release any third parties not named herein from any claims or liabilities whatsoever.

I. The parties recognize that there are significant and material considerations not specifically set forth in the Agreement that make the relationship of the parties hereto unique. Because of the unique situation herein, it is the express intent and purpose of the parties that this Agreement not be viewed nor provide precedent beyond the express scope and purpose herein. Therefore, it is agreed between the parties that they will not use this Agreement as precedent outside the Agreement nor should anyone not a party hereto attempt to use the Agreement as precedent against any of the parties.

J. Headings Not Controlling. The headings in this Agreement are for convenience and reference only, and are not part of this Agreement, and in no way amplify, define, limit, or describe the scope or intent of this Agreement.

Attachments: Exhibit A - Water Shortage Response Plan, 7 pages

SIGNED:

N. Dean Maxwell Date: 9-9-96
Dean Maxwell
Mayor, City of Anacortes

James P. Kirkpatrick Date: 9-25-96
James P. Kirkpatrick
General Manager
Public Utility District #1 of Skagit County

_____ Date: _____
Ted W. Anderson, Chair
Skagit County Commissioner

Robert R. Hart Date: 12/23/96
Robert R. Hart
Skagit County Commissioner

O. Harvey Wolden Date: 12/23/96
O. Harvey Wolden
Skagit County Commissioner

Floyd Williams Date: 9/16/96
Floyd Williams
Chairman, Upper Skagit Indian Tribe

Wa Walton Date: 9-12-96
Wa Walton
Robert Joe, Sr., Chairman
Swinomish Indian Tribal Senate

James D Roberts Date: 9-19-96
James Delano Roberts
Chairman, Sauk-Suiattle Indian Tribe

Mary Riveland Date: 9-26-96
Mary Riveland
Director, Department of Ecology

Bernard Shanks Date: 10/1/96
Bernard Shanks
Director, Department of Fish & Wildlife

EXHIBIT A
WATER SHORTAGE RESPONSE PLAN
to the
MEMORANDUM OF AGREEMENT
REGARDING UTILIZATION OF SKAGIT RIVER BASIN
WATER RESOURCES FOR INSTREAM AND OUT OF STREAM PURPOSES

I. PURPOSE OF THIS EXHIBIT

The purpose of this Exhibit is to outline a plan of action by the City, the PUD, and their customers, to reduce the possible impact the City and PUD diversions may have on the recommended Instream Flows for the Lower Skagit River.

II. DEFINITIONS

For the purpose of this Agreement, the following shall mean:

A. Commercial/Industrial Customers: Includes, but is not limited to, manufacturing, food processing, restaurant, sales, service, farm operations.

B. Discretionary Water Use: Water use which is not required for business operations or for general health and safety of the user; usually pertains to outside water use during warmer periods of the year (lawn/flower watering, car washing, washing driveways/sidewalks, etc.).

C. Governmental Customers: Governmental entities, including, but not limited to: Water-related and other City facility operations in the case of the City; water-related facility operations in the case of the PUD; gaming and other fund-raising operations in the case of the Tribes; schools, parks, administrative operations in the case of other governmental agencies.

D. Irrigation Use: the application of water to promote botanical development, whether at a residence or a commercial business.

E. Public Service Announcement (PSA): a media advertisement intended to inform the public in general, whether through television, newspaper or radio mediums.

F. PUD Pipeline Crossing: The location in Sec. 29, Twp. 35N., Rge.5 E.W.M., where the PUD water transmission main crosses the Skagit River. For purposes of determining Skagit River flows at this location, flows measured and recorded at the U.S. Geological Survey Gaging Station No. 12200500 (Skagit River near Mount Vernon) will be utilized.

G. Residential Customers: Single family or multifamily domestic water users.

H. Wholesale Customer: A customer who resells the water for commercial/industrial or residential use.

III. ACTION PLAN

The City and PUD will monitor the flow in the Skagit River at the PUD Pipeline Crossing. If the flow in the Skagit River is projected to fall below the State Department of Ecology Instream Flow Level, the City and PUD will initiate the Response Plan as outlined in the following matrix.

Each Action Level indicated in the matrix outlines specific actions by the City and PUD depending on the anticipated low flow condition in the Skagit River. The durations indicated in the matrix are the anticipated period of the specified flow condition. The duration for an action level will start when the Skagit River flows drop low enough to first meet that Action Level's definition and stop when the flows increase to no longer meet that definition; a higher Action Level can start and stop as needed, and the duration of the lower Action Level will still be calculated based on its original start date.

ACTION LEVEL	DURATION		
	1 to 2 Days	3 to 14 Days	15 Days or More
I Alert Phase	Action I.1	Action I.2	Action I.3
II Management Phase	Action II.1	Action II.2	Action II.3

A. ACTION LEVELS

The Skagit River Flow Management Committee (SRFMC) will meet in May of each year to review the projected stream flows and to identify possible management strategies to meet the collective water needs of the participants. The SRFMC will also outline the proposed Water Response Plan based on the guidelines outlined in this document and for the two Action Levels.

1. Throughout Action Levels I and II as defined below, the City and PUD will coordinate the execution of the following:

   a) Monitor water supply forecasts provided by State and federal agencies and dam operators. Stream flow projections identified in sections III.4.2 and III.4.3 of this Response Plan shall be based on these forecasts.

   b) Establish and maintain regular communications with upstream dam operators in the Skagit River Basin to track planned water releases, with the explicit motive of increasing releases to help maintain minimum Lower Skagit River Instream Flows. Monitor the current operating rule curves used for up-ramping and down-ramping for each dam and establish communications and protocol for those

situations when the City and PUD may request additional releases to augment projected deficiencies below the PUD Pipeline Crossing.

The upstream dam operators will be asked to determine the level of flow augmentation they can provide and to document their intent to provide such flow augmentation, or to provide timely notice if they cannot deliver such augmentation.

c) Establish and maintain regular communications with the Tribes' fisheries manager(s) regarding actual Skagit River flows relative to Lower Skagit River Instream Flows; and seek to coordinate water withdrawal patterns of the City and the PUD with projected fish passage patterns.

2. Action Level I, Alert Phase. Applies when flow in the Skagit River is projected to reach the Lower Skagit River Instream Flow level plus 20 percent or at an alternative level defined at the annual SRFMC meeting and as measured at the PUD Pipeline Crossing in Sedro-Wooley.

The City and the PUD will execute the following action(s) during the Alert Phase for the duration of the action level indicated:

a) Action I.1 (1 to 2-day duration):

(1) No change in water withdrawal/treatment plant operations.

(2) The PUD will evaluate the flow conditions in their Cultus Mountain project for the period(s) of low flow and will implement a program to maximize storage in Judy Reservoir. The PUD will also use peaking flows from up- and down-ramping at the upstream dams in the Skagit River to keep Judy Reservoir full.

(3) On behalf of the SRFMC, outline the route of flows from the upstream Skagit River dams downstream to the PUD pipeline crossing using the upstream dam operating rule curves, projected flows from the intervening areas, historical records of streamflows at the upstream gaging stations, and standard routing procedures.

(4) Prepare PSA #1[1].

b) Action I.2 (3 to 14 days duration):

[1] Seek voluntary 10 percent water use reduction in peak day use.

(1) No change in water withdrawal/treatment plant operations.

(2) The PUD will continue its program to maximize storage in Judy Reservoir.

(3) Promote a program of voluntary water use reduction by all City and PUD water customers, with a goal of ten percent (10%) reduction in peak day demand.

(4) Issue PSA #1 to newspaper and radio media requesting voluntary reduction of discretionary use of water.

(5) In conjunction with the Tribes, monitor and evaluate critical elements of the Lower Skagit River Instream Flows against planned and projected fisheries and habitat management plans for the period(s) of projected low flow. Elements of the Lower Skagit River Instream Flow to be evaluated include: the projected timing of use and passage of fish through the reach of the Skagit River downstream of the PUD river crossing; a comparison of routed flows (provided by the City and PUD) with flows required by the Instream Flow; and the effects of the routed flows on habitat conditions existing or projected to exist during the low flow period(s). Results of the Lower Skagit River Instream Flow critical elements monitoring and evaluation will be provided by the City and PUD.

(6) The City and PUD will develop/refine a "Contingency Plan of Operation" for the period(s) of low flow using: the routed flows from the upstream reaches of the Skagit River; maximized storage in Judy Reservoir; results from the Instream Flow monitoring and evaluation assessment; estimates of water savings from voluntary water use reduction program(s); and weather and water supply forecasts for the Skagit River Basin. The "Contingency Plan of Operation" will provide for conjunctive use of the PUD's Cultus Mountain Project and the City's and PUD's Skagit River facilities. The "Contingency Plan of Operation" will optimize the PUD's use of water from Judy Reservoir during periods when demands exceed available withdrawals from the City's and PUD's Skagit River facilities and the PUD's Cultus Mountain project due to established instream flows on those water courses.

c) Action I.3 (15 days or more duration):

(1) No change in water withdrawal/treatment plant operations.

(2) The PUD will continue its program to maximize storage in Judy Reservoir.

(3) Continue a program of voluntary water use reduction by all City and PUD water customers, with a goal of ten percent (10%) reduction in peak day demand.

(4) Continue to refine the "Contingency Plan of Operations" based on additional streamflow information and City and PUD customer demand information.

(5) Continue PSA #1 by newspaper and radio media.

3. Action Level II, Management Phase. Applies when flow in the Skagit River falls below the established Lower Skagit River Instream Flow levels, measured at the PUD Pipeline Crossing in Sedro-Wooley and continues until the flows either meet or exceed the regulated instream flow levels.

The City and the PUD will execute the following action(s) during the Management Phase for the duration of the action level indicated:

a) Action II.1 (1 to 2 day duration):

(1) Limit water withdrawals to quantities exempt (125.59 cfs/82.46 mgd) from Lower Skagit River Instream Flows.

(2) The PUD will continue its program to maximize storage in Judy Reservoir.

(3) Implement the "Contingency Plan of Operation". Continue to refine the "Contingency Plan of Operation" based on additional streamflow information and City and PUD customer demand information.

(4) Notify the upstream Skagit River dam operators of the downstream flow situation and seek additional releases, if possible, if the situation continues.

(5) Continue PSA #1 by newspaper and radio media.

(6) Prepare PSA #2[2] with a program to voluntarily reduce water demand to meet instream flows.

[2] Mandatory restrictions for discretionary exterior water use to limit diversion to 125.59 cfs/82.46 mgd.

b) Action II.2 (3 to 14 day duration):

(1) Limit water withdrawals to quantities exempt (125.59 cfs/82.46 mgd) from Lower Skagit River Instream Flows and seek voluntary reduction in demand.

(2) The PUD will continue its program to maximize storage in Judy Reservoir.

(3) Continue implementation of the "Contingency Plan of Operation". Continue to refine the "Contingency Plan of Operation" based on additional streamflow information and City and PUD customer demand information.

(4) Request the upstream Skagit River dam operators to commence additional releases. Such additional releases should be timed to realize the effect of the release at the PUD Pipeline Crossing at the time of projected deficient streamflow. The City and PUD will base their request(s) on established routing procedures.

(5) Issue PSA #2 to newspaper and radio media.

c) Action II.3 (15 days or more duration):

(1) Limit water withdrawals to quantities exempt (125.59 cfs/82.46 mgd) from Lower Skagit River Instream Flows and peek voluntary reduction in demand to meet instream flows.

(2) The PUD will continue its program to maximize storage in Judy Reservoir.

(3) Continue implementation of the "Contingency Plan of Operation". Continue to refine the "Contingency Plan of Operation" based on additional streamflow information and City and PUD customer demand information.

(4) Continue to request the upstream Skagit River dam operator to continue additional releases.

(5) Continue PSA #2 by newspaper and radio media.

PUBLIC SERVICE ANNOUNCEMENTS
(Subjects Only)

PSA #1 Alert Phase

- ❑ Seek voluntary 10 percent water use reduction with a focus on discretionary outside use of water.

PSA #2 Management Phase

- ❑ Mandatory restrictions for discretionary exterior water use to limit diversion to 125.59 cfs/82.46 mgd and voluntary reduction in demand to seek to meet the instream flows. The voluntary reduction program may include the following:

  - Restriction on commercial/industrial/residential irrigation.
  - Reduction in peak day water use by all commercial/industrial customers, including restaurants, on the City and PUD systems.
  - Reduction in peak day water use by all residential customers on the City and PUD systems.

- ❑ As the City and PUD demand approaches the out of stream diversion limit of 125.59 during low flow conditions, the use reduction program will include:

  - Mandatory restriction of governmental/commercial/industrial/residential irrigation activities from City and PUD systems, including farms.
  - Prohibition of car washing operations at commercial/residential sites.
  - Reduction in peak day water use by all commercial/industrial customers, including restaurants, on the City and PUD systems.

Reduction in peak day water use by all residential customers on the City and PUD systems.

ADDENDUM NO. 1

TO MEMORANDUM OF AGREEMENT REGARDING UTILIZATION OF SKAGIT RIVER BASIN WATER RESOURCES FOR INSTREAM AND OUT OF STREAM PURPOSES

This Addendum No. 1 is an agreement made on May 15, 1998, by and between the undersigned parties (the "Addendum"), and is an addendum to the "Memorandum Of Agreement Regarding Utilization Of Skagit River Basin Water Resources For Instream And Out Of Stream Purposes" (the "MOA") previously executed between the parties in the fall (September, October and December) of 1996. The undersigned parties agree as follows.

1. This Addendum sets forth the "agreed upon Cultus Mountain Instream Flows" referred to in Section IV.C.f.(1) of the MOA. Definitions contained in the MOA apply to this Addendum.

2. The parties agree that the instream flows for Salmon, Turner, Mundt and Gilligan Creeks set forth on the attached table, which was prepared by Cascade Environmental Services, Inc. and provided to the parties by letter dated January 9, 1998, shall be the minimum flows that will be allowed to pass the PUD diversions on these streams.

3. Pursuant to Section IV.C.f.(6) of the MOA, Skagit PUD water rights will be amended to include the instream flow limitations contained in this Addendum as part of Skagit PUD's water rights.

4. The parties to this Addendum, with the exception of the Washington Department of Ecology, will work cooperatively to establish the instream flows set forth on the attached table as Ecology regulations through Ecology's administrative rulemaking process.

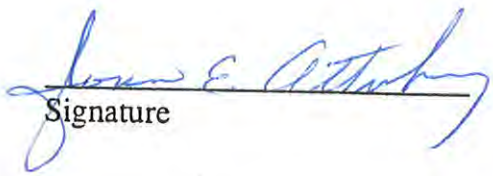
5. Any existing and pending PUD water rights, and any future water rights granted for additional diversion(s), will be based upon and subject to the provisions of this Addendum.

6. This Addendum has been executed on duplicate originals, which shall have the same effect as if all parties had executed the same document.

Each of the undersigned parties has executed a duplicate original of this Addendum on the date set forth below.

Jones E. Atterberry, President & Commissioner
Name (Please Print)

PUD #1 of Skagit County
Affiliation


Signature

November 17, 1998
Date

Attachment To Addendum No. 1
Of Skagit River Basin MOA

Table Instream Flows Required for Skagit PUD # 1 Diversions
Agreement reached in Agency Meeting October 6, 1997

Mundt Creek Stream Flows
Required at Diversion (RM 3.4)

Month	Flows (CFS)
October	7.6
November	9.4
December	9.4
January	6.4
February	6.4
March 1-15	6.4
March 16-31	9.4
April	9.4
May	9.4
June	9.4
July	7.6
August	7.6
September	7.6

Salmon Creek Stream Flows
Required at Diversion (RM 4.3)

Month	Flows (CFS)
October	4.0
November	4.0
December	4.0
January	4.0
February	4.0
March	4.0
April	4.0
May	1.4
June	1.4
July	1.4
August	1.4
September	4.0

Turner Creek Stream Flows
Required at Diversion (RM 4.2)

Month	Flows (CFS)
October	7.9
November	7.9
December	7.9
January	7.9
February	5.4
March	5.4
April	7.9
May	7.9
June	4.9
July	4.9
August	4.9
September	4.9

Gilligan Creek Stream Flows
Required at Diversion (RM 3.2)

Month	Flows (CFS)
October	23.8
November	27.7
December	27.7
January	19.8
February	19.8
March 1-15	19.8
March 16-31	27.7
April	31.7
May	31.7
June	31.7
July	39.6
August	39.6
September	39.6

ADDENDUM NO. 1

TO MEMORANDUM OF AGREEMENT REGARDING UTILIZATION OF SKAGIT RIVER BASIN WATER RESOURCES FOR INSTREAM AND OUT OF STREAM PURPOSES

This Addendum No. 1 is an agreement made on May 15, 1998, by and between the undersigned parties (the "Addendum"), and is an addendum to the "Memorandum Of Agreement Regarding Utilization Of Skagit River Basin Water Resources For Instream And Out Of Stream Purposes" (the "MOA") previously executed between the parties in the fall (September, October and December) of 1996. The undersigned parties agree as follows.

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BRIAN CLADOSBY
Name (Please Print)

SWINOMISH TRIBE
Affiliation

Brian Cladosby
Signature

Sept 24, 1998
Date

Attachment To Addendum No. 1
Of Skagit River Basin MOA

Table Instream Flows Required for Skagit PUD # 1 Diversions
Agreement reached in Agency Meeting October 6, 1997

Mundt Creek Stream Flows
Required at Diversion (RM 3.4)

Month	Flows (CFS)
October	7.6
November	9.4
December	9.4
January	6.4
February	6.4
March 1-15	6.4
March 16-31	9.4
April	9.4
May	9.4
June	9.4
July	7.6
August	7.6
September	7.6

Salmon Creek Stream Flows
Required at Diversion (RM 4.3)

Month	Flows (CFS)
October	4.0
November	4.0
December	4.0
January	4.0
February	4.0
March	4.0
April	4.0
May	1.4
June	1.4
July	1.4
August	1.4
September	4.0

Turner Creek Stream Flows
Required at Diversion (RM 4.2)

Month	Flows (CFS)
October	7.9
November	7.9
December	7.9
January	7.9
February	5.4
March	5.4
April	7.9
May	7.9
June	4.9
July	4.9
August	4.9
September	4.9

Gilligan Creek Stream Flows
Required at Diversion (RM 3.2)

Month	Flows (CFS)
October	23.8
November	27.7
December	27.7
January	19.8
February	19.8
March 1-15	19.8
March 16-31	27.7
April	31.7
May	31.7
June	31.7
July	39.6
August	39.6
September	39.6

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James Lawrence Joseph
Name (Please Print)

James L Joseph
Signature

Suquamish Tribe
Affiliation

9/11/98
Date

Attachment To Addendum No. 1
Of Skagit River Basin MOA

Table Instream Flows Required for Skagit PUD # 1 Diversions
Agreement reached in Agency Meeting October 6, 1997

Mundt Creek Stream Flows
Required at Diversion (RM 3.4)

Month	Flows (CFS)
October	7.6
November	9.4
December	9.4
January	6.4
February	6.4
March 1-15	6.4
March 16-31	9.4
April	9.4
May	9.4
June	9.4
July	7.6
August	7.6
September	7.6

Salmon Creek Stream Flows
Required at Diversion (RM 4.3)

Month	Flows (CFS)
October	4.0
November	4.0
December	4.0
January	4.0
February	4.0
March	4.0
April	4.0
May	1.4
June	1.4
July	1.4
August	1.4
September	4.0

Turner Creek Stream Flows
Required at Diversion (RM 4.2)

Month	Flows (CFS)
October	7.9
November	7.9
December	7.9
January	7.9
February	5.4
March	5.4
April	7.9
May	7.9
June	4.9
July	4.9
August	4.9
September	4.9

Gilligan Creek Stream Flows
Required at Diversion (RM 3.2)

Month	Flows (CFS)
October	23.8
November	27.7
December	27.7
January	19.8
February	19.8
March 1-15	19.8
March 16-31	27.7
April	31.7
May	31.7
June	31.7
July	39.6
August	39.6
September	39.6

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Floyd Williams
Name (Please Print)

Upper Skagit Indian Tribe, Chairman
Affiliation

Floyd Williams
Signature

10/30/98
Date

Attachment To Addendum No. 1
Of Skagit River Basin MOA

Table Instream Flows Required for Skagit PUD # 1 Diversions
Agreement reached in Agency Meeting October 6, 1997

Mundt Creek Stream Flows
Required at Diversion (RM 3.4)

Month	Flows (CFS)
October	7.6
November	9.4
December	9.4
January	6.4
February	6.4
March 1-15	6.4
March 16-31	9.4
April	9.4
May	9.4
June	9.4
July	7.6
August	7.6
September	7.6

Salmon Creek Stream Flows
Required at Diversion (RM 4.3)

Month	Flows (CFS)
October	4.0
November	4.0
December	4.0
January	4.0
February	4.0
March	4.0
April	4.0
May	1.4
June	1.4
July	1.4
August	1.4
September	4.0

Turner Creek Stream Flows
Required at Diversion (RM 4.2)

Month	Flows (CFS)
October	7.9
November	7.9
December	7.9
January	7.9
February	5.4
March	5.4
April	7.9
May	7.9
June	4.9
July	4.9
August	4.9
September	4.9

Gilligan Creek Stream Flows
Required at Diversion (RM 3.2)

Month	Flows (CFS)
October	23.8
November	27.7
December	27.7
January	19.8
February	19.8
March 1-15	19.8
March 16-31	27.7
April	31.7
May	31.7
June	31.7
July	39.6
August	39.6
September	39.6

APPENDIX I

SOURCE AND STORAGE ANALYSES

SOURCE ANALYSES

Evaluation of Source Adequacy for the Skagit Valley Floor Zone (214' HGL) - 214C County, 214D Mount Vernon, 214F South Mount Vernon and Fir Island Zone (195' HGL)				
	Year			
	2014	2019	2033	Max[17]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	12,931	13,454	15,410	258,327
Average Day Demand (gpd)	2,072,886	2,156,672	2,470,289	41,410,405
Maximum Day Demand (gpd)	3,586,093	3,731,042	4,273,600	71,640,000
Available Existing Source (gpd)				
PRV Station at College Way & Monte Vista[2]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at 18th Street & Kulshan[3]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at 9th Street & Kulshan[4]	8,856,000	8,856,000	8,856,000	8,856,000
PRV Station at 9th Street & William Way[5]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at 9th Street & Highland (Tank)[6]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at 9th Street & Highland (Tank Bypass)[7]	8,856,000	8,856,000	8,856,000	8,856,000
PRV Station at Kulshan View[8]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at College Way & Laventure[9]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Hoag & Laventure[10]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Sandlewood & N. 18th Place[11]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at Blodgett[12]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Blodgett & Anderson[13]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Blodgett & Redhawk[14]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Hickox & Burkland[15]	3,240,000	3,240,000	3,240,000	3,240,000
Source Surplus/(Deficiency) (gpd)[16]	**68,053,907**	**67,908,958**	**67,366,400**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at College and Monte Vista has a 8" PRV with a maximum flow rate of 3,900 gpm
3. The PRV Station at 18th and Kulshan has a 4" PRV with a maximum flow rate of 1,000 gpm
4. The PRV Station at 9th and Kulshan has a 10" PRV with a maximum flow rate of 6,150 gpm
5. The PRV Station at 9th and William Way has a 6" PRV with a maximum flow rate of 2,250 gpm
6. The PRV Station at 9th and Highland Tank has a 12" PRV with a maximum flow rate of 8,600 gpm
7. The PRV Station at 9th and Highland Bypass has a 10" PRV with a maximum flow rate of 6,150 gpm
8. The PRV Station at Kulshan View has a 8" PRV with a maximum flow rate of 3,900 gpm
9. The PRV Station at College andLaventure has a 8" PRV with a maximum flow rate of 3,900 gpm
10. The PRV Station at Hoag and Laventure has a 6" PRV with a maximum flow rate of 2,250 gpm
11. The PRV Station at 18th and Sandlewood has a 4" PRV with a maximum flow rate of 1,000 gpm
12. The PRV Station at Blodgett has a 6" PRV with a maximum flow rate of 2,250 gpm
13. The PRV Station at Blodgett and Anderson has a 6" PRV with a maximum flow rate of 2,250 gpm
14. The PRV Station at Blodgett and Redhawk has a 8" PRV with a maximum flow rate of 3,900 gpm
15. The PRV Station at Hickox and Burkland has a 6" PRV with a maximum flow rate of 2,250 gpm
16. Calculation based on Maximum Day Demand.
17. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Skagit Valley Floor Zone (214'HGL) - 214A Burlington, 214E Custer				
	Year			
	2014	2019	2033	Max[11]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	9,218	9,591	10,986	76,590
Average Day Demand (gpd)	1,477,713	1,537,442	1,761,012	12,277,457
Maximum Day Demand (gpd)	2,556,444	2,659,774	3,046,552	21,240,000
Available Existing Source (gpd)				
PRV Station at Rhodes Road[5]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at Cook Road & Old 99[8]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at North Hill Blvd[9]	5,616,000	5,616,000	5,616,000	5,616,000
Source Surplus/(Deficiency) (gpd)[10]	**18,683,556**	**18,580,226**	**18,193,448**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Dukes Hill has a 6" PRV with a maximum flow rate of 2,250 gpm
3. The PRV Station at SR9 and Marie Place has a 8" PRV with a maximum flow rate of 3,900 gpm
4. The PRV Station at SR20 and Fruitdale Road has a 6" PRV with a maximum flow rate of 2,250 gpm
5. The PRV Station at Rhodes Road has a 12" PRV with a maximum flow rate of 8,600 gpm
6. The PRV Station at First and Nelson has a 12" PRV with a maximum flow rate of 8,600 gpm
7. The PRV Station at Township and Dunlap has a 8" PRV with a maximum flow rate of 3,900 gpm
8. The PRV Station at Cook Road and Old 99 has a 6" PRV with a maximum flow rate of 2,250 gpm
9. The PRV Station at North Hill Blvd has a 8" PRV with a maximum flow rate of 3,900 gpm
10. Calculation based on Maximum Day Demand.
11. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Skagit Valley Floor Zone (214' HGL) - 214B Sedro Woolley				
	Year			
	2014	2019	2033	Max[11]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	5,431	5,651	6,473	108,523
Average Day Demand (gpd)	870,674	905,866	1,037,595	17,396,532
Maximum Day Demand (gpd)	1,506,266	1,567,149	1,795,039	30,096,000
Available Existing Source (gpd)				
PRV Station at Dukes Hill[2]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at SR9 & Marie Place[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at SR20 & Fruitdale Road[4]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at First & Nelson[6]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at Township & Dunlap[7]	5,616,000	5,616,000	5,616,000	5,616,000
Source Surplus/(Deficiency) (gpd)[10]	**28,589,734**	**28,528,851**	**28,300,961**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Dukes Hill has a 6" PRV with a maximum flow rate of 2,250 gpm
3. The PRV Station at SR9 and Marie Place has a 8" PRV with a maximum flow rate of 3,900 gpm
4. The PRV Station at SR20 and Fruitdale Road has a 6" PRV with a maximum flow rate of 2,250 gpm
5. The PRV Station at Rhodes Road has a 12" PRV with a maximum flow rate of 8,600 gpm
6. The PRV Station at First and Nelson has a 12" PRV with a maximum flow rate of 8,600 gpm
7. The PRV Station at Township and Dunlap has a 8" PRV with a maximum flow rate of 3,900 gpm
8. The PRV Station at Cook Road and Old 99 has a 6" PRV with a maximum flow rate of 2,250 gpm
9. The PRV Station at North Hill Blvd has a 8" PRV with a maximum flow rate of 3,900 gpm
10. Calculation based on Maximum Day Demand.
11. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Bay View Ridge Zones (230', 270' and 290' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	3,747	3,898	4,465	20,251
Average Day Demand (gpd)	600,596	624,872	715,739	3,246,243
Maximum Day Demand (gpd)	1,039,031	1,081,029	1,238,229	5,616,000
Available Existing Source (gpd)				
PRV Station at Higgins Airport Way[2]	5,616,000	5,616,000	5,616,000	5,616,000
Source Surplus/(Deficiency) (gpd)[3]	**4,576,969**	**4,534,971**	**4,377,771**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Higgins Airport Way and Josh Wilson Road has an 8" PRV with a maximum flow rate of 3,900 gpm
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Clear Lake North Zone (284' HGL)				
	Year			
	2014	2019	2033	Max[6]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	300	313	358	24,716
Average Day Demand (gpd)	48,158	50,105	57,391	3,962,081
Maximum Day Demand (gpd)	83,314	86,681	99,286	6,854,400
Available Existing Source (gpd)				
PRV Station at Front Street and Beaver Lake[2]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Buchanan Street and Magnolia[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Buchanan Street and Maple[4]	374,400	374,400	374,400	374,400
Source Surplus/(Deficiency) (gpd)[5]	**6,771,086**	**6,767,719**	**6,755,114**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Front and Beaver Lake has a 6" PRV with a maximum flow rate of 2,250 gpm from the 365' HGL zone.
3. The PRV Station at Buchanan and Magnolia has a 6" PRV with a maximum flow rate of 2,250 gpm from the 365' HGL zone.
4. The PRV Station at Buchanan and Maple has a 2" PRV with a maximum flow rate of 260 gpm from the 365' HGL zone.
5. Calculation based on Maximum Day Demand.
6. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the 322A and 322B Mount Vernon (322' HGL), and Conway (220' HGL) Zones				
	Year			
	2014	2019	2033	Max[10]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	7,350	7,647	8,759	68,645
Average Day Demand (gpd)	1,178,167	1,225,788	1,404,038	11,003,931
Maximum Day Demand (gpd)	2,038,228	2,120,613	2,428,986	19,036,800
Available Existing Source (gpd)				
PRV Station at Waugh Road & Seneca[2]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at LaVenture Road & Kulshan[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at 18th Street & Kulshan[4]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at 9th Street & Evergreen[5]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Little Mountain Reservoir[6]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Section and LaVenture[7]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Skyridge Drive[8]	820,800	820,800	820,800	820,800
Source Surplus/(Deficiency) (gpd)[9]	**16,998,572**	**16,916,187**	**16,607,814**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Waugh Road has a 4" PRV with a maximum flow rate of 1,000 gpm from the 459' HGL zone.
3. The PRV Station at LaVenture Road has a 8" PRV with a maximum flow rate of 3,900 gpm from the 459' HGL zone
4. The PRV Station at 18th Street has a 4" PRV with a maximum flow rate of 1,000 gpm from the 459' HGL zone
5 The PRV Station at 9th Street has a 6" PRV with a maximum flow rate of 2,250 gpm from the 459' HGL zone
6 The PRV Station at Little Mountain Reservoir has a 6" PRV with a maximum flow rate of 2,250 gpm from the 463' HGL zone
7 The PRV Station at Section and LaVenture has a 6" PRV with a maximum flow rate of 2,250 gpm from the 420' HGL zone
8 The PRV Station at Skyridge Drive has a 3" PRV with a maximum flow rate of 570 gpm from the 463' HGL zone
9 Calculation based on Maximum Day Demand.
10 Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the 322C Cascade Ridge 1 Zone (322' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	31	32	37	195
Average Day Demand (gpd)	4,915	5,113	5,857	31,214
Maximum Day Demand (gpd)	8,502	8,846	10,132	54,000
Available Existing Source (gpd)				
Cascade Ridge #1 Booster Station (50 gpm)[2]	54,000	54,000	54,000	54,000
Source Surplus/(Deficiency) (gpd)[3]	**45,498**	**45,154**	**43,868**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains one pump, capable of pumping 50 gpm. It is assumed the pump is running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Sedro Woolley Zone (350' HGL)				
	Year			
	2014	2019	2033	Max[6]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	580	603	691	45,694
Average Day Demand (gpd)	92,937	96,694	110,755	7,324,855
Maximum Day Demand (gpd)	160,782	167,281	191,606	12,672,000
Available Existing Source (gpd)				
PRV Station at Fruitdale Road & Portabello[2]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Bassett Road & SR9[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Bassett Road & Longtime Lane[4]	1,440,000	1,440,000	1,440,000	1,440,000
Source Surplus/(Deficiency) (gpd)[5]	**12,511,218**	**12,504,719**	**12,480,394**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Fruitdale and Portabello has a 3" PRV and an 8" PRV with a maximum flow rate of 3,900 gpm from the 459' zone to the 350' zone.
3. The PRV Station at Bassett Road and Longtime Lane has a 1.5" PRV and a 4" PRV with a maximum flow rate of 1,000 gpm. From the 459' zone to the 350' zone
4. The PRV Station at Bassett Road and SR9 has 2", 3" and 8" PRVs with a maximum flow rate of 3,900 gpm from the 459' zone to the 350' zone.
5. Calculation based on Maximum Day Demand.
6. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the 356A Clear Lake South and Big Lake Zones (356' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	817	850	973	11,683
Average Day Demand (gpd)	130,906	136,197	156,002	1,872,832
Maximum Day Demand (gpd)	226,467	235,620	269,884	3,240,000
Available Existing Source (gpd)				
PRV Station at Beaver Lake Road[2]	3,240,000	3,240,000	3,240,000	3,240,000
Source Surplus/(Deficiency) (gpd)[3]	**3,013,533**	**3,004,380**	**2,970,116**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Beaver Lake Road has a 2" PRV and a 6" PRV with a maximum flow rate of 2,250 gpm
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Southwest Clear Lake Zone (365' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	176	183	209	11,683
Average Day Demand (gpd)	28,178	29,317	33,581	1,872,832
Maximum Day Demand (gpd)	48,748	50,719	58,094	3,240,000
Available Existing Source (gpd)				
PRV Station at Beaver Lake Road[2]	3,240,000	3,240,000	3,240,000	3,240,000
Source Surplus/(Deficiency) (gpd)[3]	**3,191,252**	**3,189,281**	**3,181,906**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Beaver Lake Road has a 2" PRV and a 6" PRV with a maximum flow rate of 2,250 gpm
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Hermway Heights Zone (412' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	91	94	108	234
Average Day Demand (gpd)	14,518	15,105	17,301	37,457
Maximum Day Demand (gpd)	25,116	26,131	29,931	64,800
Available Existing Source (gpd)				
Bulson Booster Station (60 gpm)[2]	64,800	64,800	64,800	64,800
Source Surplus/(Deficiency) (gpd)[3]	**39,684**	**38,669**	**34,869**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains one pump capable of pumping 60 gpm. It is assumed pump station is running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Hoogdal Zone (430' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	80	83	95	9,347
Average Day Demand (gpd)	12,812	13,330	15,268	1,498,266
Maximum Day Demand (gpd)	22,165	23,061	26,414	2,592,000
Available Existing Source (gpd)				
12-inch Transmission Pipeline on Fruitdale Road[2]	2,592,000	2,592,000	2,592,000	2,592,000
Source Surplus/(Deficiency) (gpd)[3]	**2,569,835**	**2,568,939**	**2,565,586**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The PRV Station at Kalloch Road and SR9 has an 8" PRV with a maximum flow rate of 3900 gpm from the 459' zone to the 430' zone. The PRV is currently bypassed to fill the Hoogdal Reservoir because the PRV is not needed due to head losses in the 12" transmission line. The source capacity is the 12" pipe flowing at 5 ft/sec, which equals 1,800 gpm.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Nookachamps Hills Zone (450' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	118	122	140	101
Average Day Demand (gpd)	18,871	19,634	22,489	16,231
Maximum Day Demand (gpd)	32,647	33,966	38,905	28,080
Available Existing Source (gpd)				
Nookachamps Hills Booster Station (26 gpm)[2]	28,080	28,080	28,080	28,080
Source Surplus/(Deficiency) (gpd)[3]	**(4,567)**	**(5,886)**	**(10,825)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 26 gpm. The maximum production is assumed to be 26 gpm, and is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Bow Hill Zone (456' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	48	50	57	2,921
Average Day Demand (gpd)	7,634	7,943	9,098	468,208
Maximum Day Demand (gpd)	13,208	13,741	15,740	810,000
Available Existing Source (gpd)				
Bow Hill Booster Station (750 gpm)[2]	810,000	810,000	810,000	810,000
Source Surplus/(Deficiency) (gpd)[3]	**796,792**	**796,259**	**794,260**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 750 gpm. The maximum production is assumed to be 750 gpm and is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Transmission Zone (459' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	947	985	1,128	25,963
Average Day Demand (gpd)	151,735	157,868	180,825	4,161,850
Maximum Day Demand (gpd)	262,502	273,112	312,827	7,200,000
Available Existing Source (gpd)				
Sedro Woolley Transmission Line[2]	7,200,000	7,200,000	7,200,000	7,200,000
Source Surplus/(Deficiency) (gpd)[3]	**6,937,498**	**6,926,888**	**6,887,173**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The 20-inch CCP transmission line and the 24-inch DI transmission line feed the different 459' HGL pressure zones. The smaller of the two is used to determine the available source, which is the 20-inch CCP flowing at 5 ft/sec, equalling approximately 5000 gpm.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Skyridge Zone (463' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	76	79	90	779
Average Day Demand (gpd)	12,118	12,607	14,441	124,855
Maximum Day Demand (gpd)	20,964	21,811	24,983	216,000
Available Existing Source (gpd)				
Anderson Road Booster Station (200 gpm)[2]	216,000	216,000	216,000	216,000
Source Surplus/(Deficiency) (gpd)[3]	**195,036**	**194,189**	**191,017**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains one pump capable of pumping 200 gpm. It is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Tinas Coma - Burlington Hill Zone (506' and 415' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	66	69	78	1,013
Average Day Demand (gpd)	10,557	10,984	12,581	162,312
Maximum Day Demand (gpd)	18,264	19,002	21,766	280,800
Available Existing Source (gpd)				
Tinas Coma Booster Station (260 gpm)[2]	280,800	280,800	280,800	280,800
Source Surplus/(Deficiency) (gpd)[3]	**262,536**	**261,798**	**259,034**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 260 gpm. The maximum production is assumed to be 260 gpm, and is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Eaglemont (560' HGL), Central Mount Vernon, (420' HGL) and 356B Skagit Highland (356' HGL) Zones				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	3,028	3,151	3,609	5,842
Average Day Demand (gpd)	485,419	505,040	578,481	936,416
Maximum Day Demand (gpd)	839,775	873,719	1,000,773	1,620,000
Available Existing Source (gpd)				
Fir/Waugh Booster Station (1500 gpm)[2]	1,620,000	1,620,000	1,620,000	1,620,000
Source Surplus/(Deficiency) (gpd)[3]	**780,225**	**746,281**	**619,227**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 1,500 gpm. The maximum production is assumed to be 1,500 gpm, and is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Cascade Ridge 2 Zone (592' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	37	39	45	779
Average Day Demand (gpd)	6,000	6,243	7,151	124,855
Maximum Day Demand (gpd)	10,380	10,800	12,370	216,000
Available Existing Source (gpd)				
Cascade Ridge #2 Booster Station (200 gpm)[2]	216,000	216,000	216,000	216,000
Source Surplus/(Deficiency) (gpd)[3]	**205,620**	**205,200**	**203,630**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains one pump, capable of pumping 200 gpm. It is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Eagle's Nest Zone (645' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	193	218	250	209
Average Day Demand (gpd)	31,000	35,000	40,000	33,488
Maximum Day Demand (gpd)	200,000	210,000	230,000	216,000
Available Existing Source (gpd)				
Eagle's Nest Booster Station (150 gpm)[2]	216,000	216,000	216,000	216,000
Source Surplus/(Deficiency) (gpd)[3]	**16,000**	**6,000**	**(14,000)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 150 gpm. The maximum production is assumed to be 200 gpm maximum and it is assumed to be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Lake 16 Zone (684' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	57	59	68	389
Average Day Demand (gpd)	9,151	9,521	10,906	62,428
Maximum Day Demand (gpd)	15,832	16,471	18,867	108,000
Available Existing Source (gpd)				
Lake 16 Booster Station (100 gpm)[2]	108,000	108,000	108,000	108,000
Source Surplus/(Deficiency) (gpd)[3]	**92,168**	**91,529**	**89,133**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains two pumps, each capable of pumping 100 gpm. The maximum production is assumed to be 100 gpm maximum, and it is assumed to be running 18 hours per day
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Panorama Zone (705' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	42	44	50	78
Average Day Demand (gpd)	6,762	7,035	8,058	12,486
Maximum Day Demand (gpd)	11,698	12,171	13,941	21,600
Available Existing Source (gpd)				
Finished Water Pumps at WTP [2]	21,600	21,600	21,600	21,600
Source Surplus/(Deficiency) (gpd)[3]	**9,902**	**9,429**	**7,659**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. This zone is fed from the finished water pumps at the WTP.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

Evaluation of Source Adequacy for the Cascade Ridge 3 Zone (858' and 720' HGL)				
	Year			
	2014	2019	2033	Max[4]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)	41	43	49	779
Average Day Demand (gpd)	6,588	6,855	7,851	124,855
Maximum Day Demand (gpd)	11,398	11,858	13,583	216,000
Available Existing Source (gpd)				
Cascade Ridge #3 Booster Station (200 gpm)[2]	216,000	216,000	216,000	216,000
Source Surplus/(Deficiency) (gpd)[3]	**204,602**	**204,142**	**202,417**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. The station contains one pump, capable of pumping 200 gpm. It is assumed ot be running 18 hours per day.
3. Calculation based on Maximum Day Demand.
4. Maximum ERUs to be served with Existing Sources, based on maximum production rate.

STORAGE ANALYSES

Evaluation of Storage Adequacy for the Skagit Valley Floor Zone (214' HGL) - 214C County, 214D Mount Vernon, 214F South Mount Vernon and Fir Island Zone (195' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	12,931	13,454	15,410	16,730
Average Day Demand (gpd)	2,072,886	2,156,672	2,470,289	2,681,876
Maximum Day Demand (gpd)	3,586,093	3,731,042	4,273,600	4,639,645
Available Source (gpd)				
PRV Station at College Way & Monte Vista[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at 18th Street & Kulshan[3]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at 9th Street & Kulshan[3]	8,856,000	8,856,000	8,856,000	8,856,000
PRV Station at 9th Street & William Way[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at 9th Street & Highland (Tank)[3]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at 9th Street & Highland (Tank Bypass)[3]	8,856,000	8,856,000	8,856,000	8,856,000
PRV Station at Kulshan View[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at College Way & Laventure[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Hoag & Laventure[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Sandlewood & N. 18th Place[3]	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at Blodgett[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Blodgett & Anderson[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Blodgett & Redhawk[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Hickox & Burkland[3]	3,240,000	3,240,000	3,240,000	3,240,000
Multi-Source Credit (gpd)[4]	12,384,000	12,384,000	12,384,000	12,384,000
Required Storage Components				
Operational Storage (gal)[5]	422,115	422,115	422,115	422,115
Equalizing Storage (gal)[6]	269,382	293,540	383,966	444,974
Standby Storage (gal)[7]	5,172,453	5,381,522	6,164,088	6,692,057
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	691,497	715,655	806,081	867,089
Greater than 20 psi at highest meter (gal)[10]	5,953,950	6,187,177	7,060,169	7,649,146
Existing Storage Greater Than 30 psi (gal)[11]				
Clearwell #1	1,365,303	1,365,303	1,365,303	1,365,303
Clearwell #2	1,365,303	1,365,303	1,365,303	1,365,303
Clearwell #3	1,818,539	1,818,539	1,818,539	1,818,539
Bulson Road Reservoir	95,865	95,865	95,865	95,865
9th and Highland Reservoir	3,000,000	3,000,000	3,000,000	3,000,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**6,953,515**	**6,929,357**	**6,838,930**	**6,777,923**
Existing Storage Greater Than 20 psi (gal)[11]				
Clearwell #1	1,365,303	1,365,303	1,365,303	1,365,303
Clearwell #2	1,365,303	1,365,303	1,365,303	1,365,303
Clearwell #3	1,818,539	1,818,539	1,818,539	1,818,539
Bulson Road Reservoir	100,000	100,000	100,000	100,000
9th and Highland Reservoir	3,000,000	3,000,000	3,000,000	3,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**1,695,197**	**1,461,969**	**588,977**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the multiple PRVs off of the transmission pipe.
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is based on an assumed 3 feet of water.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction inside the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 214 HGL Zone. Also, 56% of the total WTP Clearwell volume was distributed to this pressure zone to provide storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Skagit Valley Floor Zone (214' HGL) - 214A Burlington, 214E Custer				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	9,218	9,591	10,986	11,318
Average Day Demand (gpd)	1,477,713	1,537,442	1,761,012	1,814,335
Maximum Day Demand (gpd)	2,556,444	2,659,774	3,046,552	3,138,800
Available Source (gpd)				
PRV Station at Rhodes Road[3]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at Cook Road & Old 99[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at North Hill Blvd[3]	5,616,000	5,616,000	5,616,000	5,616,000
Multi-Source Credit (gpd)[4]	12,384,000	12,384,000	12,384,000	12,384,000
Required Storage Components				
Operational Storage (gal)[5]	468,750	468,750	468,750	468,750
Equalizing Storage (gal)[6]	127,822	132,989	152,328	156,940
Standby Storage (gal)[7]	3,687,323	3,836,363	4,394,237	4,527,292
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	596,572	601,739	621,078	625,690
Greater than 20 psi at highest meter (gal)[10]	4,373,895	4,528,102	5,105,315	5,242,982
Existing Storage Greater Than 30 psi (gal)[11]				
Clearwell #1	973,294	973,294	973,294	973,294
Clearwell #2	973,294	973,294	973,294	973,294
Clearwell #3	1,296,395	1,296,395	1,296,395	1,296,395
9th and Highland Reservoir	2,000,000	2,000,000	2,000,000	2,000,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**4,646,410**	**4,641,243**	**4,621,905**	**4,617,292**
Existing Storage Greater Than 20 psi (gal)[11]				
Clearwell #1	973,294	973,294	973,294	973,294
Clearwell #2	973,294	973,294	973,294	973,294
Clearwell #3	1,296,395	1,296,395	1,296,395	1,296,395
9th and Highland Reservoir	2,000,000	2,000,000	2,000,000	2,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**869,087**	**714,880**	**137,668**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV stations off of the transmission pipe.
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is based on an assumed 3 feet of water.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction inside the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 214 HGL Zone. Also, 40% of the total WTP Clearwell volume was distributed to this pressure zone to provide storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Skagit Valley Floor Zone (214' HGL) - 214B Sedro Woolley				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	5,431	5,651	6,473	10,731
Average Day Demand (gpd)	870,674	905,866	1,037,595	1,720,221
Maximum Day Demand (gpd)	1,506,266	1,567,149	1,795,039	2,975,983
Available Source (gpd)				
PRV Station at Dukes Hill[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at SR9 & Marie Place[3]	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at SR20 & Fruitdale Road[3]	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at First & Nelson[3]	12,384,000	12,384,000	12,384,000	12,384,000
PRV Station at Township & Dunlap[3]	5,616,000	5,616,000	5,616,000	5,616,000
Multi-Source Credit (gpd)[4]	12,384,000	12,384,000	12,384,000	12,384,000
Required Storage Components				
Operational Storage (gal)[5]	468,750	468,750	468,750	468,750
Equalizing Storage (gal)[6]	75,313	78,357	89,752	148,799
Standby Storage (gal)[7]	2,172,584	2,260,399	2,589,100	4,292,451
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	544,063	547,107	558,502	617,549
Greater than 20 psi at highest meter (gal)[10]	2,806,647	2,897,507	3,237,602	5,000,000
Existing Storage Greater Than 30 psi (gal)[11]				
Dukes Hill Reservoir	5,000,000	5,000,000	5,000,000	5,000,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**4,455,937**	**4,452,893**	**4,441,498**	**4,382,451**
Existing Storage Greater Than 20 psi (gal)[11]				
Dukes Hill Reservoir	5,000,000	5,000,000	5,000,000	5,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**2,193,353**	**2,102,493**	**1,762,398**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV stations off of the transmission pipe.
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is based on an assumed 3 feet of water.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction inside the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 214 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Bayview Ridge Zones (230', 270' and 290' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	3,747	3,898	4,465	4,630
Average Day Demand (gpd)	600,596	624,872	715,739	742,218
Maximum Day Demand (gpd)	1,039,031	1,081,029	1,238,229	1,284,036
Available Source (gpd)				
PRV Station at Higgins Airport Way (3,900 gpm)[3]	5,616,000	5,616,000	5,616,000	5,616,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	297,246	297,246	297,246	297,246
Equalizing Storage (gal)[6]	51,952	54,051	61,911	64,202
Standby Storage (gal)[7]	1,498,662	1,559,237	1,785,977	1,852,048
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	349,198	351,297	359,157	361,448
Greater than 20 psi at highest meter (gal)[10]	1,937,859	2,000,535	2,235,135	2,303,496
Existing Storage Greater Than 30 psi (gal)[11]				
Bay View Standpipe	102,658	0	0	0
Bay View Ridge Reservoir	1,323,563	1,323,563	1,323,563	1,323,563
Storage Surplus/(Deficiency) at 30 psi (gal)	**1,077,023**	**972,266**	**964,406**	**962,115**
Existing Storage Greater Than 20 psi (gal)[11]				
Bay View Standpipe	171,888	0	0	0
Bay View Ridge Reservoir	2,303,496	2,303,496	2,303,496	2,303,496
Storage Surplus/(Deficiency) at 20 psi (gal)	**537,525**	**302,961**	**68,361**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV at Higgins Airport Way and Josh Wilson Road
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial and industrial construction outside of UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customers in the 270 HGL and 290 HGL Zones.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the ClearLake North Zone (284' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	300	313	358	2,157
Average Day Demand (gpd)	48,158	50,105	57,391	345,818
Maximum Day Demand (gpd)	83,314	86,681	99,286	598,265
Available Source (gpd)[3]				
PRV Station at Front Street (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Buchanan and Magnolia (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Buchanan and Maple (260 gpm)	374,400	374,400	374,400	374,400
Multi-Source Credit (gpd)[4]	3,240,000	3,240,000	3,240,000	3,240,000
Required Storage Components				
Operational Storage (gal)[5]	52,174	52,174	52,174	52,174
Equalizing Storage (gal)[6]	4,166	4,334	4,964	69,911
Standby Storage (gal)[7]	120,168	125,026	143,207	862,915
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	56,340	56,508	57,138	122,085
Greater than 20 psi at highest meter (gal)[10]	191,508	196,534	215,345	1,000,000
Existing Storage Greater Than 30 psi (gal)[11]				
Buchanan Hill Reservoir	1,000,000	1,000,000	1,000,000	1,000,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**943,660**	**943,492**	**942,862**	**877,915**
Existing Storage Greater Than 20 psi (gal)[11]				
Buchanan Hill Reservoir	1,000,000	1,000,000	1,000,000	1,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**808,492**	**803,466**	**784,655**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV stations from the 365 HGL zone, which are fed from the PRV station at Beaver Lake Road off the transmission pipe.
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is based on an assumed 3 feet of water in the Buchanan Hill Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 min for residential construction outside of UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~184 ft) in the 284 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the 322A and 322B Mount Vernon (322' HGL) and Conway (220' HGL) Zones				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	7,350	7,647	8,759	12,085
Average Day Demand (gpd)	1,178,167	1,225,788	1,404,038	1,937,241
Maximum Day Demand (gpd)	2,038,228	2,120,613	2,428,986	3,351,427
Available Source (gpd)[3]				
PRV Station at Waugh Road (1,000 gpm)	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at LaVenture Road (3,900 gpm)	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at 18th Street (1,000 gpm)	1,440,000	1,440,000	1,440,000	1,440,000
PRV Station at 9th Street (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Little Mountain Reservoir (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Section and LaVenture (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
PRV Station at Skyridge Drive (570 gpm)	820,800	820,800	820,800	820,800
Multi-Source Credit (gpd)[4]	5,616,000	5,616,000	5,616,000	5,616,000
Required Storage Components				
Operational Storage (gal)[5]	93,750	593,750	593,750	593,750
Equalizing Storage (gal)[6]	263,404	277,135	328,531	482,271
Standby Storage (gal)[7]	2,939,867	3,058,696	3,503,483	4,833,979
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	357,154	870,885	922,281	1,076,021
Greater than 20 psi at highest meter (gal)[10]	3,387,022	4,019,581	4,515,764	6,000,000
Existing Storage Greater Than 30 psi (gal)[11]				
Division Street Reservoir #1	330,288			
Division Street Reservoir #2		1,651,442	1,651,442	1,651,442
		0	0	0
Storage Surplus/(Deficiency) at 30 psi (gal)	**(26,866)**	**780,557**	**729,162**	**575,421**
Existing Storage Greater Than 20 psi (gal)[11]				
Division Street Reservoir #1	1,000,000			
Division Street Reservoir #2		6,000,000	6,000,000	6,000,000
		0	0	0
Storage Surplus/(Deficiency) at 20 psi (gal)	**(2,387,022)**	**1,980,419**	**1,484,236**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the multiple PRV stations from the transmission line, 463' HGL and 420' HGL zones.
   The PRV Station at Waugh Road has a 4" PRV with a maximum flow rate of 1,000 gpm from the 459' HGL zone.
   The PRV Station at LaVenture Road has a 8" PRV with a maximum flow rate of 3,900 gpm from the 459' HGL zone
   The PRV Station at 18th Street has a 4" PRV with a maximum flow rate of 1,000 gpm from the 459' HGL zone
   The PRV Station at 9th Street has a 6" PRV with a maximum flow rate of 2,250 gpm from the 459' HGL zone
   The PRV Station at Little Mountain Reservoir has a 6" PRV with a maximum flow rate of 2,250 gpm from the 463' HGL zone
   The PRV Station at Section and LaVenture has a 6" PRV with a maximum flow rate of 2,250 gpm from the 420' HGL zone
   The PRV Station at Skyridge Drive has a 3" PRV with a maximum flow rate of 570 gpm from the 463' HGL zone
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is based on an assumed 3 feet of water.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction in the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~243 ft) in the 322 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the 322C Cascade Ridge 1 Zone (322' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	31	32	37	97
Average Day Demand (gpd)	4,915	5,113	5,857	15,624
Maximum Day Demand (gpd)	8,502	8,846	10,132	27,029
Available Source (gpd)				
Cascade Ridge #1 Booster Station (50 gpm)[3]	54,000	54,000	54,000	54,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	21,141	21,141	21,141	21,141
Equalizing Storage (gal)[6]	1,013	1,084	1,352	4,873
Standby Storage (gal)[7]	12,263	12,759	14,614	38,986
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	22,154	22,225	22,493	26,014
Greater than 20 psi at highest meter (gal)[10]	49,417	49,984	52,108	80,000
Existing Storage Greater Than 30 psi (gal)[11]				
Cascade Ridge Reservoir #1	74,516	74,516	74,516	74,516
Storage Surplus/(Deficiency) at 30 psi (gal)	**52,362**	**52,290**	**52,022**	**48,502**
Existing Storage Greater Than 20 psi (gal)[11]				
Cascade Ridge Reservoir #1	80,000	80,000	80,000	80,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**30,583**	**30,016**	**27,892**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Cascade Ridge #1 Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on storage tank level when pump turns on, for the Cascade Ridge #1 Reservoir this is a level of 25 feet.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~221 ft) in the 322 Cascade Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Sedro Woolley Zone (350' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	581	604	692	(153)
Average Day Demand (gpd)	92,937	96,694	110,755	(24,400)
Maximum Day Demand (gpd)	160,782	167,281	191,606	(42,212)
Available Source (gpd)[3]				
PRV Station at Fruitdale Road & Portabello (3,900 gpm)	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Bassett Road and SR9 (3,900 gpm)	5,616,000	5,616,000	5,616,000	5,616,000
PRV Station at Bassett Road and Longtime Lane (1,000 gpm)	1,440,000	1,440,000	1,440,000	1,440,000
Multi-Source Credit (gpd)[4]	5,616,000	5,616,000	5,616,000	5,616,000
Required Storage Components				
Operational Storage (gal)[5]	1,000	1,000	1,000	1,000
Equalizing Storage (gal)[6]	8,039	8,364	9,580	0
Standby Storage (gal)[7]	232,344	241,735	276,887	(61,000)
Fire Flow Storage (gal)[8]	60,000	60,000	60,000	60,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	9,039	9,364	10,580	1,000
Greater than 20 psi at highest meter (gal)[10]	301,383	311,099	347,468	0
Existing Storage Greater Than 30 psi (gal)[11]				
Clearwell #1	0	0	0	0
Clearwell #2	0	0	0	0
Clearwell #3	0	0	0	0
Storage Surplus/(Deficiency) at 30 psi (gal)	**(9,039)**	**(9,364)**	**(10,580)**	**(1,000)**
Existing Storage Greater Than 20 psi (gal)[11]				
Clearwell #1	0	0	0	0
Clearwell #2	0	0	0	0
Clearwell #3	0	0	0	0
Storage Surplus/(Deficiency) at 20 psi (gal)	**(301,383)**	**(311,099)**	**(347,468)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the multiple PRV stations from the transmission line
   The PRV Station at Fruitdale and Portabello has a 3" PRV and a 8" PRV with a maximum flow rate of 3,900 gpm. From the 459' zone to the 350' zone
   The PRV Station at Bassett Road and SR9 has 2", 3" and 8" PRVs with a maximum flow rate of 3,900 gpm from the 459' zone to the 350' zone.
   The PRV Station at Bassett Road and Longtime Lane has a 1.5" PRV and a 4" PRV with a maximum flow rate of 1,000 gpm. From the 459' zone to the 350' zone
4. Multi source credit calculation assumed largest source is off-line.
5. Required operational storage is an assumed amount based on the size of the zone.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,000 gpm x 1 hour for single family and duplex construction within the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 350 Zone. In this case, there is no existing storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the 356A Clear Lake South and Big Lake Zones (356' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	817	850	973	1,082
Average Day Demand (gpd)	130,906	136,197	156,002	173,480
Maximum Day Demand (gpd)	226,467	235,620	269,884	300,121
Available Source (gpd)				
PRV Station at Beaver Lake Road (2,250 gpm)[3]	3,240,000	3,240,000	3,240,000	3,240,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	56,061	56,061	56,061	56,061
Equalizing Storage (gal)[6]	11,323	11,781	13,494	15,006
Standby Storage (gal)[7]	326,647	339,850	389,270	432,883
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	67,384	67,842	69,555	71,067
Greater than 20 psi at highest meter (gal)[10]	484,032	497,692	548,826	593,950
Existing Storage Greater Than 30 psi (gal)[11]				
Big Lake Reservoir West	69,851	69,851	69,851	69,851
Big Lake Reservoir East 1	70,000	70,000	70,000	70,000
Big Lake Reservoir East 2	70,000	70,000	70,000	70,000
Nokkachamps Hills Reservoir	118,383	118,383	118,383	118,383
Storage Surplus/(Deficiency) at 30 psi (gal)	**260,850**	**260,393**	**258,680**	**257,168**
Existing Storage Greater Than 20 psi (gal)[11]				
Big Lake Reservoir West	140,000	140,000	140,000	140,000
Big Lake Reservoir East 1	70,000	70,000	70,000	70,000
Big Lake Reservoir East 2	70,000	70,000	70,000	70,000
Nokkachamps Hills Reservoir	313,950	313,950	313,950	313,950
Storage Surplus/(Deficiency) at 20 psi (gal)	**109,919**	**96,258**	**45,125**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV on Beaver Lake Road
4. No multi-source credit
5. Required operational storage is based on an assumed 3 feet of water in tanks.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hour for outside of the UGA and commercial/industrial construction.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~273 ft) in the 356 Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Southwest Clear Lake Zone (365' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	176	183	209	1,373
Average Day Demand (gpd)	28,178	29,317	33,581	220,077
Maximum Day Demand (gpd)	48,748	50,719	58,094	380,734
Available Source (gpd)[3]				
PRV Station at Beaver Lake Road (2,250 gpm)	3,240,000	3,240,000	3,240,000	3,240,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	52,174	52,174	52,174	52,174
Equalizing Storage (gal)[6]	2,437	2,536	2,905	19,037
Standby Storage (gal)[7]	70,313	73,155	83,793	549,157
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	54,611	54,710	55,079	71,211
Greater than 20 psi at highest meter (gal)[10]	214,924	217,865	228,872	710,368
Existing Storage Greater Than 30 psi (gal)[11]				
Buchanan Hill Reservoir	309,030	309,030	309,030	309,030
Storage Surplus/(Deficiency) at 30 psi (gal)	**254,419**	**254,320**	**253,951**	**237,819**
Existing Storage Greater Than 20 psi (gal)[11]				
Buchanan Hill Reservoir	710,368	710,368	710,368	710,368
Storage Surplus/(Deficiency) at 20 psi (gal)	**495,443**	**492,503**	**481,496**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the PRV on Beaver Lake Road
4. No mulit-source credit
5. Required operational storage is based on an assumd 3 feet of water in the Buchanan Hill Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hour for outside of the UGA and commercial/industrial construction.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~279 ft) in the 365 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Hermway Heights Zone (412' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	91	94	108	86
Average Day Demand (gpd)	14,518	15,105	17,301	13,791
Maximum Day Demand (gpd)	25,116	26,131	29,931	23,859
Available Source (gpd)				
Bulson Booster Station (60 gpm)[3]	64,800	64,800	64,800	64,800
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	7,500	7,500	7,500	7,500
Equalizing Storage (gal)[6]	3,349	3,561	4,352	3,087
Standby Storage (gal)[7]	36,226	37,690	43,171	34,413
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	10,849	11,061	11,852	10,587
Greater than 20 psi at highest meter (gal)[10]	62,075	63,751	70,023	60,000
Existing Storage Greater Than 30 psi (gal)[11]				
Hermway Heights Reservoir	60,000	60,000	60,000	60,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**49,151**	**48,939**	**48,148**	**49,413**
Existing Storage Greater Than 20 psi (gal)[11]				
Hermway Heights Reservoir	60,000	60,000	60,000	60,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**(2,075)**	**(3,751)**	**(10,023)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Bulson Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in Hermway Heights Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~300 ft) in the 412 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Hoogdal Zone (430' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	80	83	95	167
Average Day Demand (gpd)	12,812	13,330	15,268	26,807
Maximum Day Demand (gpd)	22,165	23,061	26,414	46,377
Available Source (gpd)				
12-inch Transmission Pipeline on Fruitdale Road[3]	2,592,000	2,592,000	2,592,000	2,592,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	15,789	15,789	15,789	15,789
Equalizing Storage (gal)[6]	1,108	1,153	1,321	2,319
Standby Storage (gal)[7]	31,970	33,262	38,099	66,892
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	16,897	16,942	17,110	18,108
Greater than 20 psi at highest meter (gal)[10]	63,867	65,204	70,209	100,000
Existing Storage Greater Than 30 psi (gal)[11]				
Hoogdal Reservoir	36,154	36,154	36,154	36,154
Storage Surplus/(Deficiency) at 30 psi (gal)	**19,257**	**19,212**	**19,044**	**18,046**
Existing Storage Greater Than 20 psi (gal)[11]				
Hoogdal Reservoir	100,000	100,000	100,000	100,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**36,133**	**34,796**	**29,791**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. The PRV Station at Kalloch Road and SR9 has an 8" PRV with a maximum flow rate of 3900 gpm. The PRV is currently bypassed to fill the Hoogdal Reservoir because the PRV is not needed due to head losses in the 12" transmission line. The source capacity is the 12" pipe flowing at 5 ft/sec, which equals 1,800 gpm.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on storage tank level when pump turns on, for the Skyline and 29th Street Reservoirs this is a level of 30 feet.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~354 ft) in the 430 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Nookachamps Hills Zone (450' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	118	122	140	(88)
Average Day Demand (gpd)	18,871	19,634	22,489	(14,026)
Maximum Day Demand (gpd)	32,647	33,966	38,905	(24,266)
Available Source (gpd)				
Nookachamps Hills Booster Station (26 gpm)[3]	28,080	28,080	28,080	28,080
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	20,000	20,000	20,000	20,000
Equalizing Storage (gal)[6]	8,743	9,018	10,047	0
Standby Storage (gal)[7]	47,088	48,992	56,116	(35,000)
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	28,743	29,018	30,047	20,000
Greater than 20 psi at highest meter (gal)[10]	90,831	93,010	101,163	0
Existing Storage Greater Than 30 psi (gal)[11]				
		0	0	0
Storage Surplus/(Deficiency) at 30 psi (gal)	**(28,743)**	**(29,018)**	**(30,047)**	**(20,000)**
Existing Storage Greater Than 20 psi (gal)[11]				
		0	0	0
Storage Surplus/(Deficiency) at 20 psi (gal)	**(90,831)**	**(93,010)**	**(101,163)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Nookachamp Hills Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is an assumed amount based on the size of the zone.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of UGA and 1 lot per 2.5 acres or less.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 450 HGL Zone. In this case, there is no existing storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Bow Hill Zone (456' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	48	50	57	1,866
Average Day Demand (gpd)	7,634	7,943	9,098	299,044
Maximum Day Demand (gpd)	13,208	13,741	15,740	517,346
Available Source (gpd)				
Bow Hill Booster Station (750 gpm)[3]	810,000	810,000	810,000	810,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	137,931	137,931	137,931	137,931
Equalizing Storage (gal)[6]	660	687	787	25,867
Standby Storage (gal)[7]	19,050	19,820	22,702	746,202
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	138,591	138,618	138,718	163,798
Greater than 20 psi at highest meter (gal)[10]	247,642	248,438	251,420	1,000,000
Existing Storage Greater Than 30 psi (gal)[11]				
Bow Hill Reservoir	1,000,000	1,000,000	1,000,000	1,000,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**861,409**	**861,382**	**861,282**	**836,202**
Existing Storage Greater Than 20 psi (gal)[11]				
Bow Hill Reservoir	1,000,000	1,000,000	1,000,000	1,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**752,358**	**751,562**	**748,580**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Bow Hill Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Bow Hill Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for outside of UGA and commercial/industrial construction.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~287 ft) in the 456 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Transmission Zone (459' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	947	985	1,128	311
Average Day Demand (gpd)	151,735	157,868	180,825	49,817
Maximum Day Demand (gpd)	262,502	273,112	312,827	86,183
Available Source (gpd)				
Sedro Woolley Transmission Line[3]	7,200,000	7,200,000	7,200,000	7,200,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	100,000	100,000	100,000	100,000
Equalizing Storage (gal)[6]	52,950	54,718	61,338	23,564
Standby Storage (gal)[7]	378,623	393,927	451,211	124,308
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	152,950	154,718	161,338	123,564
Greater than 20 psi at highest meter (gal)[10]	621,573	638,646	702,549	337,872
Existing Storage Greater Than 30 psi (gal)[11]				
Clearwell #1	101,403	101,403	101,403	101,403
Clearwell #2	101,403	101,403	101,403	101,403
Clearwell #3	135,066	135,066	135,066	135,066
Storage Surplus/(Deficiency) at 30 psi (gal)	**184,921**	**183,153**	**176,534**	**214,308**
Existing Storage Greater Than 20 psi (gal)[11]				
Clearwell #1	101,403	101,403	101,403	101,403
Clearwell #2	101,403	101,403	101,403	101,403
Clearwell #3	135,066	135,066	135,066	135,066
Storage Surplus/(Deficiency) at 20 psi (gal)	**(283,702)**	**(300,774)**	**(364,677)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Sedro Woolley transmission pipeline
4. Multi source credit calculation assumed largest source is off-line. No credit applies in this scenario.
5. Required operational storage is assumed based on the amount of customers in this zone
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction inside the UGA
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 459 HGL Zone. Also, 4% of the total WTP Clearwell volume was distrubuted to this pressure zone to provide storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Skyridge Zone (463' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	76	79	90	741
Average Day Demand (gpd)	12,118	12,607	14,441	118,712
Maximum Day Demand (gpd)	20,964	21,811	24,983	205,372
Available Source (gpd)				
Anderson Road Booster Station (200 gpm)[3]	216,000	216,000	216,000	216,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	109,375	109,375	109,375	109,375
Equalizing Storage (gal)[6]	1,048	1,091	1,249	34,404
Standby Storage (gal)[7]	30,237	31,459	36,034	296,221
Fire Flow Storage (gal)[8]	60,000	60,000	60,000	60,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	110,423	110,466	110,624	143,779
Greater than 20 psi at highest meter (gal)[10]	200,660	201,925	206,658	500,000
Existing Storage Greater Than 30 psi (gal)[11]				
Little Mountain Reservoir	500,000	500,000	500,000	500,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**389,577**	**389,534**	**389,376**	**356,221**
Existing Storage Greater Than 20 psi (gal)[11]				
Little Mountain Reservoir	500,000	500,000	500,000	500,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**299,340**	**298,075**	**293,342**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Anderson Road Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Little Mountain Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,000 gpm x 1 hour for single family and duplex construction within the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~349 ft) in the 463 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Tinas Coma - Burlington Hill Zone (506' and 415' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	66	69	78	311
Average Day Demand (gpd)	10,557	10,984	12,581	49,856
Maximum Day Demand (gpd)	18,264	19,002	21,766	86,251
Available Source (gpd)				
Tinas Coma Booster Station (260 gpm)[3]	280,800	280,800	280,800	280,800
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	41,282	41,282	41,282	41,282
Equalizing Storage (gal)[6]	913	950	1,088	4,313
Standby Storage (gal)[7]	26,344	27,409	31,394	124,405
Fire Flow Storage (gal)[8]	60,000	60,000	60,000	60,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	42,195	42,232	42,370	45,595
Greater than 20 psi at highest meter (gal)[10]	128,539	129,641	133,764	230,000
Existing Storage Greater Than 30 psi (gal)[11]				
Tinas Coma Reservoir	176,152	176,152	176,152	176,152
Storage Surplus/(Deficiency) at 30 psi (gal)	**133,957**	**133,920**	**133,782**	**130,557**
Existing Storage Greater Than 20 psi (gal)[11]				
Tinas Coma Reservoir	230,000	230,000	230,000	230,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**101,461**	**100,359**	**96,236**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU.
3. Available source is assumed to be the Tinas Coma Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in Tinas Coma Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,000 gpm x 1 hours for single family and duplex construction within the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~407 ft) in the 506 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Eaglemont (560' HGL), Central Mount Vernon (420' HGL) and 356B Skagit Highland (356' HGL) Zones

	Year			
	2014	**2019**	**2033**	**Max[12]**
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	3,028	3,151	3,609	9,043
Average Day Demand (gpd)	485,419	505,040	578,481	1,449,574
Maximum Day Demand (gpd)	839,775	873,719	1,000,773	2,507,762
Available Source (gpd)				
Fir/Waugh Booster Station (1500 gpm)[3]	1,620,000	1,620,000	1,620,000	1,620,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	1,034,483	1,034,483	1,034,483	1,034,483
Equalizing Storage (gal)[6]	41,989	43,686	50,039	258,410
Standby Storage (gal)[7]	1,211,262	1,260,221	1,443,479	3,617,107
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	1,076,472	1,078,169	1,084,522	1,292,893
Greater than 20 psi at highest meter (gal)[10]	2,377,734	2,428,390	2,618,000	5,000,000
Existing Storage Greater Than 30 psi (gal)[11]				
Eaglemont Reservoir	4,105,040	4,105,040	4,105,040	4,105,040
Storage Surplus/(Deficiency) at 30 psi (gal)	**3,028,568**	**3,026,871**	**3,020,518**	**2,812,147**
Existing Storage Greater Than 20 psi (gal)[11]				
Eaglemont Reservoir	5,000,000	5,000,000	5,000,000	5,000,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**2,622,266**	**2,571,610**	**2,382,000**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Fir/Waugh Booster Station. The 420' and 356' zones are served by PRVs from the 560' zone.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Eaglemont Reservoir.
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD].
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction within the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage.
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the Eaglemont Zone. Based on water meter GPs data, the highest meter elevation in the 560 zone is 549.5 feet at 5219 Eaglemont Drive, P# 042154710
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Cascade Ridge 2 Zone (592' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	37	39	45	2
Average Day Demand (gpd)	6,000	6,243	7,151	277
Maximum Day Demand (gpd)	10,380	10,800	12,370	478
Available Source (gpd)				
Cascade Ridge #2 Booster Station (200 gpm)[3]	216,000	216,000	216,000	216,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	4,286	4,286	4,286	4,286
Equalizing Storage (gal)[6]	519	540	619	24
Standby Storage (gal)[7]	14,972	15,577	17,843	690
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	4,805	4,826	4,905	4,310
Greater than 20 psi at highest meter (gal)[10]	34,777	35,403	37,747	20,000
Existing Storage Greater Than 30 psi (gal)[11]				
Cascade Ridge Reservoir #2	20,000	20,000	20,000	20,000
Storage Surplus/(Deficiency) at 30 psi (gal)	**15,195**	**15,174**	**15,095**	**15,690**
Existing Storage Greater Than 20 psi (gal)[11]				
Cascade Ridge Reservoir #2	20,000	20,000	20,000	20,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**(14,777)**	**(15,403)**	**(17,747)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Cascade Ridge #2 Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on storage tank level when pump turns on, for the Cascade Ridge #2 Reservoir this is a level of 11 feet
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~507 ft) in the 592 Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Eagle's Nest Zone (645' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	193	218	250	728
Average Day Demand (gpd)	31,000	35,000	40,000	116,728
Maximum Day Demand (gpd)	200,000	210,000	230,000	201,940
Available Source (gpd)				
Eagle's Nest Booster Station (150 gpm)[3]	216,000	216,000	216,000	216,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	87,077	87,077	87,077	87,077
Equalizing Storage (gal)[6]	10,000	10,500	11,500	20,356
Standby Storage (gal)[7]	77,354	87,335	99,812	291,271
Fire Flow Storage (gal)[8]	90,000	90,000	90,000	90,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	97,077	97,577	98,577	107,433
Greater than 20 psi at highest meter (gal)[10]	264,431	274,912	288,389	488,704
Existing Storage Greater Than 30 psi (gal)[11]				
Eagle's Nest Standpipe	280,804	280,804	280,804	280,804
Storage Surplus/(Deficiency) at 30 psi (gal)	**183,727**	**183,227**	**182,227**	**173,371**
Existing Storage Greater Than 20 psi (gal)[11]				
Eagle's Nest Standpipe	488,704	488,704	488,704	488,704
Storage Surplus/(Deficiency) at 20 psi (gal)	**224,273**	**213,792**	**200,315**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Eagle's Nest Booster Station and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Eagle's Nest Standpipe
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 1,500 gpm x 1 hours for commercial, industrial and multi-family construction within the UGA.
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~ 545 ft) in the 645 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Lake 16 Zone (684' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	57	59	68	81
Average Day Demand (gpd)	9,151	9,521	10,906	12,961
Maximum Day Demand (gpd)	15,832	16,471	18,867	22,422
Available Source (gpd)				
Lake 16 Booster Station (100 gpm)[3]	108,000	108,000	108,000	108,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	11,538	11,538	11,538	11,538
Equalizing Storage (gal)[6]	792	824	943	1,121
Standby Storage (gal)[7]	22,835	23,758	27,213	32,341
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	12,330	12,362	12,481	12,659
Greater than 20 psi at highest meter (gal)[10]	50,164	51,119	54,694	60,000
Existing Storage Greater Than 30 psi (gal)[11]				
Lake 16 Standpipe	54,426	54,426	54,426	54,426
Storage Surplus/(Deficiency) at 30 psi (gal)	**42,096**	**42,064**	**41,945**	**41,767**
Existing Storage Greater Than 20 psi (gal)[11]				
Lake 16 Standpipe	60,000	60,000	60,000	60,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**9,836**	**8,881**	**5,306**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Lake 16 Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on an assumed 3 feet of water in the Lake 16 Standpipe
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~ 568 ft) in the 684 HGL Zone.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Panorama Zone (705' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	42	44	50	(66)
Average Day Demand (gpd)	6,762	7,035	8,058	(10,635)
Maximum Day Demand (gpd)	11,698	12,171	13,941	(18,399)
Available Source (gpd)				
Finished Water Pumps at WTP[3]	21,600	21,600	21,600	21,600
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	11,538	11,538	11,538	11,538
Equalizing Storage (gal)[6]	4,219	4,342	4,803	0
Standby Storage (gal)[7]	16,873	17,555	20,108	(26,538)
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	15,757	15,880	16,341	11,538
Greater than 20 psi at highest meter (gal)[10]	47,630	48,435	51,448	0
Existing Storage Greater Than 30 psi (gal)[11]				
	0	0	0	0
Storage Surplus/(Deficiency) at 30 psi (gal)	**(15,757)**	**(15,880)**	**(16,341)**	**(11,538)**
Existing Storage Greater Than 20 psi (gal)[11]				
	0	0	0	0
Storage Surplus/(Deficiency) at 20 psi (gal)	**(47,630)**	**(48,435)**	**(51,448)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source are the finished water pumps at the WTP.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is assumed based on number of customers in this zone
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer in the 705 HGL Zone. In this case, the is no existing storage.
12. Maximum ERUs supported by Available Storage.

Evaluation of Storage Adequacy for the Cascade Ridge 3 Zone (858' and 720' HGL)				
	Year			
	2014	2019	2033	Max[12]
Projected ERUs and Demand[1]				
Equivalent Residential Units (ERU's)[2]	41	43	49	18
Average Day Demand (gpd)	6,588	6,855	7,851	2,905
Maximum Day Demand (gpd)	11,398	11,858	13,583	5,026
Available Source (gpd)				
Cascade Ridge #3 Booster Station (200 gpm)[3]	216,000	216,000	216,000	216,000
Multi-Source Credit (gpd)[4]				
Required Storage Components				
Operational Storage (gal)[5]	7,500	7,500	7,500	7,500
Equalizing Storage (gal)[6]	570	593	679	251
Standby Storage (gal)[7]	16,440	17,104	19,592	7,249
Fire Flow Storage (gal)[8]	15,000	15,000	15,000	15,000
Required Storage Criteria				
Greater than 30 psi at highest meter (gal)[9]	8,070	8,093	8,179	7,751
Greater than 20 psi at highest meter (gal)[10]	39,510	40,197	42,771	30,000
Existing Storage Greater Than 30 psi (gal)[11]				
Cascade Ridge Reservoir #3	0	0	0	0
Storage Surplus/(Deficiency) at 30 psi (gal)	**(8,070)**	**(8,093)**	**(8,179)**	**(7,751)**
Existing Storage Greater Than 20 psi (gal)[11]				
Cascade Ridge Reservoir #3	30,000	30,000	30,000	30,000
Storage Surplus/(Deficiency) at 20 psi (gal)	**(9,510)**	**(10,197)**	**(12,771)**	**0**

Notes:

1. Projected demands as presented in Chapter 4. ERUs calculated as Average Day Demand / ERU water use factor (160 gpd/ERU).
2. Number of ERUs are based on Average Day Demand divided by 160 gpd per ERU
3. Available source is assumed to be the Cascade Ridge #3 Booster Station, and is assumed to be running 18 hours per day.
4. Multi source credit calculation assumed largest source is off-line. No credit in this scenario.
5. Required operational storage is based on storage tank level when pump turns on, for the Cascade Ridge #3 Reservoir this is a level of 10.5 fee
6. Required equalization storage is the greater of either [(PHD - Total Available Source) * 150 minutes] or [5% of MDD]
   PHD : (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18
   (C & F values obtained from Table 5-1 in DOH Dec 2009 WSDM)
   (N is the number of ERUs)
7. Required standby storage for existing source = greater of (2*ADD - Multi source credit) or 200 gallons per day per ERU. PUD has a goal of 2*MDD per ERU, equivalent to 600 gallons per ERU.
8. Required fire flow storage = 500 gpm x 30 minutes for outside of the UGA and 1 lot per 2.5 acres or less
9. Total required storage greater than 30 psi is equal to the total of operational and equalizing storage
10. Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of standby or fire flow storage.
11. The storage volume available in existing reservoirs at 30 and 20 psi is calculated based on the elevation of the highest customer (~789 ft) in the 858/790 Zone.
12. Maximum ERUs supported by Available Storage.

APPENDIX J

WATER RIGHTS

Gilligan Creek

Mundt Creek

Turner Creek

Salmon Creek

Skagit

Storage

Other

Satellite Systems

GILLIGAN CREEK WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CERTIFICATE
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	WATER RIGHT CERTIFICATE NUMBER
October 10, 1929	2728	1431	411

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Gilligan Creek or the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
1.5		1086

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round

Diversion from Gilligan Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Gilligan Creek diversion:
Within the NW¼ NE¼ of Section 2, Township 34N, Range 5E, W.M. (875 feet south and 420 feet east of the N¼ corner of Section 2)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Gilligan Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

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Water Rights on Record for the PUD:

Not including water rights held for satellite management systems, the PUD has seven water right claims, five surface water certificates (SWC), two ground water permits (GWP), a reservoir permit and a reservoir certificate. These rights are summarized as follows:

Document Number	Priority Date	Source of Appropriation	Instantaneous Rate "Qi" (cfs or gpm)	Annual Rate "Qa" (acre-feet per year)	Comments
Claim 009332	Prior to 1917	Salmon Creek	1.8 cfs	307	Change application
Claim 009333	Prior to 1917	Turner Creek	4.3 cfs	2,300	Change application
Claim 009334	Prior to 1917	Rock Springs Creek	0.2 cfs	40?	Inactive
Claim 009335	Prior to 1917	Pigeon Creek	0.2 cfs	40?	Inactive
Claim 009336	Prior to 1917	Unnamed creek	0.1 cfs	20?	Inactive
Claim 009337	Prior to 1917	Cold Springs	0.2 cfs	40?	Inactive
Claim 009338	Prior to 1917	East Nookachamps	1.1 cfs	110?	Inactive
SWC 26	September 28, 1917	Mundt Creek	2.5 cfs	Not listed	Change application
SWC 411	October 10, 1929	Gilligan Creek	1.5 cfs	Not listed	Subject of this report
S1-00724C	October 30, 1963	Gilligan Creek	8.89 cfs	Supplemental Qa	Change application
S1-00737C	October 30, 1963	Mundt Creek	8.0 cfs	Supplemental Qa	Change application
S1-00739C	October 30, 1963	Turner Creek	6.2 cfs	Supplemental Qa	Change application
GWP 2911	March 26, 1953	Sedro-Woolley well	900 gpm	1440	Change application
GWC 3350	May 12, 1954	Ranney Well	4,000 gpm	6400	Change application
Reservoir 8738	January 16, 1946	Cultus Streams	Not Applicable	1500	Judy Reservoir
R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Gilligan Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Gilligan Creek diversions to minimum instream flows (not a previous requirement). When Gilligan Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Certificate:

Name on Certificate:	Puget Sound Pulp & Timber Company (acquired by the Clear Lake Water Company)
Priority Date:	October 10, 1929
Instantaneous Quantity:	1.5 cubic feet per second
Annual Quantity:	Not listed
Source:	Gilligan Creek
Point of Diversion:	NW¼ NE¼ of Section 2, Township 34 North, Range 5 East
Period of Use:	At all times
Purpose of Use:	Domestic supply and Manufacturing (Municipal)
Place of Use:	Town of Clear Lake

Change Request:

Name Change to:	Public Utility District No. 1 of Skagit County
Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on June 24th & July 1st, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use and perfection of the subject certificate,
(9) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(10) The 1994 PUD Water System Plan,
(11) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(12) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(13) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Gilligan Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

The Puget Sound Pulp and Timber Company initiated development of the diversion structure and pipeline for Gilligan Creek in 1930. The Gilligan Creek diversion consists of two water rights, the subject right (SWC 411) for 1.5 cfs and certificate S1-00724C for 8.89 cfs. SWC 411 was issued for 1.5 cfs, with no limitation or indication of the annual use in acre-feet per year. Continuous year-round diversion at the rate of 1.5 cfs is equivalent to 1086 acre-feet per year.

The initial pipeline was a 12-inch wood pipe. The current diversion structure was constructed in 1958, with slight modification in 1987. The hydraulic capacity of the Gilligan Creek system is greater than the 1.5 cfs authorized by SWC 411, therefore it is safe to assume SWC 411 has been perfected on an instantaneous basis.

The PUD has maintained records of the annual stream diversions for all of the Cultus Mountain Water Supply System since 1954. These records show that water has been diverted on an annual basis from the Gilligan/Salmon Creek system. Although separate records are not maintained on the amount of diversion from each creek, the majority of the diversion for this collector system has been from Gilligan Creek over the years. These records from recent years show that as much as 2,488 million gallons per year has been diverted through the

Gilligan/Salmon Creek system. This is equivalent to 7,635 acre-feet per year, which exceeds the maximum of 1,086 acre-feet per year associated with this right.

Based on the above information, it appears that SWC 411 has been fully perfected on an instantaneous and annual basis. Because SWC 411 appears to be a perfected right, adding an additional point of diversion and changing the place of use description will not enhance the original right. Approval of this change request will not result in an increase of the instantaneous or annual quantity of water perfected under the original right.

Official confirmation of the true extent and perfection of the right can only occur as result of a general water rights adjudication through Superior Court.

Same Source of Water:

Gilligan Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Gilligan Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Surface Water Certificate 411 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Gilligan Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Gilligan Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Gilligan Creek
January	1-31	19.8 cfs
February	1-29	19.8
March	1-15	19.8
March	16-31	27.7
April	1-30	31.7
May	1-31	31.7
June	1-30	31.7
July	1-31	39.6
August	1-31	39.6
September	1-30	39.6
October	1-31	23.8
November	1-30	27.7
December	1-31	27.7

No diversion of water from Gilligan Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of the perfection of SWC 411. Official confirmation of the true extent of the right can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination."

The applicant is advised that a Superseding Certificate will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

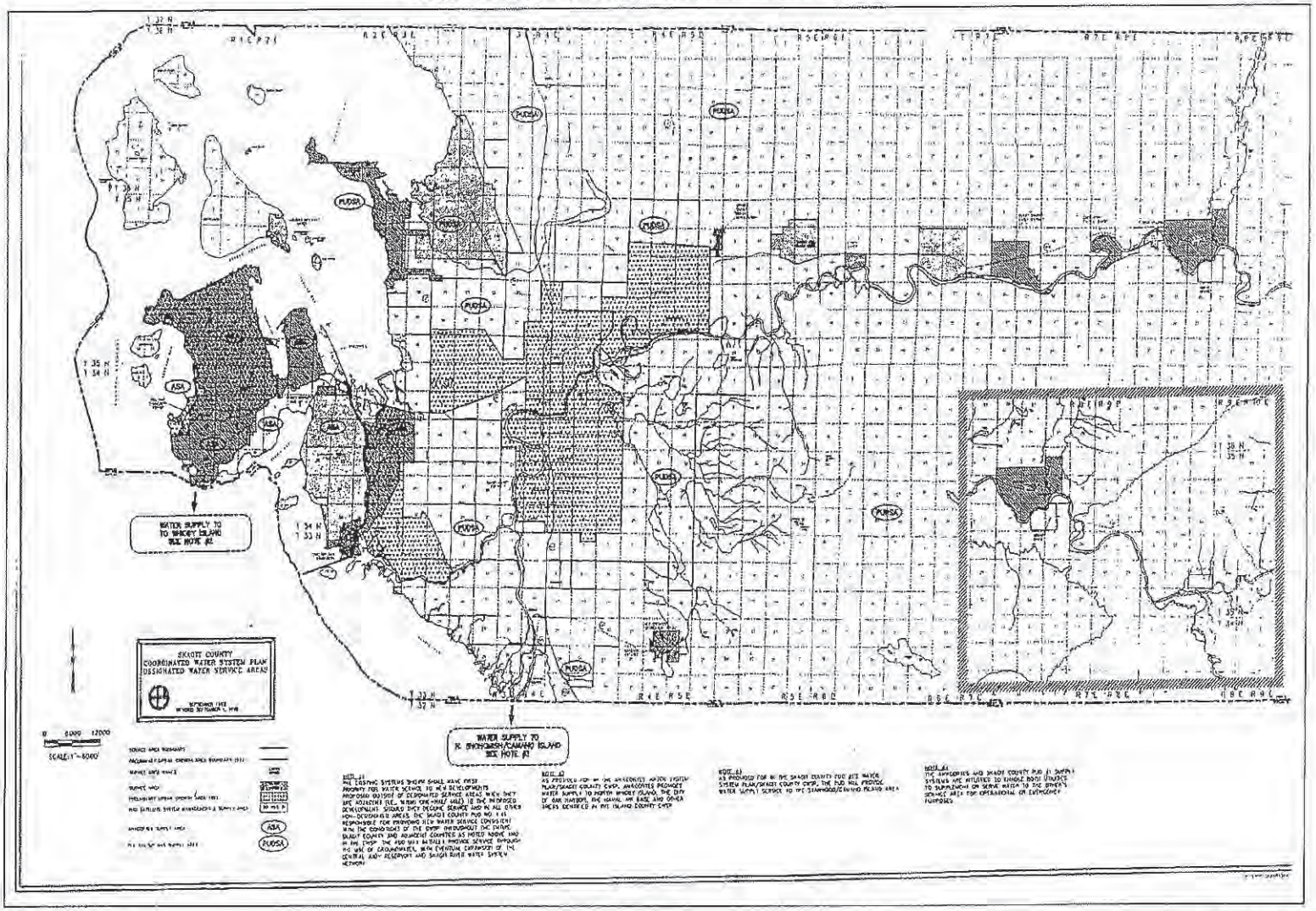
A Superseding Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude that Surface Water Certificate 411 is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing right and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Buck Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CERTIFICATE
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	WATER RIGHT CERTIFICATE NUMBER
October 30, 1963	S*18218	S1-00724P	S1-00724C

NAME: Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Gilligan Creek or the Skagit River

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
7.39		3700*

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round

Diversion from Gilligan Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

* Annual quantity is supplemental to existing rights

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

Gilligan Creek diversion:
Within the NW¼ NE¼ of Section 2, Township 34N, Range 5E, W.M. (875 feet south and 420 feet east of the N¼ corner of Section 2)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Gilligan Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

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Water Rights on Record for the PUD:

Not including water rights held for satellite management systems, the PUD has seven water right claims, five surface water certificates (SWC), two ground water permits (GWP), a reservoir permit and a reservoir certificate. These rights are summarized as follows:

Document Number	Priority Date	Source of Appropriation	Instantaneous Rate "Qi" (cfs or gpm)	Annual Rate "Qa" (acre-feet per year)	Comments
Claim 009332	Prior to 1917	Salmon Creek	1.8 cfs	307	Change application
Claim 009333	Prior to 1917	Turner Creek	4.3 cfs	2,300	Change application
Claim 009334	Prior to 1917	Rock Springs Creek	0.2 cfs	40?	Inactive
Claim 009335	Prior to 1917	Pigeon Creek	0.2 cfs	40?	Inactive
Claim 009336	Prior to 1917	Unnamed creek	0.1 cfs	20?	Inactive
Claim 009337	Prior to 1917	Cold Springs	0.2 cfs	40?	Inactive
Claim 009338	Prior to 1917	East Nookachamps	1.1 cfs	110?	Inactive
SWC 26	September 28, 1917	Mundt Creek	2.5 cfs	Not listed	Change application
SWC 411	October 10, 1929	Gilligan Creek	1.5 cfs	Not listed	Change application
S1-00724C	October 30, 1963	Gilligan Creek	8.89 cfs	Supplemental Qa	Subject of this report
S1-00737C	October 30, 1963	Mundt Creek	8.0 cfs	Supplemental Qa	Change application
S1-00739C	October 30, 1963	Turner Creek	6.2 cfs	Supplemental Qa	Change application
GWP 2911	March 26, 1953	Sedro-Woolley well	900 gpm	1440	Change application
GWP 3350	May 12, 1954	Ranney Well	4,000 gpm	6400	Change application
Reservoir 8738	January 16, 1946	Cultus Streams	Not Applicable	1500	Judy Reservoir
R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Gilligan Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Gilligan Creek diversions to minimum instream flows (not a previous requirement). When Gilligan Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Certificate:

Name on Certificate:	PUD No.1 of Skagit County
Priority Date:	October 30, 1963
Instantaneous Quantity:	8.89 cubic feet per second
Annual Quantity:	3700 acre-feet per year (supplemental to existing rights)
Source:	Gilligan Creek
Point of Diversion:	NW¼ NE¼ of Section 2, Township 34 North, Range 5 East
Period of Use:	Continuously
Purpose of Use:	Municipal supply
Place of Use:	Area served by PUD No.1 of Skagit County

Change Request:

Name Change to:	Public Utility District No. 1 of Skagit County
Filed on:	November 4, 1997
Instantaneous Quantity:	7.39 cubic feet per second
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on June 25th & July 2nd, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(9) The 1994 PUD Water System Plan,
(10) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(11) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(12) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Gilligan Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

The Puget Sound Pulp and Timber Company initiated development of the Gilligan Creek diversion structure and pipeline in 1929 (prior to the formation of the PUD in 1937). The initial pipeline was a 12-inch wood pipe. The Gilligan Creek diversion currently consists of two water rights, Surface Water Certificate 411 (priority date of October 10, 1929) and the subject water right (S1-00724C). SWC 411 was issued for 1.5 cfs, with no limitation or indication of a maximum annual quantity. Continuous year-round diversion at the rate of 1.5 cfs is equivalent to 1086 acre-feet per year.

The application that led to the issuance of S1-00724C was submitted for 27 cfs. The report of examination and subsequent permit issued in 1984 for 15 cfs and 6840 acre-feet per year (supplemental to existing rights). The hydraulic capacity of the diversion works and pipeline was evaluated in 1987, prior to the issuance of the final certificate, and was determined to be 8.89 cfs. The certificate issued for 8.89 cfs, with the annual quantity reduced to 3700 afy (supplemental to existing rights). Because SWC 411 had already been issued for 1.5 cfs, the certificated instantaneous quantity for S1-00724C should have been 7.39 cfs (8.89 minus 1.5). Therefore, upon approval of this change authorization, the instantaneous rate of this water right shall be reduced from 8.89 cfs to 7.39 cfs.

The PUD has maintained records of the annual stream diversions for all of the Cultus Mountain Water Supply System since 1954. These records show that water has been diverted on an annual basis from the Gilligan/Salmon Creek system. Although separate records are not maintained on the amount of diversion from each creek, the majority of the diversion for this collector system has been from Gilligan Creek over the years. These records from recent years show that as much as 2,488 million gallons per year has been diverted (under all rights) through this system. This is equivalent to 7,635 acre-feet per year, which exceeds the maximum of 3,700 acre-feet per year associated with this right.

In accordance with the above information, S1-00724C has been perfected and approval of this change request will not create an enhancement of the original right.

Same Source of Water:

Gilligan Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Gilligan Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Surface Water Certificate S1-00724C be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Gilligan Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Gilligan Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Gilligan Creek
January	1-31	19.8 cfs
February	1-29	19.8
March	1-15	19.8
March	16-31	27.7
April	1-30	31.7
May	1-31	31.7
June	1-30	31.7
July	1-31	39.6
August	1-31	39.6
September	1-30	39.6
October	1-31	23.8
November	1-30	27.7
December	1-31	27.7

No diversion of water from Gilligan Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of the perfection of S1-00724C. Official confirmation of the true extent of the right can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination."

The applicant is advised that a Superseding Certificate will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

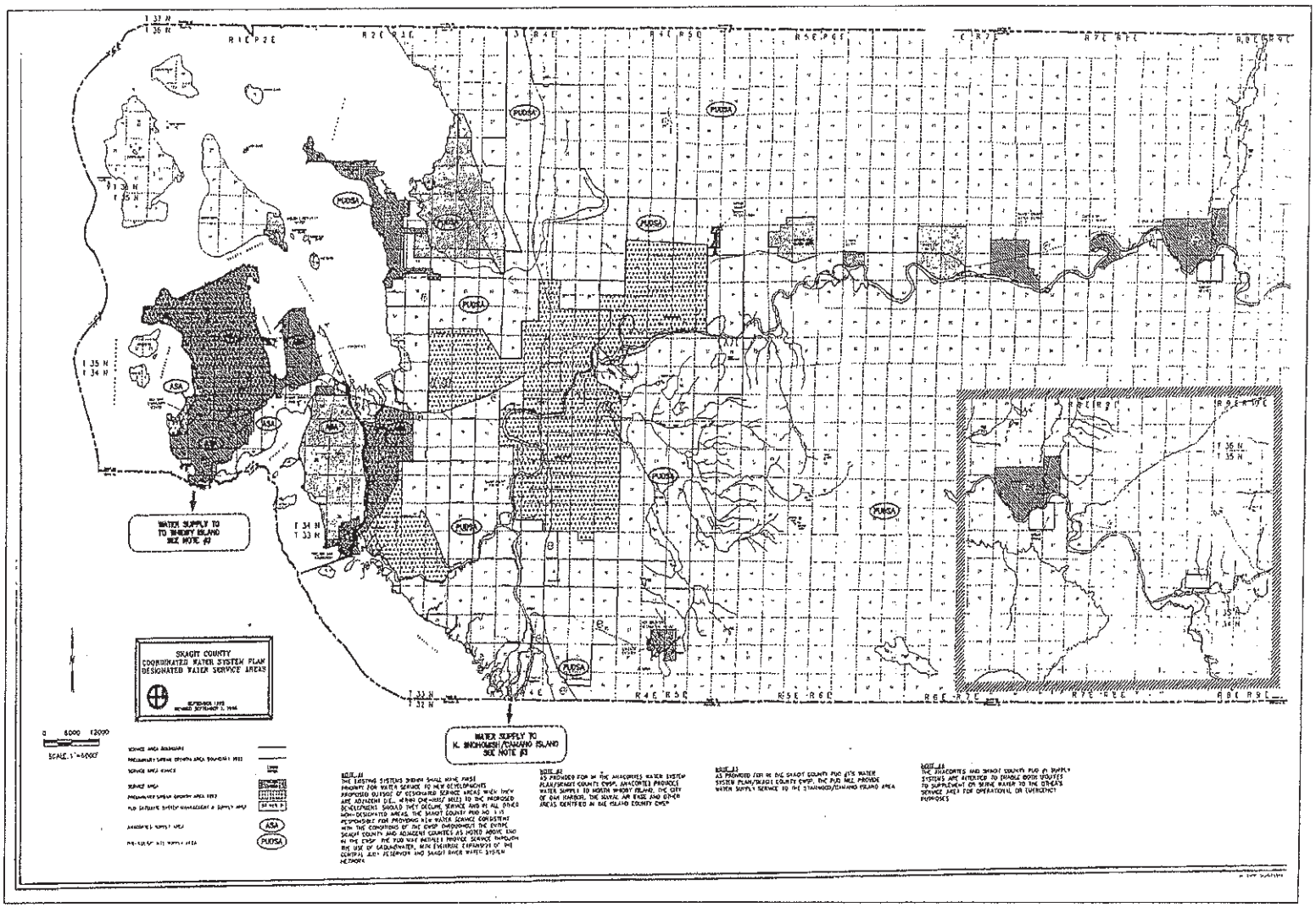
A Superseding Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude that Surface Water Certificate S1-00724C is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing right and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Buck Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
November 16, 1987	S1-25129	S1-25129P	

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 1436	Mount Vernon	WA	98273

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Gilligan Creek and the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
13.15*		3700**

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round diversion conditioned to the following:
Diversion from Gilligan Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC
Diversion from the Skagit River is subject to the Skagit River Instream Flows as established in chapter 173-503 WAC

*Maximum 55.39 cfs (35.80 mgd) diverted from the Cultus Mountain streams or from the Skagit River into Judy Reservoir

**Maximum Acre-Feet per Year diverted from Gilligan Creek and/or the Skagit River under Surface Water Certificate 411 and S1-00724, and S1-25129 shall not exceed 3700 acre feet per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Gilligan Creek diversion: NW 1/4 NE 1/4 of Section 2, Township 34N, Range 5E, W.M.
Skagit River diversion: SW 1/4 SW 1/4, Section 29, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.
The Gilligan Creek diversion is located approximately 875 feet south and 420 feet east from the N 1/4 corner.	2	34	5E
The Skagit River diversion is located approximately 1,100 feet north and 1000 feet east from the SW corner.	29	35	5E

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas, approved by the Washington State Department of Health.

DESCRIPTION OF PROPOSED WORKS

Gilligan Creek:
Water is diverted by way of a small dam, or diversion structure in Gilligan Creek through pipelines, to Judy Reservoir.

Skagit River:
Water is pumped from the Skagit River up to Judy Reservoir.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	Completed	December 23, 2046

PROVISIONS

Memorandum of Agreement

This approval is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

In accordance with the 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Gilligan Creek and the Skagit River shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

No diversion of water from Gilligan Creek shall take place when the creek falls below minimum instream flow levels at river mile 3.2.

January 1 – March 15	19.8 cfs
March 16 – March 31	27.7 cfs
April 1 – June 30	31.7 cfs
July 1 – Sept. 30	39.6 cfs
Oct. 1 – Oct. 31	23.8 cfs
Nov. 1 – Dec. 31	27.7 cfs

No diversion of water from the Skagit River shall take place when the river falls below minimum instream flow levels at USGS station 12-2005-00.

January 1 – March 31	10,000 cfs
April 1 – June 30	12,000 cfs
July 1 – September 30	10,000 cfs
October 1 – November 15	13,000 cfs
November 16 – December 15	11,000 cfs
December 16 – December 31	10,000 cfs

Stream Gage

A stream gage shall be installed and maintained at river mile 3.2 on Gilligan Creek as specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and interested local tribes upon request.

Metering

An approved measuring device shall be installed and maintained for each diversion of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded daily with the source of water noted (Gilligan Creek or Skagit River). The maximum daily instantaneous rate of diversion and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of meter readings to collect information for water resource planning, management and compliance.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

Other

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Nothing in this application for water right approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

The applicant is advised that a Certificate of Water Right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

A Certificate of Water Right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 22 *day of* August, *2013.*

REVIEWED BY
OKAY

Department of Ecology

By _____
Jacqueline Klug, Section Manager, Water Resources

MUNDT CREEK WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	WATER RIGHT CERTIFICATE NUMBER
September 28, 1917	42	8	26

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Mundt Creek or the Skagit River

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
2.5*		1810**

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round

Diversion from Mundt Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

* Total instantaneous diversion under this right and S1-00737C shall not exceed 8.0 cfs

** Total annual diversion under this right and S1-00737C shall not exceed 3886.0 afy

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Mundt Creek diversion:
NW¼ NW¼ of Section 16, Township 34N, Range 5E, W.M. (1000 feet south and 850 feet east from the NW corner of Section 16)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS
Mundt Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE		
BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to a total of 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

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R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Mundt Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Mundt Creek diversions to minimum instream flows (not a previous requirement). When Mundt Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Certificate:

Name on Certificate:	The Skagit Improvement Company (acquired by Peoples Water and Gas Company)
Priority Date:	September 28, 1917
Instantaneous Quantity:	2.5 cubic feet per second
Annual Quantity:	Not listed
Source:	Mundt Creek
Point of Diversion:	Section 16, Township 34 North, Range 5 East
Period of Use:	Year round (according to Proof of Appropriation from)
Purpose of Use:	Domestic supply for Sedro-Woolley and Burlington (Municipal)
Place of Use:	Cities of Sedro-Woolley and Burlington

Change Request:

Name Change to:	Public Utility District No. 1 of Skagit County
Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on June 24th & July 1st, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use and perfection of the subject certificate,
(9) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(10) The 1994 PUD Water System Plan,
(11) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(12) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(13) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Mundt Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

Surface Water Certificate 26 was issued to The Skagit Improvement Company (Peoples Water and Gas Company) in 1920. The PUD obtained this right when it purchased the water system in 1939. This certificate allows for a maximum instantaneous diversion of 2.5 cfs from Mundt Creek. No annual quantity is specified on the certificate, but at a continuous diversion rate of 2.5 cfs, the maximum annual diversion rate would be 1,810 acre-feet per year.

Surface Water Certificate S1-00737C (priority date October 30, 1963) issued for 8.0 cfs as a supplemental supply (5.5 cfs new supply) from the same diversion point on Mundt Creek. This certificate limits the total annual diversion under both certificates to 3,886 afy and the total annual quantity diverted from all sources (including groundwater) to 23,417.4 afy.

Information obtained from the PUD's "Affidavit of Beneficial Use" and their 1994 Water System Plan indicate SWC 26 has been fully perfected on an instantaneous and annual basis. Because SWC 26 appears to be a perfected right, adding an additional point of diversion and changing the place of use description will not enhance the original right. Approval of the change request will not result in an increase of the instantaneous or annual quantity of water perfected under the original right.

Official confirmation of the true extent and perfection of the right can only occur as result of a general water rights adjudication through Superior Court.

Same Source of Water:

Mundt Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Mundt Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Surface Water Certificate 26 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Mundt Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Mundt Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Mundt Creek
January	1-31	6.4 cfs
February	1-29	6.4
March	1-15	6.4
March	16-31	9.4
April	1-30	9.4
May	1-31	9.4
June	1-30	9.4
July	1-31	7.6
August	1-31	7.6
September	1-30	7.6
October	1-31	7.6
November	1-30	9.4
December	1-31	9.4

No diversion of water from Mundt Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of the perfection of SWC 26. Official confirmation of the true extent of the right can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination."

The applicant is advised that a Superseding Certificate will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

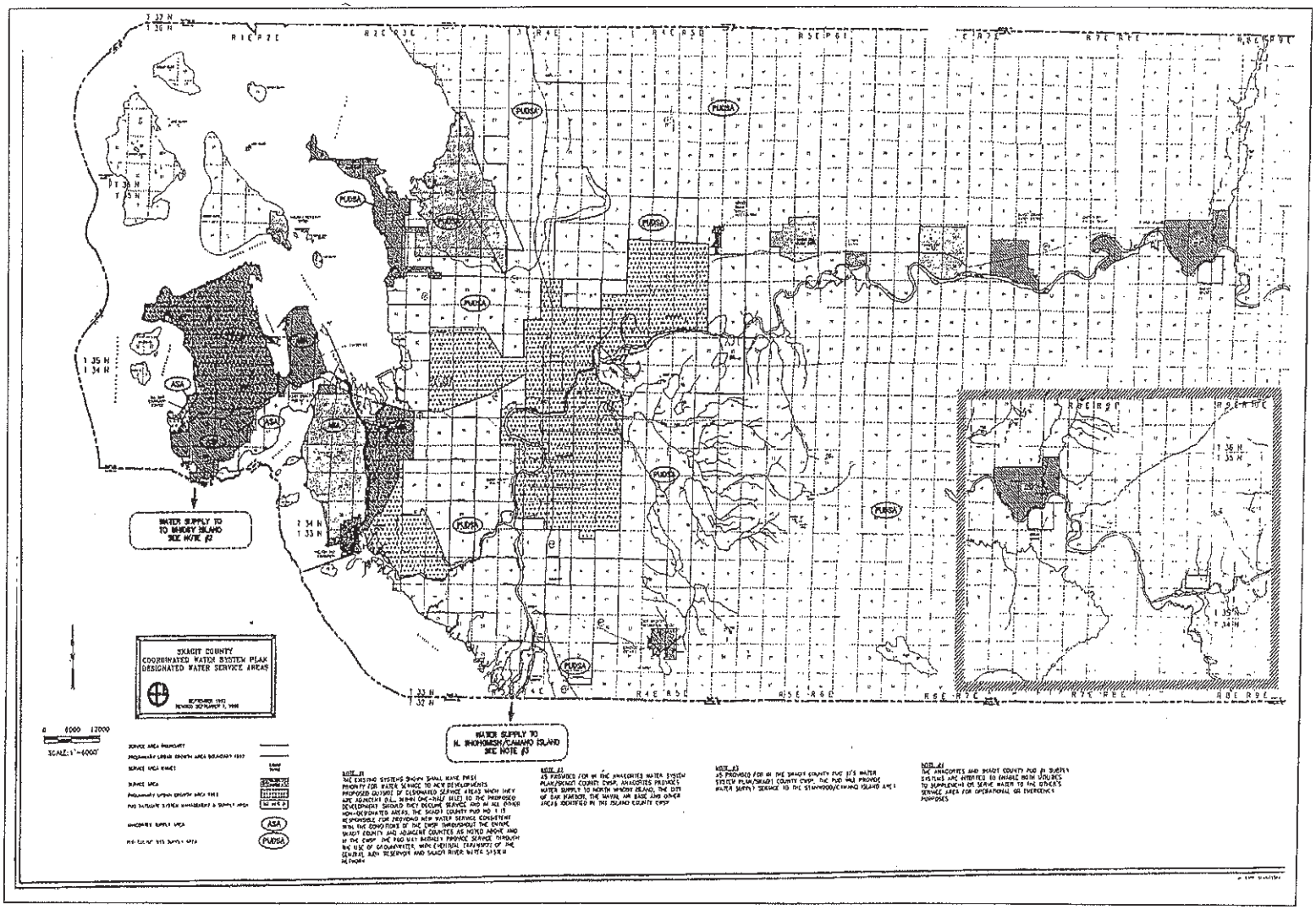
A Superseding Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude that Surface Water Certificate 26 is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing right and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Buck Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CERTIFICATE
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	WATER RIGHT CERTIFICATE NUMBER
October 30, 1963	S*18221	S1-00737P	S1-00737C

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Mundt Creek or the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
8.0*		3,886.0*

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – When available

Diversion from Mundt Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

* Issued supplemental to existing rights under certificates 26, 8738 and Reservoir Permit R-293. The total instantaneous quantity diverted from Mundt Creek shall not exceed 8.0 cfs, nor shall the total annual quantity appropriated or withdrawn from all sources, to include ground water sources, exceed 23,417.4 acre-feet of water per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Mundt Creek diversion:
NW¼ NW¼ of Section 16, Township 34N, Range 5E, W.M. (1000 feet south and 850 feet east from the NW corner of Section 16)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Mundt Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

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R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Mundt Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Mundt Creek diversions to minimum instream flows (not a previous requirement). When Mundt Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Certificate:

Name on Certificate:	P.U.D. No. 1 of Skagit County
Priority Date:	October 30, 1963
Instantaneous Quantity:	8.0 cubic feet per second (Total diversion from Mundt Creek)
Annual Quantity:	3,886.0 acre-feet per year (Supplemental)
Source:	Mundt Creek
Point of Diversion:	NW¼ NW¼ of Section 16, Township 34 North, Range 5 East
Purpose of Use:	Municipal supply
Place of Use:	The area served by Skagit County P.U.D. No. 1

Change Request:

Name Change to:	Public Utility District No. 1 of Skagit County
Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on June 25th & July 2nd, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(9) The 1994 PUD Water System Plan,
(10) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(11) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(12) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Mundt Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

This water right was issued as a supplemental supply for 8.0 cfs and 3,886 acre-feet per year. A hydraulic analysis of all the diversions for the Cultus Mountain Water Supply System was performed in 1996. The results of the hydraulic analysis indicate that the Mundt Creek Diversion System is capable of conveying the full certificated instantaneous quantity of 8.0 cfs.

The PUD has maintained records of the annual stream diversions for all of the Cultus Mountain Water Supply System since 1954. These records show that water has been diverted on an annual basis from Mundt Creek. Certificate S1-00737C was issued for a maximum annual quantity of 3,886 acre-feet per year based on an estimation of water available from this source. This annual quantity was also shown on the certificate as being supplemental to existing water rights, which means that this annual quantity is not in addition to the PUD's other existing water rights. Because this right is supplemental to existing rights, and all previously existing rights have been perfected, the logical conclusion shall be that this right has also been perfected.

In accordance with the above information, S1-00737C has been perfected and approval of this change request will not create an enhancement of the original right.

Same Source of Water:

Mundt Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Mundt Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Surface Water Certificate S1-00737C be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Mundt Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Mundt Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Mundt Creek
January	1-31	6.4 cfs
February	1-29	6.4
March	1-15	6.4
March	16-31	9.4
April	1-30	9.4
May	1-31	9.4
June	1-30	9.4
July	1-31	7.6
August	1-31	7.6
September	1-30	7.6
October	1-31	7.6
November	1-30	9.4
December	1-31	9.4

No diversion of water from Mundt Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of the perfection of S1-00737C. Official confirmation of the true extent of the right can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination."

The applicant is advised that a Superseding Certificate will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

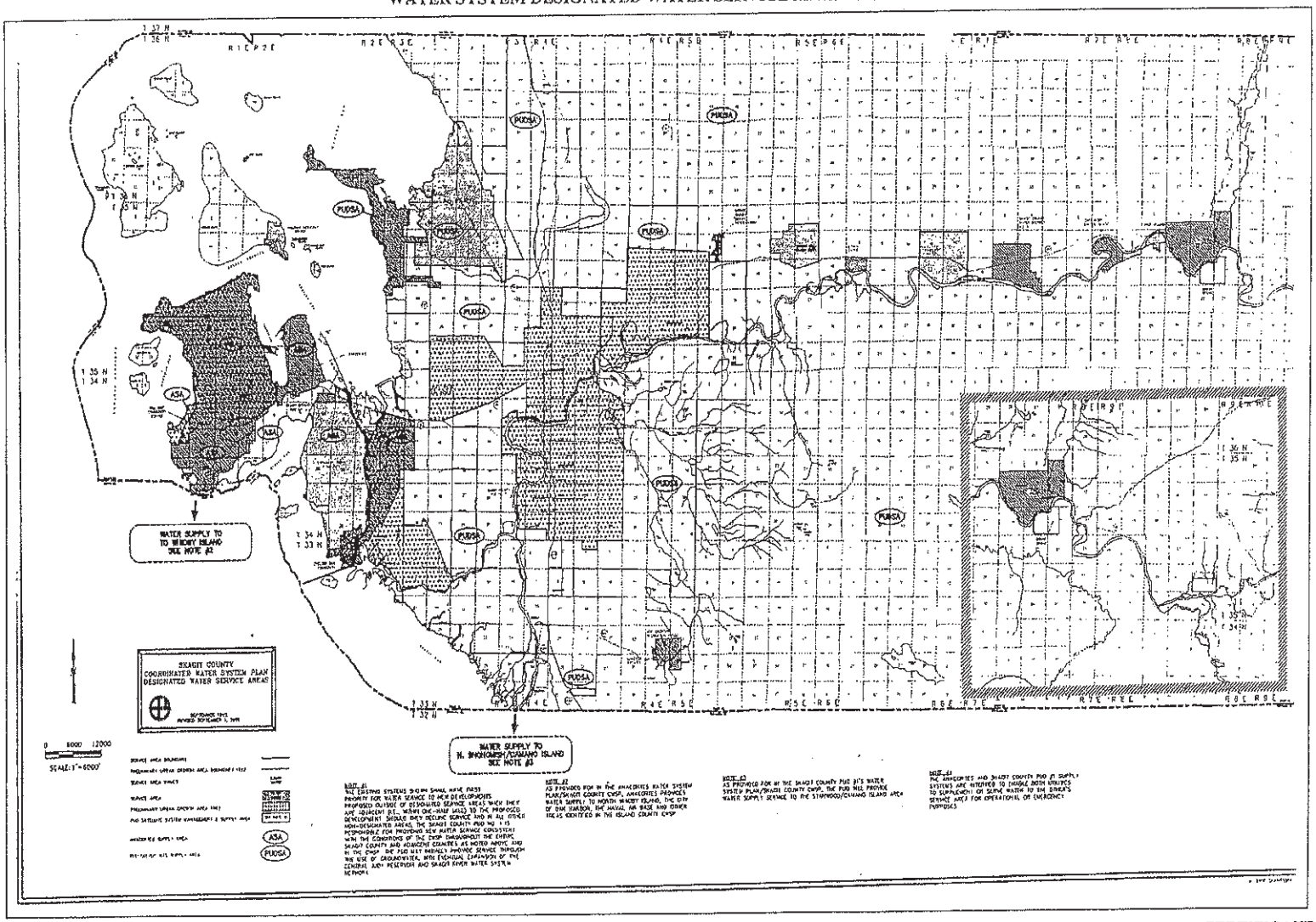
A Superseding Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude that Surface Water Certificate S1-00737C is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing right and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Buck Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



State of Washington
Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid $ 3212
Date 10-22-97

Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name Public Utility District No 1 of Skagit County Home Tel:( ) -
Mailing Address P.O. Box 1436 Work Tel:(360) - 424-7104
City Mount Vernon State WA Zip+4 98273 + 1436 FAX:(360) - 424-8764

Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☒ Same as above, except

Name Greg Peterka or Brad Spangler Home Tel:( ) -
Mailing Address Work Tel:( ) -
City State Zip+4 + FAX:(360) 416 - 0352
Relationship to applicant Staff

Section 3. STATEMENT OF INTENT

The applicant requests a permit to use not more than 16.06 (☐ gallons per minute or ☒ cubic feet per second) from a ☒ surface water source or ☐ ground water source (check only one) for the purpose(s) of Municipal Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.*
Estimate a maximum annual quantity to be used in acre-feet per year: See comments on last page

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:
From ___/___/___ to ___/___/___

Section 4. WATER SOURCE

If SURFACE WATER	If GROUNDWATER
Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.: Mundt Creek Number of diversions: 1	A permit is desired for _____ well(s).
Source flows into (name of body of water): East Fork Nookachamps Creek	Size & depth of well(s):

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner:
1000 feet south and 850 feet east from the NW corner of Sec. 16

¼ of	¼ of	Section	Township	Range(E/W)	County	If location of source is platted, complete below: Lot	Block	Subdivision
NW	NW	16	34N	5E	Skagit			
		29/30	35N	5E	Skagit			

Mundt Cr.
Skagit River

per letter 6/23/00 RW

For Ecology Use Date Received: 10-22-97 Priority Date: 10-22-97
SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #
Date Accepted As Complete 11-4-97 By JW Date Returned By WRIA: 3

ECY 040-1-14
Rev. 9/95 F

APPLICATION

Appl. No.: S1-27861

Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Mundt Collector

B. Briefly describe your proposed water system. (See instructions.)
Mundt Collector (Cap. 26.56 cfs) pipeline provides water to PUD's South Collector and thence to Judy Reservoir.

SEE ATTACHED WATER SYSTEM PLAN.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. Surface Water Certificates No. 26 and S1-00737C

Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
(Completed for all domestic/public supply uses.)

SEE ATTACHED WATER SYSTEM PLAN

A. Number of "connections" requested: _____ Type of connection _____
(Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.*

Complete C. and D. only if the proposed water system will have fifteen or more connections.

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 10-5-95 Please attach the current approved version of your plan.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 10-5-95 Please attach the current approved version of your plan.

Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
(Complete for all irrigation and agriculture uses.)

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☒ YES ☐ NO

NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.

Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site.
SR 9 south of ~~Sedro-Woolley~~ to Clear Lake. East on Old Day Creek Road, north (left) at SECOND Morford Rd, past water storage tanks (on right) to Judy Reservoir Water Treatment Plant (on left). WTP staff can direct you further.

Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)
Please see map identified as Figure 1.

Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

Public Water Supplier

B. Does the applicant own the land on which the water source is located? ☒ YES ☐ NO
If no, submit a copy of agreement:

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.

Bradley R Spangler PE — 28 OCT 97
Applicant (or authorized representative) — Date

N/A — ____
Landowner for place of use (if same as applicant, write "same") — Date

Use this page to continue your answers to any questions on the application. Please indicate section number before answer.

3. In compliance with the Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources, rights issued under this application will be subject to both Cultus Mountain and Lower Skagit River Instream Flows (which have not yet been established). Therefore, a realistic estimate of annual use cannot be made - whenever available, the water will normally be used.

We are returning your application for the following reason(s):	
____ Examination fee was not enclosed	APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128
____ Section number(s) _____ is/are incomplete	APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE
Explanation:	
Please provide the additional information requested above and return your application by _____ _____ *(date).*	

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).

Place of Use

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996.

Skagit River Pumping Plant location has not been specifically identified yet, but will be on reach within W½ SW¼ of Sec. 29 and E½ S½ of Sec. 30. T. 35N., R. 5E.

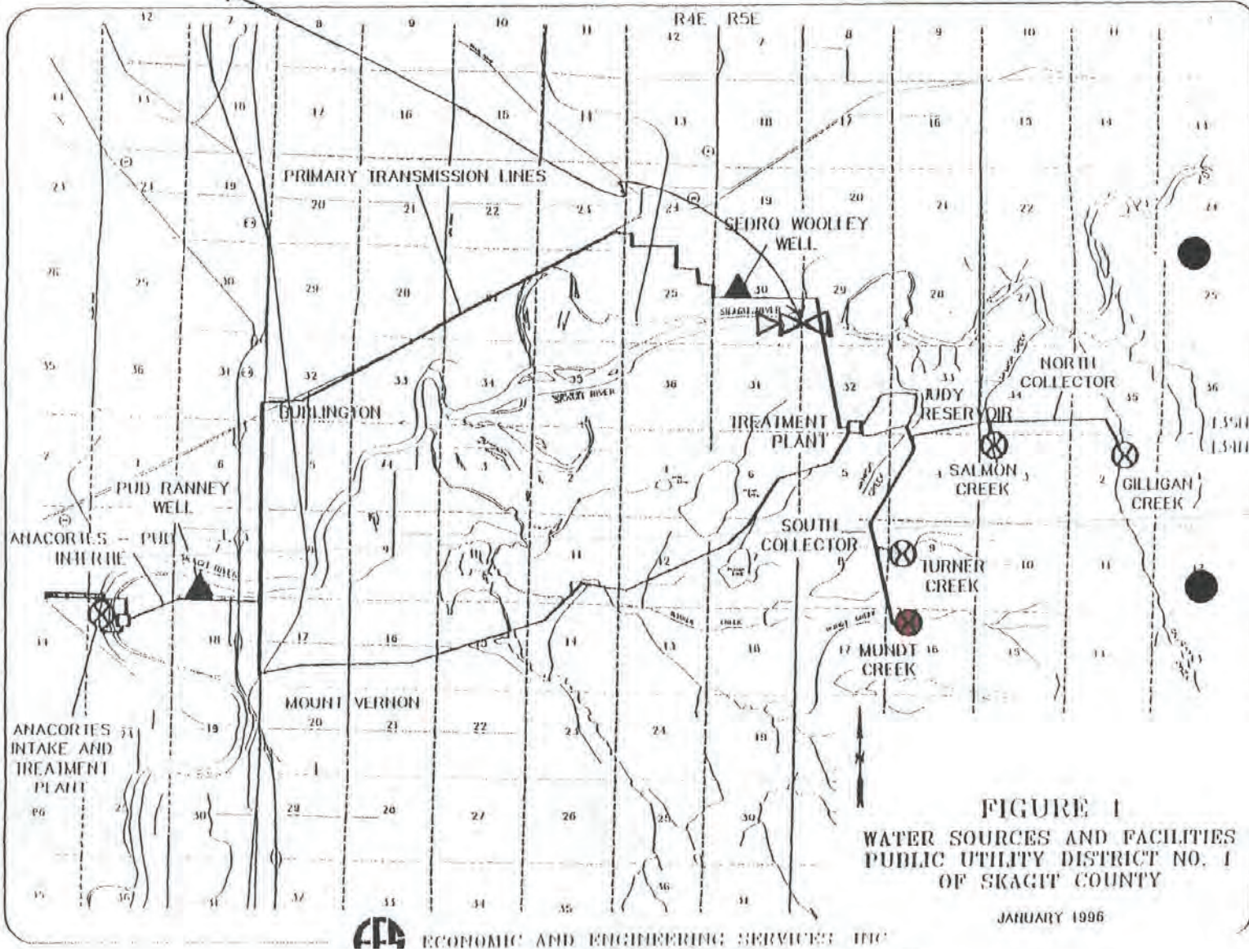


FIGURE 1
WATER SOURCES AND FACILITIES
PUBLIC UTILITY DISTRICT NO. 1
OF SKAGIT COUNTY

JANUARY 1996

ECONOMIC AND ENGINEERING SERVICES, INC.

TURNER CREEK WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CLAIM
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE			WATER RIGHT CLAIM NUMBER
Prior to 1917			009333

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Turner Creek or the Skagit River

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
4.3		2,300

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round

Diversion from Turner Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Turner Creek diversion:
SW¼ NW¼ of Section 9, Township 34N, Range 5E, W.M. (460 feet north and 63 feet east of the W¼ corner of Section 9)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Turner Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to a total of 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

Although organized early in 1937, the PUD did not actually engage in the utility business until November 4, 1939, when it purchased by friendly condemnation, the water systems in the Cities of Mount Vernon, Burlington and Sedro-Woolley from the Peoples Water and Gas Company. The water systems totaled 3,134 water services, 51.5 miles of pipeline, 3,940,000 gallons of distribution storage, 1.75 million gallons per day in treatment facilities, and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt and Turner Creeks). On March 7, 1940, the PUD purchased the Clear Lake Water Corporation comprised of 180 water services, 11.5 miles of pipeline, 500,000 gallons of distribution storage, and diversions on three Cultus Mountain streams (Gilligan, Salmon and Turner Creeks). On July 1, 1940, the PUD purchased 1.8 miles of water line from the Avon Mutual Water System. In 1940, the PUD commenced to integrate the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon, this line was completed that same year through support of the Works Progress Administration. The further development of the PUD's Judy Reservoir, Fidalgo Island and remote systems is chronicled as follows:

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435' AMSL.
1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.
1956 Acquired/constructed the PUD's Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.
1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.
1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.
1960 Extended Judy Reservoir system to Bayview through LUD No. 4.
1961 Expanded Fidalgo Island system to the Gibralter and Dewey Beach areas through LUD No. 5.
1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.
1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.
1965 Raised Judy Reservoir from elevation 435' above mean sea level (AMSL) to 451' AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.
1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.
1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley river crossing with concrete cylinder pipe.
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- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Turner Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Turner Creek diversions to minimum instream flows (not a previous requirement). When Turner Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Claim:

Claimant:	Public Utility District No 1. of Skagit County
Claim Number:	009333
Filing Date:	March 17, 1972
Date of First Water Use:	Prior to 1917
Claimed Instantaneous Quantity:	4.3 cubic feet per second
Claimed Annual Quantity:	2300 acre-feet per year
Source:	Turner Creek

Point of Diversion:	NW¼ of Section 9, Township 34 North, Range 5 East
Period of Use:	Year round
Purpose of Use:	Municipal water supply
Place of Use:	Central Skagit County including cities of Mount Vernon, Burlington, Sedro-Woolley, Clear Lake and surrounding rural areas

Change Request:

Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on July 3rd & 10th, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use and perfection of the subject claim,
(9) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(10) The 1994 PUD Water System Plan,
(11) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(12) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(13) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.14 RCW establishes the process for registering claims to pre-water code (vested) rights. Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the right perfected under the original claim,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Turner Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

The PUD registered Water Right Claim 009333 for 4.3 cubic feet per second and 2,300 acre-feet per year. The Clear Lake Water Company and the Peoples Water and Gas Company (the PUD's predecessors) began using water from Turner Creek prior to 1917 (possibly as early as 1908). Upon takeover of the system the PUD has used the water, when available, ever since. The hydraulic capacity of the original diversion was 4.3 cfs. When the diversion works and the collector pipeline were rebuilt in 1967, the hydraulic capacity increased. The PUD then obtained Surface Water Right S1-00739C for an additional 6.2 cfs. The claim and certificate combined indicate the current instantaneous rights on Turner Creek are 10.5 cfs (4.3 + 6.2). Stream diversion records indicate the claimed annual quantity of 2,300 afy has been diverted on numerous occasions

In consideration of the available data, Ecology has tentatively determined Claim 009333 to be a valid and perfected vested right. Official confirmation of the true extent and perfection of the claim to vested rights can only occur as result of a general water rights adjudication through Superior Court.

Claim 009333 appears to be a perfected right, therefore adding an additional point of diversion and changing the place of use description will not enhance the original right. Approval of the change request will not result in an increase of the instantaneous or annual quantity of water perfected under the original claim.

Same Source of Water:

Turner Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Turner Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Water Right Claim 009333 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Turner Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Turner Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Turner Creek
January	1-31	7.9 cfs
February	1-29	5.4
March	1-15	5.4
March	16-31	5.4
April	1-30	7.9
May	1-31	7.9
June	1-30	4.9
July	1-31	4.9
August	1-31	4.9
September	1-30	4.9
October	1-31	7.9
November	1-30	7.9
December	1-31	7.9

No diversion of water from Turner Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of any vested water rights represented by Water Right Claim 009333. Official confirmation of the true extent of the claim to vested rights can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination" of the existence of a vested right.

The applicant is advised that a Certificate of Change will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

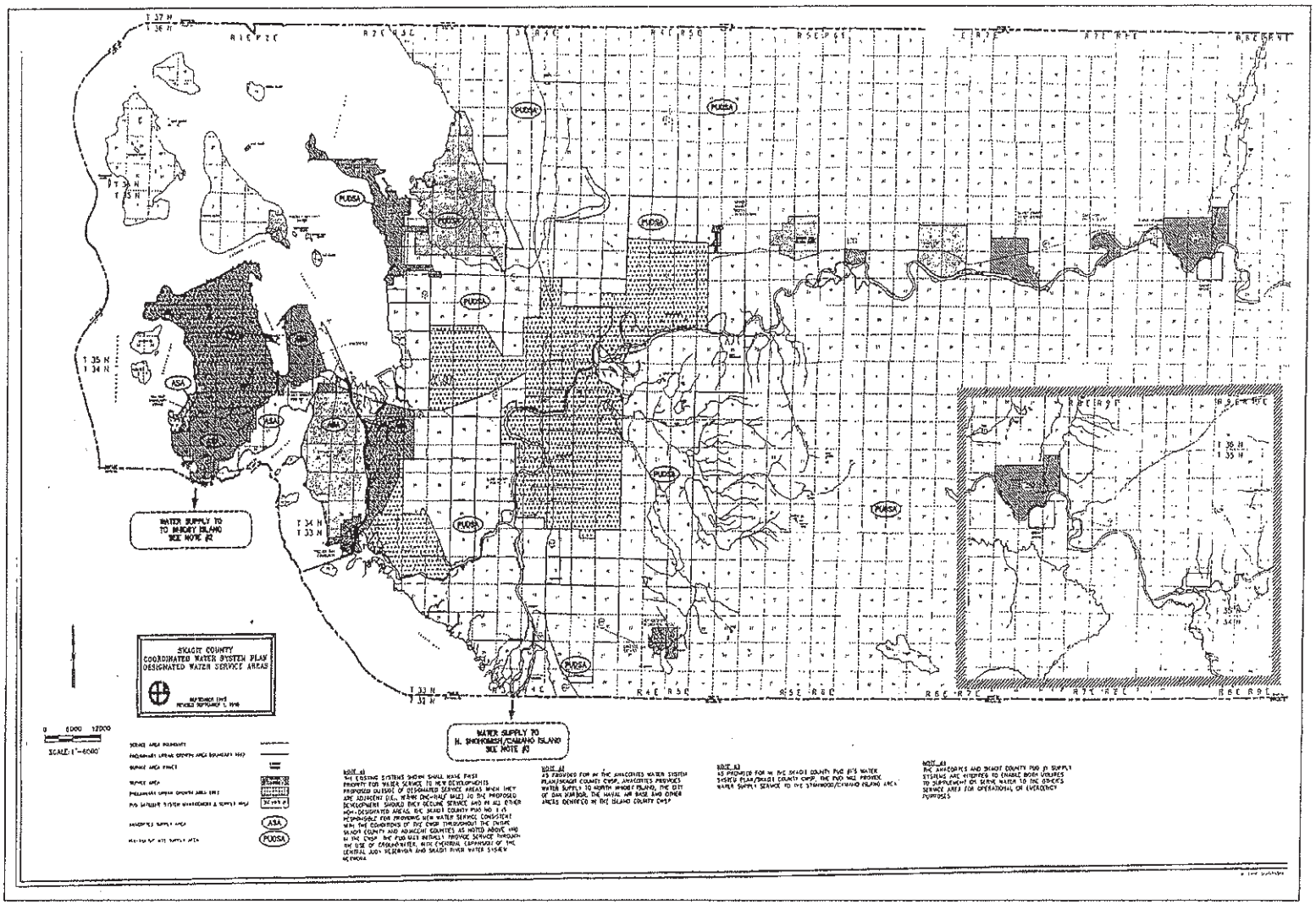
A Certificate of Change will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.14 RCW, I conclude that Water Right Claim 009333 is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing claim and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Buck Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CERTFICATE
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	WATER RIGHT CERTIFICATE NUMBER
October 30, 1963	S*18221	S1-00739P	S1-00739C

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Turner Creek or the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
6.2		3,022*

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – When available

Diversion from Mundt Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

* Issued supplemental to existing rights under certificate 8738 and reservoir permit R-293, the total instantaneous quantity diverted shall not exceed 6.2 cubic feet per second nor a maximum annual appropriation of 23,417 acre-feet per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Turner Creek diversion:
SW¼ NW¼ of Section 9, Township 34N, Range 5E, W.M. (460 feet north and 63 feet east from the W¼ corner of Section 9)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		34 & 35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Turner Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to a total of 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

Although organized early in 1937, the PUD did not actually engage in the utility business until November 4, 1939, when it purchased by friendly condemnation, the water systems in the Cities of Mount Vernon, Burlington and Sedro-Woolley from the Peoples Water and Gas Company. The water systems totaled 3,134 water services, 51.5 miles of pipeline, 3,940,000 gallons of distribution storage, 1.75 million gallons per day in treatment facilities, and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt and Turner Creeks). On March 7, 1940, the PUD purchased the Clear Lake Water Corporation comprised of 180 water services, 11.5 miles of pipeline, 500,000 gallons of distribution storage, and diversions on three Cultus Mountain streams (Gilligan, Salmon and Turner Creeks). On July 1, 1940, the PUD purchased 1.8 miles of water line from the Avon Mutual Water System. In 1940, the PUD commenced to integrate the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon, this line was completed that same year through support of the Works Progress Administration. The further development of the PUD's Judy Reservoir, Fidalgo Island and remote systems is chronicled as follows:

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435' AMSL.
1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.
1956 Acquired/constructed the PUD's Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.
1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.
1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.
1960 Extended Judy Reservoir system to Bayview through LUD No. 4.
1961 Expanded Fidalgo Island system to the Gibralter and Dewey Beach areas through LUD No. 5.
1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.
1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.
1965 Raised Judy Reservoir from elevation 435' above mean sea level (AMSL) to 451' AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.
1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.
1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley river crossing with concrete cylinder pipe.
1977 Installed a concrete cylinder pipe transmission line parallel to the wood stave distribution line between Sedro-Woolley and Burlington.

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The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Certificate:

Name on Certificate:	Public Utility District No. 1 of Skagit County
Priority Date:	October 30, 1963
Instantaneous Quantity:	6.2 cubic feet per second
Annual Quantity:	3,022 acre-feet per year (supplemental)
Source:	Turner Creek
Point of Diversion:	SW¼ NW¼ of Section 9, Township 34 North, Range 5 East
Period of Use:	When available
Purpose of Use:	Municipal supply
Place of Use:	Area served by P.U.D. No.1 of Skagit County

Change Request:

Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on June 25th & July 2st, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use and perfection of the subject certificate,
(9) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(10) The 1994 PUD Water System Plan,
(11) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(12) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(13) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Turner Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

This water right issued for 6.2 cubic feet per second (cfs) and a supplemental annual quantity of 3,022 acre-feet per year.

A hydraulic analysis of all the diversions for the Cultus Mountain Water Supply System was performed in 1996. The results of the hydraulic analysis indicate that the Turner Creek Diversion System is capable of conveying the full certificated instantaneous quantity of 6.2 cfs, plus the 4.3 cfs diverted under Water Right Claim 009333.

The PUD has maintained records of the annual stream diversions for all of the Cultus Mountain Water Supply System since 1954. These records show that water has been diverted on an annual basis from Turner Creek and that the 3,022 acre-feet per year authorized under this water right has been perfected.

In accordance with the above information, S1-00739C has been perfected and approval of this change request will not create an enhancement of the original right.

Same Source of Water:

Turner Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Turner Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to S1-00739C be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Turner Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Turner Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

Month	Day	Turner Creek
January	1-31	7.9 cfs
February	1-29	5.4
March	1-15	5.4
March	16-31	5.4
April	1-30	7.9
May	1-31	7.9
June	1-30	4.9
July	1-31	4.9
August	1-31	4.9
September	1-30	4.9
October	1-31	7.9
November	1-30	7.9
December	1-31	7.9

No diversion of water from Turner Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of the perfection of S1-00739C. Official confirmation of the true extent of the right can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination."

The applicant is advised that a Superseding Certificate will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

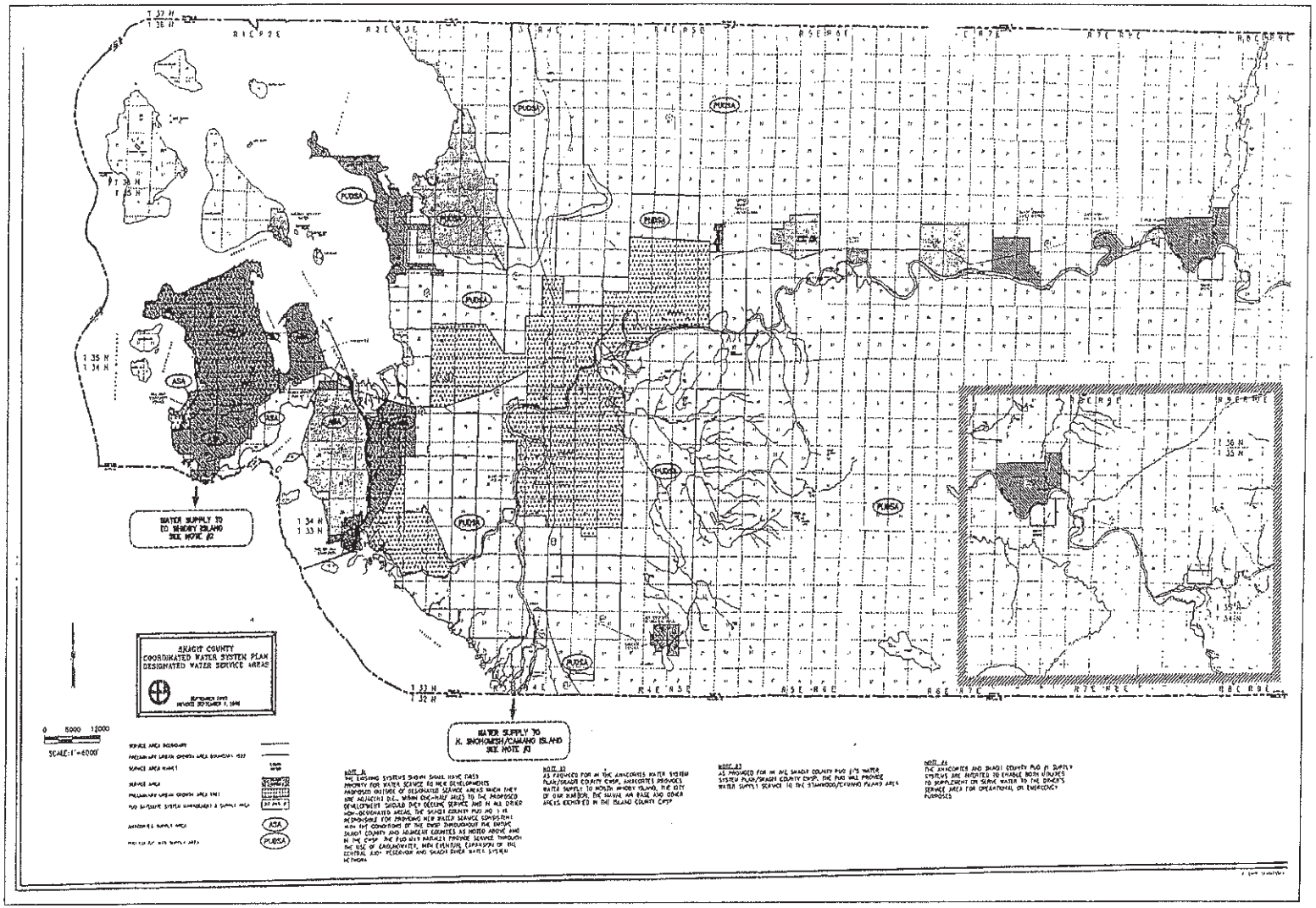
A Superseding Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapter 90.03 RCW, I conclude that Surface Water Certificate S1-00739C is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing right and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Bill Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 22, 1997	S1-27862	S1-27862P	

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 1436	Mount Vernon	WA	98273

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Turner Creek and the Skagit River

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
6.6*		3,022**

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round diversion conditioned to the following:
Diversion from Turner Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC
Diversion from the Skagit River is subject to the Skagit River Instream Flows as established in chapter 173-503 WAC

* Maximum 55.39 cfs (35.80 mgd) diverted from the Cultus Mountain streams or from the Skagit River into Judy Reservoir

**Maximum Acre-Feet per Year diverted from Turner Creek and/or the Skagit River under Surface Water Claim 009333, Certificate S1-00739, and S1-27862 shall not exceed 3,022 acre feet per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Turner Creek diversion: SW 1/4 NW 1/4, Section 9, Township 34N, Range 5E, W.M.
Skagit River diversion: SW 1/4 SW 1/4, Section 29, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.
The Turner Creek diversion is located approximately 460 feet north and 63 feet east from the west 1/4 corner.	9	34	5E
The Skagit River diversion is located approximately 1,100 feet north and 1000 feet east from the SW corner.	29	35	5E

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas, approved by the Washington State Department of Health.

DESCRIPTION OF PROPOSED WORKS

Turner Creek:
Water is diverted by way of a small dam, or diversion structure in Turner Creek through pipelines, to Judy Reservoir

Skagit River:
Water is pumped from the Skagit River up to Judy Reservoir.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	Completed	December 30, 2046

PROVISIONS

Memorandum of Agreement

This approval is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

In accordance with the 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversions from Turner Creek and the Skagit River shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

No diversion of water from Turner Creek shall take place when the creek falls below minimum instream flow levels at river mile 4.2.

January 1 – January 31	7.9 cfs
February 1-March 31	5.4 cfs
April 1 – May 31	7.9 cfs
June 1 – September 30	4.9cfs
October 1 – December 31	7.9 cfs

No diversion of water from the Skagit River shall take place when the river falls below minimum instream flow levels at USGS station 12-2005-00.

January 1 – March 31	10,000 cfs
April 1 – June 30	12,000 cfs
July 1 – September 30	10,000 cfs
October 1 – November 15	13,000 cfs
November 16 – December 15	11,000 cfs
December 16 – December 31	10,000 cfs

Stream Gage

A stream gage shall be installed and maintained at river mile 4.2 on Turner Creek as specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and interested local tribes upon request.

Metering

An approved measuring device shall be installed and maintained for each diversion of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded daily with the source of water noted (Turner Creek or Skagit River). The maximum daily instantaneous rate of diversion and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of meter readings to collect information for water resource planning, management and compliance.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

Other

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Nothing in this application for water right approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

The applicant is advised that a Certificate of Water Right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

A Certificate of Water Right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 22 *day of* August, *2013.*

REVIEWED BY
OKAY

Department of Ecology

By _____
Jacqueline Klug, Section Manager, Water Resources

SALMON CREEK WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT CLAIM
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE			WATER RIGHT CLAIM NUMBER
Prior to 1917			009332

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Salmon Creek or the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
1.8		307

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round

Diversion from Salmon Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Salmon Creek diversion:
SW¼ of Section 34, Township 35N, Range 5E, W.M. (1200 feet N32°E of the Southwest corner of Section 34)

Skagit River diversion:
Within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
		35	5E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

Salmon Creek intake and pipeline collection system, a Skagit River intake and pumping plant, storage in Judy Reservoir and an area-wide distribution system

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
June 30, 2002 03 04 06	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District (PUD) No. 1 of Skagit County is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the PUD's Judy Reservoir system ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to a total of 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

Although organized early in 1937, the PUD did not actually engage in the utility business until November 4, 1939, when it purchased by friendly condemnation, the water systems in the Cities of Mount Vernon, Burlington and Sedro-Woolley from the Peoples Water and Gas Company. The water systems totaled 3,134 water services, 51.5 miles of pipeline, 3,940,000 gallons of distribution storage, 1.75 million gallons per day in treatment facilities, and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt and Turner Creeks). On March 7, 1940, the PUD purchased the Clear Lake Water Corporation comprised of 180 water services, 11.5 miles of pipeline, 500,000 gallons of distribution storage, and diversions on three Cultus Mountain streams (Gilligan, Salmon and Turner Creeks). On July 1, 1940, the PUD purchased 1.8 miles of water line from the Avon Mutual Water System. In 1940, the PUD commenced to integrate the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon, this line was completed that same year through support of the Works Progress Administration. The further development of the PUD's Judy Reservoir, Fidalgo Island and remote systems is chronicled as follows:

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435' AMSL.
1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.
1956 Acquired/constructed the PUD's Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.
1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.
1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.
1960 Extended Judy Reservoir system to Bayview through LUD No. 4.
1961 Expanded Fidalgo Island system to the Gibralter and Dewey Beach areas through LUD No. 5.
1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.
1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.
1965 Raised Judy Reservoir from elevation 435' above mean sea level (AMSL) to 451' AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.
1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.
1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley river crossing with concrete cylinder pipe.
1977 Installed a concrete cylinder pipe transmission line parallel to the wood stave distribution line between Sedro-Woolley and Burlington.

1984 Transferred service from the wood stave line to the transmission line between Burlington and Sedro-Woolley.
1990 Completed and put on line the PUD's multi-media direct filtration water treatment plant at Judy Reservoir to serve the Judy Reservoir system.
1991 Acquired the remote public water system at Rockport through LUD No. 11.
1991 Extended the Judy Reservoir system toward Big Lake along Gunderson Road through LUD No. 12.
1992 Acquired the remote public water system at Cedargrove On The Skagit through LUD No. 10.
1993 Extended the Judy Reservoir system around Big Lake through LUD No. 16 and to Lake 16 through LUD No. 17.
1999 Began expansion of Judy Reservoir to elevation 465' AMSL, increasing impoundment capacity to 1,460 million gallons.

Water Rights on Record for the PUD:

Not including water rights held for satellite management systems, the PUD has seven water right claims, five surface water certificates (SWC), two ground water permits (GWP), a reservoir permit and a reservoir certificate. These rights are summarized as follows:

Document Number	Priority Date	Source of Appropriation	Instantaneous Rate "Qi" (cfs or gpm)	Annual Rate "Qa" (acre-feet per year)	Comments
Claim 009332	Prior to 1917	Salmon Creek	1.8 cfs	307	Subject of this report
Claim 009333	Prior to 1917	Turner Creek	4.3 cfs	2,300	Change application
Claim 009334	Prior to 1917	Rock Springs Creek	0.2 cfs	40?	Inactive
Claim 009335	Prior to 1917	Pigeon Creek	0.2 cfs	40?	Inactive
Claim 009336	Prior to 1917	unnamed creek	0.1 cfs	20?	Inactive
Claim 009337	Prior to 1917	Cold Springs	0.2 cfs	40?	Inactive
Claim 009338	Prior to 1917	East Nookachamps	1.1 cfs	110?	Inactive
SWC 26	September 28, 1917	Mundt Creek	2.5 cfs	Not listed	Change application
SWC 411	October 10, 1929	Gilligan Creek	1.5 cfs	Not listed	Change application
S1-00724C	October 30, 1963	Gilligan Creek	8.89 cfs	Supplemental Qa	Change application
S1-00737C	October 30, 1963	Mundt Creek	8.0 cfs	Supplemental Qa	Change application
S1-00739C	October 30, 1963	Turner Creek	6.2 cfs	Supplemental Qa	Change application
GWP 2911	March 26, 1953	Sedro-Woolley well	900 gpm	1440	Change application
GWP 3350	May 12, 1954	Ranney Well	4,000 gpm	6400	Change application
Reservoir 8738	January 16, 1946	Cultus Streams	Not Applicable	1500	Judy Reservoir
R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of seven applications for change submitted to modify the PUD's Cultus Mountain water rights. These seven applications for change were submitted to add a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The Cultus Mountain streams currently utilized by the PUD are Salmon Creek, Gilligan Creek, Turner Creek and Mundt Creek. Approval of this application for change will reduce or eliminate the impact on fish caused by the diversion of water from Salmon Creek. This will be accomplished by adding an alternate point of diversion on the Skagit River and by subjecting the PUD's Salmon Creek diversions to minimum instream flows (not a previous requirement). When Salmon Creek is not flowing above minimum flow levels, the PUD will instead divert water from the Skagit River and pump it up to Judy Reservoir.

The additional point of diversion is to be located on the south shoreline of the Skagit River, downstream of the PUD's existing pipeline. This new point of diversion will be downstream of the reach of the Skagit River designated as Wild and Scenic. A new diversion structure and pumping plant proposed for this location will have a capacity of 55.39 cfs. Water will be pumped through a new pipeline of this capacity to Judy Reservoir for storage and eventual transfer through the existing distribution system.

Attributes of the Claim:

Claimant:	Public Utility District No 1. of Skagit County
Claim Number:	009332
Filing Date:	March 17, 1972
Date of First Water Use:	Prior to 1917
Claimed Instantaneous Quantity:	1.8 cubic feet per second
Claimed Annual Quantity:	307 acre-feet per year
Source:	Salmon Creek
Point of Diversion:	SW¼ of Section 34, Township 35 North, Range 5 East

Period of Use:	Year round
Purpose of Use:	Municipal water supply
Place of Use:	Central Skagit County including cities of Mount Vernon, Burlington, Sedro-Woolley, Clear Lake and surrounding rural areas

Change Request:

Filed on:	November 4, 1997
Point of Diversion:	To add a point of diversion on the Skagit River within the SW¼ of Section 29 and/or the SE¼ of Section 30, Township 35N, Range 5E, W.M., in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Legal Notice:	Published in the Skagit Valley Herald on July 3rd & 10th, 1998
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Records on other water rights in the vicinity,
(4) Topographic and local area maps,
(5) Records of site visits,
(6) Meeting notes and correspondence with Bradley Spangler and Robert Powell (PUD employees),
(7) Meeting notes and correspondence with Jerry Louthain (Economic and Engineering Services (EES), Inc.),
(8) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use and perfection of the subject claim,
(9) The 1996 report titled "Water Right Analysis for Public Utility District No.1 of Skagit County" (EES),
(10) The 1994 PUD Water System Plan,
(11) The 2000 "Skagit County Coordinated Water System Plan Regional Supplement" (EES),
(12) The 1997 PUD Environmental Checklist and Determination of Non-Significance, and
(13) Numerous file notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfies subsection (3) - "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.14 RCW establishes the process for registering claims to pre-water code (vested) rights. Chapter 90.03 RCW authorizes the appropriation of public water for beneficial use and describes the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to existing rights are specifically addressed in RCW 90.03.380.

In accordance with state law, the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the right perfected under the original claim,
- The additional point of diversion must be from the same source of water, and
- The public interest must not be impaired.

Water Availability:

Water is available from the Skagit River for the requested additional point of diversion. Upon approval of this change request, the PUD will not be able to divert water from their original point of diversion unless Salmon Creek is flowing at a rate higher than the minimum instream flows established by chapter 173-503 WAC. Approval of the requested additional point of diversion will allow the PUD to instead utilize water from the Skagit River, which has a greater capacity to support this diversion.

No Detriment to Existing Rights:

There will be no detriment to existing water rights as a result of adding the additional point of diversion or by changing the place of use.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement of the Original Right:

The PUD registered Water Right Claim 009332 for 1.8 cubic feet per second and 307 acre-feet per year. The Clear Lake Water Company (one of the PUD's predecessors) began using water from Salmon Creek prior to 1917. Upon takeover of the system, the PUD diverted water from Salmon Creek on a daily basis through 1967, and has used it intermittently since then. It is the PUD's current practice to divert Salmon Creek to supplement supply to Judy Reservoir when Salmon Creek is running full (3+ cfs) and other streams are not being diverted for water quality concerns (high turbidity).

The diversions from Salmon Creek and Gilligan Creek are measured collectively, so there is no means of documenting the actual annual diversion quantities from Salmon Creek. Based on a diversion rate of 1.8 cfs, it is reasonable to assume that 307 afy has been perfected by beneficial use. The following calculations show the PUD would need to divert water from Salmon Creek for only 86 days per year to reach their claimed annual quantity of 307 afy.

1 cfs = 1.98 acre-feet per day
1.8 cfs = 3.56 acre-feet per day (1.8 x 1.98)
307 acre-feet per year divided by 3.56 acre-feet per day = 86 days

In consideration of available data and the above calculation, Ecology has tentatively determined Claim 009332 to be a valid and perfected vested right. Official confirmation of the true extent and perfection of the claim to vested rights can only occur as result of a general water rights adjudication through Superior Court.

Claim 009332 appears to be a perfected right, therefore adding an additional point of diversion and changing the place of use description will not enhance the original right. Approval of the change request will not result in an increase of the instantaneous or annual quantity of water perfected under the original claim.

Same Source of Water:

Salmon Creek is tributary to the Skagit River, therefore it is considered the same source of water.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely be enhanced because the PUD will no longer be able to divert water from Salmon Creek during low flow periods.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend the request for change to Water Right Claim 009332 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

A stream gage shall be maintained on Salmon Creek at the location specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

In accordance with the signed 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversion from Salmon Creek shall be subject to the following minimum instream flows, as measured at the Control Station specified in WAC 173-503-040:

January 1 – April 30	4.0 cfs
May 1 – August 31	1.4 cfs
September 1 – December 31	4.0 cfs

No diversion of water from Salmon Creek shall take place when the creek falls below minimum instream flow levels.

An approved measuring device shall be installed on each point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

Nothing in this approval shall be construed as an official confirmation of any vested water rights represented by Water Right Claim 009332. Official confirmation of the true extent of the claim to vested rights can only occur as result of a general water rights adjudication through Superior Court. The findings presented in this report shall be considered a "tentative determination" of the existence of a vested right.

The applicant is advised that a Certificate of Change will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

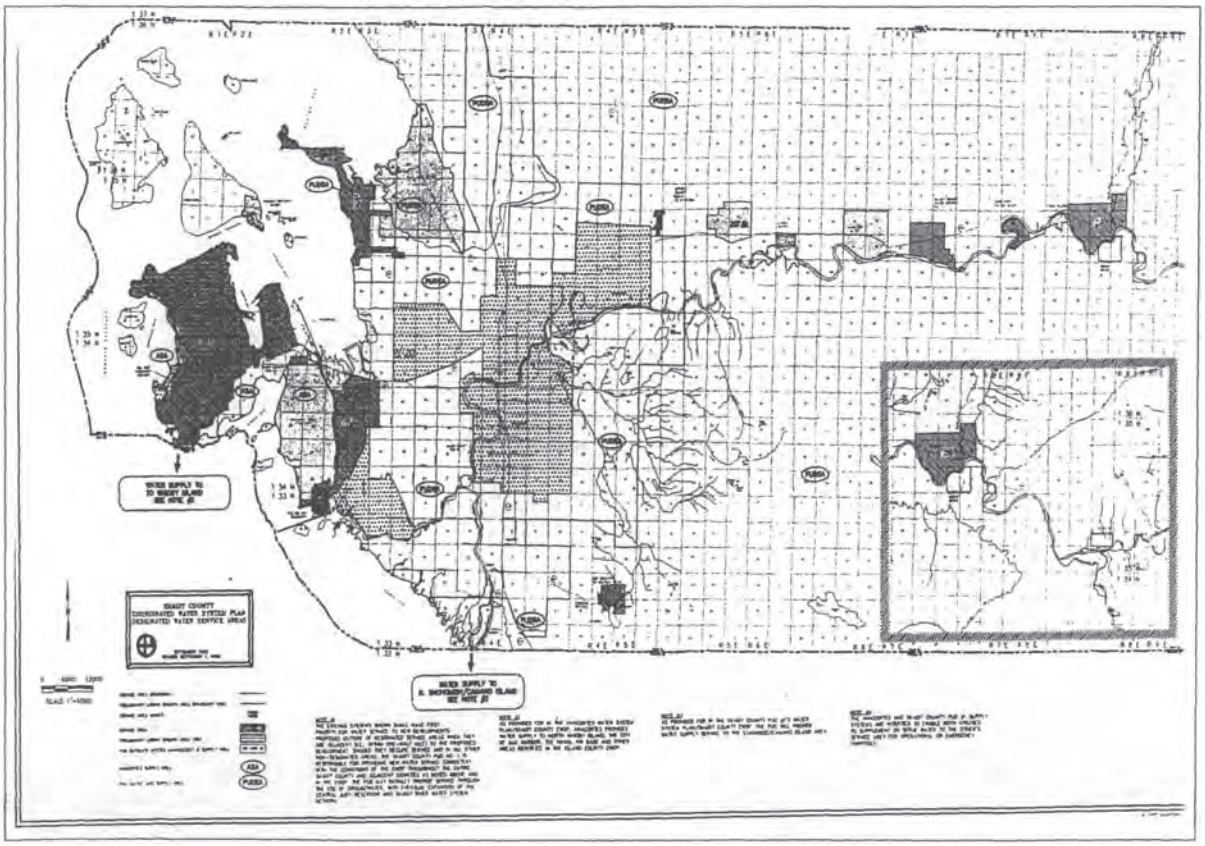
A Certificate of Change will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.14 RCW, I conclude that Water Right Claim 009332 is in good standing and is eligible for change. I have determined that water is available at the additional point of diversion and will be diverted from the same source of public water as at the original point of diversion. The additional point of diversion and the change in place of use will not enlarge the existing claim and the water use will be beneficial. Approval of the change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions.

REPORT BY Burke Smith DATED March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☐ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 30, 1963	S1-*18219	S1-*18219P	

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 1436	Mount Vernon	WA	98273

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Salmon Creek and the Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
4.0*		307**

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply – Year round diversion conditioned to the following:

Diversion from Salmon Creek is subject to the Cultus Mountain Instream Flows as established in chapter 173-503 WAC
Diversion from the Skagit River is subject to the Skagit River Instream Flows as established in chapter 173-503 WAC

*A maximum of 55.39 cfs (35.80 mgd) may be diverted from the Cultus Mountain streams and/or from the Skagit River into Judy Reservoir.

**Maximum Acre-Feet per Year diverted from Salmon Creek and/or the Skagit River under Surface Water Claim 009332 and S1-*18219 shall not exceed 307 acre feet per year.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Salmon Creek diversion: SW 1/4 SW 1/4, Section 34, Township 35N, Range 5E, W.M.
Skagit River diversion: SW 1/4 SW 1/4, Section 29, Township 35N, Range 5E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
The Salmon Creek diversion is located approximately 1,200 feet north and 400 feet east from the SW corner.	34	35	5E	3	Skagit
The Skagit River diversion is located approximately 1,100 feet north and 1000 feet east from the SW corner.	29	35	5E		

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes, as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas, approved by the Washington State Department of Health.

DESCRIPTION OF PROPOSED WORKS

Salmon Creek:
Water is diverted by way of a small dam, or diversion structure in Salmon Creek through pipelines, to Judy Reservoir.

Skagit River:
Water is pumped from the Skagit River up to Judy Reservoir.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	Completed	December 23, 2046

PROVISIONS

Memorandum of Agreement

This approval is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

In accordance with the 1996 Memorandum of Agreement, and chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM AND WATERSHED MANAGEMENT PLAN - Lower and Upper Skagit Water Resources Inventory Areas (WRIA 3 and 4), diversions from Salmon Creek and the Skagit River shall be subject to the following minimum instream flows, as measured at the Control Stations specified in WAC 173-503-040:

No diversion of water from Salmon Creek shall take place when the creek falls below minimum instream flow levels at river mile 4.3.

January 1 – April 30	4.0 cfs
May 1 – August 31	1.4 cfs
September 1 – December 31	4.0 cfs

No diversion of water shall take place from the Skagit River when the river falls below minimum instream flow levels at USGS station 12-2005-00.

January 1 – March 31	10,000 cfs
April 1 – June 30	12,000 cfs
July 1 – September 30	10,000 cfs
October 1 – November 15	13,000 cfs
November 16 – December 15	11,000 cfs
December 16 – December 31	10,000 cfs

Stream Gage

A stream gage shall be installed and maintained at river mile 4.3 on Salmon Creek as specified in WAC 173-503-040. Stream flow measurements shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and interested local tribes upon request.

Metering

An approved measuring device shall be installed and maintained for each diversion of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded daily with the source of water noted (Salmon Creek or Skagit River). The maximum daily instantaneous rate of diversion and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of meter readings to collect information for water resource planning, management and compliance.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

Other

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Nothing in this application for water right approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statutes, ordinances, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

The applicant is advised that a Certificate of Water Right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology.

A Certificate of Water Right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 22 *day of* August, *2013.*

REVIEWED BY
OKAY DS

Department of Ecology

By _____
Jacqueline Klug, Section Manager, Water Resources

SKAGIT RIVER WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT PERMIT

FOR APPLICATION FOR CHANGE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
May 12, 1954	3613	GWP 3350	

NAME
Public Utility District #1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Skagit River

TRIBUTARY OF (IF SURFACE WATERS)
Puget Sound

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
8.91 cfs		6400

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Supply -- Year round

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Within the SW1/4 of Section 29 and/or SE1/4 of Section 30, Township 35N, Range 5E, W.M. in Skagit County

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	29 and/or 30	35	5 E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 (PUD No.1) of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map, dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

A new point of diversion is proposed to be located on the south shoreline of the Skagit River, downstream of the existing PUD pipeline, so the proposed point of diversion will be downstream of the reach of the Skagit River designated as a Wild and Scenic River. The proposed pumping plant will have a pumping capacity of 55.39 cfs, and water will be pumped through a new pipeline with this capacity to be constructed from the new pumping plant to Judy Reservoir for distribution through the existing distribution lines.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District No. 1 of Skagit County (PUD) is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the Judy Reservoir system of the PUD ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

Although organized early in 1937, the PUD did not actually engage in the utility business until November 4, 1939, when it purchased by friendly condemnation, the water systems in the Cities of Mount Vernon, Burlington and Sedro-Woolley from the Peoples Water and Gas Company. The water systems totaled 3,134 water services, 51.5 miles of pipeline, 3,940,000 gallons of distribution storage, 1.75 million gallons per day in treatment facilities, and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt and Turner Creeks). On March 7, 1940, the PUD purchased the Clear Lake Water Corporation comprised of 180 water services, 11.5 miles of pipeline, 500,000 gallons of distribution storage, and diversions on three Cultus Mountain streams (Gilligan, Salmon and Turner Creeks). On July 1, 1940, the PUD purchased 1.8 miles of water line from the Avon Mutual Water System. In 1940, the PUD commenced to integrate the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon, this line was completed that same year through support of the Works Progress Administration. The further development of the Judy Reservoir, Fidalgo Island and remote systems of the PUD is chronicled as follows:

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435' AMSL.
1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.
1956 Acquired/constructed the PUD's Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.
1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.
1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.
1960 Extended Judy Reservoir system to Bayview through LUD No. 4.
1961 Expanded Fidalgo Island system to the Gibraltar and Dewey Beach areas through LUD No. 5.
1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.
1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.
1965 Raised Judy Reservoir from elevation 435' above mean sea level (AMSL) to 451' AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.
1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.
1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley river crossing with concrete cylinder pipe.
1977 Installed a concrete cylinder pipe transmission line parallel to the wood stave distribution line between Sedro-Woolley and Burlington.
1984 Transferred service from the wood stave line to the transmission line between Burlington and Sedro-Woolley.

INVESTIGATION

In considering this application for change, the investigation included, but is not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Topographic and local area maps,
(4) Records of site visits,
(5) Conversations, e-mail, and other correspondence with Brad Spangler and Robert Powell, employees of the PUD,
(6) Conversations, e-mail, and other correspondence with Jerry Louthain of Economic and Engineering Services (EES), Inc.,
(7) The Washington State Supreme Court decision George Theodoratus v. Ecology,
(8) The Skagit River Memorandum of Agreement,
(9) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use of the subject right,
(10) The 1996 report titled "Water Right Analysis for Public Utility District No. 1 of Skagit County (EES),
(11) The 1994 PUD Water System Plan,
(12) The 2000 "Skagit County Coordinated Water System Plant Regional Supplement" (EES), and
(13) Numerous files notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfied subsection (3) "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW and Chapter 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to these rights are covered under RCW 90.03.380 and 90.44.100.

In accordance with state law the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The new point of diversion must be from the same source of water, and
- The water use must be in the public interest.

Water Availability:

Water is available from the Skagit River for the requested change in point of diversion.

No Detriment to Existing Rights:

The original point of diversion (a Ranney well) is constructed on a riverbank of the Skagit River. Changing the point of withdrawal from the Ranney well to a point of diversion on the Skagit River will not impair existing rights.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement to Ground Water Permit 3350:

The requested changes to Ground Water Permit 3350 will not increase the instantaneous or the annual quantities of water granted under the original permit.

Same Source of Water:

The original point of withdrawal is constructed on a bank of the Skagit River. The static water level in the Ranney well is approximately the same elevation as the Skagit River. Therefore the water in the Ranney well and the water in the Skagit River are the same.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely benefit because the requested changes will enhance the PUD's ability to provide a regional water supply.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Recision of Ground Water Certificate 2107-A:

Upon initial review of this application for change it was determined that Water Right Certificate GWC 2107-A contained inchoate water (water not previously put to beneficial use). By separate administrative action, this certificate was rescinded back to permit status to allow the PUD to fulfill the original intent of the application. This change authorization is being made to the reinstated permit.

1990 Completed and put on line the PUD's multi-media direct filtration water treatment plant at Judy Reservoir to serve the Judy Reservoir system.
1991 Acquired the remote public water system at Rockport through LUD No. 11.
1991 Extended the Judy Reservoir system toward Big Lake along Gunderson Road through LUD No. 12.
1992 Acquired the remote public water system at Cedargrove On The Skagit through LUD No. 10.
1993 Extended the Judy Reservoir system around Big Lake through LUD No. 16 and to Lake 16 through LUD No. 17.
1999 Began expansion of Judy Reservoir to elevation 465' AMSL, increasing impoundment capacity to 1,460 million gallons.

Water Rights on Record for the PUD:

Not including water rights held for satellite management systems, the PUD has seven water right claims, five surface water certificates (SWC), two ground water permits (GWP), a reservoir permit and a reservoir certificate. These rights are summarized as follows:

Document Number	Priority Date	Source of Appropriation	Instantaneous Rate "Qi" (cfs or gpm)	Annual Rate "Qa" (acre-feet per year)	Comments
Claim 009332	Prior to 1917	Salmon Creek	1.8 cfs	307	Change application
Claim 009333	Prior to 1917	Turner Creek	4.3 cfs	2,300	Change application
Claim 009334	Prior to 1917	Rock Springs Creek	0.2 cfs	40?	Inactive
Claim 009335	Prior to 1917	Pigeon Creek	0.2 cfs	40?	Inactive
Claim 009336	Prior to 1917	Unnamed creek	0.1 cfs	20?	Inactive
Claim 009337	Prior to 1917	Cold Springs	0.2 cfs	40?	Inactive
Claim 009338	Prior to 1917	East Nookachamps	1.1 cfs	110?	Inactive
SWC 26	September 28, 1917	Mundt Creek	2.5 cfs	Not listed	Change application
SWC 411	October 10, 1929	Gilligan Creek	1.5 cfs	Not listed	Change application
S1-00724C	October 30, 1963	Gilligan Creek	8.89 cfs	Supplemental Qa	Change application
S1-00737C	October 30, 1963	Mundt Creek	8.0 cfs	Supplemental Qa	Change application
S1-00739C	October 30, 1963	Turner Creek	6.2 cfs	Supplemental Qa	Change application
GWP 2911	March 26, 1953	Sedro-Woolley well	900 gpm	1440	Change application
GWP 3350	May 12, 1954	Ranney Well	4,000 gpm	6400	Subject of this report
Reservoir 8738	January 16, 1946	Cultus Streams	Not Applicable	1500	Judy Reservoir
R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

Memorandum of Agreement:

In 1996, representatives from the PUD, the City of Anacortes, Skagit County, the Upper Skagit Indian Tribe, the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, the Department of Ecology and the Department of Fish and Wildlife signed the *"Memorandum of Agreement (MOA) Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes."* By signing the MOA (a fifty-year commitment) each party agreed to the following:

- To develop a comprehensive watershed management plan for the Skagit River Basin designed to meet both instream and out of stream objectives,
- To reach agreement prior to expanding service areas beyond those identified in the Coordinated Water System Plan, and
- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of nine applications for change submitted to modify the PUD's existing water rights. These nine applications were submitted to add or change to a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The following information pertains to the change to Ground Water Permit 3350.

Attributes of the Permit:

Applicant:	Public Utility District No 1. Of Skagit County
Ground Water Permit Number:	3350 (Formerly known as Ground Water Certificate 2107-A)
Priority Date:	May 12, 1954
Instantaneous Quantity:	4000 gallons per minute (8.91 cubic feet per second)
Annual Quantity:	6400 acre-feet per year
Source:	Well (commonly called the Ranney well)
Purpose of Use:	Municipal Supply - Continuous use
Place of Use:	Public Utility District No. 1 of Skagit County, Washington

Change Request:

Filed on:	November 4, 1997
Point of Diversion:	The Skagit River within the SW1/4 of Section 29 and/or the SE1/4 of Section 30, Township 35 North, Range 5E, W.M. in Skagit County
Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Published:	June 24 and July 1, 1998 in the Skagit Valley Herald
Protests:	None

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

Single family residential consumption averaged 200 gallons per service per day in 1990. Projected growth is expected to be predominantly from new home construction. Due to current building code efficiency standards (requiring low flow plumbing fixtures), the PUD expects new homes to average approximately 150 gallons per service per day.

The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend that the requested changes to Ground Water Permit 3350 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

An approved measuring device shall be installed at the point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, as revised.

The original point of withdrawal must be properly decommissioned within three years of approval of this authorization.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statues, ordinance, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

The applicant is advised that a Certificate of Water Right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated based on the best information available to Ecology.

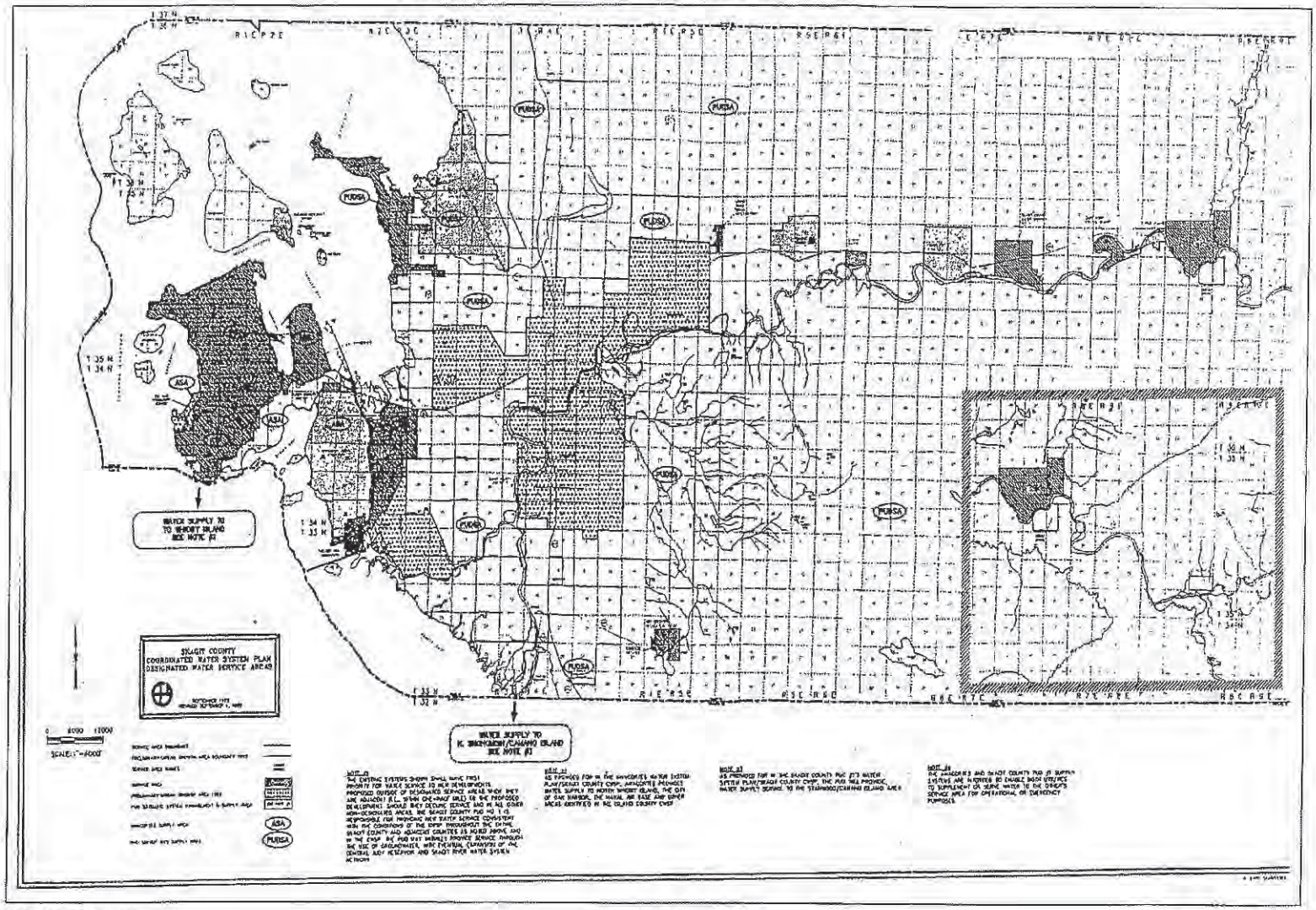
A Water Right Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude that Water Right Permit 3350 is in good standing and is eligible for change. I have determined that water is available from the proposed point of diversion and will be diverted from the same source of public water as the original point of withdrawal. The proposed point of diversion and change in place of use will not enlarge the existing permit and the water use will be beneficial. Approval of this change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved, subject to existing rights and the above-indicated provisions.

REPORT BY Peggy Williams DATE March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE OF WATER RIGHT PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 26, 1953	3121	GWP 2911	

NAME
Public Utility District No. 1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	Washington	98273

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Skagit River
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
2.0		1440

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Supply – Year round

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Within the SW1/4 of Section 29 and/or SE1/4 of Section 30, Township 35 N., Range 5E, W.M. in Skagit County

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	29 and/or 30	35	5 E	3	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map, dated September 1992, revised September 1, 1996 (A service area map is on the last page of this report).

DESCRIPTION OF PROPOSED WORKS

A new point of diversion is proposed to be located on the south shoreline of the Skagit River, downstream of the existing PUD pipeline, so the proposed point of diversion will be downstream of the reach of the Skagit River designated as a Wild and Scenic River. The proposed pumping plant will have a pumping capacity of 55.39 cfs, and water will be pumped through a new pipeline with this capacity to be constructed from the new pumping plant to Judy Reservoir for distribution through the existing distribution lines.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 30, 2002	June 30, 2004	December 23, 2046

REPORT

INTRODUCTION

Skagit River Watershed:

The Skagit River originates in the mountains of Manning Provincial Park in British Columbia, Canada. Gorge Dam, Diablo Dam and Ross Dam impound the Skagit River on the United States side of the border. The river flows through an eagle nesting area and past the towns of Sedro-Woolley, Burlington and Mount Vernon before forming a delta and entering into Skagit Bay. The Skagit is the largest watershed in the Puget Sound Basin. The Skagit River Watershed has numerous runs of Pacific Ocean salmon. Present management of salmon is under the jurisdiction of the state of Washington and the consolidated Skagit Tribes. The three Skagit Tribes include the Swinomish, Upper Skagit and Sauk/Suiattle.

Public Utility District No. of Skagit County:

Public Utility District No. 1 of Skagit County (PUD) is a municipal corporation of the State of Washington, established as a result of the general election of November 3, 1936, for the purpose of conserving the water and power resources of the State of Washington. The PUD is authorized to acquire, construct and operate water systems within and without the county boundaries and to furnish water service to the inhabitants of the district and other persons. Pursuant to such authority, the PUD acquired and now operates water utility properties serving the cities of Mount Vernon, Burlington, Sedro-Woolley, the communities of Cedargrove, Clear Lake, Conway, Dewey, Rockport and Similk Beach and the rural and suburban areas adjacent to those areas. The PUD presently serves more than 17,000 water services and requests for waterline extensions and additional services are being received regularly.

Of the 150 public water systems in Skagit County, the Judy Reservoir system of the PUD ranks as the most important by virtue of the large number of customers served and its role as the Countywide Satellite System Management Agency. Only the City of Anacortes' system produces more water, wholesaling much of it to local industries and municipalities. The balance of the public water systems obtain supplies from individual sources and/or by purchasing from one of these two major systems.

In 1939, the PUD bought three water systems serving Burlington, Mount Vernon and Sedro-Woolley from the Peoples' Water And Gas Company, forming the basis for the PUD's present system. The sources for the original system were the southern Cultus Mountain streams and the Skagit River. The system included over 50 miles of water mains, four million gallons of storage and over 3,000 water services. The Cultus Mountain streams are the PUD's principle source of supply and the system has grown through other acquisitions, improvements and outside development to over 450 miles of pipeline and over 22 million gallons of storage. The PUD also owns and operates one water system on Fidalgo Island, one water system just east of Mount Vernon, and two water systems farther east along the Skagit River.

The population of Skagit County was 79,555 as of the 1990 U. S. Census. The PUD then served approximately 45,390 people (57 percent of the County population) through 15,044 services. Population projections used for the Coordinated Water System Plan and County/City Comprehensive Plans indicate Skagit County will grow to 137,597 by 2014. PUD services are projected to number over 29,100 by 2014.

History of Development of the PUD Water Systems:

Although organized early in 1937, the PUD did not actually engage in the utility business until November 4, 1939, when it purchased by friendly condemnation, the water systems in the Cities of Mount Vernon, Burlington and Sedro-Woolley from the Peoples Water and Gas Company. The water systems totaled 3,134 water services, 51.5 miles of pipeline, 3,940,000 gallons of distribution storage, 1.75 million gallons per day in treatment facilities, and diversions on the Skagit River, local springs, and five creeks in the Cultus Mountains (East Fork Nookachamps, Rock Springs, Pigeon, Mundt and Turner Creeks). On March 7, 1940, the PUD purchased the Clear Lake Water Corporation comprised of 180 water services, 11.5 miles of pipeline, 500,000 gallons of distribution storage, and diversions on three Cultus Mountain streams (Gilligan, Salmon and Turner Creeks). On July 1, 1940, the PUD purchased 1.8 miles of water line from the Avon Mutual Water System. In 1940, the PUD commenced to integrate the entire system by laying a wood stave transmission line from Sedro-Woolley to Burlington and Mount Vernon, this line was completed that same year through support of the Works Progress Administration. The further development of the Judy Reservoir, Fidalgo Island and remote systems of the PUD is chronicled as follows:

1947 Completed construction of impoundment dams in Janicki Basin, forming Judy Reservoir, capacity 450 million gallons, spillway at 435' AMSL.
1954 Completed construction of a new Ranney well next to the Skagit River in northwest Mount Vernon.
1956 Acquired/constructed the PUD's Fidalgo Island water system at Similk Beach through Local Utility District (LUD) No. 2.
1958 Completed new overhead Skagit River pipeline crossing south of Sedro-Woolley, replacing failed 1951 submarine crossing.
1958 Replaced Gilligan and Salmon Creek diversions/pipeline to increase supply to Judy Reservoir.
1960 Extended Judy Reservoir system to Bayview through LUD No. 4.
1961 Expanded Fidalgo Island system to the Gibraltar and Dewey Beach areas through LUD No. 5.
1961 Installed concrete cylinder pipe transmission line connecting Judy Reservoir to Mount Vernon.
1962 Acquired the Conway Water Company and connected it to the Judy Reservoir System.
1965 Raised Judy Reservoir from elevation 435' above mean sea level (AMSL) to 451' AMSL, increasing its impoundment capacity from 450 million gallons to 1,010 million gallons.
1967 Completed the transmission line loop with the installation of concrete cylinder pipe between Burlington and Mount Vernon.
1970 Replaced the wood stave transmission line between Judy Reservoir and the Sedro-Woolley river crossing with concrete cylinder pipe.
1977 Installed a concrete cylinder pipe transmission line parallel to the wood stave distribution line between Sedro-Woolley and Burlington.

1984 Transferred service from the wood stave line to the transmission line between Burlington and Sedro-Woolley.
1990 Completed and put on line the PUD's multi-media direct filtration water treatment plant at Judy Reservoir to serve the Judy Reservoir system.
1991 Acquired the remote public water system at Rockport through LUD No. 11.
1991 Extended the Judy Reservoir system toward Big Lake along Gunderson Road through LUD No. 12.
1992 Acquired the remote public water system at Cedargrove On The Skagit through LUD No. 10.
1993 Extended the Judy Reservoir system around Big Lake through LUD No. 16 and to Lake 16 through LUD No. 17.
1999 Began expansion of Judy Reservoir to elevation 465' AMSL, increasing impoundment capacity to 1,460 million gallons.

Water Rights on Record for the PUD:

Not including water rights held for satellite management systems, the PUD has seven water right claims, five surface water certificates (SWC), two ground water permits (GWP), a reservoir permit and a reservoir certificate. These rights are summarized as follows:

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R-293 (permit)	April 24, 1963	Cultus Streams	Not Applicable	4250	Judy Reservoir

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- To participate in establishing minimum instream flow levels for the Skagit River and the Cultus Mountain tributaries.

The Department of Ecology specifically agreed to the following:

- To process the PUD and City of Anacortes applications for change identified in the MOA. The changes may or may not be subject to the Skagit instream flows and/or the Cultus Mountain instream flows (as identified in the MOA),
- Ecology will promulgate an administrative rule (chapter 173-503 WAC) establishing minimum instream flows, and
- Ecology agreed to hold water right applications until the final adoption of the rule.

BACKGROUND

This report of examination addresses one of nine applications for change submitted to modify the PUD's existing water rights. These nine applications were submitted to add or change to a Skagit River point of diversion and to change the place of use description to reflect the PUD's current service area.

The following information pertains to the change to Ground Water Permit 2911.

Attributes of the Permit:

Applicant:	Public Utility District No 1. Of Skagit County
Ground Water Permit Number:	2911 (Formerly known as Ground Water Certificate 1904-A)
Priority Date:	March 26, 1953
Instantaneous Quantity:	900 gallons per minute (2.0 cubic feet per second)
Annual Quantity:	1440 acre-feet per year
Source:	Well (commonly called the Sedro Woolley well)
Purpose of Use:	Municipal Supply - Continuous use
Place of Use:	Towns of Sedro Woolley, Mount Vernon, Burlington, Clear Lake and adjacent rural areas in Skagit County, Washington

Change Request:

Filed on:	November 4, 1997
Point of Diversion:	The Skagit River within the SW1/4 of Section 29 and/or the SE1/4 of Section 30, Township 35 North, Range 5E, W.M. in Skagit County

Place of Use:	Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996
Published:	June 26 and July 3, 1998, in the Skagit Valley Herald
Protests:	None

INVESTIGATION

In considering this application for change, the investigation included, but is not limited to, research and/or review of:

(1) The State Water Code,
(2) Existing water right documents for the PUD and predecessors,
(3) Topographic and local area maps,
(4) Records of site visits,
(5) Conversations, e-mail, and other correspondence with Brad Spangler and Robert Powell, employees of the PUD,
(6) Conversations, e-mail, and other correspondence with Jerry Louthain of Economic and Engineering Services (EES), Inc.,
(7) The Washington State Supreme Court decision George Theodoratus v. Ecology,
(8) The Skagit River Memorandum of Agreement,
(9) An "Affidavit of Beneficial Use" signed by Robert Powell attesting to the use of the subject right,
(10) The 1996 report titled "Water Right Analysis for Public Utility District No. 1 of Skagit County (EES),
(11) The 1994 PUD Water System Plan,
(12) The 2000 "Skagit County Coordinated Water System Plant Regional Supplement" (EES), and
(13) Numerous files notes and records.

State Water Code:

WAC 173-152-050 lists criteria for priority processing of competing applications. This change request satisfied subsection (3) "An application for change or transfer to an existing water right may be processed prior to competing applications provided . . . (b) The change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas."

Chapter 90.03 RCW and Chapter 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights including the process to amend or change existing rights. Changes or amendments to these rights are covered under RCW 90.03.380 and 90.44.100.

In accordance with state law the following criteria must be addressed during the process of evaluating this change request:

- Water must be available from the new point of diversion,
- The change must not cause detriment or injury to existing rights,
- The water use must be for a beneficial purpose,
- The change shall not allow an enhancement of the original right,
- The new point of diversion must be from the same source of water, and
- The water use must be in the public interest,

Water Availability:

Water is available from the Skagit River for the requested change in point of diversion.

No Detriment to Existing Rights:

Changing the source of water from a shallow well approximately ¼ mile north of the Skagit River, to a point of diversion on the Skagit River will not impair existing rights. There are no applications, permits or certificates between the well and the proposed point of diversion on the Skagit River.

Beneficial Use:

According to RCW 90.54.020, municipal water use (for domestic, stock, industrial, commercial, irrigation, etc.) is considered a beneficial use of water.

No Enhancement to Ground Water Permit 2911:

The requested changes to Ground Water Permit 2911 will not increase the instantaneous or annual quantities of water granted under the original permit

Same Source of Water:

The original point of withdrawal is a 55-foot deep well. The static water level in the well is approximately six feet below ground surface, which is the same elevation as the nearby Skagit River. Therefore the water in the well and the water in the Skagit River are the same.

Public Interest:

No detriment to the public interest could be identified during the investigation of this application for change. The public interest will most likely benefit because the requested changes will enhance the PUD's ability to provide a regional water supply.

OTHER RELEVANT FINDINGS

State Environmental Policy Act:

State Environmental Policy Act (SEPA) requirements have been satisfied. To address this application for change, both an Environmental Checklist and a Determination of Non-Significance were filed on October 20, 1997.

Recision of Ground Water Certificate 1904-A:

Upon initial review of this application for change it was determined that Water Right Certificate GWC 1904-A contained inchoate water (water not previously put to beneficial use). By separate administrative action, this certificate was rescinded back to permit status to allow the PUD to fulfill the original intent of the application. This change authorization is being made to the reinstated permit.

Conservation:

The PUD's water conservation goal is to "provide all PUD customers with the knowledge and incentive(s) to use water wisely and eliminate wasteful water use practices." The PUD has a public education program and a technical assistance program developed to promote conservation. The PUD meters its stream diversions, its production from Judy Reservoir and its wells, and mainline flow within the system. All source meters and mainline meters are read on the first working day of each month. The PUD also has an aggressive water accountability program.

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The PUD has identified its largest water consumers to be commercial and agricultural customers with large demands for process water, stockwater and irrigation water. Many of the agricultural irrigation customers are already using drip irrigation systems to optimize water use; several of these irrigators have interruptible flow contracts with the PUD, requiring them to stop consumption if their high demands are adversely impacting domestic use in their area of the distribution system. The PUD requires new large irrigation customers to submit Blaney-Criddle Water Balance calculations to the PUD for review before the new irrigation service is approved and installed.

RECOMMENDATIONS

I recommend that the requested changes to Ground Water Permit 2911 be approved, subject to the provisions listed below.

Provisions:

This change is conditioned upon the fulfillment of the terms of the Skagit Memorandum of Agreement (MOA), as agreed to by the signatory parties (the City of Anacortes, the PUD No. 1 of Skagit County, the Skagit System Cooperative, the Department of Fish and Wildlife, Skagit County Commissioners, and the Department of Ecology), signed December 23, 1996.

An approved measuring device shall be installed at the point of diversion and maintained in accordance with RCW 90.03.360 and chapter 508-64 WAC. Meter readings shall be recorded daily and this data shall be maintained and be made available to the Department of Ecology and the Skagit Cooperative upon request.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria. This water right is issued subject to Washington Department of Fish and Wildlife Hydraulic Project Approval.

If it can be shown that this change approval has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease diversion of water.

Issuance of this water right may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, as revised.

The original point of withdrawal must be properly decommissioned within three years of approval of this authorization.

Nothing in this change approval shall be construed as excusing the PUD from compliance with any applicable federal, state or local statues, ordinance, or regulations. Specifically the Department of Health has regulations that may require permitting for the proposed activity.

The applicant is advised that a Certificate of Water Right will issue for only that quantity of water that has been diverted and applied to actual beneficial use. Such quantity applied to actual beneficial use under this authorization shall not exceed the quantity specified in this report of exam and will be calculated based on the best information available to Ecology.

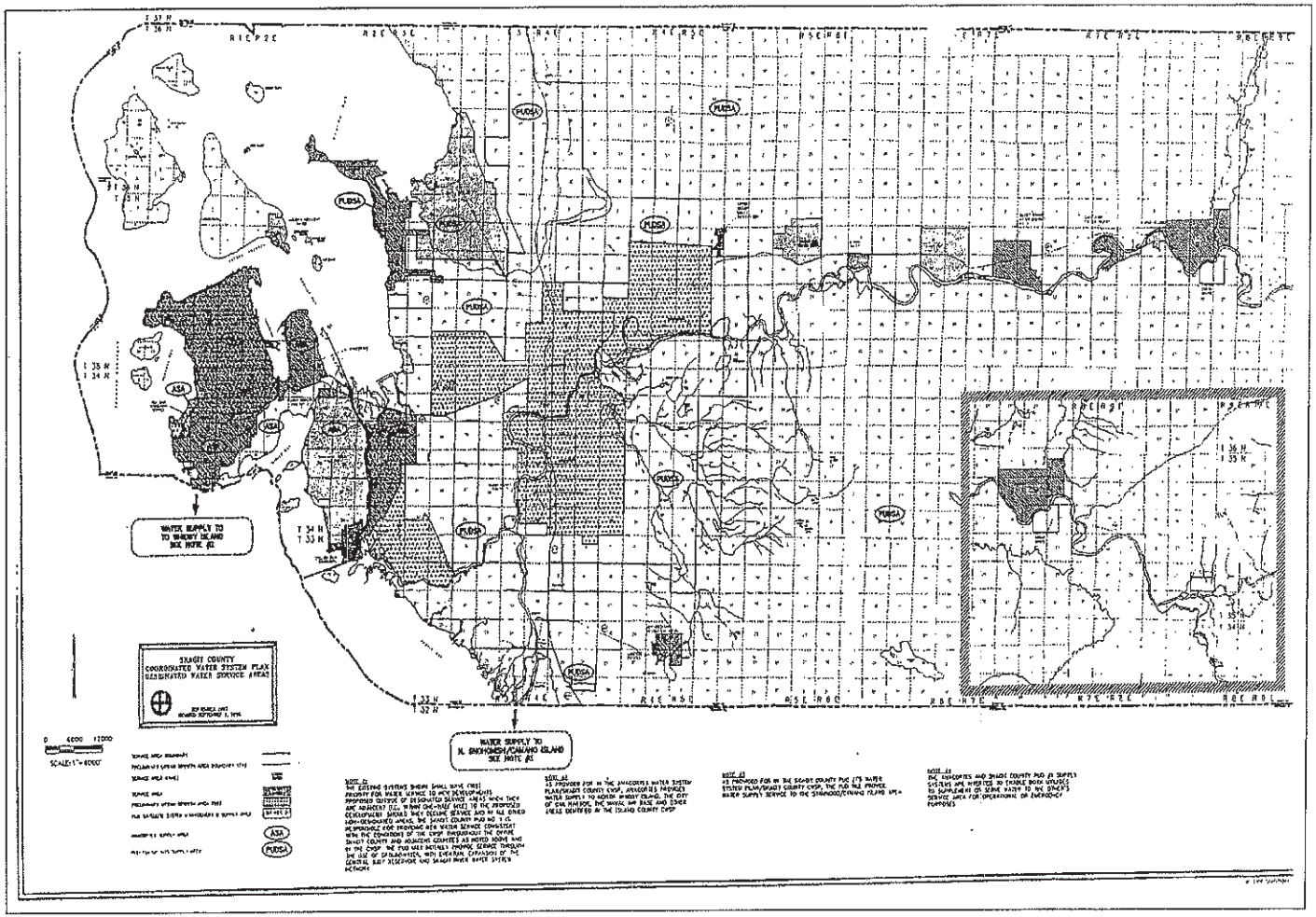
A Water Right Certificate will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude that Ground Water Permit 2911 is in good standing and is eligible for change. I have determined that water is available from the proposed new point of diversion and will be diverted from the same source of public water as the original point of withdrawal. The proposed point of diversion and change in place of use will not enlarge the existing permit and the water use will be beneficial. Approval of this change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved, subject to existing rights and the above-indicated provisions.

REPORT BY Peggy Williams DATE March 12, 2001

WATER SYSTEM DESIGNATED WATER SERVICE AREAS MAP



State of Washington
Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid $26.60
Date 10-22-97

Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name Public Utility District No. 1 of Skagit County Home Tel:( ) -
Mailing Address P.O. Box 1436 Work Tel:(360) 424-7104
City Mount Vernon State WA Zip+4 98273 + FAX:(360) 424-8764

Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☒ **Same as above**, except

Name Greg Peterka or Brad Spangler Home Tel:( ) -
Mailing Address Work Tel:( ) -
City State Zip+4 + FAX:(360) 416-0352
Relationship to applicant Staff

Section 3. STATEMENT OF INTENT

The applicant requests a permit to use not more than 12.80 (☐ gallons per minute or ☒ cubic feet per second) from a ☒ surface water source or ☐ ground water source (check only one) for the purpose(s) of Municipal Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.*
Estimate a maximum annual quantity to be used in acre-feet per year: See comments on last page.

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:
From ___/___/___ to ___/___/___

Section 4. WATER SOURCE

If SURFACE WATER	If GROUNDWATER
Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.: Skagit River Number of diversions: 1	A permit is desired for _____ well(s).
Source flows into (name of body of water): Skagit Bay / Puget Sound	Size & depth of well(s):

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: Specific location on river not yet determined.

¼ of	¼ of	Section	Township	Range(E/W)	County	If location of source is platted, complete below: Lot	Block	Subdivision
W½	SW¼	29	35N	5E	Skagit			
E½	S½	30	35N	5E	Skagit			

For Ecology Use Date Received: 10-22-97 Priority Date: 10-22-97
SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #
Date Accepted As Complete 11-4-97 By JW Date Returned By WRIA: 3

ECY 040-1-14
Rev. 9/95 F

APPLICATION

Appl. No.: S1-27860

Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Judy Reservoir Water System

B. Briefly describe your proposed water system. **(See instructions.)**

SEE ATTACHED WATER SYSTEM PLAN

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. SEE ATTACHED WATER SYSTEM PLAN / MOA.

Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
(Completed for all domestic/public supply uses.)

SEE ATTACHED WATER SYSTEM PLAN

A. Number of "connections" requested: _____ Type of connection _____
(Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.*

Complete C. and D. only if the proposed water system will have fifteen or more connections.

C. Do you have a current water system plan approved by the
Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 10-5-95 Please attach the current approved version of your plan.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 10-5-95 Please attach the current approved version of your plan.

Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
(Complete for all irrigation and agriculture uses.)

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☒ YES ☐ NO

NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.

Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site.

I5 to Mount Vernon, WA. College Way offramp. Turn west onto College Way, then south at light onto Freeway Drive. PUD headquarters located @ 1415 Freeway Drive, entrance at north end of property. Parking in the rear (lawn / 3 fountains in front). PUD staff can direct your further to site.

Section 10. REQUIRED MAP

A. Attach a map of the project. **(See instructions.)**

Please see map identified as Figure 1

Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

Public Water Supplier

B. Does the applicant own the land on which the water source is located? ☐ YES ☒ NO
If no, submit a copy of agreement:

Will acquire land or necessary rights of way for pumping plant and transmission facilities.

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.

Bradley R Spangler PE — 28 OCT 97

Applicant (or authorized representative) — Date

NA

Landowner for place of use (if same as applicant, write "same") — Date

Use this page to continue your answers to any questions on the application. Please indicate section number before answer.

3. In accordance with the MOA Regarding Utilization of Skagit River Basin Water Resources, rights issued under this application will be subject to Lower Skagit River Instream Flows (which have not yet been established). Therefore, a realistic estimate of annual use cannot be made at this time.

We are returning your application for the following reason(s):	
_____ Examination fee was not enclosed	APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128
_____ Section number(s) _____ is/are incomplete	APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE
Explanation:	
Please provide the additional information requested above and return your application by _____ _____ *(date).*	

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).

Place of Use

Areas served by the Public Utility District No. 1 of Skagit County and the City of Anacortes as indicated in the Skagit County Coordinated Water System Plan Designated Water Service Areas map dated September 1992, revised September 1, 1996.

Skagit River Pumping Plant location has not been specifically identified yet, but will be on reach within W½ SW¼ of Sec. 29 and E½ SE½ of Sec. 30. T. 35N., R. 5E.

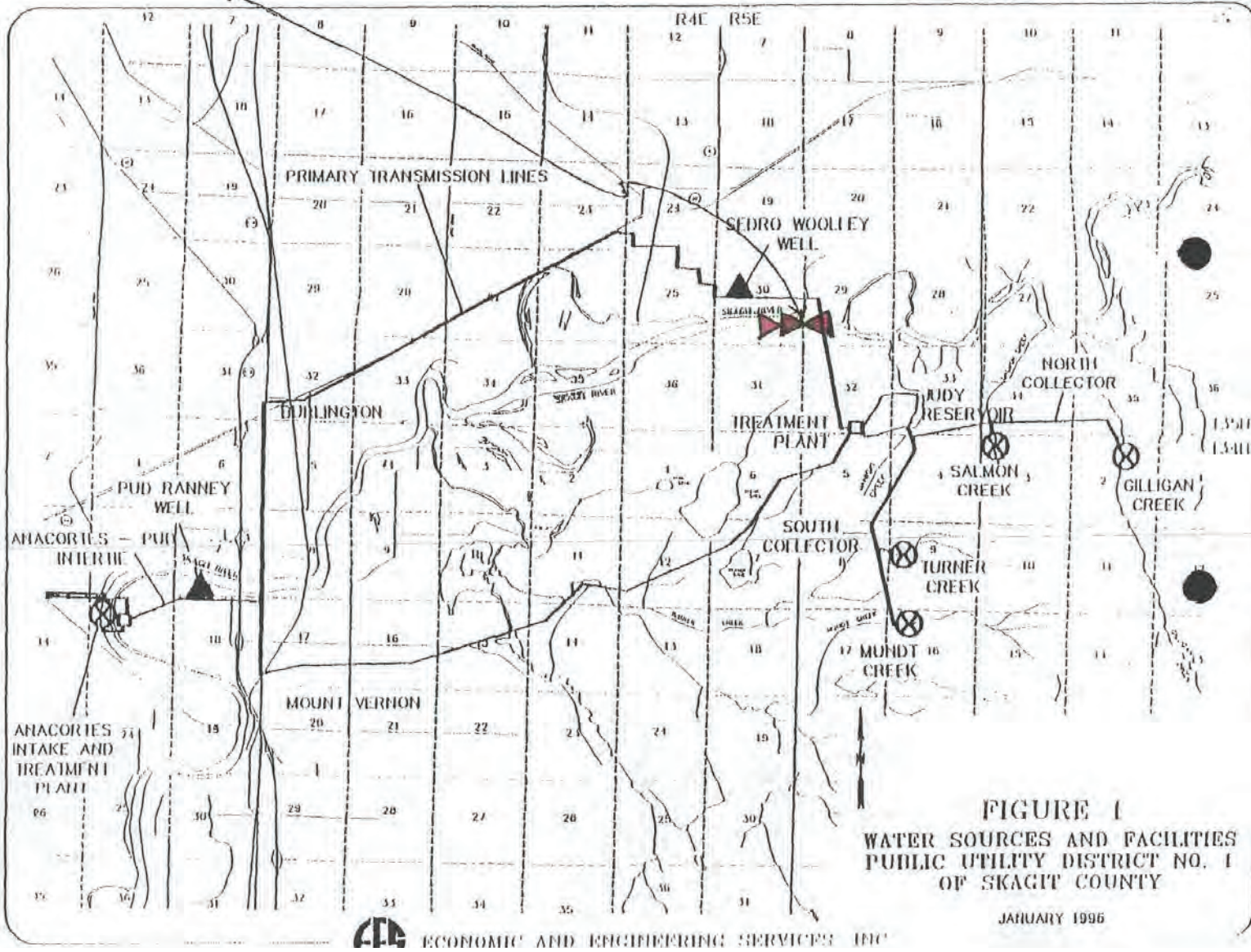


FIGURE 1
WATER SOURCES AND FACILITIES
PUBLIC UTILITY DISTRICT NO. 1
OF SKAGIT COUNTY

JANUARY 1996

ECONOMIC AND ENGINEERING SERVICES, INC.

STORAGE WATER RIGHTS

S. F. No. 369—1-37—3M. 4759. O.S.

CERTIFICATE RECORD NO. 18, PAGE NO. 8738

STATE OF WASHINGTON, COUNTY OF Skagit

CERTIFICATE OF SURFACE WATER RIGHT

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendatory thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.)

This is to certify that SKAGIT COUNTY P. U. D. #1

of Mount Vernon, State of Washington, has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the waters of Gilligan, Turner, Nunt, Nelson & Judkin Creeks, tributary of [illegible] impounding structure located within the [illegible] within the NE¼ of Sec. 32 and SW¼ of Sec. 33, Twp. 35 N., R. 5 E., W. M., under and subject to provisions contained in Reservoir Permit No. R-312 issued by the State Supervisor of Water Resources, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume 18, at Page 8738, on the 1st day of April, 19 63; that the priority date of the right hereby confirmed is January 16, 1946; that the amount of water under the right hereby confirmed, for the following purposes is limited to an amount actually beneficially used and shall not exceed 1500 acre-feet to be stored annually for domestic and industrial supply.

A description of the lands under such right to which the water right is appurtenant, and the place where such water is put to beneficial use, is as follows:

Central Skagit County, Washington, including cities of Sedro-Woolley, Burlington, Mount Vernon, Clear Lake and rural areas surrounding these centers.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Water Resources affixed this 1st day of April, 19 63.

M. Walker
State Supervisor of Water Resources.

G DATA

PUD #1 of Skagit County
P.O. Box 1436
1415 Freeway Drive
Mount Vernon, WA 98273

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
AMENDED SUPERSEDING RESERVOIR CERTIFICATE

TO CONSTRUCT A RESERVOIR AND STORE FOR BENEFICIAL USE

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 - 160th Avenue Southeast
Bellevue, WA 98008-5452

Applicant: PUD #1 of Skagit County
P.O. Box 1436
1415 Freeway Drive
Mount Vernon, WA 98273

Reference Number: N/A

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
April 24, 1963	R1-17876	R-293	R1-00673C

The applicant is hereby granted a certificate to construct a reservoir and store waters of the State of Washington, subject to the following limitations and provisions: Permittee shall construct the impounding dam or dike in accordance with the approved detailed plans and specifications and shall maintain or make any repairs to said structure as may be considered necessary by the State of Washington to ensure safety to life and property. It is also provided that the perittee shall construct and maintain such fish protection devices as may be required by the Department of Fish and Wildlife.

NAME OF STREAM OR OTHER SOURCE FOR RESERVOIR SUPPLY	TRIBUTARY OF (IF SURFACE WATERS)
Gilligan, Salmon, Turner, Mundt, Rock Springs, Pigeon, unnamed tributary of Mundt Creek, Cold Springs, and East Fork Nookachamps Creeks	Skagit River

NUMBER OF ACRE-FEET STORED WHEN RESERVOIR IS FILLED TO NOPL (one acre-foot is equal to 325,851 gal)	USE(S) TO BE MADE OF IMPOUNDED WATER
4,250	**For community and municipal domestic supply**

NOTE: NOPL MEANS: Normal Operating Pool Level

LOCATION OF IMPOUNDING STRUCTURE

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
	32, 33, 5	35 and 34	5E	3	Skagit

LEGAL SUBDIVISION OF LANDS IN WHICH THE SUBMERGED AREA IS TO BE LOCATED

Center of Judy Reservoir is approximately 1320 feet north of southeast corner of Section 32

PARCEL # P30031, P30034, P40538, P40540, P40522, P40609, P40542, P40543 and P40611.

ADDITIONAL LEGAL IS ON PAGE 2.

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY

PARCEL #

ADDITIONAL LEGAL IS ON PAGE 2.

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by PUD No. 1 of Skagit County.

CONSTRUCTION OF IMPOUNDING STRUCTURE for DAM "A"

HEIGHT OF DAM (FEET)	LENGTH ON TOP (FEET)	WIDTH ON TOP (FEET)
57	687	25

SLOPE OF FRONT OR WATER SIDE (NUMBER OF FEET HORIZONTAL TO ONE FOOT VERTICAL)	SLOPE OF BACK SIDE (NUMBER OF FEET HORIZONTAL TO ONE FOOT VERTICAL)
2:1	2:1

HEIGHT OF DAM ABOVE WATER LINE AT NOPL (FEET)
5

TYPE OF CONSTRUCTION OF DAM AND CONSTRUCTION MATERIALS
Earthfill embankment

LOCATION AND APPROXIMATE DIMENSIONS OF SPILLWAY INCLUDING CREST LENGTH
No spillway

LOCATION, SIZE, AND TYPE OF VALVE AND OUTLET CONDUIT STRUCTURE

	Location	Size	Type	Valve
Alternate Supply Line	North Dam A	36"	Ductile Iron Pipe	36" Manual Butterfly
Withdrawal Tower	Center of Dam A	2-24"	Concrete Bell & Spigot Pipes	1-24" Slide Gate Valve on each of the 3 intakes on the Withdrawal Tower

NUMBER OF ACRES SUBMERGED WHEN RESERVOIR IS FILLED TO NOPL
145

MAXIMUM DEPTH (FEET AT NOPL)
49.2

CONSTRUCTION OF IMPOUNDING STRUCTURE for DAM "B"

	HEIGHT OF DAM (FEET)	LENGTH ON TOP (FEET)	WIDTH ON TOP (FEET)
East Dam B	60	775	25
West Dam B	47	600	25

SLOPE OF FRONT OR WATER SIDE (NUMBER OF FEET HORIZONTAL TO ONE FOOT VERTICAL)	SLOPE OF BACK SIDE (NUMBER OF FEET HORIZONTAL TO ONE FOOT VERTICAL)
2:1	2:1

HEIGHT OF DAM ABOVE WATER LINE AT NOPL (FEET)
East Dam B 5
West Dam B 6

TYPE OF CONSTRUCTION OF DAM AND CONSTRUCTION MATERIALS
East & West Dams B Earthfill Embankment

LOCATION AND APPROXIMATE DIMENSIONS OF SPILLWAY INCLUDING CREST LENGTH
On East Dam B, there is a 36" diameter, concrete encased, corregated metal pipe (CMP) spillway.

LOCATION, SIZE, AND TYPE OF VALVE AND OUTLET CONDUIT STRUCTURE
On east Dam B, the outlet structure is a concrete intake slab with galvanized steel trash rack on the inlet to the CMP.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

Given under my hand and the seal of this office at Bellevue, Washington, this 19th *day of* August, *2004.*

Linda Hoffman
Department of Ecology

By Daniel Swenson
Daniel Swenson, Section Supervisor

DEPARTMENT OF ECOLOGY
DATA REVIEW
OK
STATE OF WASHINGTON

ECY 040-1-2 (Rev. 8-97)

OTHER WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

MAR 7 7 2 1 1972

1. NAME Public Utility District No.1 of Skagit County, Washington

ADDRESS 1415 Freeway Drive

Mount Vernon, Washington ZIP CODE 98273

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Surface (SURFACE OR GROUND WATER)

Rock Springs Creek W.R.I.A. 03 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS ~~XXXX XXXXXXX XXXXX~~

B. IF SURFACE WATER, THE SOURCE IS Rock Springs Creek, Cultus Mountain

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 0.2 cfs (CUBIC FEET PER SECOND OR GALLONS PER MINUTE) PRESENTLY USED 0

B. ANNUAL QUANTITY CLAIMED Unknown 40 AF/YR ~~120~~ (ACRE FEET PER YEAR) PRESENTLY USED 0

C. IF FOR IRRIGATION, ACRES CLAIMED _____ PRESENTLY IRRIGATED _____

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Year Around

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Assume prior to YEAR 1917

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2,900 FEET N 27°E ~~AND~~ _____

~~FEET~~ _____ FROM THE S W CORNER OF SECTION 16

BEING WITHIN S W 1/4 OF SECTION 16 T. 34 N., R. 5E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT _____ BLOCK _____ OF

(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Central Skagit County including cities of Mount Vernon, Burlington, Sedro Woolley, Clear Lake and surrounding rural areas.

COUNTY Skagit

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal Water Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Vested right transferred from predecessor water purveyors.

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED MAR 17,72 THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO. 009334

DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X Robert A. Yale

Robert A. Yale, Senior Engineer

DATE March 6, 1972

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

PUBLIC UTILITY DIST. #1, SKAGIT CO.
1415 Freeway Drive
Mount Vernon, Washington 98273

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98501

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

MAR-7 72 011803

1. NAME Public Utility District No.1 of Skagit County, Washington

ADDRESS 1415 Freeway Drive

Mount Vernon, Washington ZIP CODE 98273

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Surface (SURFACE OR GROUND WATER)

Pigeon Creek W.R.I.A. 03 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS

B. IF SURFACE WATER, THE SOURCE IS Pigeon Creek, Cultus Mountain

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 0.2 cfs (CUBIC FEET PER SECOND OR GALLONS PER MINUTE) PRESENTLY USED 0

B. ANNUAL QUANTITY CLAIMED Unknown 40 AF/YR (~~1500~~ ACRE FEET PER YEAR) PRESENTLY USED 0

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Year Around

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Assume prior to YEAR 1917

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 1,900 FEET N 64°E ~~AND~~

~~FEET~~ FEET FROM THE S W CORNER OF SECTION 16

BEING WITHIN S W 1/4 OF SECTION 16 T. 34 N., R. 5E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF

(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Central Skagit County including cities of Mount Vernon, Burlington, Sedro Woolley, Clear Lake and surrounding rural areas.

COUNTY Skagit

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal Water Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Vested right transferred from predecessor water purveyors.

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED MAR 17 72

THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO. 009335

DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X Robert A. Yale

Robert A. Yale, Senior Engineer

DATE March 6, 1972

IF CLAIM FILED BY DESIGNATED REPPESENTATIVE PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

PUBLIC UTILITY DIST. #1, SKAGIT CO.

1415 Freeway Drive

Mount Vernon, Washington 98273

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98501

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

MAR-7 72 011810

1. NAME Public Utility District No. 1 of Skagit County, Washington

ADDRESS 1415 Freeway Drive

Mount Vernon, Washington ZIP CODE 98273

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Surface (SURFACE OR GROUND WATER)
Unnamed Creek W.R.I.A. 03 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS

B. IF SURFACE WATER, THE SOURCE IS an unnamed creek, Cultus Mountain

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 0.1 cfs (CUBIC FEET PER SECOND OR GALLONS PER MINUTE) PRESENTLY USED 0

B. ANNUAL QUANTITY CLAIMED Unknown 20 AF/YR (ACRE FEET PER YEAR) PRESENTLY USED 0

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Year Around

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Assume prior to YEAR 1917

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2,000 FEET S 70°E AND
~~FEET~~ FROM THE N W CORNER OF SECTION 21

BEING WITHIN N W 1/4 OF SECTION 21 T. 34 N., R. 5E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Central Skagit County including cities of Mount Vernon, Burlington, Sedro Woolley, Clear Lake and surrounding rural areas.

COUNTY Skagit

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal Water Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Vested right transferred from predecessor water purveyors.

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO.

MAR 17 72 009336

DIRECTOR - DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X Robert A. Yale

Robert A. Yale, Senior Engineer

DATE March 6, 1972

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

PUBLIC UTILITY DIST. #1, SKAGIT CO.
~~1415 Freeway Drive~~
Mount Vernon, Washington 98273

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P O BOX 829 OLYMPIA WASHINGTON 98501

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

RECEIVED
MAR-7 1972
CASH ✓ CHECK MONEY ORDER

1. NAME Public Utility District No.1 of Skagit County, Washington

ADDRESS 1415 Freeway Drive

Mount Vernon, Washington ZIP CODE 98273

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Surface (SURFACE OR GROUND WATER)

Cold Springs Creek W.R.I.A. 03 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS

B. IF SURFACE WATER, THE SOURCE IS Cold Springs Creek, Cultus Mountain

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 0.2 cfs (CUBIC FEET PER SECOND OR GALLONS PER MINUTE) PRESENTLY USED 0

B. ANNUAL QUANTITY CLAIMED Unknown 40 AF/YR. Estimated (ACRE FEET PER YEAR) PRESENTLY USED 0

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Year Around

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Assume prior to YEAR 1917

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2,900 FEET S 51°W AND

FEET FROM THE N E CORNER OF SECTION 21

BEING WITHIN N E 1/4 OF SECTION 21 T. 34 N., R. 5 E (E. OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF

(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Central Skagit County including ~~XXXXX~~ cities of Mount Vernon, Burlington, Sedro Woolley, Clear Lake and surrounding rural areas.

COUNTY Skagit

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal Water Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Vested right transferred from predecessor water purveyors.

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO

MAR 17 72 009337

DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X Robert A. Yale

Robert A. Yale, Senior Engineer

DATE March 6, 1972

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

PUBLIC UTILITY DIST. # 1, SKAGIT CO.

1415 Freeway Drive

Mount Vernon, Washington 98273

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P O BOX 829 OLYMPIA WASHINGTON 98501

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

MAR-7 72 0118 2

1. NAME Public Utility District No.1 of Skagit County, Washington OWNER

ADDRESS 1415 Freeway Drive

Mount Vernon, Washington ZIP CODE 98273

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Surface (SURFACE OR GROUND WATER)

East Fork Nookachamps Creek W.R.I.A. 03 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS

B. IF SURFACE WATER, THE SOURCE IS East Fork Nookachamps Creek, Cultus Mountain

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 1.1 cfs PRESENTLY USED 0 (CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED Unknown 110 AF/YR PRESENTLY USED 0 (ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Year Around

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Assume prior to YEAR 1977

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 1,600 FEET N65°E AND

FEET FROM THE S W CORNER OF SECTION 22

BEING WITHIN S W 1/4 OF SECTION 22 T. 34 N., R. 5 E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF

(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Central Skagit County including cities of Mount Vernon, Burlington, Sedro Woolley, Clear Lake and surrounding rural areas.

COUNTY Skagit

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal Water Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Vested right transferred from predecessor water purveyors.

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO.

MAR 17 72 009338

DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X Robert A. Yale

Robert A. Yale, Senior Engineer

DATE March 6, 1972

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

PUBLIC UTILITY DIST. #1, SKAGIT CO.
1415 Freeway Drive
Mount Vernon, Washington 98273

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

A FEE OF $200 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98501

WASHINGTON STATE DEPARTMENT OF ECOLOGY

I have examined this application as required by SEPA and it is: ☐ not an action ☑ categorically exempt.

10/1/92 DATE

APPLICATION FOR PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

RECEIVED
SEP 29 1992
DEPT. OF ECOLOGY

☐ SURFACE WATER ☒ GROUND WATER

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO.	W.R.I.A.	COUNTY	PRIORITY DATE	TIME	ACCEPTED
G1-26742	3	Skagit	9-29-92		SB

APPLICANT'S NAME — PLEASE PRINT

Richard Bertelsen

Bus. Tel. 206-424-7057
Home Tel. 206-445-5093
Other Tel. 206-671-7866

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
1833 Starbird Rd.	Mt. Vernon	WA	98273

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION

N/A

1. SOURCE OF SUPPLY

IF SURFACE WATER	IF GROUND WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE)	SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.) Three (3) wells
TRIBUTARY: N/A	SIZE AND DEPTH: See attached well reports

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.)

Irrigation, golf course, domestic supply, 110 residential lots, clubhouse, restaurant

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF:	CUBIC FEET PER SECOND (CFS)	OR	GALLONS PER MINUTE (GPM)	ACRE FEET PER YEAR
			400	61

Community domestic supply - year round - as needed

TIMES DURING YEAR WATER WILL BE REQUIRED

May through October - Irrigation — golf course is key during irrigation

All year - Domestic uses

IF IRRIGATION, NUMBER OF ACRES	IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME, 1-MOBILE HOME, 2-CAMPSITES, ETC.	IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY
approximately 100	110 homes	N/A

DATE PROJECT WAS OR WILL BE STARTED	DATE PROJECT WAS OR WILL BE COMPLETED
wells drilled May, June 1992 project start January 1994	June 1996 (approx.)

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE	ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION
		N/A				

3B. IF NOT IN PLATTED PROPERTY

ON ACCOMPANYING SECTION MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION, SHOW NORTH-SOUTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER OR PROPERTY CORNER

ALSO, ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL.

See attached Exhibit "B"

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
	28, 33	33 N	4 E	Skagit

2 wells SW¼ sec 28 / 1 well NW¼ sec 33

4. DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER

yes

5. LEGAL DESCRIPTION OF PROPERTY *ON WHICH WATER IS TO BE USED*

ATTACH A COPY OF THE LEGAL DESCRIPTION OF THE PROPERTY (ON WHICH THE WATER WILL BE USED) TAKEN FROM **A REAL ESTATE CONTRACT, PROPERTY DEED OR TITLE INSURANCE POLICY** OR, COPY CAREFULLY IN THE SPACE BELOW

See attached Exhibit "A" - Legal Description

RECEIVED
MAR 3 1 1993
DEPT. OF ECOLOGY

I have examined this application as required by SEPA and find that it is: ☐ not an "action". ☑ categorically exempt.

4/19/93 DATE — Sheila Baka SIGNATURE

WASHINGTON STATE DEPARTMENT OF ECOLOGY

APPLICATION FOR PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ SURFACE WATER ☐ GROUND WATER

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO.	W.R.I.A.	COUNTY	PRIORITY DATE	TIME	ACCEPTED
G1-27030	3	Skagit	3/31/93		S

APPLICANT'S NAME — PLEASE PRINT
Richard A Bertelsen

Bus. Tel. 206 424 7057
Home Tel. 206 445-5093
Other Tel.

ADDRESS (STREET): 1833 Starbird Rd (CITY): Mt Vernon (STATE): Wa. (ZIP CODE): 98273

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION: N/A

1. SOURCE OF SUPPLY

IF SURFACE WATER	IF GROUND WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE)	SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.): Well - Designated B-1
TRIBUTARY: N/A	SIZE AND DEPTH: See Attached well reports from Previous Application G1-26742

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.)
Irrigation, Golf Course, domestic Supply, 130 Residential lots, clubhouse, Restaurant

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF: CUBIC FEET PER SECOND (CFS) OR GALLONS PER MINUTE (GPM) ACRE FEET PER YEAR

Well B-1 350 GPM
Wells B-2 + B-3 500 GPM (Amended Application # G1-26742) Previously 400 gpm

TIMES DURING YEAR WATER WILL BE REQUIRED
May through October – Irrigation Irrig - dusk to dawn Golf course irrig - during daylight hours
All Year – Domestic Uses Comm/dom: sewage, commercial use - year round as needed

IF IRRIGATION, NUMBER OF ACRES	IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME, 1-MOBILE HOME, 2-CAMPSITES, ETC.	IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY
Approx 100 Acres	130 homes	N/A

DATE PROJECT WAS OR WILL BE STARTED	DATE PROJECT WAS OR WILL BE COMPLETED
January 1994	June 1997 (Approx.)

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE	ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION
		N/A				

3B. IF NOT IN PLATTED PROPERTY

ON ACCOMPANYING SECTION MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION, SHOW NORTH-SOUTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER OR PROPERTY CORNER

ALSO, ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL.

See Attached

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
NE¼ NW¼	28, 33	33 N	4 E	Skagit

4. DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER
Yes

5. LEGAL DESCRIPTION OF PROPERTY *ON WHICH WATER IS TO BE USED*

ATTACH A COPY OF THE LEGAL DESCRIPTION OF THE PROPERTY (ON WHICH THE WATER WILL BE USED) TAKEN FROM A REAL ESTATE CONTRACT, PROPERTY DEED OR TITLE INSURANCE POLICY. OR, COPY CAREFULLY IN THE SPACE BELOW.

See Attached Exhibit "A" Legal Description from previous application G1-26742

WHAT IS YOUR INTEREST IN THE PROPERTY ON WHICH THE WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

ARE THERE ANY EXISTING WATER RIGHTS RELATED TO THE LAND ON WHICH THE WATER IS TO BE USED (INCLUDING WATER PROVIDED BY IRRIGATION DISTRICTS OR DITCH COMPANIES.) ☐ YES ☒ NO

IF YES, FROM WHAT SOURCE (i.e. SURFACE OR GROUND WATER) AND UNDER WHAT AUTHORITY

6. DESCRIPTION OF SYSTEM PROPOSED OR INSTALLED

(FOR EXAMPLE: SIZE OF PUMP, CAPACITY OF PUMP, PUMP MOTOR HORSE POWER, PIPE DIAMETER, NUMBER OF SPRINKLERS, ETC.)

The pump size and capacities will be related to the irrigation technology available when the golf course is completed. The design specifications have not been completed. Detailed information relating to this section will be provided in 1993.

REMARKS

7.

8.

COMPLETE THIS SECTION ONLY IF THIS APPLICATION INCLUDES IRRIGATION AS A USE

IN ORDER TO IMPLEMENT THE PROVISIONS OF INITIATIVE MEASURE NUMBER 59, THE FAMILY FARM WATER ACT WHICH WAS PASSED BY THE VOTERS ON NOVEMBER 3, 1977, WE MUST ASK THE FOLLOWING QUESTIONS:

DOES THE TOTAL NUMBER OF ACRES IN WHICH YOU HAVE CONTROLLING INTEREST IN THE STATE OF WASHINGTON EXCEED 2000 ACRES FOR THE FOLLOWING THREE CATEGORIES:

1. LANDS THAT ARE BEING IRRIGATED UNDER WATER RIGHTS ACQUIRED AFTER DECEMBER 8, 1977. YES ☐ NO ☒
2. LANDS THAT MAY BE IRRIGATED UNDER APPLICATIONS NOW ON FILE WITH THE DEPARTMENT OF ECOLOGY. YES ☐ NO ☒
3. LANDS THAT MAY BE IRRIGATED UNDER THIS APPLICATION. YES ☐ NO ☒

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

SIGNATURES

APPLICANT'S SIGNATURE

Richard A Bertelsen
LEGAL LANDOWNERS NAME (PLEASE PRINT)

LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 5)

1833 Starbird Rd
Mt Vernon, Wa. 98273
LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON
DEPARATMENT OF ECOLOGY } ss.

This is to certify that I have examined this application together with the accompanying maps and data, and am returning it for correction or completion as follows: .....

.....

.....

In order to retain its priority date, this application must be returned to the Department of Ecology, with corrections, on or before ....., 19.....

Witness my hand this ..... *day of* ....., 19.....

.....
Department of Ecology

ECY 040-1-14
Rev. 8/91 F

SB-2631

EXHIBIT "A" - LEGAL DESCRIPTION

PARCEL A:

The Southwest Quarter of the Southwest Quarter of Section 28, Township 33 North, Range 4 East of the Willamette Meridian, and the Northwest Quarter of the Northwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, EXCEPT from said Northwest Quarter of the Northwest Quarter of Section 33 the following three described tracts:

1. The Skagit County Road right-of-way commonly known as the Starbird Road along the South line thereof;

2. That portion thereof taken by the State of Washington pursuant to Stipulated Judgment and Decree of Appropriation entered December 27, 1971, in Skagit County Superior Court Cause No. 32404.

3. The South 254 feet of the West 90 feet of the following described tract:

   That portion of the East Half of the Northwest Quarter of the Northwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, described as follows:

   Commencing at a point on the centerline of the County road running along the Southerly boundary of the East Half of the Northwest Quarter of the Northwest Quarter of said section as it existed December 10, 1947, where the same is intersected by the East line of the East Half of the Northwest Quarter of the Northwest Quarter of said section, the true point of beginning;
   thence North on the East line of the East Half of the Northwest Quarter of the Northwest Quarter of said section, 642 feet;
   thence West 326.5 feet;
   thence South parallel with the said East line to the center of the said County road;
   thence East along the centerline of the county road to the point of beginning.

PARCEL B:

The Northeast Quarter of the Southeast Quarter of Section 29, Township 33 North, Range 4 East of the Willamette Meridian.

continued. . . . .

SB-2631

EXHIBIT "A" - LEGAL DESCRIPTION
Page 2

PARCEL C: WCHL # 2,3

The Northwest Quarter of the Southwest Quarter of Section 28, Township 33 North, Range 4 East of the Willamette Meridian.

PARCEL D:

The Southeast Quarter of the Southwest Quarter of Section 28, Township 33 North, Range 4 East of the Willamette Meridian.

PARCEL E:

The North Half of the Southwest Quarter of the Southeast Quarter of Section 28, Township 33 North, Range 4 East of the Willamette Meridian.

PARCEL F:

The South Half of the Southwest Quarter of the Southeast Quarter of Section 28, Township 33 North, Range 4 East of the Willamette Meridian, EXCEPT the East 20 feet thereof reserved for public road by deed recorded in Volume 91 of Deeds, page 416, records of Skagit County, Washington.

PARCEL G:

That portion of the Northwest Quarter of the Northeast Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, described as follows:

Beginning at the Southwest corner of said Northwest Quarter of the Northeast Quarter;
thence East 221 feet;
thence North 45°48' West 360 feet;
thence West 37 feet;
thence North 967 feet;
thence West 33 feet;
thence South 1,320 feet to the point of beginning;

EXCEPT that portion conveyed to Skagit County for road purposes by deed recorded May 23, 1969, under Auditor's File No. 726870, records of Skagit County, Washington.

continued. . . . .

SB-2631

EXHIBIT "A" - LEGAL DESCRIPTION
Page 3

PARCEL H: WELL #1

The Northeast Quarter of the Northwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, EXCEPT the West 66 feet thereof, AND ALSO EXCEPT that portion conveyed to Skagit County for road purposes by deed recorded June 11, 1969, under Auditor's File No. 727589, records of Skagit County, Washington.

PARCEL I:

The West 66 feet of the Northeast Quarter of the Northwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, EXCEPT that portion conveyed to Skagit County for road purposes by deed recorded May 22, 1969, under Auditor's File No. 726808, records of Skagit County, Washington.

PARCEL J:

The Southwest Quarter of the Northwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, EXCEPT the West 20 feet thereof as conveyed to Skagit County by deed recorded May 15, 1928, under Auditor's File No. 213246, records of Skagit County, Washington, EXCEPT that portion conveyed to the State of Washington by deed recorded June 6, 1934, under Auditor's File No. 262729, records of Skagit County, Washington, EXCEPT that portion condemned by the State of Washington by decree entered October 10, 1956, in Skagit County Superior Court Cause No. 23734, EXCEPT that portion thereof conveyed to Skagit County for road purposes by deed recorded May 13, 1969, under Auditor's File No. 726426, records of Skagit County, Washington, AND ALSO EXCEPT that portion condemned by the State of Washington by decree entered February 16, 1972, in Skagit County Superior Court Cause No. 32365.

PARCEL K:

That portion of the North 165 feet of the Northwest Quarter of the Southwest Quarter of Section 33, Township 33 North, Range 4 East of the Willamette Meridian, lying East of Primary State Highway No. 1, as condemned by State of Washington by decree entered February 16, 1972, in Skagit County Superior Court Cause No. 32365.

continued. . . . .

SB-2631

EXHIBIT "A" - LEGAL DESCRIPTION
Page 4

PARCEL L:

Tract 1 of SHORT PLAT NO. 36-84 as approved October 18, 1984, and recorded October 18, 1984, in Volume 6 of Short Plats, page 181, under Auditor's File No. 8410180023, records of Skagit County, Washington; being a portion of the Northeast Quarter of the Northeast Quarter of Section 32, Township 33 North, Range 4 East of the Willamette Meridian

ALL Situated in Skagit County, Washington.

- END OF EXHIBIT "A" -

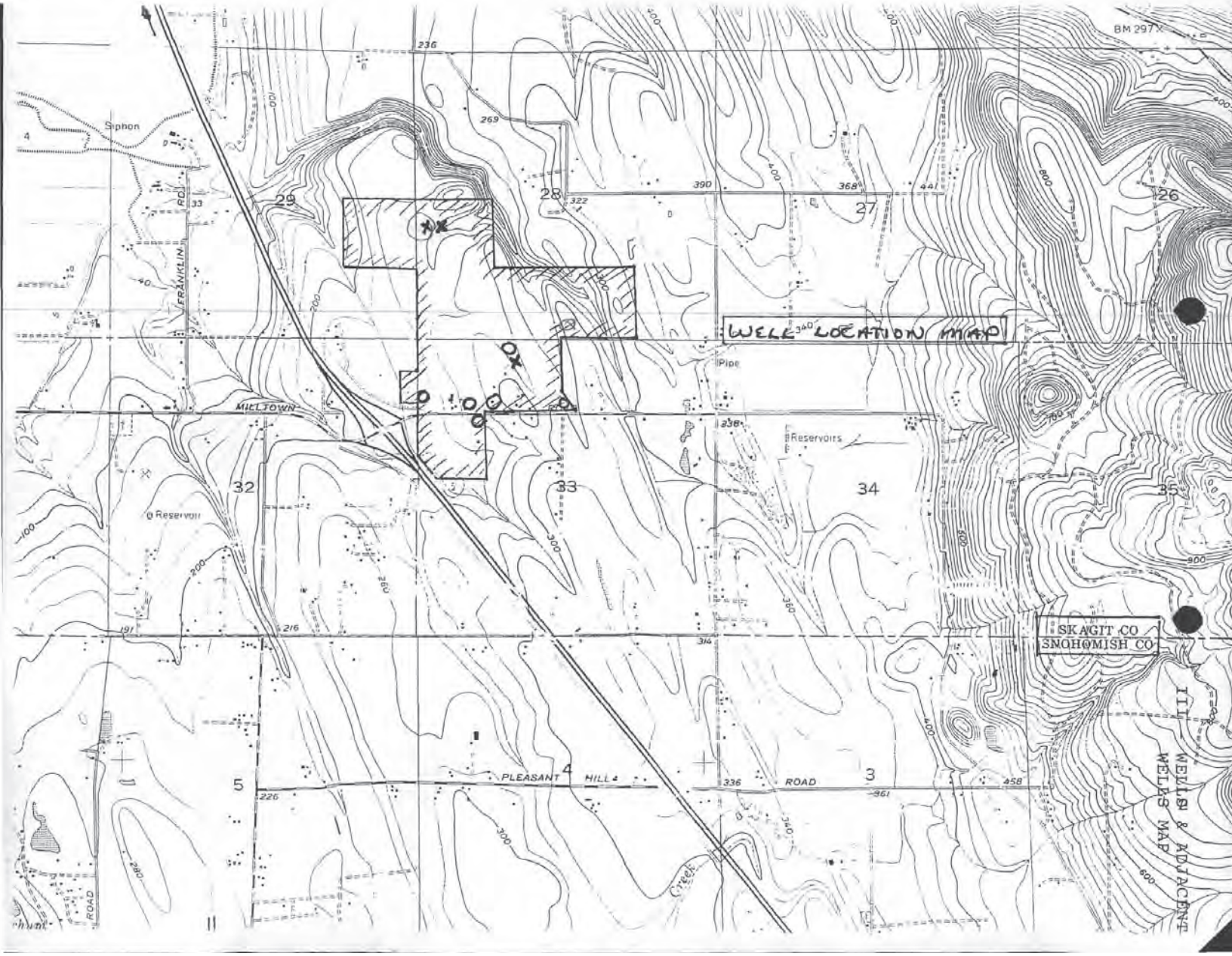
EXHIBIT "B"

See Section 3B on Application for Permit to Appropriate Public Waters

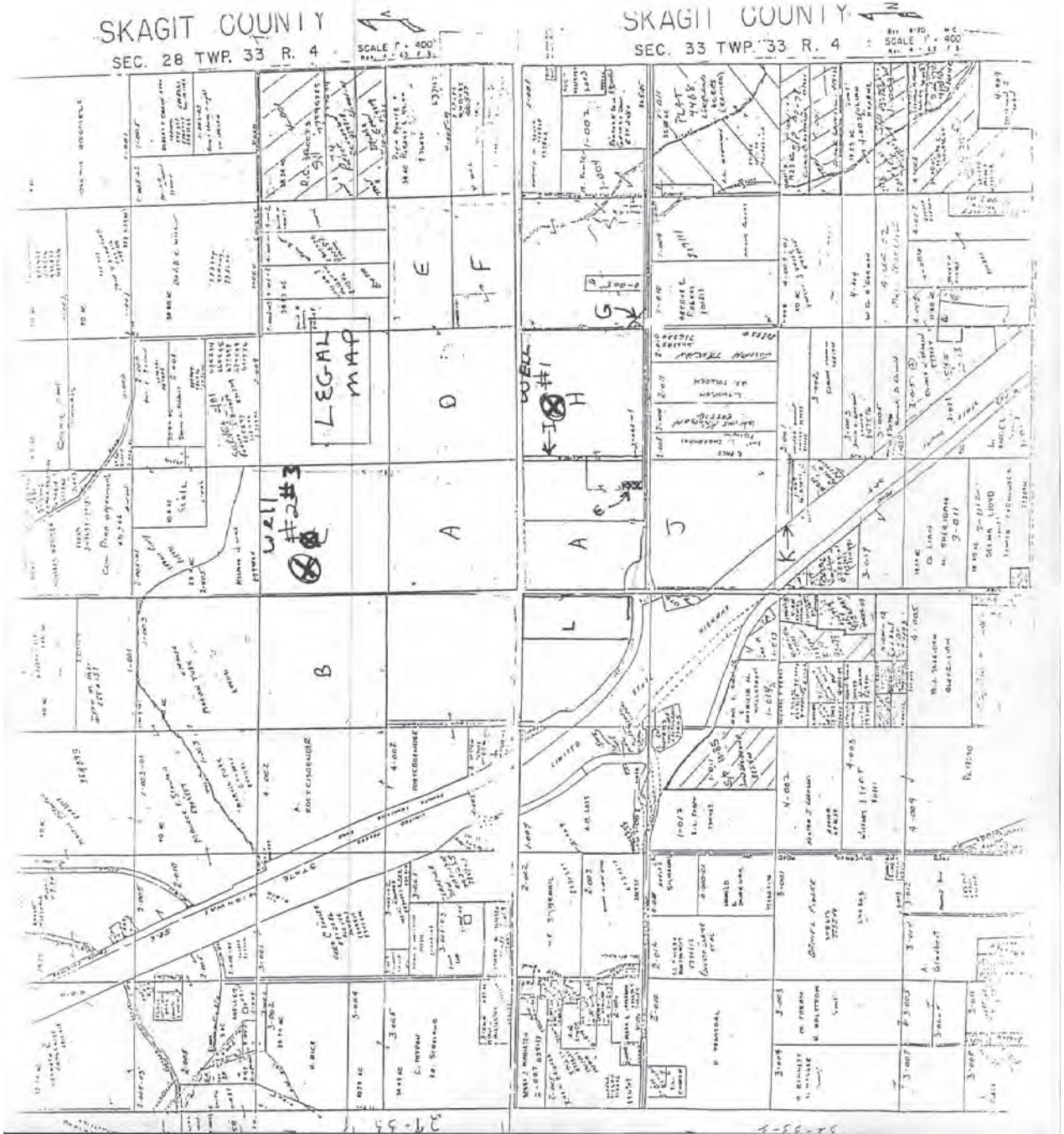
Well #1: 200' south of the north boundary of Section 33, and 800' east of the west boundary of Section 33 in the northeast quadrant of the northwest quadrant of Section 33, Twp 33N, R 4 E WM

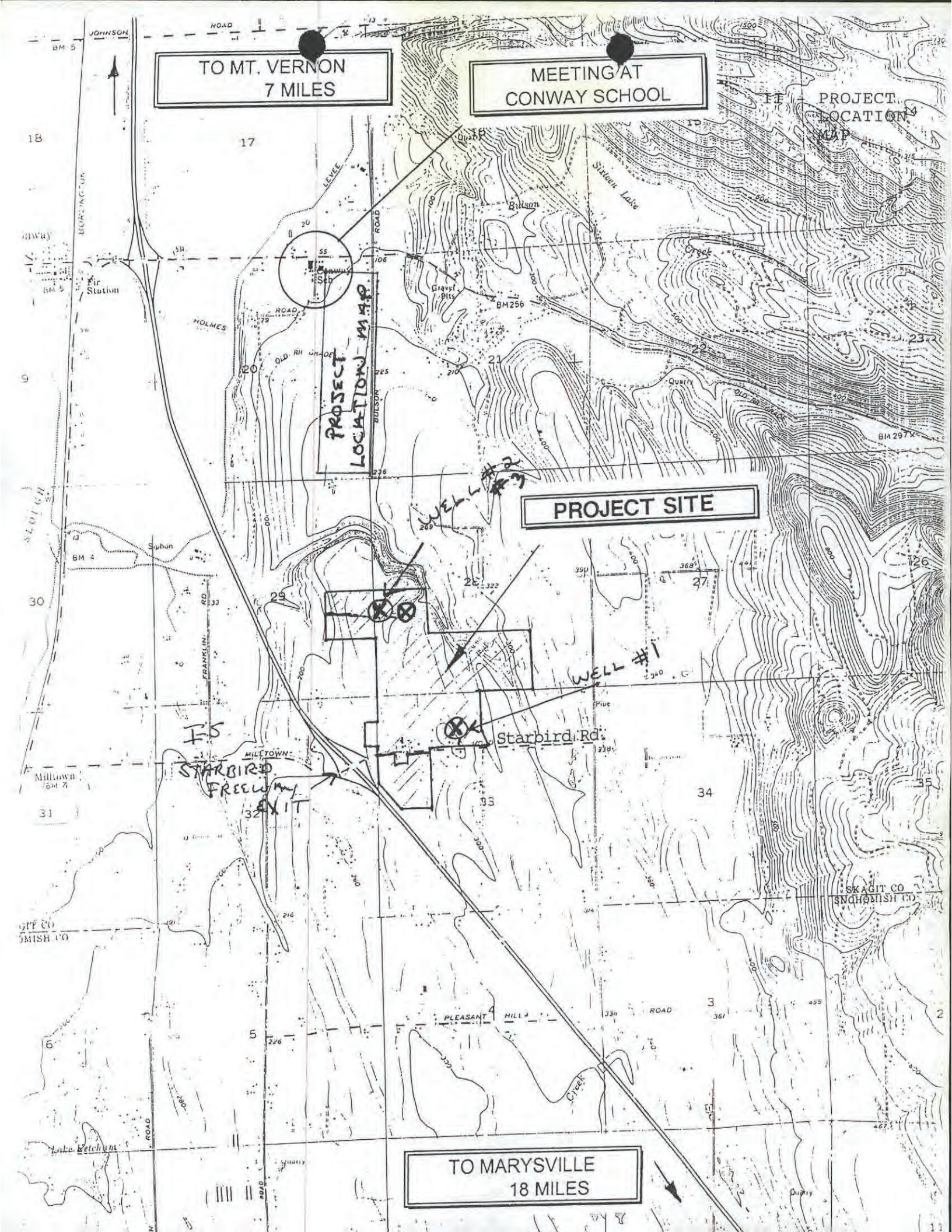
Well #2: 300' south of the north boundary of the northwest quadrant of the southwest quadrant of Section 28, and 125' east of the west boundary of Section 28, Twp 33N, R 4 E WM.

Well #3: 300' south of the north boundary of the northwest quadrant of the southwest quadrant of Section 28, and 225' east of the west boundary of Section 28, Twp 33N, R 4 E WM.


WELL LOCATION MAP
SKAGIT CO
SNOHOMISH CO
ITT WELLS & ADJACENT WELLS MAP
BM 297
Siphon
FRANKLIN RD
MICLTOWN
Reservoirs
Reservoir
PLEASANT HILL 4 ROAD
ROAD
Creek
Pipe
29
28
27
26
32
33
34
5
4
3

I - LEGAL MAP


SKAGIT COUNTY
SEC. 28 TWP. 33 R. 4
SCALE 1" = 400'
SKAGIT COUNTY
SEC. 33 TWP. 33 R. 4
SCALE 1" = 400'
LEGAL map
well #3
well #1
A
B
D
E
F
G
H
J
K
L


TO MT. VERNON
7 MILES
MEETING AT
CONWAY SCHOOL
PROJECT
LOCATION
MAP
PROJECT
LOCATION MAP
PROJECT SITE
WELL #2
WELL #3
WELL #1
Starbird Rd.
STARBIRD
FREEWAY
EXIT
TO MARYSVILLE
18 MILES
JOHNSON
ROAD
BURLINGTON
Fir
Station
Conway Sch
HOLMES
ROAD
OLD RR GRADE
BULSON
ROAD
Gravel
Pits
BM256
Bulson
Sixteen Lake
Quarry
Creek
Siphon
BM 4
FRANKLIN
RD.
MILLTOWN
Milltown
BM 7
PLEASANT
HILL
ROAD
Lake Ketchum
SKAGIT CO
SNOHOMISH CO
SKAGIT CO
SNOHOMISH CO
BM 5
BM 297

WHAT IS YOUR INTEREST IN THE PROPERTY ON WHICH THE WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

Owner

ARE THERE ANY EXISTING WATER RIGHTS RELATED TO THE LAND ON WHICH THE WATER IS TO BE USED (INCLUDING WATER PROVIDED BY IRRIGATION DISTRICTS OR DITCH COMPANIES.) ☐ YES ☒ NO

IF YES, FROM WHAT SOURCE (i.e. SURFACE OR GROUND WATER) AND UNDER WHAT AUTHORITY

6. DESCRIPTION OF SYSTEM PROPOSED OR INSTALLED

(FOR EXAMPLE: SIZE OF PUMP, CAPACITY OF PUMP, PUMP MOTOR HORSE POWER, PIPE DIAMETER, NUMBER OF SPRINKLERS, ETC.

The pump size and capacities will be related to the irrigation technology available when the golf course is completed. The design specifications have not been completed. Detailed information relating to this section will be provided in 1993.

REMARKS

7.

8. **COMPLETE THIS SECTION ONLY IF THIS APPLICATION INCLUDES IRRIGATION AS A USE**

IN ORDER TO IMPLEMENT THE PROVISIONS OF INITIATIVE MEASURE NUMBER 59, THE FAMILY FARM WATER ACT WHICH WAS PASSED BY THE VOTERS ON NOVEMBER 3, 1977, WE MUST ASK THE FOLLOWING QUESTIONS:

DOES THE TOTAL NUMBER OF ACRES IN WHICH YOU HAVE CONTROLLING INTEREST IN THE STATE OF WASHINGTON EXCEED 2000 ACRES FOR THE FOLLOWING THREE CATEGORIES:

1. LANDS THAT ARE BEING IRRIGATED UNDER WATER RIGHTS ACQUIRED AFTER DECEMBER 8, 1977. YES ☐ NO ☒
2. LANDS THAT MAY BE IRRIGATED UNDER APPLICATIONS NOW ON FILE WITH THE DEPARTMENT OF ECOLOGY. YES ☐ NO ☒
3. LANDS THAT MAY BE IRRIGATED UNDER THIS APPLICATION. YES ☐ NO ☒

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

SIGNATURES

APPLICANT'S SIGNATURE

Richard Bertelsen
LEGAL LANDOWNERS NAME (PLEASE PRINT)

LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 5)

1833 Starbird Road
Mt. Vernon, WA 98273
LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON }
DEPARATMENT OF ECOLOGY } ss.

This is to certify that I have examined this application together with the accompanying maps and data, and am returning it for correction or completion as follows: .....

.....

.....

In order to retain its priority date, this application must be returned to the Department of Ecology, with corrections, on or before ....., *19*.....

Witness my hand this .....*day of* ....., *19*.....

.....
Department of Ecology

ECY 040-1-14
Rev. 8/91 F

201106020017
Skagit County Auditor
6/2/2011 Page 1 of 2 9:17AM

Public Utility District No. 1 of Skagit County
c/o Mike Benton
PO Box 1436
Mount Vernon WA 98273

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
SUPERSEDING CERTIFICATE OF WATER RIGHT

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008

Applicant: **Public Utility District No. 1 of Skagit County**
c/o Mike Benton
PO Box 1436
Mount Vernon WA 98273

Reference Number: NA

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
July 26, 1971	12060	10727	G1-00128C

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	150	30

QUANTITY/TYPE OF USE/PERIOD OF USE

Municipal use - continuously

LOCATION OF DIVERSION/WITHDRAWAL

Tract A of the plat of Samish River Park Division No. 1

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
	7	35	4 E	3	Skagit

PARCEL # P68789

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY

PARCEL #

ADDITIONAL LEGAL IS ON PAGE 2

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

The plat of Samish River Park, Division No. 1, in Section 6 and 7, T. 35 N., R. 4 E.W.M.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Bellevue, Washington, this 1st *day of* June, *2011.*

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
DATA REVIEW
OK
ECY 040-1-2 (Rev. 8-97)

Ted Sturdevant, Director
Department of Ecology

By _____
Jacqueline Klug, Section Manager
Water Resources Program

SATELLITE SYSTEM WATER RIGHTS

Fidalgo (not applicable – supplied by City of Anacortes)

Alger

Cedargrove

Marblemount

Mountain View

Potlatch Beach (not applicable – withdrawal of salt water from a marine water body)

Rockport

Skagit View Village

No. 7361—5-60—3M. 62306.

VOL 3 PAGE 137

606775

CERTIFICATE RECORD NO. 8 PAGE NO. 3885-A

STATE OF WASHINGTON, COUNTY OF Skagit

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.

THIS IS TO CERTIFY *That* ALGER COMMUNITY CLUB, INC.

of Bellingham, Washington, *has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the ground waters of a* well

located within NW¼SW¼

Sec. 8, *Twp.* 36 *N., R.* 4 *E.W.M.,*

for the purpose of community domestic supply

under and subject to provisions contained in Ground Water Permit No. 5401 *issued by the State Supervisor of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume* 8 *at page* 3885-A; *that the right hereby confirmed dates from* September 21, 1960; *that the quantity of ground water under the right hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 100 gallons per minute; 100 acre-feet per year for community domestic supply.

Special provisions required by the Supervisor of Water Resources:

A description of the lands to which such ground water right is appurtenant:

Community of Alger, Skagit County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Water Resources affixed this 21st *day of* April, 1961.

M Walker

State Supervisor of Water Resources.

ENGINEERING DATA

Received for record at Apr. 24 1961 8:53 AM

at request of Dept. of Conservation

A. H. JOHNSON, Auditor Skagit Co., Washington

Mr. Bradley Spangler
PUD No. 1 of Skagit County
1415 Freeway Drive
Mount Vernon, WA 98273

'98 MAY 15 A9:20

9805150016

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 160th Avenue Southeast
Bellevue, WA 98008-5452

Applicant: PUD No. 1 of Skagit County
1415 Freeway Drive
Mount Vernon, WA 98273

Reference Number: N/A

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 5, 1990	G1-25994	G1-25994 P	G1-25994 C

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well (8" x 182') - (Cedargrove)	N/A

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
N/A	262	53.8

QUANTITY/TYPE OF USE/PERIOD OF USE

Community domestic supply/continuously

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW SE	15	35	8E	4	Skagit

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N/A	N/A	35	8E	4	Skagit

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

9805150016

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

1220 feet east and 1220 feet north from the South quarter corner of Section 15.

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

Cedargrove LUD No. 10, within NE quarter of Section 15 and the NW quarter of Section 14, all in Township 35N, Range 8E, Skagit County.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The well access port shall be maintained at all times.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through –040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

This certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Bellevue, Washington, this 13th *day of* MAY, *1998.*

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON ENGINEERING DATA

Tom Fitzsimmons
Department of Ecology

By Daniel Swenson
Daniel Swenson, Section Supervisor

ECY 040-1-2 (Rev. 8-97)

9805150016

BK 181 PG 0413

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 4, 2002	G1-28137A	G1-28137P	

NAME
Public Utility District #1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1436	Mount Vernon	WA	98273

The applicant is pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	150	*19.4

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Water Supply –

*ANNUAL QUANTITIES: INTERRUPTIBLE – 9.4 acre feet per year is subject to the instream flow set for the Skagit River, according to chapter 173-503 WAC Instream Resources Protection Program - Lower and Upper Skagit Water Resources Inventory Area, measured at the Mount Vernon gage (12200500); however, CONTINUOUS USE of the 9.4 afy can be realized when mitigated under an Ecology approved mitigation plan. An additional 10.0 afy is made available for mitigation purposes only as needed for the growth of municipal water use.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Approximately 780 feet north and 1,000 feet east of the SW corner of Section 12, Township 35 North, Range 10 East, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW1/4 SW1/4	12	35	10E	4	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Public Uulity District #1 (PUD) of Skagit County—Marblemount Water System local utility district (LUD #28). Portions of: Sections 12 and 13, T35N, R10E, north of the Skagit River; and Section 7, T35N, R11E, west of the Skagit River; and Section 18, T35N, R11E, north and west of the Skagit River.

SKAGIT COUNTY WASHINGTON
REAL ESTATE EXCISE TAX

MAR 25 2004

Amount Paid $
Skagit Co. Treasurer
By Deputy

DESCRIPTION OF PROPOSED WORKS

The wate. ,stem will consist of a well, a 57,600 gallon reservoir tank in the foothills, possible additional storage ponds, 12,600 lineal fee. and 8-inch water mains, fire hydrants, and water meters to serve the community. The water reservoir on high ground will provide a gravity flow system. The proposed location keeps the withdrawal and storage facilities outside areas subject to flooding.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
October 2003	June 4, 2008	June 4, 2023

PROVISIONS

Provisions:

Water is available for this proposed request when the Skagit River instream flows are met. The Skagit River instream flows established are as follows:

MONTH	DAY	USGS Station # 12200500 Skagit River
January	1-31	10,000
February	1-29	10,000
March	1-31	10,000
April	1-30	12,000
May	1-31	12,000
June	1-30	12,000
July	1-31	10,000
August	1-31	10,000
September	1-30	10,000
October	1-31	13,000
November	1-15	13,000
	16-30	11,000
December	1-15	11,000
	16-31	10,000

Skagit County PUD #1 Mitigation Plant for the Marblemount Water System

An Ecology approved mitigation plan will be developed and adopted prior to withdrawals during low flows of the Skagit River. The mitigation plan will be in compliance with the flow restrictions under chapter 173-503 WAC Instream Resources Protection Program - Lower and Upper Skagit Water Resources Inventory Area.

Metering:

An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use," Chapter 173-173 WAC.

Water use data shall be recorded weekly. Data shall be maintained by the property owner and promptly submitted to Ecology upon request. Recording and retention of data by the water right holder are required to inform the water users about how much water is used, when the water is used and to assist users in efficient water management.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air-line gauge may be installed in addition to the access port.

This authorization to make use of public waters of the state is subject to existing rights, including any existing rights held by the United States for the benefit of Tribes under treaty or settlement.

If it can be shown that the requested water right has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The applicant is advised that a water right certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated based on metering data submitted to the Department of Ecology.

A certificate of water right will be issued after a final investigation is made. The final investigation will evaluate metering data and any other information needed to validate perfected use prior to issuing a final certificate of water right.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 10th *day of* October, *2003.*

Department of Ecology

ENGINEERING DATA
OK

By Daniel L. Swenson
Daniel L. Swenson, Section Supervisor, Water Resources

PERMIT

G1-28137

Public Utility District No. 1
of Skagit County
Attn: Bradley Spangler
P.O. Box 1436
Mount Vernon, WA 98273-9907

200206070063
Skagit County Auditor
6/7/2002 Page 1 of 2 10:52AM

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 160th Avenue NE
Bellevue, WA 98008

Applicant: Public Utility District No. 1
of Skagit County
Attn: Bradley Spangler
P.O. Box 1436
Mount Vernon, WA 98273-9907

Reference Number:

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 26, 1990	G1-25755	G1-25755P	G1-25755C

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	41	3.8

QUANTITY/TYPE OF USE/PERIOD OF USE

Group domestic supply – continuously for 12 homes – Mountain View

LOCATION OF DIVERSION/WITHDRAWAL

800 feet east and 100 feet north of the west quarter corner of Section 26

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼ NW¼	26	34	4E	3	Skagit

PARCEL #

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY

PARCEL #

The west half of the northwest quarter of Section 26, Township 34 North, Range 4 East W.M. in Skagit County, Washington.

ADDITIONAL LEGAL IS ON PAGE 2

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

N/A

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

N/A

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with the rule "Requirements for Measuring and Reporting Water Use," Chapter 173-173 WAC. Water use data shall be recorded monthly and this data shall be maintained and be made available to Ecology upon request.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements.

At a minimum, the following information shall be included with each submittal of water use data: Owner, Contact name if different, Mailing address, Daytime Phone Number, WRIA, Certificate Number, Source Name, Annual Quantity Used including Units, Maximum Rate of Diversion Including Units, Period of Use.

Static Water Level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Bellevue, Washington, this 5th *day of* JUNE, *2002*

Tom Fitzsimmons
Department of Ecology

By Daniel Swenson
Daniel Swenson, Section Supervisor

DEPARTMENT OF ECOLOGY
ENGINEERING DATA
OK V.R.
ECY 040-1-2 (Rev. 8-97)
STATE OF WASHINGTON

200206070063
Skagit County Auditor
6/7/2002 Page 2 of 2 10:52AM

Mr. Bradley Spangler
PUD No. 1 of Skagit County
1415 Freeway Drive
Mount Vernon, WA 98273

STATE OF WASHINGTON
CERTIFICATE OF WATER RIGHT

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 160th Avenue Southeast
Bellevue, WA 98008-5452

Applicant: PUD No. 1 of Skagit County
1415 Freeway Drive
Mount Vernon, WA 98273

Reference Number: N/A

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 25, 1989	G1-25509	G1-25509 P	G1-25509 C

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well	N/A

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
N/A	95*	19.0*

QUANTITY/TYPE OF USE/PERIOD OF USE

Community domestic supply/continuously

*Total withdrawal under G1-25509 and G1-22623C shall not exceed 100 gpm and 38.6 acre-feet per year.

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE SE	27	35	9E	4	Skagit

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
N/A	N/A	35	9E	4	Skagit

PARCEL # N/A

ADDITIONAL LEGAL IS ON PAGE 2

CONTINUED LEGAL DESCRIPTION FOR LOCATION OF DIVERSION/WITHDRAWAL

700 feet west and 650 feet south from the East quarter corner of Section 27.

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

Skagit County Local Utility District No. 11, Town of Rockport, within SE quarter Section 26, SW quarter Section 25 and North half NE quarter Section 35, all north of Skagit River, all in Township 35N, Range 9E, W.M., Skagit County.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

Total annual withdrawal under G1-25509 and G1-22623C shall not exceed 100 gpm and 38.6 acre-feet per year.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Bellevue, Washington, this 13th *day of* MAY, *1998.*

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Tom Fitzsimmons
Department of Ecology

By Daniel Swenson
Daniel Swenson, Section Supervisor

ECY 040-1-2 (Rev. 8-97)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
July 24, 1973	G1-20763	G1-20763P	

NAME
PUD #1 of Skagit County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 1436	Mount Vernon	WA	98273

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Two wells
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	*200.0	**38.4

QUANTITY, TYPE OF USE, PERIOD OF USE

*80 GPM subject to Chapter 173-503 WAC
**0.3 AFY per equivalent residential units (ERU) for a maximum of 128 ERU connections
Municipal Supply – Continuous Use

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

#1 – 250 feet North and 1260 feet West of East quarter corner of Section 8
#1 – 350 feet North and 1260 feet West of East quarter corner of Section 8

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
Gov't Lot 10	8	35	08E	4	Skagit

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Divisions 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, and 14 of the Wilderness Village Planned Unit Residential Development as modified and approved by the Skagit County Board of Commissioners April 28th, 1997

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	Complete	January 1, 2021

PROVISIONS

This authorization to make use of public waters of the state is subjected to existing rights held by the United States for benefit of Native American Tribes under treaty or otherwise.

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An airline and gauge may be installed in addition to the access port.

In order to protect the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and provided to Ecology on a quarterly basis. Ecology shall provide the reporting format.

This authorization is subject to the implementation of the minimum requirements established in the Conservation Planning Requirements: Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, March 1994, which are enclosed.

The applicant is advised that a certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this ORDER, and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the states water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this water right, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology. Outside lawn watering shall be restricted when flows at the Mount Vernon gauge USGS station #12200500 on the Skagit River are below the minimums in Chapter 173-503 WAC.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under RCW 18.104, Washington Water Well Construction Act of 1972, and Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

In accordance with WAC 173-160-205, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from a sewer, septic tank, privy, or other source of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations. Specifically, the Department of Health has regulations that may require permitting for the proposed activity.

During the period when flows at the Mount Vernon gauge USGS station #12200500 on the Skagit River are below the minimums in Chapter 173-503 WAC, the water system shall report on a weekly basis to the Department of Ecology the instantaneous pumping rates of the water system supply wells.

The water system shall submit annual reports to the Department of Ecology containing information on the water system's construction status, the number of new hookups added during the year, the quantity of water (instantaneous and annual) used by the system, any changes in local permitting status for the planned residential use development, and any changes in the management of the water system. The annual reports shall be due on March 1 for the previous year's information.

An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded weekly. Data shall be maintained by the property owner and promptly submitted to Ecology upon request. Recording and retention of data by the water right holder are required to inform the water users about how much water is used, when the water is used and to assist users in efficient water management.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 22nd *day of* January, *2008.*

DEPARTMENT OF ECOLOGY
ENGINEERING DATA
OKAY
STATE OF WASHINGTON

Department of Ecology

By Daniel L. Swenson
Daniel L. Swenson, Section Supervisor, Water Resources

APPENDIX K

EMERGENCY RESPONSE PLAN TABLE OF CONTENTS

Emergency Response Plan

Public Utility District No. 1 of Skagit County

1415 Freeway Drive
P.O. BOX 1436
Mount Vernon, WA 98273
(360) 424-7104
Skagitpud.org

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APPENDIX L

DOH EXEMPTION LETTER FOR LT2ESWTR

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
20435 72nd Ave. S. , Suite 200, K17-12 • Kent, Washington 98032 -2358

July 2, 2007

GREG PETERKA
SKAGIT COUNTY PUD NO. 1
PO BOX 1436
MOUNT VERNON, WA 98273

Subject: Skagit County PUD No. 1-Judy Reservoir (ID# 79500)
Skagit County
Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)
Grandfathered Source Water Data- Judy Reservoir Water Treatment Plant

Dear Mr. Peterka:

We have reviewed the grandfathered *Cryptosporidium* monitoring data that were received by EPA on April 27, 2007 and the monitoring location schematic received on June 22, 2007. These data include the results of 26 *Cryptosporidium* samples that were collected between January, 2004 and December, 2005. It is understood that you have submitted this data in lieu of collecting the source monitoring data required to comply with the LT2ESWTR. These data have been reviewed against the requirements of CFR 141.707 and are hereby APPROVED for the purposes of grandfathering.

The report indicates that your calculated Cryptosporidium bin concentration for your Judy Reservoir source is 0 oocysts/L, placing your source in bin 1. Under this bin classification no additional treatment for *Cryptosporidium* is required. You have satisfied the requirement for a *Cryptosporidium* bin classification report under CFR 141.710.

A second round of source water monitoring is required as part of the LT2ESWTR. The sampling plan for round 2 is due July 1, 2015 and sampling must start by October 1, 2015. Your bin classification may change based on the results of the second round of monitoring.

Please continue to send us copies of any items you submit to EPA regarding this rule. For more information regarding the rule, visit the LT2ESWTR website at www.epa.gov/safewater/disinfection/lt2.

If you have any questions regarding this letter, please contact me at (253) 395-6765.

Sincerely,

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
NW Drinking Water Operations

cc: Lorna Parent, Skagit County Health Department
Greg Hamilton, Skagit County PUD
Information Processing Management Center

APPENDIX M

COLIFORM MONITORING PLANS

JUDY SYSTEM COLIFORM MONITORING PLAN

SATELLITE SYSTEMS COLIFORM MONITORING PLANS

- Fidalgo Island
- Alger
- Cedargrove
- Marblemount
- Mountain View
- Potlatch Beach
- Rockport
- Skagit View Village

COLIFORM MONITORING PLAN

Plan Preparation Information

System Name:	Judy Reservoir System (PWSID 79500 E)
Date:	July 2014
Modification Dates:	
Names of Plan Preparers:	Emilia Blake & Darlene Holmstrom
Contact Information:	360-424-7104

State Reviewer:

Water Quality compliance monitoring requirements for the Public Utility District No. 1 of Skagit County are covered in the following three documents: Coliform Monitoring Plan, Inorganic and Organic Monitoring Plan, and Disinfectants and Disinfection Byproducts Monitoring Plan. This is the first of those three documents.

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1 System Information

This Coliform Monitoring Plan was developed for the use of the Public Utility District No. 1 of Skagit County (District) and to satisfy Washington State Department of Health (DOH) requirements. The plan outlines current water system information regarding coliform monitoring and compliance with state and federal regulations.

1.1 Sources

Judy Reservoir is the sole source water supply for the District's Judy Reservoir System. The Judy Reservoir System is classified by DOH as a Group A public water system under Washington Administrative Code (WAC) 246-290-020, with system ID # 79500E. The Judy Reservoir System diverts water from the Cultus Mountain watershed (Gilligan, Salmon, Turner, and Mundt creeks) and the diversion pump station providing water from the Skagit River. The Cultus Mountain watershed starts about 2 miles due east of Clear Lake. All streams in the watershed drain eventually to the Skagit River. Water is collected from the four streams at diversion structures and transported to an impoundment (Judy Reservoir) through two collector pipelines. The diversion structures are set up on a bypass system, allowing water to flow past the diversion. Instream flows set by rule under WAC 173-505 limit the diversion quantities available from each stream based on the month of the year. When the water measured on a downstream gauge does not meet these minimum flows, the District diverts water from the Skagit River when it has acceptable water quality parameters.

1.2 Storage

The District has a total storage capacity of 29,881,000 gallons of water spread throughout 25 storage reservoirs within the Judy System (Table 1).

Table 1. Storage Capacity for Judy System

Description	HGL* (feet)	Nominal Capacity (gal)
9th and Highland Reservoir	214	5,000,000
Bay View Ridge Reservoir	290	2,930,000
Bayview Standpipe	270	300,000
Big Lake Reservoir (West)	356	140,000
Big Lake Reservoirs (East) 1	356	70,000
Big Lake Reservoirs (East) 2	356	70,000
Bow Hill Reservoir	456	1,000,000
Buchanan Hill Reservoir	365	1,000,000
Bulson Road Reservoir	195	100,000

Description	HGL* (feet)	Nominal Capacity (gal)
Cascade Ridge Reservoir #1	322	75,000
Cascade Ridge Reservoir #2	592	23,000
Cascade Ridge Reservoir #3	858	33,000
Division Street Reservoir	322	1,000,000
Dukes Hill Reservoir	214	5,000,000
Eaglemont Reservoir	560	5,000,000
Eagles Nest Reservoir	645	1,000,000
Nookachamps Hills Reservoir	356/450	500,000
Hermway Heights Reservoir	412	60,000
Hoogdal Reservoir	430	100,000
Lake 16 Standpipe	684	60,000
Little Mountain Reservoir	463	500,000
Tinas Coma Reservoir	506	230,000
WTP Clearwells #1	459	1,220,000
WTP Clearwells #2	459	1,220,000
3rd Clearwell	459	3,250,000
TOTAL		29,881,000

*Hydraulic Grade Line

1.3 Pressure Zones

The Judy Reservoir System currently has 27 pressure zones, as shown on Figure 1. The main pressure zone is the 214-foot Hydraulic Grade Line (HGL), which covers most of Sedro-Woolley, Burlington, and part of Mount Vernon.

Pressures are maintained by 130 pressure-reducing stations and 18 water booster stations.

1.4 Interties

The District currently has four interties with the City of Anacortes where additional water can be obtained for the Judy Reservoir System. These interties are connected to the City's transmission line system, which starts from its Water Treatment Plant adjacent to the Skagit River in Mount Vernon and extends westward to Anacortes on Fidalgo Island. The interties are meant to be used on an emergency basis.

1.5 Connections and Population Served

In the most recent Water Facilities Inventory (WFI) update submitted in January 2013, the Judy Reservoir System had 29,375 water service connections serving a residential population of approximately 65,000.

1.6 Treatment

Treatment of the raw water from Judy Reservoir consists of direct filtration and chlorination provided by the Water Treatment Plant (WTP). Safe Drinking Water Act (SDWA) requirements are met for disinfected and filtered water. The disinfection process includes use of chlorine dioxide, chlorine, and chloramines.

Finished water from the WTP flows by gravity to three storage reservoirs (clearwells) adjacent to the plant. In turn, water in the clearwells flows by gravity to the District's customers.

2 Coliform Monitoring Program

Table 2 shows contact information for the people involved in the District's water quality monitoring. Routine coliform samples are taken Monday through Thursday to the District's certified lab. Lab hours are from 6:30 am to 3:00 pm Monday through Friday and on-call for emergencies.

Table 2. Contacts for Monitoring and Compliance

Water Treatment Plant Superintendent	Dale Wardell	(360) 848-2132
Water Quality Program Faciilitator	Darlene Holmstrom	(360) 848-4461
Water Quality Technician	Elaine Pitman	(360) 848-2174
District Lab Analyst	Emilia Blake	(360) 848–2135
DOH, Northwest Region – Coliform Program Manager	Carol Stuckey	(253) 395-6775
DOH, Northwest Region – Regional Engineer	Nancy Feagin	(253) 395-6765

2.1 Source Monitoring

The Surface Water Treatment Rule requires public water systems to monitor their source water for various parameters. One of these parameters is fecal coliform analysis of the raw water from Judy Reservoir—seven samples per month. When Skagit River water is pumped to Judy Reservoir, one fecal coliform sample is taken from the Skagit River pump station—one sample per week (when in service).

2.2 Coliform Sample Number and Sites

Public water systems are required by state and federal regulations to collect and submit coliform samples from representative points throughout the distribution system, at regular intervals on a monthly basis. Each public water system is required to collect a minimum number of samples based on the population served.

WAC 246-290-300 (3) determines the minimum number of routine coliform samples and is monitored by DOH. Judy Reservoir's monitoring requirement is based on a residential population of 65,000, which equates to 70 samples per month.

Per WAC 246-290-300 (3)(a), the routine coliform sampling sites represent all distribution areas, pressure zones, and potential areas of concern.

Currently, the District has 28 sample stations/locations dispersed throughout Skagit County used for routine coliform monitoring. Table 3 lists current sampling stations, their addresses, sample frequency, and upstream and downstream locations in case of a positive coliform sample.

Table 3. Sampling Station Locations

Sample Station No.	Location	Address	Sample Frequency	Upstream Sample	Downstream Sample
1	Lake 16 Pump Station	21193 Lake 16 Rd.	3/Month	21193 Lake 16 Rd.	21260 Lake 16 Rd.
2	Rawlins Road Sample Station	S of 14937 Rawlins Rd.	3/Month	15170 Fir Island Rd.	14937 Rawlins Rd.
3	Dodge Valley Road Sample Station	13459 Rawlins Rd.	3/Month	13677 Dodge Valley Rd.	13459 Dodge Valley Rd.
4	Bradshaw Road Pump Station	15011 Bradshaw Rd./ Summers Dr.	3/Month	14966 Summers Ln.	18935 Bradshaw Rd.
5	McLean Rd. and Penn Rd. N Side Sample Station	15621 Penn Rd. (Christmas tree farm)	2/Month	17820 Penn Rd.	17645 Mclean Rd.
6	City Hall and Cleveland St. W Side Sample Station	1019 Cleveland St. (S of City Hall)	3/Month	1030 Cleveland St.	1003 Cleveland St.
7	Hillcrest Park W Side Sample Station	W of 1624 13th St.	3/Month	1717 Hillcrest Parkway	1523 S 13th St.
8	Cedardale Fire Department S Side Sample Station	19746 E Hickox Rd.	2/Month	20100 Hickox Rd.	19526 Burkland Rd.
9	Eaglemont Golf Course/Grille Sample Station	4129 Eaglemont Dr.	3/Month	1428 Eagle Ridge Dr.	1618 Unison Pl.

Sample Station No.	Location	Address	Sample Frequency	Upstream Sample	Downstream Sample
10	Old Hwy 99 South W Side	Across from 3228 Old Hwy 99 S.	2/Month	3813 Old Hwy 99 S.	3001 Old Hwy 99 S.
11	Big Lake Blvd. and Big Lake Grocery E Side Sample Station	16818 W Big Lake Blvd.	3/Month	23350 Day Lumber Ln.	16802 Lakeview Blvd.
12	Cascade Ridge Pump Station #1	20463 Cascade Ridge Dr.	3/Month	20490 Cascade Ridge Dr.	20417 Cascade Ridge Dr.
13	Cascade Ridge Pump Station #2	20690 Cascade Ridge Dr.	2/Month	20888 Cascade Ridge Dr.	18657 Cascade Ridge Ct.
14	Cascade Ridge Pump Station #3	20962 Cascade Ridge Dr.	2/Month	18482 Peregrine Ln.	20926 Cascade Ridge Dr.
15	Swan Rd. and Sherman Ln. Sample Station	21254 Sherman Ln.	2/Month	3741 Swan Rd.	21415 Sherman Ln.
16	Conway Church	18101 Fir Island Rd	2/Month	18100 Fir Island Rd	20640 Skagit City Rd
17	Northern State E Side - Fruitdale Rd. Entry Sample Station	E of 1704 Wildflower Way	2/Month	8103 Fruitdale Rd.	1605 Wildflower Ct.
18	Bow Hill Rd. Sample Station	18994 Bow Hill Rd.	3/Month	18554 Bow Hill Rd.	6148 N Green Rd.
19	Holiday Inn Express W Parking Lot Sample Station	900/1000 Andis Rd.	3/Month	900 Andis Rd.	18577 Andis Rd.
20	Airport Dr./Bayview Airport Sample Station	15290 Airport Dr.	2/Month	15400 Airport Dr.	15259 Flightline Rd.
21	Bayview Edison Rd. N Side	10901 Bayview Edison	3/Month	10661 Bayview Edison Rd.	10905 Bayview Edison Rd.
22	Allen West Church	16775 Allen West Rd.	3/Month	16387 Allen West Rd.	16937 Allen West Rd.
23	Grip Road and Bridgewater Road	22958 Grip Rd	2/Month	22484 Grip Rd	22865 Bridgewater Rd
24	25th Street N of Section	SW Corner Baseball Field	3/Month	901 S 25th St.	821 S 25th St.
25	Burlington Hill Pump Station	963 Hillcrest Dr.	2/Month	1298 Hillcrest Dr.	856 North Hill Blvd (Fidalgo Coffee)
26	Peterson Road/Sunrise Lane Sample Station	Peterson/Sunrise Intersection	2/Month	16220 Peterson Rd.	16589 Peterson Rd.
27	Otter Pond Dr. and Gunderson Rd.	15784 Otterpond Dr.	2/Month	23925 Goldie Ln.	15784 Otter Pond Dr.
28	Teak Lane Sample Station	13247 Teak Ln.	2/Month	13299 Teak Ln.	13088 Teak Ln.

Sample Station No.	Location	Address	Sample Frequency	Upstream Sample	Downstream Sample
29	Clear Lake School Sample Station	23631 Lake St.	2/Month	23646 School Dr.	23631 Lake St.

Routine coliform samples are collected by the Water Quality Technician. An outline of the sampling procedure is included in Attachment 3. With the collection of each coliform sample, pH and total residual chlorine measurements are taken. Occasionally, free residual chlorine measurements are taken for quality control purposes or treatment assessment. Coliform samples are processed in the WTP Lab and results are kept in Microsoft Excel software for reporting purposes. If the sample doesn't have any residual chlorine, then an Heterotrophic Plate Count (HPC) is performed to ensure disinfectant efficiency.

2.3 Procedures Followed When Coliform Presence is Detected

When a routine sample tests positive for total coliforms, fecal coliform, or *E. coli*, the District actions are as represented in the Distribution System *E. coli* Response Checklist and *E. coli* Response Plan (Attachments 1 and 2, respectively). These actions are based on the Total Coliform Rule and recommended by DOH.

2.3.1 Repeat Samples

One set of three repeat samples is collected for each routine sample that is positive for coliforms. Repeat samples represent the initial routine sample site and locations "upstream" and "downstream" from the sample station. Samples are collected within 24 hours of notification of a positive coliform sample from the lab. Table 3 lists all sample locations and their repeat sites.

2.3.2 Notifications

When an acute violation is confirmed from routine and repeat samples (fecal coliform and *E. coli*), DOH must be notified immediately for follow-up action. Tier 1 notification is required to notify water system customers within 24 hours of determining the acute violation. The public notice needs to be approved by DOH and includes required health effects language. An example of Tier 1 notification is included in Attachment 4.

If a non-acute total coliform violation occurs, DOH must be notified the next business day of the violation. Tier 2 notification is required within 30 days of determining the violation. Examples of the District's Public Notification Notices and Boil Water Notice are provided in Attachment 4.

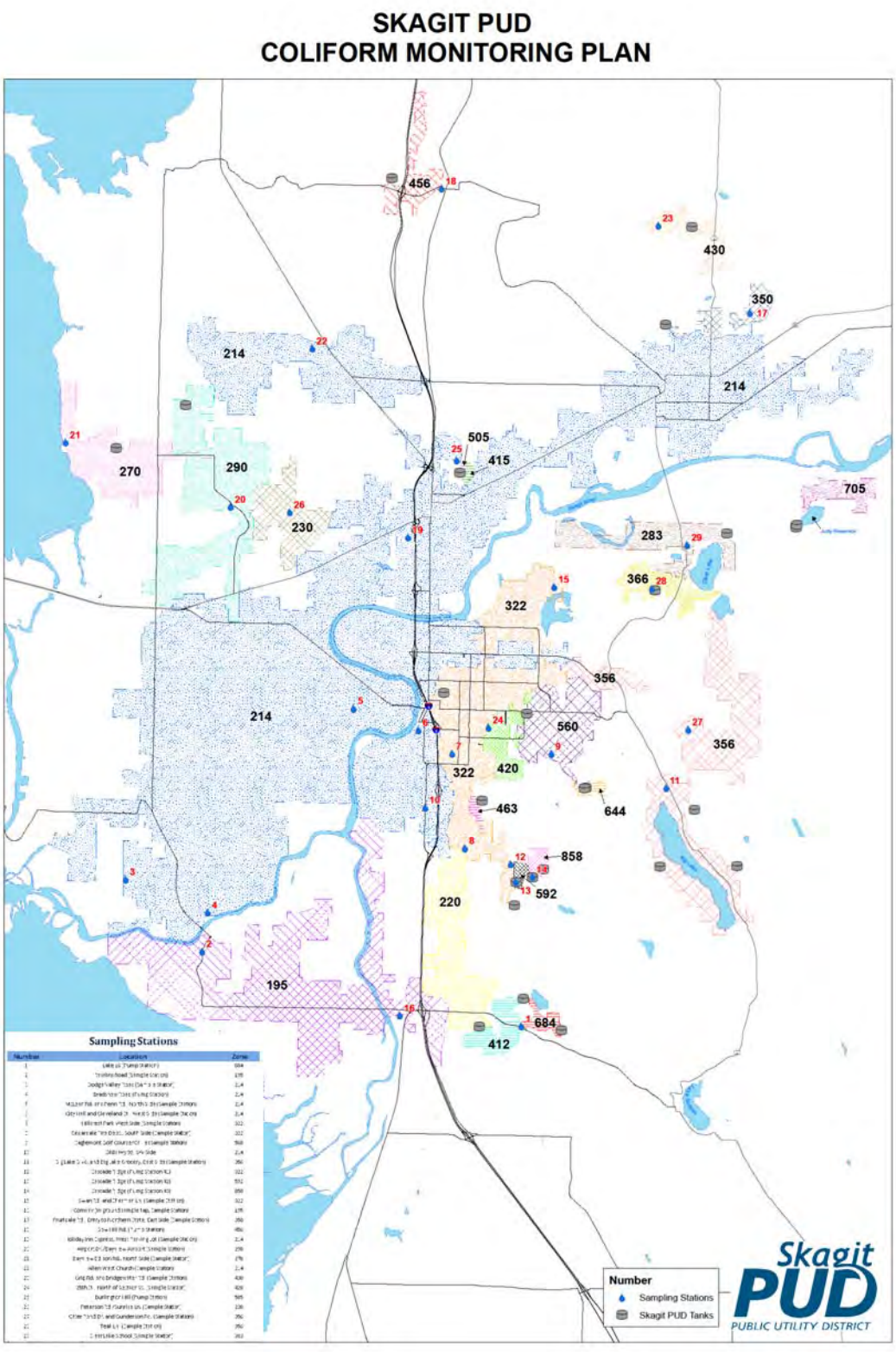


Figure 1. Judy System Sample Station Locations

Attachment 1

Distribution System *E. coli* Response Checklist

Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	X			
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	X			
We can easily access and review documentation on water main breaks, construction & repair activities, low pressure and outage incidents.	X			
Our Cross-Connection Control Program is up-to-date.	X			
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	X			
We routinely inspect all treatment facilities for proper operation.	X			
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X			
We can activate an emergency intertie with an adjacent water system in an emergency.	X			
We have a map of our service area boundaries.	X			
We have consumers who may not have access to bottled or boiled water.		X		
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.		X		
We have identified ~~the contact person at~~ each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	X			
We have messages prepared and translated into different languages to ensure they will be understood by our consumers.	X			
We have the capacity to print and distribute the required number of notices in a short time period.	X			
Policy Direction				
We have discussed the issue of *E. coli*-present sample results with our policy makers.	X			
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	X			
Potential Public Notice Delivery Methods				
It is feasible to deliver a notice going door-to-door.		X		
We have a list of all of our customer's addresses.	X			
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	X			
We have a list of customer email addresses.		X		

Background Information	Yes	No	N/A	To Do List
We encourage our customers to remain in contact with us using social media.	X			
We have an active website we can quickly update to include important messages.	X			
Our customers drive by a single location where we could post an advisory and expect everyone to see it.		X		
We need a news release to supplement our public notification process.	X			

Attachment 2

Distribution System *E. coli* Response Plan

If we have *E. coli* in our distribution system, we will immediately:

1. Call DOH.
2. Collect repeat sample, upstream and downstream samples (per Coliform Monitoring Plan). Collect additional investigative samples as necessary.
3. Inspect our water system facilities, including treatment plant proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have occurred prior the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted based on the findings of Steps 3–6. Issue advisory if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory. Lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA if not already in place. Host DOH for a system inspection and respond appropriately to inspection findings.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.

   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:

   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at < 10^{o} C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, or posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____/____.
☐ Notice was hand delivered to all water customers on ___ / ___ /___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ /____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

SATELLITE SYSTEMS COLIFORM MONITORING PLANS

COLIFORM MONITORING PLAN (CMP)
For a Small Water System
Single Source – Treatment

A. System Information

Plan Date: 1.10.14

Water System Name Skagit PUD#1 Fidalgo System	**County** Skagit	**System I.D. Number** 00932
Name of Plan Preparer Darlene Holmstrom	**Position** Water Quality Program Facilitator	**Daytime Phone #** (360) 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	SO1, Fidalgo (intertie), surface water, 50-200 gpm	
Storage: List and Describe	800,000 gallons, welded steel	
Treatment: Source Number & Process	Chlorine & filtration (intertie with Anacortes)	
Pressure Zones: Number and name	6	
Population	1945	
Number of Routine Samples Required Monthly by Regulation: 2	**Number of Sample Sites Needed to Represent the Distribution System:** 3	

B. Laboratory Information

Laboratory Name Skagit PUD #1	**Office Phone #** (360) 848-2135
Address 11932 Morford Rd Sedro Woolley Wa 98284	**After Hours #** (360) 630-1632
Hours of Operation 6:30AM-3:00PM	
Contact Name Emilia Blake	
Emergency Laboratory Name Avocet Environmental Testing	**Office Phone #** (360) 734-9033
Address 1600 North State St Suite 200 Bellingham WA 98225	**After Hours #** (360) 988-0110 (Madell)
Hours of Operation Monday-Thursday, 8AM-5PM Friday, 8AM-4PM	
Contact Name Madell Briggs	

C. Routine, and Repeat Sample Locations

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat Sample Sites**	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1. Gibralter Rd (ps)	**1-1.** Gibralter Rd pump station	**1.** Gibralter Rd pump station
pump station	**1-2.** 13459 Gibralter Rd	**2.** 13262 Gibralter Rd (down)
	1-3. 13206 Gibralter Rd	**3.** 13206 Gibralter Rd
** First connection served from intertie with Anacortes Water	**1-4.** ** 7427 State Route 20	**4.** ** 7427 State Route 20
	**First connection served	**5.** 13590 Gibralter Rd(school) Choice
X2. Satterlee Rd (ss)	**2-1.** Satterlee Rd ss	**1.** Satterlee Rd sample station
sample station	**2-2.** 13207 Satterlee Rd	**2.** 13207 Satterlee Rd
	2-3. 13064 Satterlee Rd	**3.** 13064 Satterlee Rd
	2-4. *13393 Driver St	**4.** *13393 Driver St
	*First service from tank	**5.** ** 7427 State Route 20
X3. Carolina/Hoxie (ss)	**3-1.** Carolina/Hoxie ss	**1.** Carolina/Hoxie ss
sample station	**3-2.** 6795 Carolina St	**2.** 6795 Carolina St
	3-3. 14876 Hoxie Ln	**3.** 14876 Hoxie Ln
	3-4. *14687 Hoxie Ln	**4.** *14687 Hoxie Ln
	*First service from tank	**5.** ** 7427 State Route 20

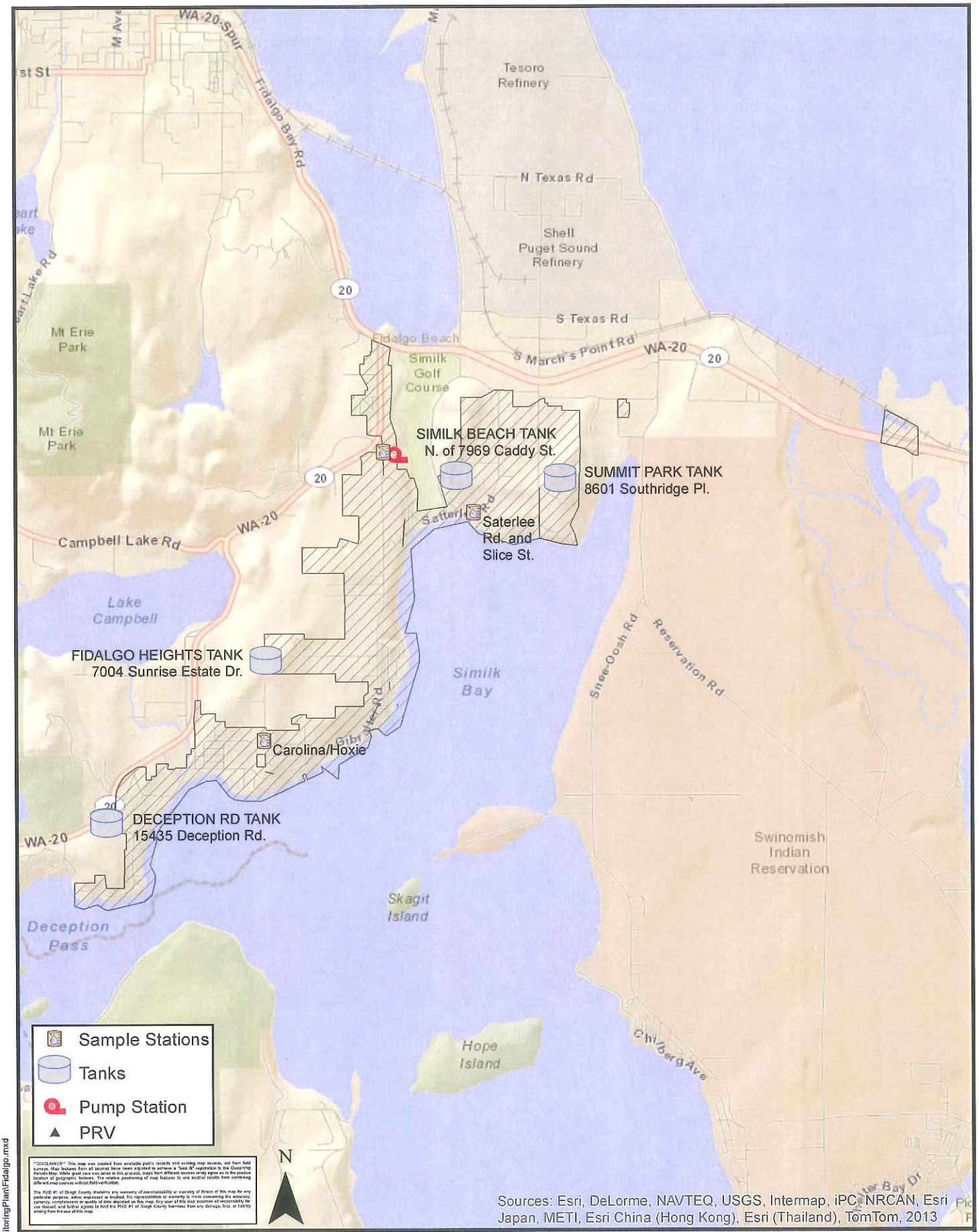
Important notes for sample collector:

While performing follow up/repeat samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, if there is any questionable circumstances. Contact supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Gibralter/Satterlee	July	Gibralter/Satterlee
February	Gibralter/Hoxie	August	Gibralter/Hoxie
March	Gibralter/Satterlee	September	Gibralter/Satterlee
April	Gibralter/Hoxie	October	Gibralter/Hoxie
May	Gibralter/Satterlee	November	Gibralter/Satterlee
June	Gibralter/Hoxie	December	Gibralter/Hoxie

E. *E. coli*-Present Sample Response



Path: M:\Project Maps\MonitoringPlan\Fidalgo.mxd

Skagit PUD PUBLIC UTILITY DISTRICT

Fidalgo Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 1 2 Miles

Figure XX-XX

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00932 Y	SKAGIT COUNTY PUD 1 FIDALGO	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org	Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☒ Commercial / Business
- ☐ Day Care
- ☒ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☒ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

800,000

15	16	17	18 SOURCE CATEGORY											19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4 / 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	02200C/ANACORTES	02200 C											X			Y	X							200	NE SW	03	34N	02E
S02	02200C/ANACORTES	02200 C											X			Y	X							200	NE SW	05	34N	02E
S03	02200C/ANACORTES	02200 C											X			Y	X							50	NE SW	18	34N	02E
S04	02200C/ANACORTES	02200 C											X			Y	X							100	SE NE	24	34N	01E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00932 Y	SKAGIT COUNTY PUD 1 FIDALGO	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	696	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	667		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	13		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	29		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	12	12	
28. TOTAL SERVICE CONNECTIONS		708	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 1945

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	2	2	2	2	2	2	2	2	2	2	2	2

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples from (Coliform Monitoring Plan) part C:
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served by Anacortes intertie (7427 State Route 20)
    - Collect additional investigative samples as necessary, along with the first connection that serves the pump/sample station where E. coli was detected.
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C of the Coliform Monitoring Plan.

Attachment 2

Skagit PUD will notify Anacortes Water Treatment Plant of a distribution E. coli positive sample. They will be notified of our findings.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at $< 10^{o}$ C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ___.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
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Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Fidalgo System ID# 00932

E. coli-present Sample Response Plan

Distribution System E. coli Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	X			
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	x			
We can easily access and review documentation on water main breaks, construction & repair activities, low pressure and outage incidents.	x			
Our Cross-Connection Control Program is up-to-date.	X			
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	X			
We routinely inspect all treatment facilities for proper operation.	X			
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X			
We can activate an emergency intertie with an adjacent water system in an emergency.		x		
We have map of our service area boundaries.	X			
We have consumers who may not have access to bottled or boiled water.		X		
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.		X		
We have identified (Not the contact person at) each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	X			
We have messages prepared and translated into different languages to ensure they will be understood by our consumers.	X			
We have the capacity to print and distribute the required number of notices in a short time period.		X		
Policy Direction				
We have discussed the issue of *E. coli*-present sample results with our policy makers.	X			
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	X			
Potential Public Notice Delivery Methods				
It is feasible to deliver a notice going door-to-door.		X		
We have a list of all of our customer's addresses.	X			
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	X			
We have a list of customer email addresses.		X		
Continue				

Distribution System E. coli Response Checklist				
We encourage our customers to remain in contact with us using social media.	X			
We have an active website we can quickly update to include important messages.	X			
Our customers drive by a single location where we could post an advisory and expect everyone to see it.		X		
We need a news release to supplement our public notification process.	x			

COLIFORM MONITORING PLAN (CMP)
For a Small Water System
Single Source – Treatment

A. System Information

Plan Date: 10.27.13

Water System Name: Alger	**County: Skagit**	**System I.D. Number:** 01400
Name of Plan Preparer: Darlene Holmstrom	**Position: Water Quality Program Facilitator**	**Daytime Phone # (360)** 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S01, Skagit Co PUD Alger, Well# AER3S0, 35'well depth, 75gpm	
Storage: List and Describe	132,000 gallons, Concrete	
Treatment: Source Number & Process	S-01, Chlorination, Filtration	
Pressure Zones: Number and name	3 pressure zones	
Population	210	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System: 3**	

B. Laboratory Information

Laboratory Name: Skagit PUD#1	**Office Phone # (360) 848-2135**
Address: 11932 Morford Rd Sedro Woolley, WA 98284	**After Hours # (360) 630-1632**
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name: Emilia Blake	
Emergency Laboratory Name: Avocet Environmental Testing	**Office Phone # (360) 734-9033**
Address: 1500 North State St, Suite 200 Bellingham WA 98225	**After Hours # (360) 988-0110 (Madell)**
Hours of Operation: Monday-Thursday, 8AM-5PM Friday -8AM-4PM	
Contact Name: Madell Briggs	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat and Triggered Source Sample* Sites**	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1. Cimmaron Ridge sample station	**1-1.** Cimmaron Ridge ss	**1.** Cimmaron Ridge ss
	1-2. 687 Sedona Ln	**2.** 687 Sedona Ln
	1-3. 846 Lake Samish Rd	**3.** 846 Lake Samish Rd
	1-4. 730 Sedona Ln (1st)	**4.** 730 Sedona Ln (1st)
	S0 4 - well / Raw Source	**5.** Alger Well pump/finished
X2. Appaloosa Ln sample station	**2-1.** Appaloosa Ln ss	**1.** Appaloosa Ln ss
	2-2. 86 Appaloosa Ln ss	**2.** 86 Appaloosa Ln ss
	2-3. 194 Lake Samish Rd	**3.** 194 Lake Samish Rd
	2-4. 125 Appaloosa Ln (1st)	**4.** 125 Appaloosa Ln (1st)
	S0 4 - well / Raw Source	**5.** Alger Well pump/finished
X3. Lake Samish Rd sample station (Azure Ln)	**3-1.** Lake Samish/Azure ss	**1.** Lake Samish/Azure ss
	3-2. 1671 Lake Samish Rd	**2.** 1671 Lake Samish Rd
	3-3. 1695 Lake Samish Rd	**3.** 1695 Lake Samish Rd
	3-4. 1590 Cain Lake Rd (1st)	**4.** 1590 Cain Lake Rd (1st)
	S0 4 - well /Raw Source	**5.** Alger Well pump/finished

* You should mark the lab slip for the source sample "RAW" in type of sample and request an analysis for *E coli* count.

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

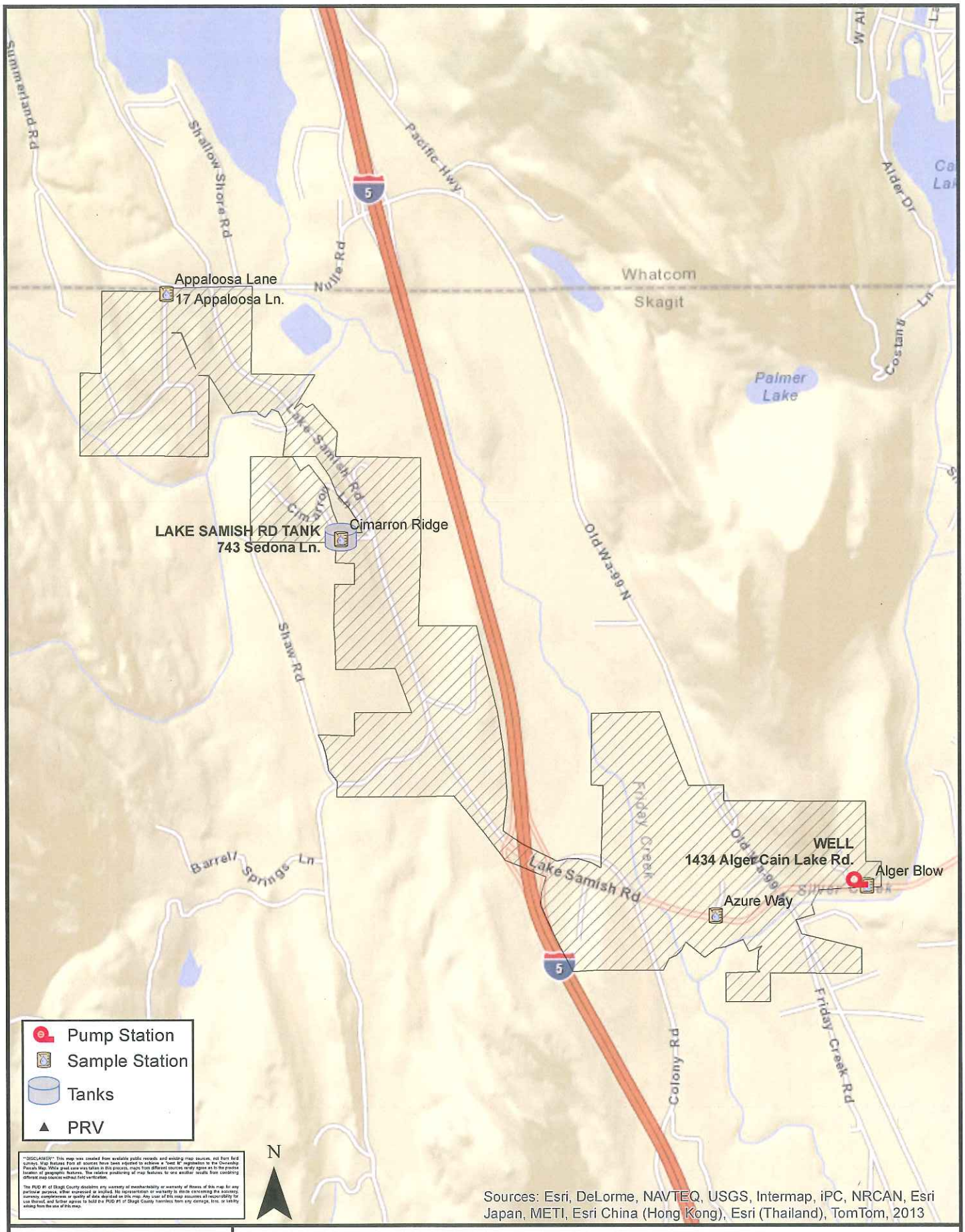
Important notes for Sample Collector:

While performing follow up samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, should there be any questionable circumstances. Contact Supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Lake Samish/Azure	July	Lake Samish/Azure
February	Appaloosa Ln	August	Appaloosa Ln
March	Cimmaron Ridge	September	Cimmaron Ridge
April	Lake Samish/Azure	October	Lake Samish/Azure
May	Appaloosa Ln	November	Appaloosa Ln
June	Cimmaron Ridge	December	Cimmaron Ridge

E. *E. coli*-Present Sample Response



"DISCLAIMER" This map was created from available public records and existing map sources, not from field surveys. Map features from all sources have been adjusted to achieve a "best fit" registration to the Ownership Parcels Map. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. The relative positioning of map features to one another results from combining different map sources without field verification.

The PUD #1 of Skagit County disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, currency, completeness or quality of data depicted on this map. Any user of this map assumes all responsibility for use thereof, and further agrees to hold the PUD #1 of Skagit County harmless from any damage, loss, or liability arising from the use of this map.

Skagit PUD
PUBLIC UTILITY DISTRICT

Alger Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.45 0.9 Miles

Figure XX-XX

Path: M:\Project Maps\MonitoringPlan\Alger.mxd

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C, (Coliform Monitoring Plan)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served from finished source water
    - "Raw" triggered source sample
    - Collect additional investigative samples as necessary
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C, (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release.
3. Interview PUD staff, discuss situation & staffing needs.
4. In connection with DOH, begin work on a Corrective Action Plan.
5. Corrective Action options: discontinue use of the contaminated source, or provide treatment of the source to the 4-log virus inactivation standard.
6. After corrective action is completed, collect follow up samples from source and/or distribution system, as appropriate depending on the corrective action.
7. Lift HA when appropriate and in consultation with DOH.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at $< 10^{o}$ C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

ALGER SYSTEM ID# 01400

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E.-coli* present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☑	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review the results of our sanitary survey and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☑ ☐	☐ ☐	☐ ☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☑	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☐	☑	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? 0.60 mg/L	☑	☐	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☑	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☑	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☑	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

Storage

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
01400 K	SKAGIT CO PUD - ALGER	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

7. OWNER NAME & MAILING ADDRESS **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org	Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☒ Commercial / Business
- ☒ Day Care
- ☒ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☒ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

132,000

15	16	17	18										19			20	21						22	23	24				
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well AER350		X										X					X	X				35	75	NW SW	08	36N	04E

Washington State Department of Health
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ADDRESS 1415 FREEWAY DR
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7. OWNER NAME & MAILING ADDRESS **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX TITLE: MANAGER
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MT VERNON, WA 98273-1436

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CITY MOUNT VERNON STATE WA ZIP 98273

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- ☒ Commercial / Business
- ☒ Day Care
- ☒ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☒ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

132,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well AER350		X										X					X	X				35	75	NW SW	08	36N	04E

COLIFORM MONITORING PLAN (CMP)
For a Small Water System
Single Source – Treatment

A. System Information

Plan Date: 10.25.13

Water System Name: Skagit Co PUD Cedargrove	**County: Skagit**	**System I.D. Number: 11917**
Name of Plan Preparer: Darlene Holmstrom	**Position: Water Quality Program Facilitator**	**Daytime Phone # (360) 848-4461**
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S02, Skagit Co PUD Cedargrove, Well#2 AET033, 155'well depth, 262gpm	
Storage: List and Describe	270,000 gallons, Bolted Steel (porc.)	
Treatment: Source Number & Process	S-04, Chlorination, Filtration	
Pressure Zones: Number and name	1 pressure zone	
Population by Pressure Zone	400	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System: 2**	

B. Laboratory Information

Laboratory Name: Skagit PUD#1	**Office Phone # (360) 848-2135**
Address: 11932 Morford Rd Sedro Woolley, WA 98284	**After Hours # (360) 630-1632**
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name: Emilia Blake	
Emergency Laboratory Name: Avocet Environmental Testing	**Office Phone # (360) 734-9033**
Address: 1500 North State St, Suite 200 Bellingham WA 98225	**After Hours # (360) 988-0110 (Madell)**
Hours of Operation: Monday-Thursday, 8AM-5PM Friday -8AM-4PM	
Contact Name: Madell Briggs	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine** Sample Sites	Location/Address for **Repeat and Triggered Source** Sample* Sites	**Sample Locations for Month Following Unsatisfactory** Sample(s)
X1.	**1-1.** Cedargrove Ave ss	**1.** Cedargrove Ave ss
Cedargrove Ave sample station (ss)	**1-2.** 8324 Cedargrove Ave	**2.** 8324 Cedargrove Ave ss
	1-3. 46221 Baker Dr	**3.** 46221 Baker Dr
** 45748 Concrete Sauk Valley Rd	**1-4.** 46263 Baker Loop Rd	**4.** 46263 Baker Loop Rd
	** **S0 2 - well** /raw source	**5.** ** Pump station/finished
X2.	**2-1.** Baker Loop Rd ss	**1.** Baker Loop Rd ss
Baker Loop Rd sample station (ss)	**2-2.** 46455 Baker Loop Rd	**2.** 46455 Baker Loop Rd
	2-3. 46489 Baker Loop Rd	**3.** 46489 Baker Loop Rd
** 45748 Concrete Sauk Valley Rd	**2-4.** 46263 Baker Loop Rd	**4.** 46263 Baker Loop Rd
	** **S0 2 - well** /raw source	**5.** ** Pump station/finished
X3.	**3-1.**	**1.**
	3-2.	**2.**
	3-3.	**3.**
	3-4.	**4.**
	S0_ - well	**5.**

* You should mark the lab slip for the source sample "RAW" in type of sample and request an analysis for *E coli* count.

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

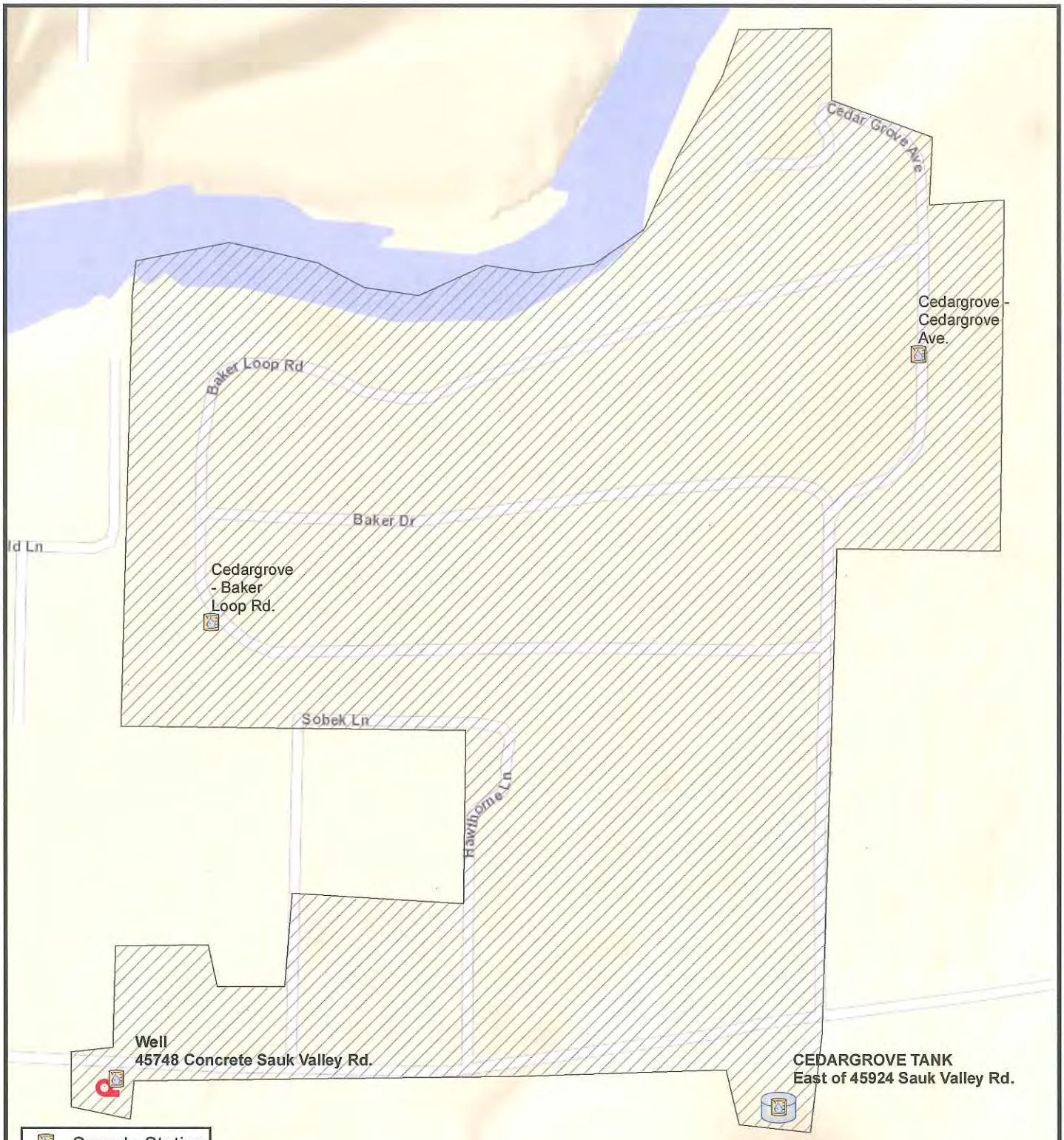
Important notes for Sample Collector:

While performing follow up samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, should there be any questionable circumstances. Contact Supervisor for directive.

D. Routine Sample Rotation Schedule

January	Across St from 46466 Baker Lp.	**July**	Across St from 46466 Baker Lp.
February	Cedargrove Ave. west side of stree	**August**	Cedargrove Ave, west. side of street
March	Across St from 46466 Baker Lp.	**September**	Across St from 46466 Baker Lp.
April	Cedargrove Ave west side of street	**October**	Cedargrove Ave west side of street
May	Across St from 46466 Baker Lp.	**November**	Across St from 46466 Baker Lp.
June	Cedargrove Ave west side of street	**December**	Cedargrove Ave west side of street

E. *E. coli*-Present Sample Response



"DISCLAIMER": This map was created from available public records and existing map sources, not from field surveys. Map features from all sources have been adjusted to achieve a "best fit" registration to the Ownership Parcels Map. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. The relative positioning of map features to one another results from combining different map sources without field verification.

The PUD #1 of Skagit County disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, currency, completeness or quality of data depicted on this map. Any user of this map assumes all responsibility for use thereof, and further agrees to hold the PUD #1 of Skagit County harmless from any damage, loss, or liability arising from the use of this map.

Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Skagit PUD
PUBLIC UTILITY DISTRICT

Cedargrove Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.1 0.2 Miles

Figure XX-XX

Path: M:\Project Maps\MonitoringPlan\Cedargrove.mxd

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
11917 4	SKAGIT CO PUD - CEDARGROVE	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

7. OWNER NAME & MAILING ADDRESS **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org	Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☒ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

270,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 08/01/1991 WELL #1		X										X				X						102	50	NE SW	14	35N	08E
S02	WELL # 2 AET033		X										X			Y		X	X				155	262	SW SE	15	35N	08E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
11917 4	SKAGIT CO PUD - CEDARGROVE	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	157	466
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	157		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	1	1	0
28. TOTAL SERVICE CONNECTIONS		158	466

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 400

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C, (Coliform Monitoring Plan)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served from finished source water
    - "Raw" triggered source sample
    - Collect additional investigative samples as necessary
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C, (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release.
3. Interview PUD staff, discuss situation & staffing needs.
4. In connection with DOH, begin work on a Corrective Action Plan.
5. Corrective Action options: discontinue use of the contaminated source, or provide treatment of the source to the 4-log virus inactivation standard.
6. After corrective action is completed, collect follow up samples from source and/or distribution system, as appropriate depending on the corrective action.
7. Lift HA when appropriate and in consultation with DOH.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at < 10° C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed. Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____/____.
☐ Notice was hand delivered to all water customers on ___ / ___ /___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ /___.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

CEDARGROVE SYSTEM ID# 11917

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E.-coli* present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☑	☐	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review the results of our sanitary survey and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and	☐	☑	☐	☐
If yes, we can eliminate them.	☐	☐	☐	☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☑	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☑	☐	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? 0.60 mg/L	☑	☐	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☑	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☑	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☑	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

Storage

COLIFORM MONITORING PLAN TEMPLATE

For a Small Water System

Single Source – No Treatment

A. System Information

Plan Date: 11.4.13

Water System Name Marblemount	**County** Skagit	**System I.D. Number** AA642
Name of Plan Preparer Darlene Holmstrom	**Position** WQ Program Facil.	**Daytime Phone #** (360) 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S-01,Skagit Co PUD – Marblemount, 163' well, 150gpm	
Storage: List and Describe	57,000	
Pressure Zones: Number and name	One pressure zone	
Population	30	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System:** 3	

B. Laboratory Information

Laboratory Name Skagit PUD#1	**Office Phone #** (360) 848-2135
Address 11932 Morford Rd Sedro Woolley WA 98284	**After Hours #** (360) 630-1632
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name Emilia Blake	
Emergency Laboratory Name Avocet Environmental Testing	**Office Phone #** (360) 734-9033
Address: 1500 North State St. Suite 200 **Bellingham WA 98225**	**After Hours # (360) 988**-0110 (Madell)
Hours of Operation 8:00AM-5PM Monday-Thursday Friday-8:00AM-4PM.	
Contact Name Madell Briggs:	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine** Sample Sites	Location/Address for **Repeat** and **Triggered Source** Sample Sites	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1.	**1-1.** Eagle Towing ss	**1.** Eagle Towing ss
Eagle Towing sample station (ss)	**1-2.** 59379 SR 20	**2.** 59379 SR 20
	1-3. 59291 SR 20	**3.** 59291 SR 20
* PUD will use well for triggered source & #4 repeat samples on 3 ss	*1-4. S01 - well	**4.** 59379 SR 20 1st connect
	(59347 SR 20/off Tessa Ln)	**5.** Marblemount pump station
X2.	**2-1.** Shell station ss	**1.** Shell station ss
Shell station sample station	**2-2.** 60076 SR 20	**2.** 60076 SR 20
	2-3. 59759 SR 20	**3.** 59759 SR 20
	*2-4. S01 - well	**4.** 59379 SR 20 1st connect
	(59347 SR 20/off Tessa Ln)	**5.** Marblemount pump station
X3.	**3-1.** Fire Station ss	**1.** Fire station ss
Fire Station sample station (ss)	**3-2.** 60147 SR 20	**2.** 60147 SR 20
	3-3. 60155 SR 20	**3.** 60155 SR 20
	*3-4. S01 - well	**4.** 59379 SR 20 1st connect
	(59347 SR 20/off Tessa Ln)	**5.** Marblemount pump station

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

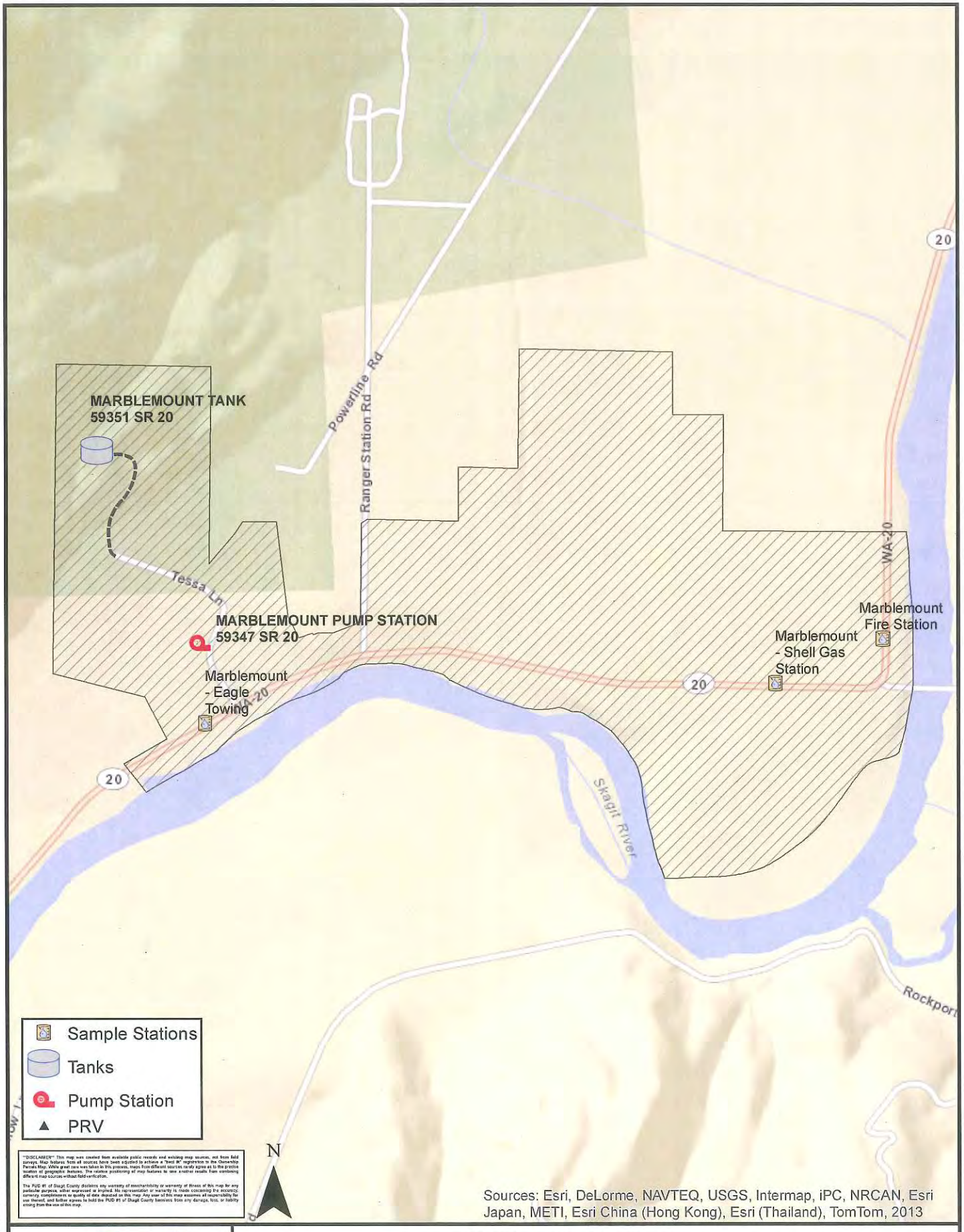
Important notes for sample collector:

While performing repeat/follow up samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, should there be any questionable circumstances. Please contact your Supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Eagle Towing ss	July	Eagle Towing ss
February	Fire Hall ss	August	Fire Hall ss
March	Shell ss	September	Shell ss
April	Eagle Towing ss	October	Eagle Towing ss
May	Fire Hall ss	November	Fire Hall ss
June	Shell ss	December	Shell ss

E. *E. coli*-Present Sample Response



"DISCLAIMER" This map was created from available public records and existing map sources, not from field surveys. Map features from all sources have been adjusted to achieve a "Best fit" registration to the Ownership Parcels Map. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. The relative positioning of map features to one another results from combining different map sources without field verification.

The PUD #1 of Skagit County disclaims any warranty of merchantibility or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, currency, completeness or quality of data depicted on this map. Any user of this map assumes all responsibility for use thereof, and further agrees to hold the PUD #1 of Skagit County harmless from any damage, loss, or liability arising from the use of this map.

Skagit PUD
PUBLIC UTILITY DISTRICT

Marblemount Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure XX-XX

Path: M:\Project Maps\MonitoringPlan\Marblemount.mxd

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C (Coliform Monitoring Plan.)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 Skagit PUD will collect our fourth repeat sample at source. We will count as both a repeat and as the required triggered source sample.
    - Collect additional investigative samples as necessary.
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release.
3. Interview PUD staff, discuss situation & staffing needs.
4. In connection with DOH, begin work on a Corrective Action Plan.
5. Corrective Action options: discontinue use of the contaminated source, or provide treatment of the source to the 4-log virus inactivation standard.
6. After corrective action is completed, collect follow up samples from source and/or distribution system, as appropriate depending on the corrective action.
7. Lift HA when appropriate and in consultation with DOH.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at < 10° C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice.* Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
AA642 3	SKAGIT CO PUD - MARBLEMOUNT	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440 E-mail: fox@skagitpud.org		Fax: (360) 424-5440 E-mail: fox@skagitpud.org	

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☒ Commercial / Business
- ☐ Day Care
- ☒ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☒ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

57,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INFILTRATION GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	16, 17 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well #1 AHB745		X										X			Y	X						163	150	SW SW	12	35N	10E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
AA642 3	SKAGIT CO PUD - MARBLEMOUNT	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	14	43
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	14		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	12	12	11
28. TOTAL SERVICE CONNECTIONS		26	54

29. FULL-TIME RESIDENTIAL POPULATION	
A. How many residents are served by this system 180 or *more* days per year?	30

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	781	952	789	1266	2916	2850	4175	5601	3570	2460	770	783
B. How many days per month is water accessible to the public?	31	28	31	30	31	30	31	31	30	31	30	31

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

MARBLEMOUNT SYSTEM ID# AA642

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system should it become necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☑	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☑ ☐	☐ ☐	☐ ☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☑	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☑	☐	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☑	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☑	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☑	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

Storage

COLIFORM MONITORING PLAN TEMPLATE

For a Small Water System

Single Source – No Treatment

A. System Information

Plan Date: 11.4.13

Water System Name Mt. View System	**County** Skagit	**System I.D. Number** 03774
Name of Plan Preparer Darlene Holmstrom	**Position** WQ Program Facil.	**Daytime Phone #** (360) 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S-01,Skagit Co PUD-Mt. View System,292' well depth, 47gpm	
Storage: List and Describe	57,000	
Pressure Zones: Number and name	One pressure zone	
Population by Pressure Zone	30	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System:** 1	

B. Laboratory Information

Laboratory Name Skagit PUD#1	**Office Phone #** (360) 848-2135
Address 11932 Morford Rd Sedro Woolley WA 98284	**After Hours #** (360) 630-1632
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name Emilia Blake	
Emergency Laboratory Name Avocet Environmental Testing	**Office Phone #** (360) 734-9033
Address: 1500 North State St. Suite 200 **Bellingham WA 98225**	**After Hours # (360) 988**-0110 (Madell)
Hours of Operation 8:00AM-5PM Monday-Thursday Friday-8:00AM-4PM.	
Contact Name Madell Briggs:	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine** Sample Sites	Location/Address for **Repeat and Triggered Source** Sample Sites	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1.	**1-1.** Mt. View ss	**1.** Mt. View ss
Mt. View sample station (ss)	**1-2.** 16243 Mt. View Rd	**2.** 16243 Mt. View Rd
	1-3. 16104 Mt. View Rd	**3.** 16104 Mt. View Rd
* PUD will use well for triggered source & #4 repeat sample	*1-4. S01 - well /raw source	**4.** 16040 Mt. View Rd
	(16187 Mt. View Rd)	**5.** Mt. View Well after softener
X2.	**2-1.**	**1.**
	2-2.	**2.**
	2-3.	**3.**
	*2-4. S0_ - well	**4.**
		5.
X3.	**3-1.**	**1.**
	3-2.	**2.**
	3-3.	**3.**
	*3-4. S0_ - well	**4.**
		5.

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

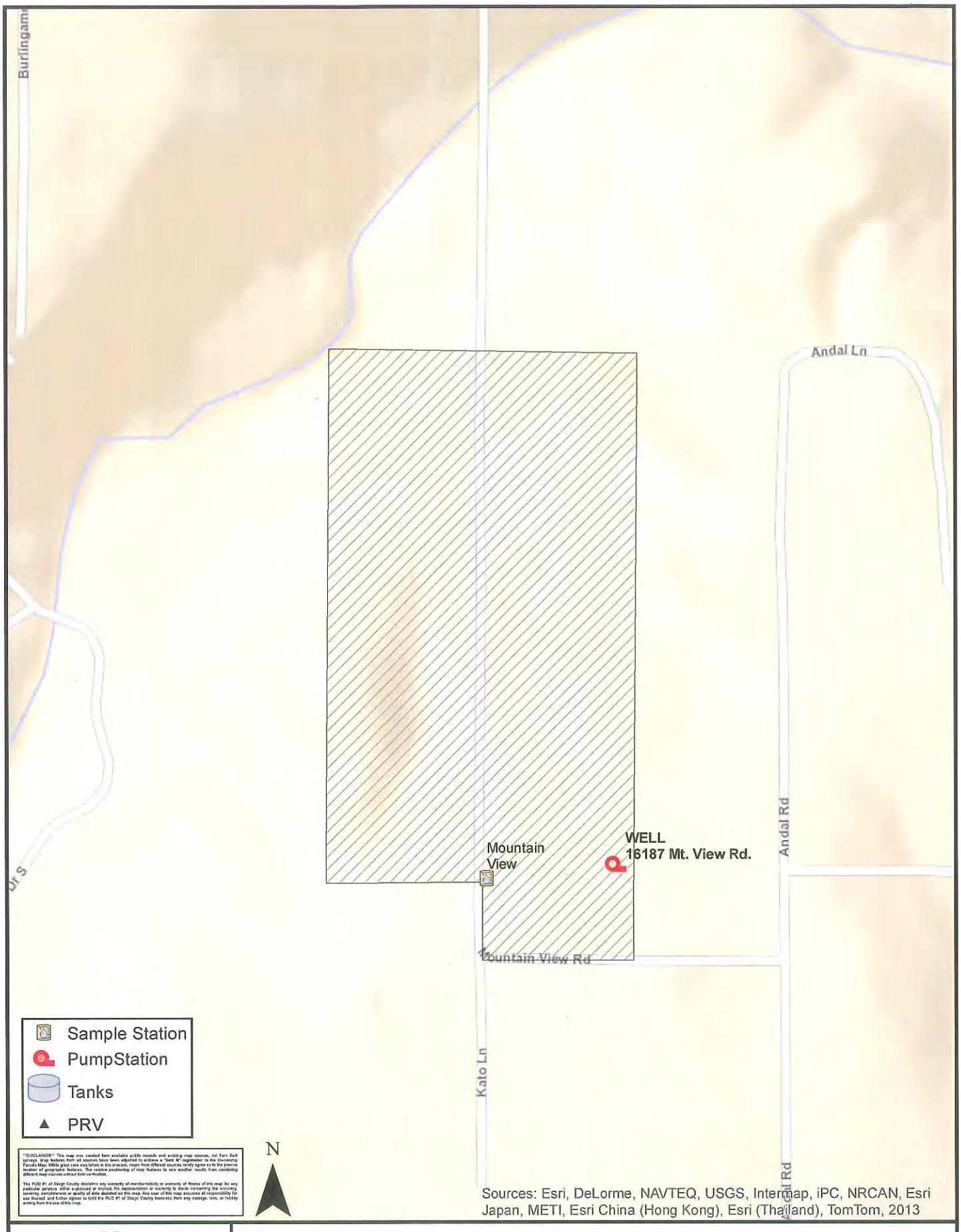
Important notes for sample collector:

While performing repeat/follow up samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, should there be any questionable circumstances. Please contact your Supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Mt. View sample station	July	Mt. View sample station
February	Mt. View sample station	August	Mt. View sample station
March	Mt. View sample station	September	Mt. View sample station
April	Mt. View sample station	October	Mt. View sample station
May	Mt. View sample station	November	Mt. View sample station
June	Mt. View sample station	December	Mt. View sample station

E. *E. coli*-Present Sample Response



Skagit PUD
PUBLIC UTILITY DISTRICT

Mountain View Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.1 0.2 Miles

Figure XX-XX

Path: M:\Project Maps\MonitoringPlan\MtView.mxd

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C (Coliform Monitoring Plan.)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 Skagit PUD will collect our fourth repeat sample at source. We will count as both a repeat and as the required triggered source sample.
    - Collect additional investigative samples as necessary.
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release.
3. Interview PUD staff, discuss situation & staffing needs.
4. In connection with DOH, begin work on a Corrective Action Plan.
5. Corrective Action options: discontinue use of the contaminated source, or provide treatment of the source to the 4-log virus inactivation standard.
6. After corrective action is completed, collect follow up samples from source and/or distribution system, as appropriate depending on the corrective action.
7. Lift HA when appropriate and in consultation with DOH.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. Do NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at $< 10^{\circ}$ C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 08/02/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Pop/Connect Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
03774 Y	MOUNTAIN VIEW SUBDIVISION	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440 E-mail: fox@skagitpud.org		Fax: (360) 424-5440 E-mail: fox@skagitpud.org	

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed
- ☐ Managed Only
- ☐ Owned Only

SMA NAME: SKAGIT COUNTY PUD 1 SMA Number: 103

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☒ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☐ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

0

15	16	17	18										19	20			21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	WELL #1		X										X									X	292	47	SW NW	26	34N	04E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
03774 Y	MOUNTAIN VIEW SUBDIVISION	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	13	14
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	13		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		13	14

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 30

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

MT. VIEW SYSTEM ID# 03774

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system should it become necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☑	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☑ ☐	☐ ☐	☐ ☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☐	☑	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☑	☐	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☐	☑	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☐	☑	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☐	☑	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

COLIFORM MONITORING PLAN (CMP)
For a Small Water System

Single Source – Treatment

A. System Information

Plan Date: 1.21.14

Water System Name Potlatch Beach	**County** Skagit	**System I.D. Number** 69034
Name of Plan Preparer Darlene Holmstrom	**Position** Water Quality Program Facilitator	**Daytime Phone #** (360) 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S04, Potlatch, Sea Water, 80gpm	
Storage: List and Describe	30,000 gallons	
Treatment: Source Number & Process	Reverse osmosis, chlorination, filtration	
Pressure Zones: Number and name	2	
Population	70	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System:** 2	

B. Laboratory Information

Laboratory Name Skagit PUD#1	**Office Phone #** (360) 848-2135
Address 11932 Morford Rd Sedro Woolley WA 98284	**After Hours #** (360) 630-1632
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name Emilia Blake	
Emergency Laboratory Name Avocet Environmental Services	**Office Phone #** (360) 734-9033
Address 1600 North State St Suite 200 Bellingham WA 98225	**After Hours #** (360) 988-0110 (Madell)
Hours of Operation Monday-Thursday, 8AM-5PM, Friday, 8AM-4PM	
Contact Name Madell Briggs	

C. Routine, and Repeat Sample Locations

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat Sample Sites**	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1. Gravity Zone (ss)	**1-1.** Gravity Zone (ss)	**1.** Gravity Zone (ss)
sample station	**1-2.** 5276 West Shore Rd	**2.** 5276 West Shore Rd
* first connection served	**1-3.** 5170 West Shore Rd	**3.** 5170 West Shore Rd
** pump station	**1-4.** * 5109 Potlatch Ln	**4.** * 5109 Potlatch Ln
	*First connection served	**5.** ** 5112 Potlatch Ln
X2. Boosted Zone (ss)	**2-1.** Boosted Zone (ss)	**1.** Boosted Zone (ss)
sample station	**2-2.** 5360 West Shore Rd	**2.** 5360 West Shore Rd
	2-3. 5398 West Shore Rd	**3.** 5398 West Shore Rd
	2-4. * 5109 Potlatch Ln	**4.** * 5109 Potlatch Ln
	* First connection served	**5.**** 5112 Potlatch Ln (ps)
X3.	**3-1.**	**1.**
	3-2.	**2.**
	3-3.	**3.**
	3-4.	**4.**
		5.

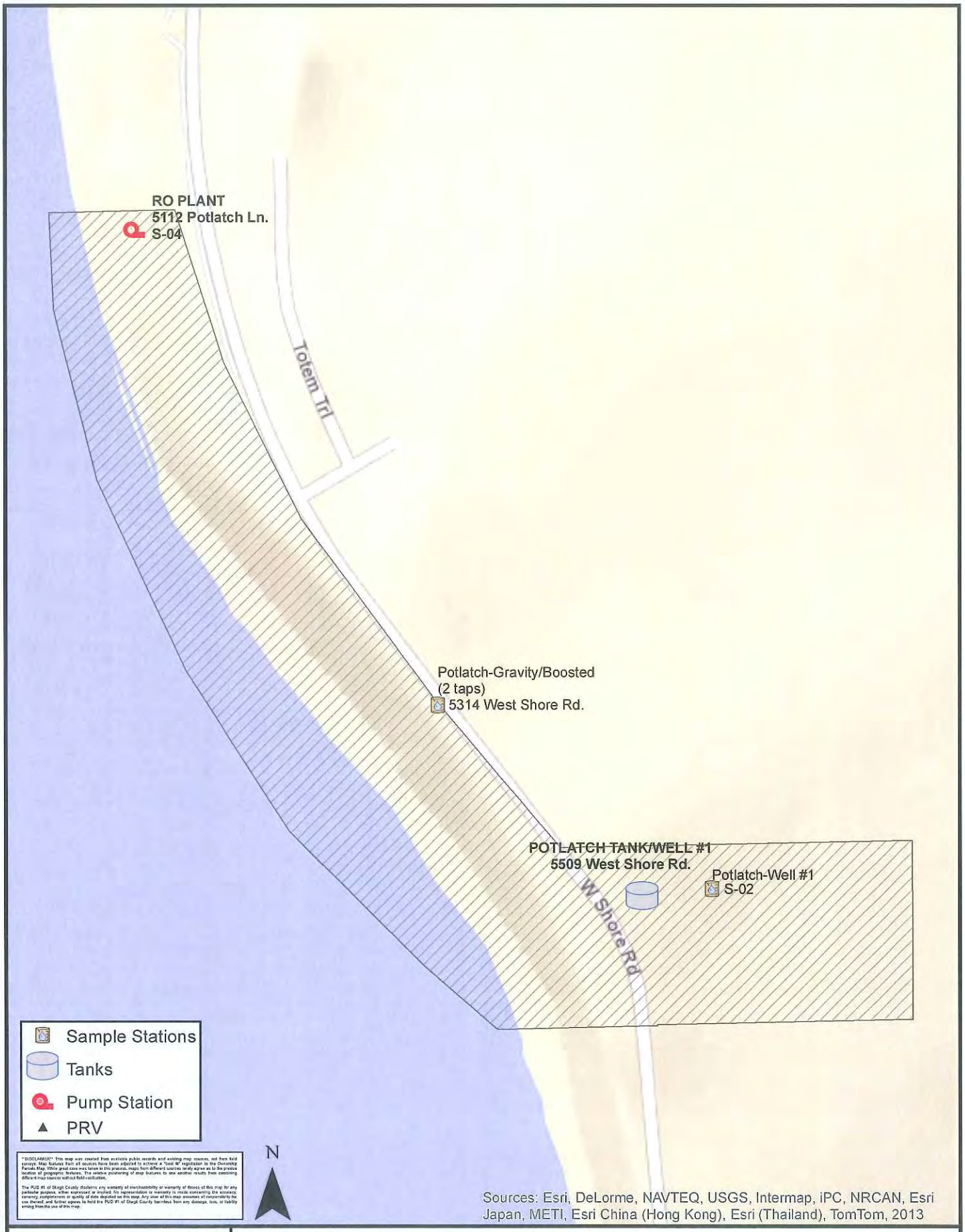
Important notes for sample collector:

While performing follow up/repeat samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, if there is any questionable circumstances. Contact supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Boosted Zone	July	Boosted Zone
February	Gravity Zone	August	Gravity Zone
March	Boosted Zone	September	Boosted Zone
April	Gravity Zone	October	Gravity Zone
May	Boosted Zone	November	Boosted Zone
June	Gravity Zone	December	Gravity Zone

E. *E. coli*-Present Sample Response



Path: M:\Project Maps\Monitoring Plan\Potlatch1.mxd

Skagit PUD
PUBLIC UTILITY DISTRICT

Potlatch Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.095 0.19 Miles

Figure XX-XX

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples from (Coliform Monitoring Plan) part C.
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served from Potlatch Reverse Osmosis Pump station
    - Collect additional investigative samples as necessary.
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C.

Attachment 2

In connection with DOH, Skagit PUD will consider the option of using Well #1 S-02 for water service, if needed, during circumstances of emergency, pump failure, etc.

Skagit PUD samples Well #1 S-02 for coliform monthly, along with an annual Nitrate sample.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.

   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:

   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.

2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at $< 10^{\circ}$ C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____/____.
☐ Notice was hand delivered to all water customers on ___/___ /___.
☐ Notice was posted (*with department approval*) at:
_____ on ___/___ /____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
69034 L	SKAGIT CO PUD - POTLATCH BEACH	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org

10. OWNER CONTACT INFORMATION

Owner Daytime Phone:	(360) 848-4457
Owner Mobile/Cell Phone:	(360) 661-4032
Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

30,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME — LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME. Example: SEATTLE	INTERTIE — INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 01/19/1993 Well		X										X				X						130	20		35	36N	01E
S02	Well 1 AAE847		X												X	Y	X						168	8	SW NE	35	36N	01E
S03	InAct 01/05/2000 Well 2		X										X			N	X						160	0	SE SE	35	36N	01E
S04	Sea Water								X				X			Y		X	X			X		80	NE NW	35	36N	01E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
69034 L	SKAGIT CO PUD - POTLATCH BEACH	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	32	182
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	32		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		32	182

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 70

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Potlatch System ID# 69034

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system should it become necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☐	☐	☑	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☑	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	☐	☐	☑	☐
We address any significant deficiencies identified during a sanitary survey.	☐	☐	☑	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and	☐	☐	☑	☐
If yes, we can eliminate them.	☐	☐	☐	☐
We routinely inspect our well site.	☐	☐	☑	☐
We have a good raw water sample tap installed at our well.	☐	☐	☑	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☐	☐	☑	☐
(Cont.)				

COLIFORM MONITORING PLAN (CMP)
For a Small Water System
Single Source – Treatment

A. System Information

Plan Date: 10.27.13

Water System Name: Rockport	**County: Skagit**	**System I.D. Number:** 73600
Name of Plan Preparer: Darlene Holmstrom	**Position: Water Quality Program Facilitator**	**Daytime Phone # (360)** 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	SO4 Skagit PUD Rockport. SP740/SO1 Rockport State Park, AET03, 334' well depth, 95gpm	
Storage: List and Describe	60,000 gallons, Concrete	
Treatment: Source Number & Process	S-04, Chlorination, Filtration	
Pressure Zones: Number and name	2 pressure zone	
Population	148	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System: 2**	

B. Laboratory Information

Laboratory Name: Skagit PUD#1	**Office Phone # (360) 848-2135**
Address: 11932 Morford Rd Sedro Woolley, WA 98284	**After Hours # (360) 630-1632**
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name: Emilia Blake	
Emergency Laboratory Name: Avocet Environmental Testing	**Office Phone # (360) 734-9033**
Address: 1500 North State St, Suite 200 Bellingham WA 98225	**After Hours # (360) 988-0110 (Madell)**
Hours of Operation: Monday-Thursday, 8AM-5PM Friday -8AM-4PM	
Contact Name: Madell Briggs	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine** Sample Sites	Location/Address for **Repeat** and **Triggered Source** Sample* Sites	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1.	**1-1.** Alfred St / Fire Hall ss	**1.** Gravity Zone ss
Alfred St / Fire Hall sample station (ss) ** S-01 Rockport State Park ID# SP740 51905 SR 20 (use Park entrance)	**1-2.** 10871 Alfred St	**2.** 5276 West Shore Rd
	1-3. 52748 Main St	**3.** 52748 Main St
	1-4. 52809 Rockport State Park	**4.** 52809 Rockport State Park
	** **S0_1 - well** / raw source	** **5.** Well house / Finished
X2.	**2-1.** Hwy 20/ Rockport Store ss	**1.** Hwy 20/ Rockport Store ss
SR20/ Rockport Store sample station (ss)	**2-2.** 53074 SR 20	**2.** 53074 SR 20
	2-3. 53045 SR 20	**3.** 53045 SR 20
	2-4. 52809 Rockport Park Rd	**4.** 52809 Rockport Park Rd
	** **S01 - well** /raw source	** **5.** Well house / Finished
X3.	**3-1.**	**1.**
	3-2.	**2.**
	3-3.	**3.**
	3-4.	**4.**
	S0_ - well	**5.**

* You should mark the lab slip for the source sample "RAW" in type of sample and request an analysis for *E coli* count.

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

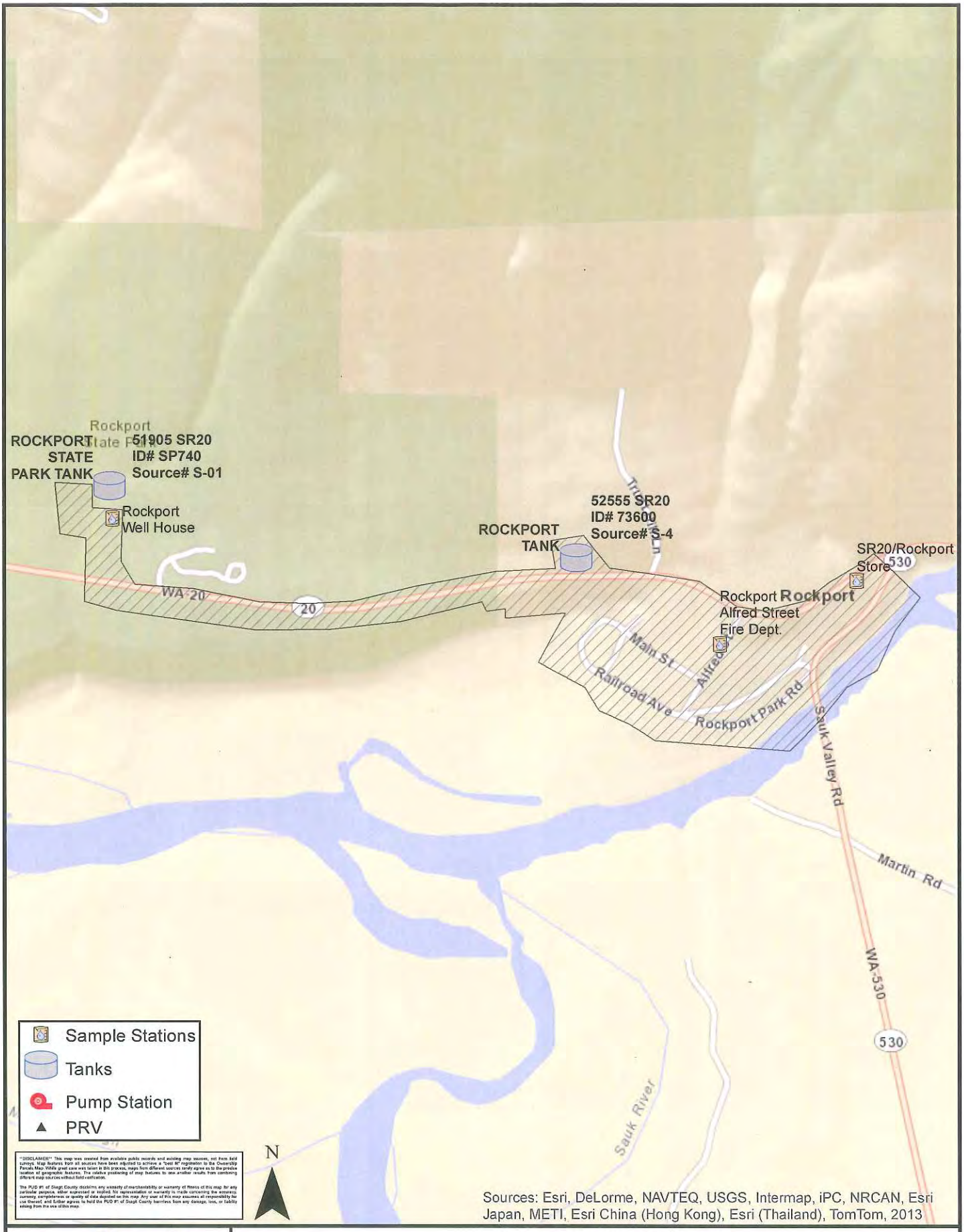
Important notes for Sample Collector:

While performing follow up samples, inspect sample taps for debris of any type. Clean & sterilize. If there has been a period of no use, run tap for a longer period of time. Choose another tap within 5 service connections, should there be any questionable circumstances. Contact Supervisor for directive.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Hwy 20 /Rockport Store	July	Hwy 20 /Rockport Store
February	Alfred St/Rockport Fire Hall	August	Alfred St/Rockport Fire Hall
March	Hwy 20/Rockport Store	September	Hwy 20/Rockport Store
April	Alfred St/Rockport Fire Hall	October	Alfred St/Rockport Fire Hall
May	Hwy 20/Rockport Store	November	Hwy 20/Rockport Store
June	Alfred St/Rockport Fire Hall	December	Alfred St/Rockport Fire Hall

E. *E. coli*-Present Sample Response



Path: M:\Project Maps\MonitoringPlan\Rockport.mxd

Skagit PUD
PUBLIC UTILITY DISTRICT

Rockport Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.25 0.5 Miles

Figure XX-XX

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/29/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Source Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
73600 6	SKAGIT CO PUD ROCKPORT	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

7. OWNER NAME & MAILING ADDRESS | **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE
ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440	E-mail: fox@skagitpud.org	Fax: (360) 424-5440	E-mail: fox@skagitpud.org

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

☐ Not applicable (Skip to #12)
☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
☐ Managed Only
☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

☐ Agricultural
☒ Commercial / Business
☒ Day Care
☒ Food Service/Food Permit
☐ 1,000 or more person event for 2 or more days per year
☐ Hospital/Clinic
☐ Industrial
☐ Licensed Residential Facility
☐ Lodging
☒ Recreational / RV Park
☒ Residential
☐ School
☐ Temporary Farm Worker
☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

☐ Association ☐ County ☐ Investor ☒ Special District
☐ City / Town ☐ Federal ☐ Private ☐ State

14. STORAGE CAPACITY (gallons)

60,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 08/25/1991 SURFACE #1									X			X				X							0			35N	09E
S02	InAct 08/25/1991 SURFACE #2									X			X				X							0			35N	09E
S03	InAct 08/25/1991 WELL #1		X										X				X						100	45	NE SE	27	35N	05E
S04	SP740H/WELL @ ROCKPORT SP AET03		X										X			Y		X	X				334	95	NE SE	27	35N	09E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
73600 6	SKAGIT CO PUD ROCKPORT	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	51	100
A. Full Time Single Family Residences (Occupied 180 days or *more* per year)	51		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	2	2	6
28. TOTAL SERVICE CONNECTIONS		53	106

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or *more* days per year? 148

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	300	300	400	400	600	1500	1500	1500	1500	400	300	300
B. How many days per month is water accessible to the public?	31	28	31	30	31	30	31	31	30	31	30	31

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C, (Coliform Monitoring Plan)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served from finished source water
    - "Raw" triggered source sample
    - Collect additional investigative samples as necessary
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C, (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release
3. Interview PUD staff, discuss situation & staffing needs
4. In connection with DOH, begin work on a corrective action plan
5. Corrective action options: discontinue use of the contaminated source, provide 4-log virus treatment of the source, when possible
6. After corrective actions are completed, collect follow up samples at source and in the distribution system.
7. Lift boil water HA when all follow up samples are E. coli absent along with DOH approval.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan

Attachment 2b

Rockport State Park ID# SP740

If we have unsatisfactory coliform, E. coli in distribution, or E. coli in source water, Skagit PUD will provide appropriate notifications, assessment, corrective action & collect samples as necessary for Rockport State Park. Skagit PUD will cover partial costs, if not all costs.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. DO NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at $< 10^{o}$ C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

ROCKPORT SYSTEM ID# 73600

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E.-coli* present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☑	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review the results of our sanitary survey and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☑ ☐	☐ ☐	☐ ☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☑	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☑	☐	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? 0.60 mg/L	☑	☐	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☑	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☑	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☑	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

Storage

COLIFORM MONITORING PLAN (CMP)
For a Small Water System

Single Source – Treatment

A. System Information

Plan Date: 10.27.13

Water System Name: Skagit View Village	**County: Skagit**	**System I.D. Number:** 96879
Name of Plan Preparer: Darlene Holmstrom	**Position: Water Quality Program Facilitator**	**Daytime Phone # (360)** 848-4461
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S01, Skagit Co PUD Skagit View Village, Well# AETO15, 54' well depth, 100gpm	
Storage: List and Describe	157,000 gallons, Concrete	
Treatment: Source Number & Process	S-01, Chlorination, Filtration	
Pressure Zones: Number and name	1 pressure zone	
Population by Pressure Zone	78	
Number of Routine Samples Required Monthly by Regulation: 1	**Number of Sample Sites Needed to Represent the Distribution System: 2**	

B. Laboratory Information

Laboratory Name: Skagit PUD#1	**Office Phone # (360) 848-2135**
Address: 11932 Morford Rd Sedro Woolley, WA 98284	**After Hours # (360) 630-1632**
Hours of Operation 6:30AM-3:00PM Monday-Friday	
Contact Name: Emilia Blake	
Emergency Laboratory Name: Avocet Environmental Testing	**Office Phone # (360) 734-9033**
Address: 1500 North State St, Suite 200 Bellingham WA 98225	**After Hours # (360) 988-0110 (Madell)**
Hours of Operation: Monday-Thursday, 8AM-5PM Friday -8AM-4PM	
Contact Name: Madell Briggs	

C. Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat and Triggered Source Sample* Sites**	**Sample Locations for Month Following Unsatisfactory Sample(s)**
X1.	1.1 Hideaway Ln ss	1.Hideaway Ln ss
Hideaway Ln Sample station (ss)	1-2.7379 Hideaway Ln	2. 7379 Hideaway Ln
	1.3 7515 Skagit View Dr.	3. 7515 Skagit View Dr
*739S Hideaway Ln Well source & pump station	1-4 7384 Hideaway Ln	4.7384 Hideaway Ln
	*1-5. S-01 well/raw source	5. Pump station/finished
X2.	* 2.1.Pressintin/Wilderness Sample station	**1.** Pressintin/Wilderness Sample station
Pressintin Ranch Dr./Wilderness Ln Sample station (ss)	2.2 7590 Skagit View Dr	**2.** 7590 Skagit View Dr
	2.3.7709 Skagit View Dr	**3.** 7709 Skagit View Dr
	2.4 7384 Hideaway Ln	**4.** 7384 Hideaway Ln
	*2.5. S-01 well/raw source	**5.** Pump station/finished
X3.	**3-1.**	**1.**
	3-2.	**2.**
	3-3.	**3.**
	3-4.	**4.**

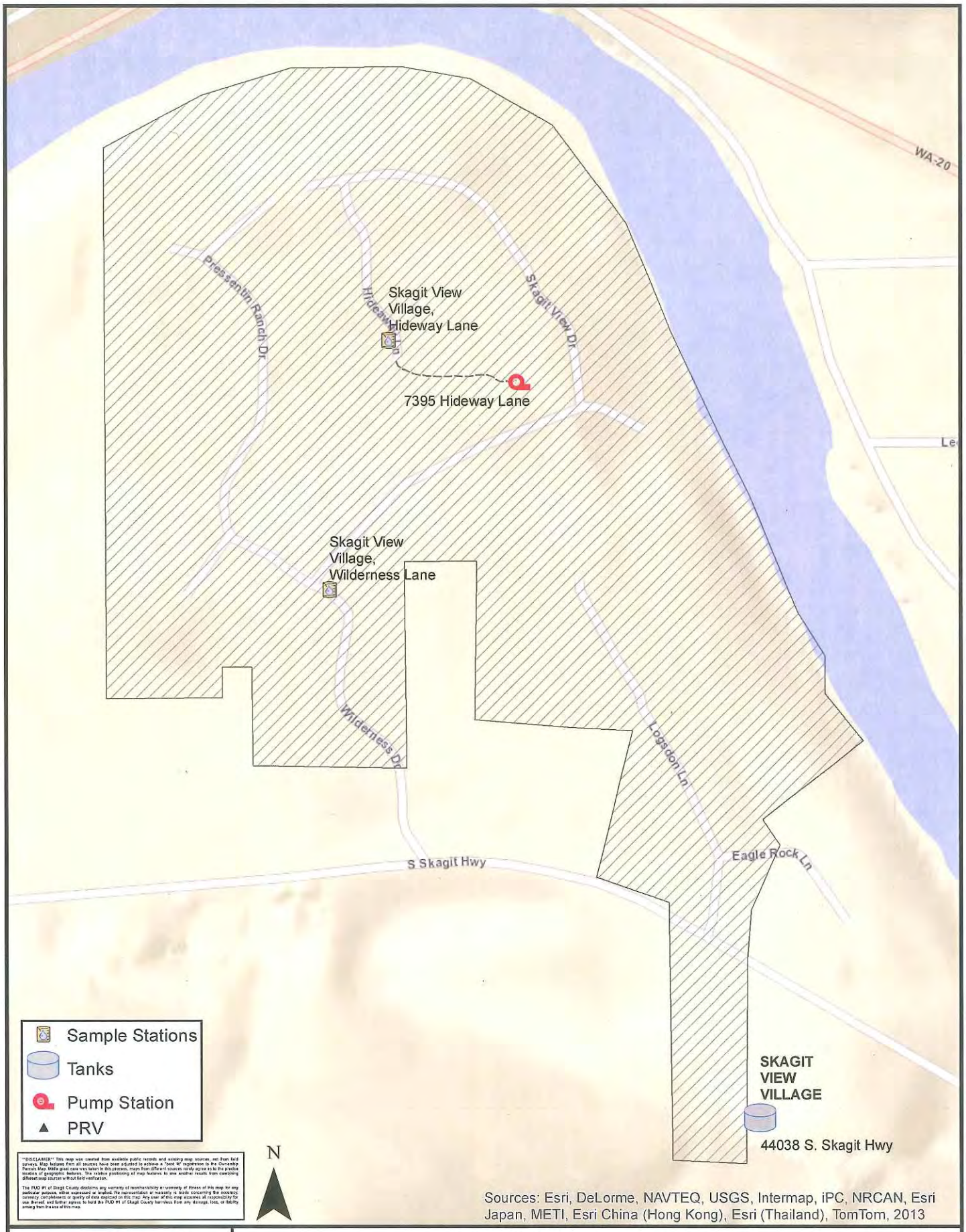
* You should mark the lab slip for the source sample "RAW" in type of sample and request an analysis for *E coli* count.

If you need more than three routine sample sites to cover the distribution system, attach additional sheets as needed.

D. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Pressentin/Wilderness ss	July	Pressentin/Wilderness ss
February	Hideaway Ln ss	August	Hideaway Ln ss
March	Pressentin/Wilderness ss	September	Pressentin/Wilderness ss
April	Hideaway Ln ss	October	Hideaway Ln ss
May	Pressentin/Wilderness ss	November	Pressentin/Wilderness ss
June	Hideaway Ln ss	December	Hideaway Ln ss

E. *E. coli*-Present Sample Response



Path: M:\Project Maps\MonitoringPlan\SkagitView.mxd

Skagit PUD
PUBLIC UTILITY DISTRICT

Skagit View Village Satellite System

2013 Skagit PUD Monitoring Plan

Coord System: WA State Plan North, NAD83

0 0.1 0.2 Miles

Figure XX-XX

Attachment 1

Distribution System E. coli Response Plan

If we have E. coli in our distribution system, we will immediately:

1. Call DOH
2. Collect four repeat samples and one triggered source sample per part C, (Coliform Monitoring Plan)
    - 1.1. Sample station with E. coli detection
    - 2.2 Upstream sample within five service connections
    - 3.3 Downstream sample within five service connections
    - 4.4 First connection served from finished source water
    - "Raw" triggered source sample
    - Collect additional investigative samples as necessary
3. Inspect our water system facilities, including treatment plant for proper operation.
4. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's samples.
5. Review new construction activities, water main breaks, and pressure outages that may have happened prior to the incident.
6. Review Cross-Connection Control Program status.
7. Discuss whether a Health Advisory (HA) is warranted, based on the findings of Steps 3-6. Issue an advisory, if necessary.
8. Await repeat sample results and respond appropriately:
    - Repeats all satisfactory, lift HA, if one was issued.
    - Any repeat unsatisfactory: Issue an HA, if not already in place.
    - District staff to perform a system inspection/assessment. Respond appropriately with findings to The Office of Drinking Water, as well as Skagit County Health Department.
9. The month following the above, five follow up samples will be taken per part C, (Coliform Monitoring Plan.)

Attachment 2

E. coli Present Triggered Source Sample Response Plan

If we have E. coli in our source water we will immediately:

1. Call DOH
2. Distribute required notice; door to door, posting notice's around residential neighborhood affected, PUD website, news release.
3. Interview PUD staff, discuss situation & staffing needs.
4. In connection with DOH, begin work on a Corrective Action Plan.
5. Corrective Action options: discontinue use of the contaminated source, or provide treatment of the source to the 4-log virus inactivation standard.
6. After corrective action is completed, collect follow up samples from source and/or distribution system, as appropriate depending on the corrective action.
7. Lift HA when appropriate and in consultation with DOH.
8. The month following the incident, PUD will follow part C of the Coliform Monitoring Plan.

Attachment 3

Coliform Sampling Procedure

1. If sampling the distribution system for Total Coliform Rule compliance, use a sampling station designated for this purpose. The District has a minimum number of routine distribution samples it must collect each month as described in WAC 246-290-300.
   In some unusual circumstances (frozen tap, tap in disrepair) another site may be used to represent the distribution system. The following criteria must be followed if a non-routine tap is used:
   - Tap is free of aerators, strainers, hose attachments, mixing type faucets, and purification devices.
   - Only a designated cold-water line is used.
2. Immediate maintenance should be initiated on a sample tap if the sampler observes any of the following:
   - Evidence of insects, dirt, or other debris. Clean tap with weak bleach solution and clean rag, flush tap for a minimum of 5 minutes, then flame tap prior to sampling.
   - Leaks shall be reported the same day to the Distribution Superintendent with the request made for quick repair.
3. Flame sample tap with a propane torch if there is any potential for tap contamination. Use best professional judgment to determine if flaming is needed and appropriate.
4. Allow the tap to run for 3–5 minutes prior to sampling. Adequate flushing is necessary to ensure that water representing the water main is sampled.
5. Adjust the flow rate from the tap so that the jet of water breaks sharply away without lapping the outside lip of the tap or splashing.
6. Determine IMMEDIATELY the free chlorine residual of the water using a chlorine field meter (Chlorine Residual, Free and Total Measurement with a Field Meter Procedure) and record on the field sheet.
7. Ensure that bottle is labeled with sample identification. Note date and time collected on field sheet.
8. Keep sample bottle closed until it is to be filled.
9. Clean hands with alcohol hand sanitizer and/or use disposable gloves, which should be cleaned with alcohol hand sanitizer as well.
10. Collect the sample:
    a. Hold the sample bottle at or near the bottom and loosen the cap.
    b. Carefully remove the lid and hold the bottle under the flow. Be careful not to touch the neck or inside of the bottle or cap.
    c. Hold the cap in hand during sampling to avoid contamination.
    d. Ensure that a minimum of 100 ml of sample is collected.
    e. Fill the bottle to within 1 inch of the top to maintain adequate space for mixing. Do NOT OVERFILL THE BOTTLE.
    f. Replace the lid and make sure that the labeling is still legible.

11. Be alert for any unusual conditions surrounding the sampling event. Examples of such conditions could include unusual smells, the presence of turbidity, a level of free chlorine residual that is unusual for the area, or the presence of air in the lines. These conditions may indicate a problem with the water main or an intentional contamination event. As such, observation of any of the following should be communicated immediately to the lab supervisor.
12. During winter months, ensure that the tap is fully drained by intentional purging with the manual hand pump. This practice will prevent frozen water lines.
13. Store the bottle on ice in the dark during transport to the laboratory. Hold samples at < 10° C during transport to the laboratory.
14. Complete the sampling forms including date, time, initials of sampler, sample location, the sample type including the residual chlorine value, and any comments.
15. Follow the guidelines for sample holding times—30 hours for treated water and 6 hours for untreated water.

Attachment 4

Public Notification Templates

Tier 1 notices must be delivered using broadcast media, hand delivery, and posting within 24 hours of confirmation of a problem. Notices should be approved by DOH first.

1. DOH Tier 1 Template – Boil Water Notice for Acute Violation of *E. coli* or fecal coliforms

Tier 2 Public Notification Notices must be delivered within 30 days of confirmation of the problem.

2. DOH Tier 2 Template – Non-acute violation due to Coliform MCL

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/*E. coli* bacteria.

Fecal coliform/*E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil for one minute. Let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.

(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Coliform Maximum Contaminant Level (MCL) Exceeded: Non-acute MCL

The _____ water system, ID# _____ in _____ County routinely monitors for the presence of total coliform bacteria and in _____ this type of bacteria was detected. Although this incident was not an emergency, as our customer, you have a right to know what happened and what we did or are doing to correct the situation.

Coliforms are bacteria which are naturally present in the environment and are used as indicators that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. The samples that showed the presence of coliform were further tested to see if other bacteria of greater concern, such as fecal coliform or *E.coli* were present. **None of these bacteria were found.**

You do not need to boil your water. People with severely compromised immune systems, infants, and some elderly may be at an increased risk. These people should seek advice from their health care provider.

What happened? What is the suspected or known source of contamination?

At this time:

☐ The problem is resolved. Additional samples collected were found to be free of coliform bacteria.
☐ We anticipate resolving the problem by ____ / ____ / ____.
☐ Other _____.

For more information, contact _____ at ( )____-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Date Distributed ____ / ____ / ____.

Coliform Non-acute Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed.
Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____ / ____.
☐ Notice was hand delivered to all water customers on ___ / ___ / ___.
☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ / ____.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2013
Printed: 10/02/2013
WFI Printed For: Annual
Submission Reason: Annual Update

RETURN TO: Northwest Regional Office, 20425 72nd Ave S STE 310, Kent, WA, 98032

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
96879 5	SKAGIT VIEW VILLAGE WATER SYSTEM	SKAGIT	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

MICHAEL R. FOX [MANAGER]
PO BOX 1436
MT VERNON, WA 98273-1436

7. OWNER NAME & MAILING ADDRESS — **8. Owner Number** 005410

SKAGIT COUNTY PUD 1
MICHAEL R. FOX — TITLE: MANAGER
PO BOX 1436
MT VERNON, WA 98273-1436

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS 1415 FREEWAY DR
CITY MOUNT VERNON STATE WA ZIP 98273

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 848-4457	Owner Daytime Phone:	(360) 848-4457
Primary Contact Mobile/Cell Phone:	(360) 661-4032	Owner Mobile/Cell Phone:	(360) 661-4032
Primary Contact Evening Phone:	(360) 661-5630	Owner Evening Phone:	(360) 661-5630
Fax: (360) 424-5440 E-mail: fox@skagitpud.org		Fax: (360) 424-5440 E-mail: fox@skagitpud.org	

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed — SMA NAME: SKAGIT COUNTY PUD 1 — SMA Number: 103
- ☐ Managed Only
- ☐ Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

157,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER Example: WELL #1 XYZ455 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4-1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well 1 AET015		X										X			Y		X	X			X	54	100	SE NE	08	35N	08E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
96879 5	SKAGIT VIEW VILLAGE WATER SYSTEM	SKAGIT	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY: CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY: APPROVED
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	70	128
A. Full Time Single Family Residences (Occupied 180 days *or more* per year)	70		
B. Part Time Single Family Residences (Occupied *less than* 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *more than* 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied *less than* 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		70	128

29. FULL-TIME RESIDENTIAL POPULATION	
A. How many residents are served by this system 180 or *more* days per year?	78

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?	25	25	25	25	25	25	25	25	25	25	25	25
B. How many days per month are they present?	8	8	8	8	8	8	8	8	8	8	8	8

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____ TITLE: _____

SKAGIT VIEW VILLAGE SYSTEM ID# 96879

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☑	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☑	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☑	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☑	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☑	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☑	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☑	☐	☐
We have a map of our service area boundaries.	☑	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☑	☐	☐
There is enough bottled water immediately available to our customers who are unable to boil their water.	☑	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers that may have difficulty responding to a Health Advisory.	☑	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☑	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☑	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E.-coli* present sample results with our policy makers.	☑	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☑	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☑	☐	☐	☐
We have a list of all of our customers' addresses.	☑	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☑	☐	☐	☐
We have a list of customer email addresses.	☐	☑	☐	☐
We encourage our customers to remain in contact with us using social media.	☑	☐	☐	☐
We have an active website we can quickly update to include important messages.	☑	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☑	☐	☐	☐
We need a news release to supplement our public notification process.	☑	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review the results of our sanitary survey and respond to any recommendations affecting the microbial quality of our water supply.	☑	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☑	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☑ ☐	☐ ☐	☐ ☐
We routinely inspect our well site.	☑	☐	☐	☐
We have a good raw water sample tap installed at our well.	☑	☐	☐	☐
After we complete work on our well, we disinfect the source, flush, and collect an investigative sample.	☑	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using this source and still provide reliable water service to our customers.	☑	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☑	☐	☐
We can provide bottled water to all or part of our distribution system for an indefinite period.	☑	☐	☐	☐
We can quickly replace our existing supply source with a more protected new source of supply.	☐	☑	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? 0.60 mg/L	☑	☐	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large part of the distribution system.	☑	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☑	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☑	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☑	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☑	☐	☐	☐

Storage

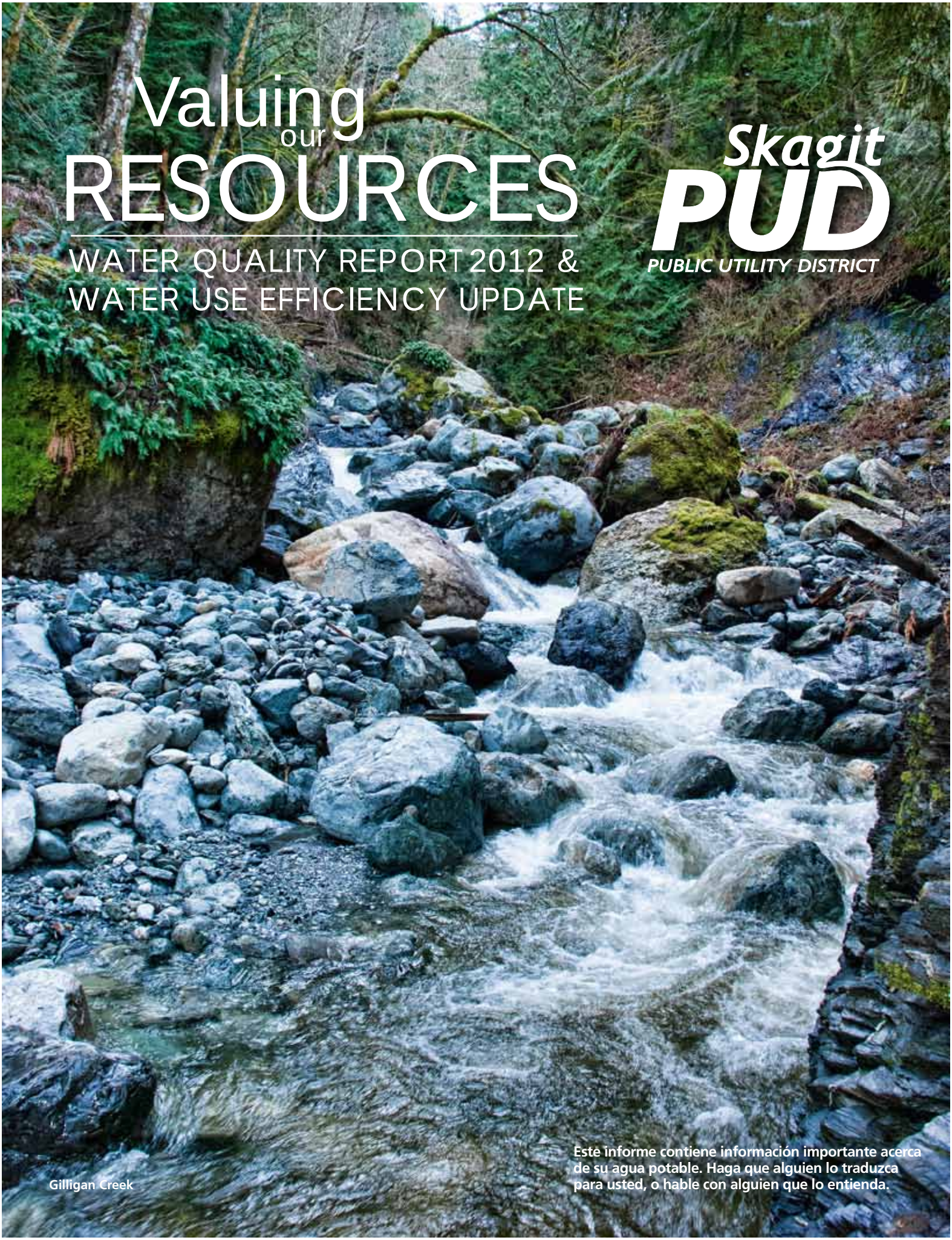
APPENDIX N

2012 CONSUMER CONFIDENCE REPORT

Valuing our RESOURCES

WATER QUALITY REPORT 2012 & WATER USE EFFICIENCY UPDATE

Skagit PUD
PUBLIC UTILITY DISTRICT



Gilligan Creek

Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Dear Skagit PUD Customer,

At Skagit PUD, we are committed to providing you the safest and most reliable drinking water possible. This report is a snapshot of the quality of water that we provided in 2012. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards.

For information about your drinking water, please call Skagit PUD at (360) 424-7104. We welcome your comments and suggestions. We also invite you to attend Skagit PUD commission meetings. The commissioners hold open meetings every Tuesday of the month at 4:30 p.m. in our Aqua Room located at 1415 Freeway Drive, Mount Vernon.

What's in your drinking water?

The sources of drinking water (both tap water and bottled water) include lakes, rivers, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants in drinking water sources may include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production, and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of some contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (1-800-426-4791) or at www.epa.gov/safewater.

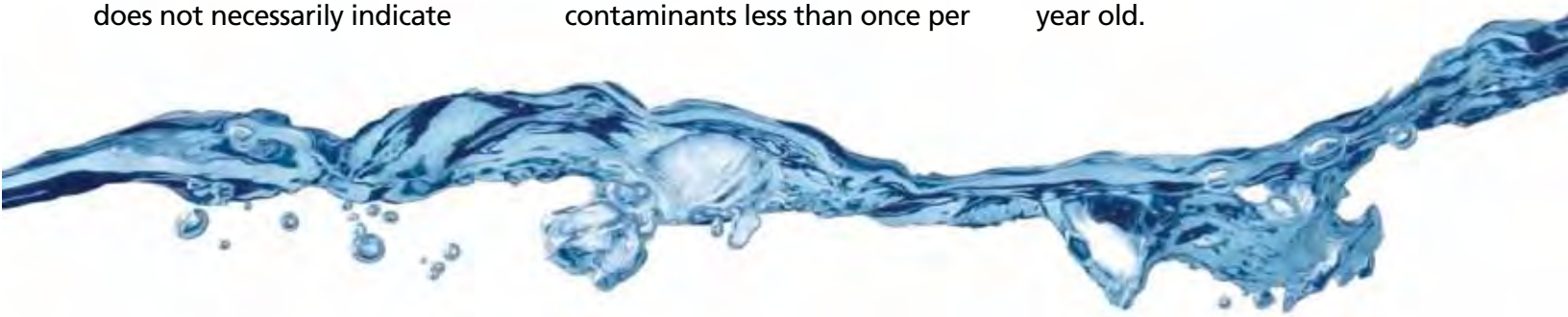
Assessing your health risk

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care providers about drinking water.

Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Water Quality Data

The Drinking Water Results tables included within this report list all the drinking water contaminants that we detected during the 2012 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in the tables are from testing done January 1 to December 31, 2012. The state requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.



[glossary: water quality definitions]

Action Level (AL). The concentration of a contaminant which, when exceeded, triggers treatment or other requirements that a water system must follow.

Haloacetic Acids. A disinfection by-product from chlorinating water that contains natural organic matter.

Maximum Contaminant Level (MCL). The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG). The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL). The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG). The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the health benefits of the use of disinfectants to control microbial contaminants.

Not Applicable (n/a). Does not apply.

Not Detected (n/d). Indicates that the parameter was not detected above the Specified Reporting Limit.

Nephelometric Turbidity Units (NTU). A unit of measure for turbidity based on the amount of light that is reflected from the water.

Part per million (ppm). One part per million is equivalent to half of an aspirin tablet dissolved in a full bathtub of water (approximately 50 gallons).

Part per billion (ppb). One part per billion is equivalent to half of an aspirin tablet dissolved in 1,000 bathtubs of water (approximately 50,000 gallons).

Total Coliforms. A group of non-pathogenic bacteria used in testing water to indicate the presence of pathogenic bacteria. They are naturally present in the environment. If coliforms were found in more samples than allowed, it would be a warning of potential problems.

Trihalomethanes. A disinfection by-product from chlorinating water that contains natural organic matter. The most common by-product is chloroform.

Treatment Technique (TT). A required process intended to reduce the level of a contaminant in drinking water.

Turbidity. A measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

Judy Reservoir Public Water System: ID# 79500 E

For customers living in or near Burlington, Mount Vernon, and Sedro-Woolley, your drinking water comes from Judy Reservoir, a 1.45 billion gallon reservoir located above the town of Clear Lake. Judy Reservoir is filled with water that has been diverted from four creeks in an uninhabited, nine square mile, forested area in the Cultus Mountain watershed. Water is also pumped from the Skagit River to Judy Reservoir during critical periods or when the streams run low in order to protect fish habitat.

Water is pumped from Judy Reservoir to the adjacent water treatment plant, which was placed into service in 1990.

The treatment process begins with primary disinfection using chlorine dioxide. Then, agents are added to cause small particles to combine into larger clusters that can be more easily settled and filtered from the water, a process called coagulation and flocculation. The water passes through filters of anthracite and sand, removing suspended particles and impurities. After leaving the treatment plant, the pH is adjusted and the water is disinfected using chloramines. The levels of additives are monitored constantly to ensure proper dosages are maintained.

Treated water flows to the customers in the Skagit Valley by way of two major transmission pipelines that are part of the 600 miles of pipelines that serve PUD customers.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Skagit PUD Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb)	15	0	2 (90th % Level)*	0 site out of 30 sites sampled			Corrosion of household plumbing
Copper (ppm)	1.3	1.3	0.07 (90th % Level)*	0 sites out of 30 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Skagit PUD Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.03	0.02 - 0.05	2012	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0 Samples	0%	n/a	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	55.0	16.3 - 94.5	2012	NO	By-product of drinking water disinfection
Haloacetic Acids (ppb)	60	n/a	31.0	13.1 - 44.6	2012	NO	By-product of drinking water disinfection
Total Chlorine Residual (ppm)	4.0	4.0	0.70	0.01 - 1.63	2012	NO	Measure of disinfectant added to water
Chlorite (ppm)	1	0.8	0.60	0.25 - 0.99	2012	NO	By-product of drinking water disinfection
Inorganic Compounds							
Barium (ppm)	2	2	0.01	n/a	2011	NO	Erosion of natural deposits
Nitrate (ppm)	10	10	0.12	n/a	2012	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Fidalgo Island Public Water System: ID# 00932Y

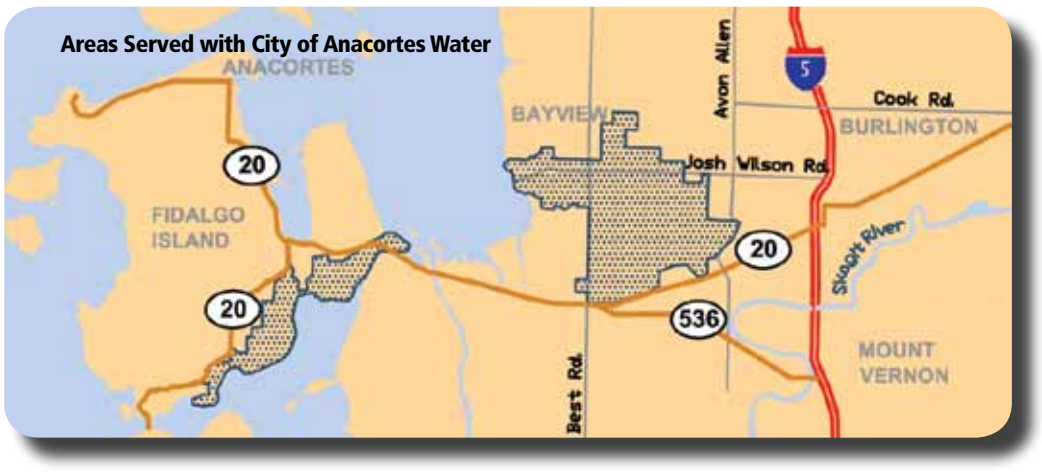
For those living in or near Country Club, Port of Skagit County, Bayview, and the Dewey Beach and Similk Beach areas of Fidalgo Island, your drinking water is produced by the Anacortes water treatment plant, whose sole source of water is the Skagit River. The Anacortes water treatment plant also uses disinfection, coagulation, and filtration to treat water. The entire Anacortes treatment process is professionally staffed and constantly monitored.

Please refer to the map to determine if you are supplied with Anacortes water. We have included information about Anacortes water quality in this report for your review.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Anacortes Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb) (2011)	15	0	3 (90th % Level)*	0 sites out of 30 sites sampled			Corrosion of household plumbing
Copper (ppm) (2011)	1.3	1.3	0.09 (90th % Level)*	0 sites out of 30 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Anacortes Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.02	0.02 - 0.16	2012	NO	Soil erosion
Total Coliform Bacteria	5% of	0.0 Samples	0% Samples	n/d	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	32.9	n/a	2012	NO	By-product of drinking water disinfection
Haloacetic Acids (ppb)	60	n/a	37.7	n/a	2012	NO	By-product of drinking water disinfection
Chlorine Residual (ppm)	4.0	4.0	0.53	0.27 - 0.78	2012	NO	Remaining chlorine from disinfection process
Inorganic Compounds							
Barium (ppm)	2	0	0.008	n/a	2012	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*



Alger Public Water System: ID# 01400K

Source of Your Drinking Water

The District obtains water for Alger from an artesian well located east of Alger. This well draws water from an aquifer approximately 60 feet below the ground surface. The facility automatically pumps water out of the aquifer to a water storage tank located west of Interstate 5. Water then flows by gravity back to the community, based on water demands from the families that reside in Alger.

Chlorine as a Disinfectant

Chlorine is added on a continual basis to drinking water that is distributed to Alger. Although the taste and odor of this disinfectant is undesirable to some people, chlorine is added to eliminate harmful bacteria that may be found in water.

Chlorine is the best method of protection for water systems that are the size of Alger.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Alger Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb)	15	0	5 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Copper (ppm)	1.3	1.3	0.38 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Alger Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.12	n/a	2008	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0 Samples	0%	n/d	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	12.6	n/a	2012	NO	By-product of drinking water chlorination
Haloacetic Acids (ppb)	60	n/a	4.7	n/a	2012	NO	By-product of drinking water chlorination
Total Chlorine Residual (ppm)	4	4	0.15	0.05 - 0.32	2012	NO	Measure of disinfectant added to water
Inorganic Compounds							
Arsenic (ppb)	10	0	6	n/a	2008	NO	Erosion of natural deposits
Radionuclides							
Beta/photon (pCi/L)	50	0	2.1	n/a	2009	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Cedargrove Public Water System: ID# 119174

Source of Your Drinking Water

The District obtains water for Cedargrove from a well located south of the Cedargrove community. This well draws water from an aquifer approximately 180 feet below the ground surface. It was constructed as part of the Cedargrove Local Utility District, which developed the entire Cedargrove water system in the early 1990s. The facility automatically pumps water out of the aquifer to a water storage tank. This water then flows by gravity to the Cedargrove community, based on water demands from the families that reside in Cedargrove.

Chlorine as a Disinfectant

Chlorine is added on a continual basis to drinking water that is distributed to Cedargrove. Although the taste and odor of this disinfectant is undesirable to some people, chlorine is added to eliminate harmful bacteria that may be found in water.

Chlorine is the best method of protection for water systems that are the size of Cedargrove.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Cedargrove Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb) (2011)	15	0	2 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Copper (ppm) (2011)	1.3	1.3	0.31 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Cedargrove Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	n/d	n/a	2010	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0 Samples	0%	n/d	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	12.1	n/a	2011	NO	By-product of drinking water chlorination
Haloacetic Acids (ppb)	60	n/a	8.7	n/a	2011	NO	By-product of drinking water chlorination
Chlorine Residual (ppm)	4	4	0.52	0.15 - 0.98	2012	NO	Measure of disinfectant added to water
Inorganic Compounds							
Arsenic (ppb)	10	0	1	n/a	2010	NO	Erosion of natural deposits
Barium (ppm)	2	0	0.02	n/a	2010	NO	Erosion of natural deposits
Nitrate (ppm)	10	0	0.27	n/a	2012	NO	Erosion of natural deposits
Radionuclides							
Beta/photon (pCi/L)	50	0	2.4	n/a	2009	NO	Erosion of natural deposits
Radium 228 (pCi/L)	5	0	0.67	n/a	2009	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Marblemount Public Water System: ID# AA642

Source of Your Drinking Water

The District obtains water for Marblemount from an aquifer approximately 215 feet below the surface. The well facility automatically pumps water out of the aquifer at 150 gallons per minute to a water storage tank. Within the system, there are 1.9 miles of eight-inch water mains, and 64,000 gallons of distribution storage capacity.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Marblemount Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb) (2011)	15	0	3 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Copper (ppm) (2011)	1.3	1.3	0.88 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Marblemount Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	1.41	n/a	2008	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0 Samples	0%	n/d	2011	NO	Naturally present in environment

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Mountain View Public Water System: ID# 03744Y

Source of Your Drinking Water

Skagit PUD obtains water for Mountain View residents from a well located within Mountain View. The water system is untreated and uses an ion exchange process for water softening. This well draws water from an aquifer approximately 382 feet below the ground surface. The Mountain View system is designed for a maximum of 16 connections, but has no storage at this time. The system can serve up to 14 connections before standby storage is required.

The District accepted the system in 1993 with the understanding that it would be incorporated into the Judy Reservoir system at some future date

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Mtn. View Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb)	15	0	n/d (90th % Level)*	0 sites out of 1 sites sampled**			Corrosion of household plumbing
Copper (ppm)	1.3	1.3	0.45 (90th % Level)*	0 sites out of 1 sites sampled**			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Mtn. View Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.20	n/a	2011	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0	0.0%	n/d	2012	NO	Naturally present in environment
Inorganic Compounds							
Fluoride (ppm)	2	4	0.26	n/a	2010	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

**Five samples for Lead and Copper were to be taken between January and June 2012. The monitoring schedule deadline provided by the state was for the month of June 2012. Only three residences volunteered for sampling, from a base service of 12 customers. One residence provided a sample within the deadline. Two other residences also conducted a sample; however, the samples occurred after the deadline of June 30, which resulted in a system violation.

Potlatch Public Water System: ID# 69034L

Source of Your Drinking Water

Drinking water that is supplied to Potlatch Beach residents has been filtered through reverse osmosis (RO) membranes. The source of water is seawater from the Bellingham Channel. This seawater is initially filtered through sand filters, followed by high-pressure filtration through the special membranes that remove salt (and other material) from the water. Finally, calcium and chlorine are added to ensure safe water to the community.

Chlorine as a Disinfectant

Chlorine is added on a continual basis to drinking water that is distributed to Potlatch. Although the taste and odor of this disinfectant is undesirable to some people, chlorine is added to eliminate harmful bacteria that may be found in water.

Chlorine is the best method of protection for water systems that are the size of Potlatch.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	**AL**	**MCLG**	**Potlatch Water**	**Number of sites found above the Action Level**			**Typical Source of Contaminant**
Lead (ppb) (2011)	15	0	1 (90th % Level)*	0 sites out of 5 sites sampled.			Corrosion of household plumbing
Copper (ppm) (2011)	1.3	1.3	0.11 (90th % Level)*	0 sites out of 5 sites sampled.			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Potlatch Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	2.78	n/a	2009	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0	0%	n/d	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	3.8	n/a	2011	NO	By-product of drinking water chlorination
Haloacetic Acids (ppb)	60	n/a	n/d	n/a	2011	NO	By-product of drinking water chlorination
Chlorine Residual (ppm)	4	4	0.47	0.25 - 0.79	2012	NO	Measure of disinfectant added to water
Inorganic Compounds							
Barium (ppm)	2	2	0.001	n/a	2009	NO	Erosion of natural deposits
Radionuclides							
Beta/photon (pCi/L)	50	0	2.59	n/a	2009	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Rockport Public Water System: ID# 736006

Source of Your Drinking Water

The District obtains water for Rockport from the existing well located within Rockport State Park. Water is pumped from a depth of nearly 350 feet below the ground surface to a concrete water tank northwest of the Rockport community. The water system was created by way of the Rockport Local Utility District, which was organized in the early 1990s.

Chlorine as a Disinfectant

Chlorine is added on a continual basis to drinking water that is distributed to Rockport. Although the taste and odor of this disinfectant is undesirable to some people, chlorine is added to eliminate harmful bacteria that may be found in water.

Chlorine is the best method of protection for water systems that are the size of Rockport.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	**AL**	**MCLG**	**Rockport Water**	**Number of sites found above the Action Level**			**Typical Source of Contaminant**
Lead (ppb) (2011)	15	0	4 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Copper (ppm) (2011)	1.3	1.3	0.04 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Rockport Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.22	n/a	2010	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0	0%	n/d	2012	NO	Naturally present in environment
Inorganic Compounds							
Barium (ppm)	2	2	0.038	n/a	2010	NO	Erosion of natural deposits
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	6.2	n/a	2011	NO	By-product of drinking water chlorination
Haloacetic Acids (ppb)	60	n/a	3.8	n/a	2011	NO	By-product of drinking water chlorination
Chlorine Residual (ppm)	4	4	0.47	0.20 - 0.75	2012	NO	Measure of disinfectant added to water
Radionuclides							
Radium 228 (pCi/L)	5	0	0.87	n/a	2009	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Skagit View Village Public Water System: ID# 96879 5

Source of Your Drinking Water

The District obtains water for Skagit View Village from a well located within Skagit View Village. This well draws water from an aquifer approximately 70 feet below the ground surface. This well was turned over to the District as part of the Skagit View Village Local Utility District.

Skagit PUD reconstructed much of the water system in 2005. A facility automatically pumps water out of the aquifer to a water tank located south of Skagit View Village. The water is then treated by an aeration process to adjust the pH, as described on the next page. A booster pump helps deliver the water to a storage tank. From here, water flows by gravity to the community, based on water demands from the homes in Skagit View Village.

Chlorine as a Disinfectant

Chlorine is added on a continual basis to drinking water that is distributed to Skagit View Village. Although the taste and odor of this disinfectant is undesirable to some people, chlorine is added to eliminate harmful bacteria that may be found in water. Chlorine is the best method of protection for water systems that are the size of Skagit View Village.

2012 Drinking Water Results – Regulated Contaminants

Lead and Copper	AL	MCLG	Skagit View Water	Number of sites found above the Action Level			Typical Source of Contaminant
Lead (ppb)	15	0	2 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Copper (ppm)	1.3	1.3	0.96 (90th % Level)*	0 sites out of 5 sites sampled			Corrosion of household plumbing
Microbiological Contaminants	**MCL (MRDL)**	**MCLG (MRDLG)**	**Skagit View Water**	**Range of Detections**	**Sample Date**	**Violation**	**Typical Source of Contaminant**
Turbidity (NTU)	TT	n/a	0.25	n/a	2008	NO	Soil erosion
Total Coliform Bacteria	5% of Samples	0.0	0%	n/d	2012	NO	Naturally present in environment
Disinfection By-Products							
Trihalomethanes (ppb)	80	n/a	2.2	n/a	2011	NO	By-product of drinking water chlorination
Haloacetic Acids (ppb)	60	n/a	n/d	n/a	2011	NO	By-product of drinking water chlorination
Chlorine Residual (ppm)	4	4	0.58	0.24 - 0.68	2012	NO	Measure of disinfectant added to water
Inorganic Compounds							
Nitrate (ppm)	10	0	0.66	n/a	2012	NO	Erosion of natural deposits
Radionuclides							
Beta/Photon Emitters (pCi/L)	50	0	5.2	n/a	2009	NO	Erosion of natural deposits
Alpha Emitters (pCi/L)	5	0	1.9	n/a	2009	NO	Erosion of natural deposits

**The 90th percentile level is the highest result obtained in 90% of the samples collected when the results are ranked in order from lowest to highest.*

Health Effects of Copper

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress.

Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

You Can Reduce Your Copper Exposure By Flushing

It is recommended that you let the water run before using it for cooking or drinking whenever the household water remains unused for more than six (6) hours. This would include the times when you first get up in the morning or when you come home from work. The longer the water sits in your household pipes, the more copper it may contain.

Flushing the faucet means running the cold-water faucet until the water feels a cold as it can get, or for a period of about one minute. Also, avoid cooking with or consuming water from hot water taps as hot water dissolves copper more readily than cold water does.

Source Water Protection

To achieve improved protection of public water supply sources and the health of Washington's citizens, the Washington State Department of Health has developed the Source Water Assessment Program (SWAP).

The SWAP program evaluates potential threats to the safety of our water supplies by assessing sources of contamination. The SWAP is designed to give you and your community more information about the source of your drinking water, and any threats to its long-term quality that we can identify and address through a pollution prevention approach.

To learn more about the SWAP, contact the Washington State Department of Health at (360) 236-3149 or visit www.doh.wa.gov/ehp/dw.

WATER USE EFFICIENCY UPDATE

In 2008, Skagit PUD established measurable water-saving goals for the next six years for both the supply- and demand-side of our distribution system. The goals provide a benchmark for achievement and play a significant role in defining the success of the PUD's water use efficiency program. Our water use efficiency goals and the steps we are taking to meet those goals are as follows:

1. Reduce consumption per Equivalent Residential Units from 178 gallons per service per day to 175 gallons per service per day.

Billing data for 2012 indicates that our Equivalent Residential Units—water use for a typical single-family residence—was **152 gallons** per service per day, which is consistent with previous years.

Skagit PUD continues to focus its public education efforts on providing customers with simple water-saving ideas to use at their home or business.

In 2012, Skagit PUD's public outreach activities included staffed informational booths at local community events, festivals and employee fairs. Skagit PUD staff shared ideas on how to identify and stop common leaks, conserve water, and ways to use water more efficiently.

Indoor retrofit kits were also introduced, which include one 1.5 GPM low-flow showerhead, plus a kitchen and bathroom aerator. The kits sell for $10 at our main office.

2. Reduce the summer peak flows from 1.7 times Average Daily Demand to 1.6 times Average Daily Demand.

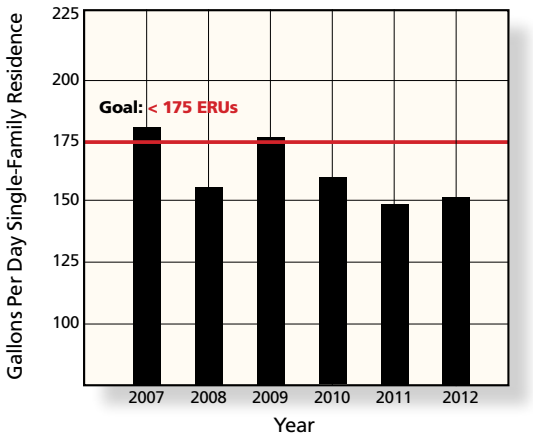
During summer months, about 30 percent of a family's household water use per day is devoted to outdoor purposes. More than half of that outdoor water is used for watering lawns and gardens.

Skagit PUD's summer peak water flows for 2012 were **1.61 times the average daily demand** (ADD). ADD is defined as the average quantity, over a one-year period, of daily water usage in the water system. In 2012, ADD for the Judy Reservoir system was 7.89 million gallons per day (mgd). Summer peak flows were 12.68 mgd. The trend of the last several years, which has featured cool conditions in the late spring and early summer transitioning to warm conditions in the late summer and early autumn, continued in 2012.

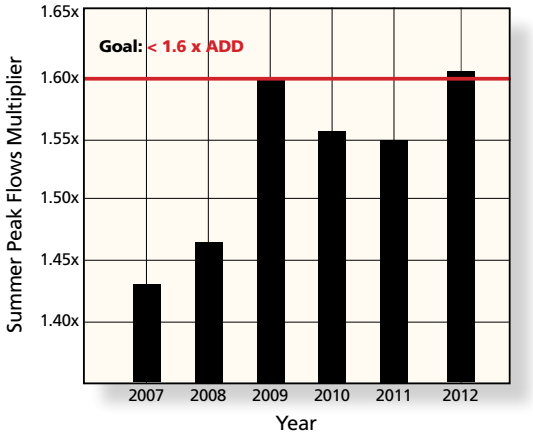
In an effort to continue to reduce summer peak flows, Skagit PUD is focused on creating public awareness of the need to use water wisely. The PUD provides outdoor water-saving tips in each issue of our *Pipeline* newsletter. Skagit PUD offers customers a soil moisture meter, which promotes healthier lawns, gardens, shrubs and helps save water by eliminating improper watering. The meters accurately measure the moisture in the soil at the root level where it counts and let's you know if it's time to water or not.

Back in 2010, Skagit PUD first introduced its Rain Barrel Program to single family and commercial customers in order to create awareness and visibility around water use practices. As part of this continuing program, District staff conduct small group workshops that teach customers how to build, set-up and maintain their rain barrel. The act of collecting rainwater can be an inspiration to find other ways to conserve water around the home and at work.

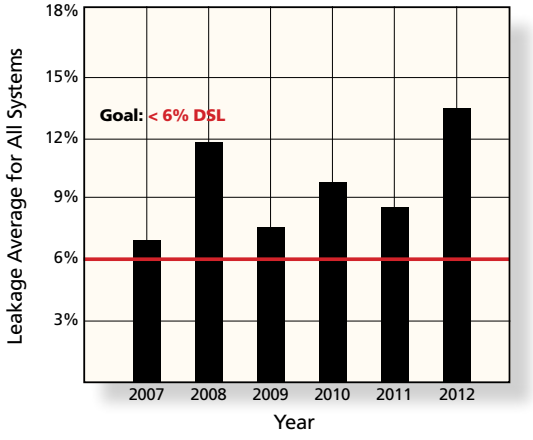
Equivalent Residential Units



Summer Peak Flows



Distribution System Leakage



3. Reduce distribution system leakage by one percent.

All water services in Skagit PUD's water systems are metered. The PUD tracks high use meters to check on accuracy and our meter technicians routinely replace service meters that show signs of inaccuracy or failure.

In 2012, the average water loss reported from distribution system leakage within Skagit PUD's main Judy Reservoir system was **13.5 percent.** One explanation for why this number increased in 2012 is due to a change in our data calculation process. In order to improve our measured water production rate accuracy, Skagit PUD plans to replace older production meters located at Judy Reservoir's water treatment plant. The new meters will provide a more precise total of the actual water being produced and entering the distribution system.

Water System Performance 2012

Judy Reservoir Production	2,921,330/Kgals Produced
Judy Reservoir Billed	2,526,649/Kgals Billed
% Distribution System Leakage	13.5% DSL
Alger Production	6,944/Kgals Produced
Alger Billed	6,519/Kgals Billed
% Distribution System Leakage	6.1% DSL
Cedargrove Production	8,289/Kgals Produced
Cedargrove Billed	7,785/Kgals Billed
% Distribution System Leakage	6.1% DSL
Fidalgo Island Production	44,809/Kgals Produced
Fidalgo Island Billed	41,017/Kgals Billed
% Distribution System Leakage	8.5% DSL
Marblemount Production	1,553/Kgals Produced
Marblemount Billed	1,480/Kgals Billed
% Distribution System Leakage	4.7% DSL
Mountain View Production	1,091/Kgals Produced
Mountain View Billed	925/Kgals Billed
% Distribution System Leakage	15.2% DSL
Potlatch Beach Production	502/Kgals Produced
Potlatch Beach Billed	465/Kgals Billed
% Distribution System Leakage	7.4% DSL
Rockport Production	3,027/Kgals Produced
Rockport Billed	2,808/Kgals Billed
% Distribution System Leakage	7.2% DSL
Skagit View Village Production	3,676/Kgals Produced
Skagit View Village Billed	3,482/Kgals Billed
% Distribution System Leakage	5.3% DSL

Numbers calculated in thousands of gallons.

The chart at the left reports each system's water production performance for 2012. All water that is not authorized consumption is considered distribution system leakage (DSL). Some examples of water use considered leakage include: water main breaks, theft, meter inaccuracies, meter reading errors, data collection and calculation errors.

Skagit PUD
PUBLIC UTILITY DISTRICT

1415 Freeway Drive
P.O. Box 1436
Mount Vernon, WA 98273-1436
tel: (360) 424-7104
www.SkagitPUD.org

APPENDIX O

SAFETY MANUAL TABLE OF CONTENTS

PUD #1 of Skagit County

SAFETY AND ACCIDENT PREVENTION PLAN

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Minutes/Agenda Form (Appendix D)
Job Hazard Analysis Assessment (Appendix E)
Exposure Incident Investigation (Appendix F)
Hepatitis B Declination Form (Appendix G)
Hepatitis B Records (Appendix H)
Employee Medical Record Checklist (Appendix I)
Needle stick/Sharps Exposure Log (Appendix J)
Post-Exposure Evaluation and Follow-Up Checklist

PSM / RMP
Program Manual

Skagit County PUD #1 WTP
Sedro Woolley, Washington
June 1999
Reviewed 2004
Reviewed 2009

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EMERGENCY ACTION PLAN

Project Name: JUDY RESERVOIR (DAM A and DAM B)

DSO File Numbers: SK03-0183 (DAM A) and SK03-0181 (DAM B)

Location: NEAR CLEAR LAKE AND SEDRO-WOOLLEY, SKAGIT COUNTY. OFFSTREAM STORAGE.

Water Treatment Plant
11932 Morford Road
Sedro Woolley, WA 98284-9428
360-856-5031

OWNER: Public Utility District No. 1 of Skagit County

ISSUE DATE: April 1, 2004

REVISED DATE: April 1, 2004

(2)

Chlorination

Process Safety Information Manual

Skagit PUD #1

Water Treatment Plant

Prepared by: Universal Dynamics

June 1999

Reviewed 2004

Reviewed 2009

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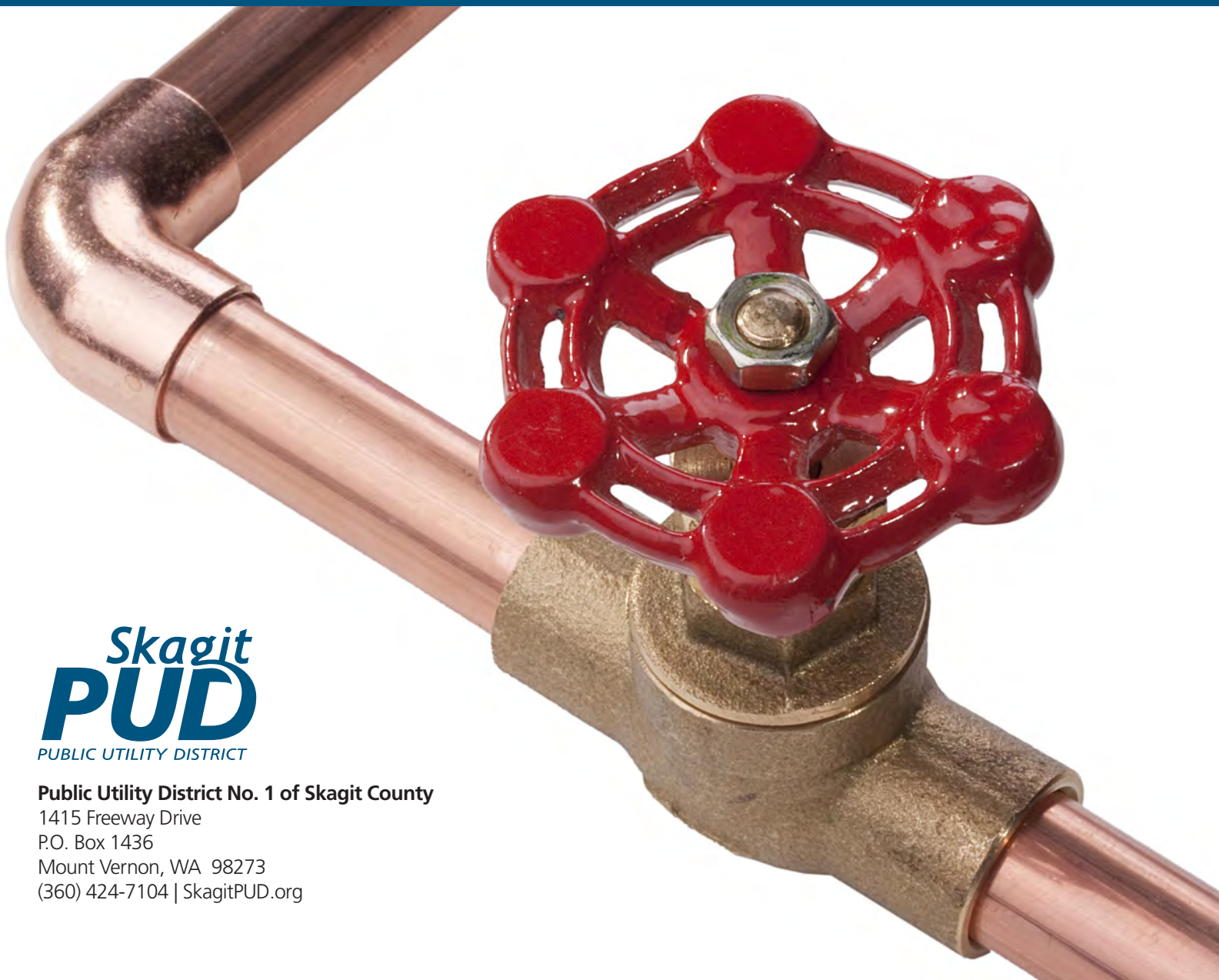
APPENDIX P

CROSS-CONNECTION TABLE OF CONTENTS AND 2011 ANNUAL SUMMARY REPORT

Cross-Connection Control Program Manual on Backflow Prevention

Internal Draft | November 2013



Skagit PUD
PUBLIC UTILITY DISTRICT

Public Utility District No. 1 of Skagit County
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TABLES

ATTACHMENTS

Washington State Department of Health

Office of Drinking Water

Public Water System Cross-Connection Control Activities Annual Summary Report for Year 2011

Part 1: Public Water System (PWS) and Cross-Connection Control Specialist (CCS) Information

PWS ID: 79500	PWS Name: SKAGIT COUNTY PUD 1 JUDY RES	County: SKAGIT
Provide name and Cert No. of CCS who develops and implements your CCC program		
CCS Name (last, first & mi): Zorn, Rebecca K.		CCS Phone: (360) 424-7104
CCS Cert No.: 12209	BAT Cert. No. (if applicable):	
CCS is (check one):	PWS owner or employee ☑ On contract to PWS ☐ Volunteer or other ☐	

Part 2: Status of Cross-Connection Control (CCC) Program at end of 2011

PWS has(check one box in each column below):	
A written CCC program plan Y ☑ N ☐	CCC implementation activities Y ☑ N ☐

(Written program may be a separate document, or part of water system plan or small water system management program).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is Currently:	
		Included in Written Program	Being Implemented or Is Completed
1	Legal Authority Established	Y ☑ N ☐	Y ☑ N ☐
2	Hazard Evaluation Procedures and Schedules	Y ☑ N ☐	Y ☑ N ☐
3	CCC Procedures and Schedules	Y ☑ N ☐	Y ☑ N ☐
4	Certified CCS Provided	Y ☑ N ☐	Y ☑ N ☐
5	Backflow Preventer Inspection and Testing	Y ☑ N ☐	Y ☑ N ☐
6	Testing Quality Control Assurance Program	Y ☑ N ☐	Y ☑ N ☐
7	Backflow Incident Response Procedures	Y ☑ N ☐	Y ☑ N ☐
8	Public Education Program	Y ☑ N ☐	Y ☑ N ☐
9	CCC Records	Y ☑ N ☐	Y ☑ N ☐
10	Reclaimed Water Permit	Y ☐ N ☐ N/A ☑	Y ☐ N ☐ N/A ☑

Part 3A: System Characteristics at End of 2011

Indicate the number of connections of each type that the PWS serves (whether or not they are protected by backflow preventers). **Estimate if necessary.**

Type of Service Connection	Number
Residential (As defined by PWS)	20797
All Other (Include dedicated fire sprinkler and irrigation lines and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers and docks.)	4335
Total Number of Connections	25132

Part 3B: Cross-Connection Control for High-Hazard Premises or Systems Served by the PWS

If PWS does not serve any high-hazard premises or systems, check here ☐ and go to Part 4A.

- Complete all cells. Enter zero (0) in cells if PWS does not serve such premises.
- Estimate number of connections served if necessary (OK to use phone book).
- Hazard evaluations do not need to be done to complete this table.

Type of High-Hazard Premises or Systems [WAC 246-290-490(4)(b)]	Number of Connections at end of 12/31/2011			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP	C. With Column B AG Inspected or RP Tested [2]	D. Granted Exception from Mandatory Premises Isolation
Agricultural (farms and dairies)	130	23	12	0
Beverage bottling plants (including breweries)	2	2	1	0
Car washes	1	1	0	0
Chemical plants	4	4	2	0
Commercial laundries and dry cleaners	2	2	1	0
Both reclaimed water and potable water provided	0	0	0	0
Film processing facilities	0	0	0	0
Dedicated fire protection systems with chemical addition or using unapproved auxiliary supplies	1	1	1	0
Food processing plants (including canneries, slaughter houses, rendering plants)	10	2	2	0
Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers	129	42	41	1
Separate irrigation systems using purveyor's water supply and chemical addition[4]	0	0	0	0
Laboratories	2	2	2	0
Metal plating industries	1	1	0	0
Petroleum processing or storage plants	1	0	0	0
Piers and docks	2	2	1	0
Radioactive material processing plants or nuclear reactors	0	0	0	0
Survey access denied or restricted	0	0	0	0
Wastewater lift/pump stations (non-residential only)	10	10	10	0
Wastewater treatment plants	4	4	4	0
Unapproved auxiliary water supply interconnected with potable water supply	0	0	0	0
	0	0	0	0
Totals	299	96	77	1

[1]Count multiple connections or parallel installations as ***separate*** connections.

[2]Count only those connections with AG or RPBA installed for premises isolation. Don't include connections with in-premises protection only, or connections with DCVA/DCDAs installed for premises isolation.

[3]Count only those connections whose premises isolation preventers were inspected (AG) or tested (RPBA) during 2011.

[4]For example, dedicated lines to irrigation systems in parks, playgrounds, golf courses, cemeteries, estates, etc.

[5]Premises with hazardous materials or processes (requiring isolation by AG or RPBA) such as: aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, e.g.: other manufacturing or other commercial. If needed, attach additional sheet giving same information as requested in table.

Part 3C: Cross-Connection Control for Medical Category High-Hazard Premises Served by the PWS

If PWS does not serve any medical type premises, check here ☐ and go to Part 4A.

- Complete all cells. Enter zero (0) in cells if PWS does not serve such premises.
- Estimate number of connections served if necessary (OK to use phone book).
- Hazard evaluations do not need to be done to complete this table.

Type of High-Hazard Premises or Systems [WAC 246-290-490(4)(b)]	Number of Connections at end of 12/31/2011			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP	C. With Column B AG Inspected or RP Tested[2]	D. Granted Exception from Mandatory Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)	2	2	2	0
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers	4	4	4	0
Out-patient clinics and offices	26	9	9	0
Alternative health out-patient clinics and offices	4	0	0	0
Psychiatric out-patient clinics and offices	2	0	0	0
Chiropractors	17	0	0	0
Hospice care centers	1	1	0	0
Childbirth centers	1	1	1	0
Kidney dialysis centers	1	1	1	0
Blood centers	0	0	0	0
Dental clinics and offices	33	9	9	0
Facilities for Housing Patients				
Nursing homes	4	4	4	0
Boarding homes	11	2	2	0
Residential treatment centers	4	1	1	0
Other Medical-Related Facilities				
Mortuaries	4	4	4	0
Morgues and autopsy facilities (not in hospitals)	0	0	0	0
Veterinarian offices, clinics and hospitals	14	4	4	0
All other (describe in Part 6: Comments on page 6)	1	0	0	1
Totals	129	42	41	1

[1]Count multiple connections or parallel installations as ***separate*** connections.

[2]Count only those connections with AG or RPBA installed for premises isolation. Don't include connections with in-premises protection only, or connections with DCVA/DCDAs installed for premises isolation.

[3]Count only those connections whose premises isolation preventers were inspected (AG) or tested (RPBA) during 2011.

Part 4A: Backflow Preventer Inventory and Testing Data During Year 2011

- Complete all cells. Enter zero (0) if there are no backflow preventers in that category.
- Count only the backflow preventers that the PWS relies upon for protection of the distribution system. If your records do not distinguish between premises isolation and in-premises protection preventers, enter all data in Premises Isolation section and check the box.
- Count AVBs on irrigation systems only. **If you do not track AVBs, enter "UNK".**
- Count multiple tests or failures for any particular backflow preventer as one test or failure for that backflow preventer.
- Multiple Service or Parallel Connections: Count each assembly separately.
- Assemblies on Dedicated Fire or Irrigation Lines: Count as Premises Isolation Assemblies.

If PWS does not track AVBs Check here: ☑

Backflow Preventer Category and Testing/Inspection Information		Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Premises Isolation, including preventers isolating PWS-owned facilities. ***If In-Premises Protection preventers are also included, check here.*** ☐									
Rows 1-3 pertain ONLY to Premises Isolation preventers in service at beginning of 2011									
1	In service on 1/1/2011	1	213	2	138	22	1	0	unk
2	Inspected and/or Tested in 2011[1]	0	105	1	61	13	1	0	unk
3	Failed Inspection or Test in 2011	0	14	0	0	0	0	0	unk
Rows 4 - 6 pertain ONLY to NEW Premises Isolation preventers installed during 2011									
4	New preventers installed in 2011[2]	0	14	0	17	6	1	0	unk
5	Inspected and/or Tested in 2011[1]	0	11	0	11	5	1	0	unk
6	Failed inspection or test in 2011[3]	0	0	0	0	0	0	0	unk
7	Preventers taken out of service in 2011[3]	0	0	0	0	0	0	0	0
Premises Isolation Total at end of 2011[4]		1	227	2	155	28	2	0	unk
In-Premises Protection (Fixture Protection or Area Isolation), including preventers within PWS-owned facilities.									
Rows 8 - 10 pertain ONLY to In-Premises Protection Preventers in service at beginning of 2011									
8	In service on 1/1/2011	13	576	2	751	202	4	4	unk
9	Inspected and/or Tested in 2011[1]	0	352	0	474	126	0	0	unk
10	Failed Inspection or Test in 2011	0	11	0	11	0	0	0	unk
Rows 11 - 13 pertain ONLY to NEW In-Premises Protection Preventers installed during 2011									
11	New preventers installed in 2011[2]	0	2	0	0	0	0	0	unk
12	Inspected and/or Tested in 2011[1]	0	2	0	0	0	0	0	unk
13	Failed inspection or test in 2011	0	0	0	0	0	0	0	unk
14	Preventers taken out of service in 2011[3]	0	0	0	0	0	0	0	0
In-Premises Protection Total at end of 2011[4]		13	578	2	751	202	4	4	unk
Grand Total at end of 2011		14	805	4	906	230	6	4	unk

[1]Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only using DOH/USC test procedures).Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at beginning of 2011. Replacement preventers may be of a different type than the original.

[2]Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of 2011. Replacement preventers may be of a different type than the original.

[3]New or existing preventers taken out of service, whether or not they were replaced by the same type or different type of preventer.

[4]Total at end of 2011 should be equal to the number of preventers in service at beginning of 2011 plus those installed during 2011 minus the number of preventers taken out of service during 2011.

Part 4B: Other Implementation Activities in 2011

Complete all cells. Enter zero (0) if not applicable.

Activity or Condition	Number
New service connections evaluated for cross-connection hazards to PWS in 2011.	17
New service connections requiring backflow protection to protect PWS.[1]	14
Existing service connections evaluated for cross-connection hazards to PWS in 2011.	20
Existing service connections requiring backflow protection to protect PWS.[1,2]	2
Exceptions granted to high-hazard premises per WAC 246-290-490(4)(b) in 2011.[3]	1
CCC enforcement actions taken by PWS during 2011.[4]	0

[1]Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2]Include existing services that need new, additional or higher level backflow prevention.

[3]A DOH Exceptions to Hazard Premises Form *must* be attached for each exception granted during the year.

[4]"Enforcement actions" mean actions taken by the PWS (such as water shut-off, PWS installation of backflow preventer) when the customer fails to comply with PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2011

	Backflow Incidents, Risk Factors and Indicators during 2011	Number (Enter 0 if none)	Check if Data Not Available
Backflow Incidents during 2011			
1	Backflow incidents that contaminated the PWS[5].	0	☐
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0	☐
Risk Factors for Backflow during 2011			
3	Distribution main breaks per 100 miles of pipe.	6.00	☐
4	Low pressure events (<20 psi in PWS distribution system).	10	☐
5	Water outage events.	10	☐
Indicators of Possible Backflow during 2011			
6	Total health-related complaints received by PWS.[6]	0	☐
7	Received during BWA or PN events.[7]	0	☐
8	Received during low pressure or water outage events.	0	☐
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	23	☐
10	Received during BWA or PN events.[7]	0	☐
11	Number of these complaints received during low pressure or water outages events.	0	☐

[5]Complete and submit a Backflow Incident Report form for each known backflow incident.

[6]Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7]"**BWA**" means ***Boil Water Advisory*** and "**PN**" means ***Public Notification*** for water quality reasons.

Part 6: Comments and Clarifications

Enter comments or clarifications to any of the information included in this report. Note for on-screen completion: Comments will not "word wrap" from one line to the next. Press to continue on new line. Maximum length of each comment is 255 characters, including spaces.

Part No.	Date Added	Comment
Other	5/21/12	I currently do not have an operator cert # available for Engineering manager George Sidhu
Pt 4A	5/21/12	After spending significant amounts of time working on our Tokay database, I believe that our data still does not reflect our numbers more accurately. It is my belief that each our accounts require individual analysis to determine the information enter accurately fits the queriable qualifications.
Gener	5/21/12	I would like to request the opportunity to submit an amended ASR for the year 2011 with in a two month period. I would then have the opportunity to work with my software company on advanced analysis of the data that has already been inputed into our database.

Part 7: Report Completion Information

I certify that the information provided in this CCC Activities Report is complete and accurate to the best of my knowledge.		
CCC Program Mgr. Name[1]: Rebecca K. Zorn		Title: Cross Connections Control Coordinator
Signature:		Date: 05/21/2012
Phone: (360) 424-7104	E-mail: zorn@skagitpud.org	
I have reviewed this report and certify that the information provided is complete and accurate to the best of my knowledge.		
PWS Mgr./Owner Name[2]: George Sidhu		Title: Engineering Manager
Signature:	Op. Cert. No.:	Date: 05/21/2012

[1] CCC Program Manager is generally the CCS who is responsible for development and implementation of the PWS's CCC Program.

[2] The person that the CCC Program Manager reports to or other manager having direct responsibility and/or oversight of the CCC program.

Washington State Department of Health

Office of Drinking Water

Severe Health Hazard Facility for 2011 Annual Summary Report

PWS ID: 79500	PWS Name: SKAGIT COUNTY PUD 1 JUDY RES	County: SKAGIT

Part 1: Backflow Protection Status

Describe the backflow protection status at the end of 2011 for each *wastewater treatment plant and nuclear facility* your system serves.

Facility Index # 1		Status of Backflow Protection at End of 2011 (check one box per row)							
Facility Name, Physical Address, and NPDES Permit Number		**Premises Isolation RP *and* In-plant Air Gap (s)**	**Premises Isolation RP but *No* In-Plant Air Gap (s)**	**Premises Isolation Air Gap**	**Fixture Protection Only**	**No Protection At All**	**Unknown**	**Exception Granted**	**Other (explain in Comment Section)**
Name	Mt Vernon wwtp	◉	○	○	○	○	○	○	○
Address	1401 britt rd								
City	mt vernon,								
Zip	98273								
NPDES Permit#	WA0024074E								
Facility Type		Wastewater Treatment Plant (WWTP)							
Comment									

Facility Index # 2		Status of Backflow Protection at End of 2011 (check one box per row)							
Facility Name, Physical Address, and NPDES Permit Number		**Premises Isolation RP *and* In-plant Air Gap (s)**	**Premises Isolation RP but *No* In-Plant Air Gap(s)**	**Premises Isolation Air Gap**	**Fixture Protection Only**	**No Protection At All**	**Unknown**	**Exception Granted**	**Other (explain in Comment Section)**
Name	Sedro-Woolley wwtp	◉	○	○	○	○	○	○	○
Address	325 metcalf st								
City	sedro-woolley,								
Zip	98284								
NPDES Permit#	WA0023752D								
Facility Type		Wastewater Treatment Plant (WWTP)							
Comment									

Facility Index # 3	Status of Backflow Protection at End of 2011 (check one box per row)							
Facility Name, Physical Address, and NPDES Permit Number	**Premises Isolation RP *and* In-plant Air Gap (s)**	**Premises Isolation RP but *No* In-Plant Air Gap(s)**	**Premises Isolation Air Gap**	**Fixture Protection Only**	**No Protection At All**	**Unknown**	**Exception Granted**	**Other (explain in Comment Section)**
Name Burlington wwtp **Address** 900 south section st **City** burlington, **Zip** 98233-2548 **NPDES Permit#** WA0020150C	◉	○	○	○	○	○	○	○
Facility Type	Wastewater Treatment Plant (WWTP)							
Comment	All prior changes have been made from last year requests.							

Facility Index # 4	Status of Backflow Protection at End of 2011 (check one box per row)							
Facility Name, Physical Address, and NPDES Permit Number	**Premises Isolation RP *and* In-plant Air Gap (s)**	**Premises Isolation RP but *No* In-Plant Air Gap(s)**	**Premises Isolation Air Gap**	**Fixture Protection Only**	**No Protection At All**	**Unknown**	**Exception Granted**	**Other (explain in Comment Section)**
Name Big Lake Sewer District **Address** 17079 Highway 9 **City** Mount Vernon,WA **Zip** 98274-8337 **NPDES Permit#** WA0030597D	◉	○	○	○	○	○	○	○
Facility Type	Wastewater Treatment Plant (WWTP)							
Comment	Big Lake Waste Treatment Plant is managed by Water-Wastewater Services LLC. Installation of premises isolation by RPBA has been achieved at this location							

Facility Index # 5	Status of Backflow Protection at End of 2011 (check one box per row)							
Facility Name, Physical Address, and NPDES Permit Number	**Premises Isolation RP *and* In-plant Air Gap(s)**	**Premises Isolation RP but *No* In-Plant Air Gap(s)**	**Premises Isolation Air Gap**	**Fixture Protection Only**	**No Protection At All**	**Unknown**	**Exception Granted**	**Other (explain in Comment Section)**
Name Upper Skagit Tribe Water Reclamation								

	Fac								
Address	5984 Darrk Lane								
City	Bow	○	○	○	○	○	○	○	○
Zip	98232								
NPDES Permit#									
Facility Type	**Wastewater Treatment Plant (WWTP)**								
Comment	**Upper Skagit Water Reclamation Facility is being managed by Water-Wasterwater Services LLC.**								

Part 2: Report Completion Information

I certify that the information provided in this CCC Activities Report is complete and accurate to the best of my knowledge.		
CCC Program Mgr. Name[1]: Rebecca K. Zorn		Title: Cross Connections Control Coordinator
Signature:		Date: 05/21/2012
Phone: (360) 424-7104	E-mail: zorn@skagitpud.org	
I have reviewed this report and certify that the information provided is complete and accurate to the best of my knowledge.		
PWS Mgr./Owner Name[2]: George Sidhu		Title: Engineering Manager
Signature:	Op. Cert. No.:	Date: 05/21/2012

[1] CCC Program Manager is generally the CCS who is responsible for development and implementation of the PWS's CCC Program.

[2] The person that the CCC Program Manager reports to or other manager having direct responsibility and/or oversight of the CCC program.

Washington State Department of Health

Office of Drinking Water

Exceptions to High Hazard Premises Isolation Requirements for 2011 Annual Summary Report

Exceptions forms must be completed and submitted to the Department of Health (DOH) with the Annual Summary Report per WAC 246-290-490(4)(b)(iii).

Complete and submit one form for each exception PWS granted:

- In 2011,
- Before 2011, if PWS didn't previously submit an Exceptions form to DOH.

Don't

- Duplicate previously submitted Exceptions forms.
- Submit any Exceptions forms for 2011, if PWS didn't grant any exceptions in 2011, and already submitted forms for exceptions granted before 2011.

This Exception is: Renewed from 2009

Part 1: Public Water System (PWS) Information

PWS ID: 79500	PWS Name: SKAGIT COUNTY PUD 1 JUDY RES	County: SKAGIT

Part 2: Premises Information

Name of Premises	Cascade Prosthetics and Ortbotics
Service Address	17670 Dunbar Road, Mount Vernon, WA 98273
Premises Type or Category - Refer to Table 9 of WAC 246-290-490(4)(b)	Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers
Additional Information or Description of Premises (to help explain why exception is appropriate):	This facility has one small water heater in the one bathroom. There is one additional sink in one of two fitting rooms. This facility is used to fit custom made prosthetics and orthotics that are made at a separate facility. Tbere is a shop in a separate part of the facility that has no water supplied to the room. This shop houses various sanding and triming tools in order to further fine tune the custom made prosthetics and orthotics. There is no labratory or water use for any of these

	processes.

Part 3: Information Regarding Exception to Premises Isolation

Date of Hazard Evaluation	04/12/2011
Date Exception Granted or Renewed	04/12/2011
Expiration Date of Exception (If Any)	04/12/2012
Date of Next Hazard Evaluation	04/12/2012

Page 1

Part 4: Justification for not Requiring Premises Isolation Using AG, RPBA, or RPDA.

- The following table shows typical reasons for not requiring mandatory premises isolation. *The WAC doesn't require purveyors to grant exceptions – exceptions are optional.*
- Purveyors may provide other reasons consistent with WAC 246-290-490(4)(b)(ii), i.e. no hazard exists for this particular service.

Reason that the Premises Do Not Pose a High Health Hazard to Public Water System	Check if Applicable
Medical/Health Services Facility not having laboratory or similar facilities, no water-connected X-ray equipment, e.g. Psychiatric or Counseling Office, outpatient clinics, etc.	☑
Dental Office having independent water supplies for dental work (no interconnection with purveyor's water system) and digital X-ray equipment, i.e. no water-connected X-ray or other dental equipment.	☐
"Bottling Plant" without bottling processes, e.g. Warehousing only.	☐
Laundry or Dry Cleaners without cleaning processes on premises, e.g. customer drop-off and/or pick-up only.	☐
Marina/Dock for small boat moorage only (no water/sewage facilities on board).	☐
Agricultural Premises with "hobby farm" (non-commercial) activities only.	☐
Chiropractor's office with digital X-ray equipment, i.e. no water-connected X-ray or other medical equipment.	☐
Mortuary facility with funeral services only, no water-connected equipment for processing or embalming bodies.	☐
Nursing or boarding home with no water-connected medical equipment, specialized plumbing, or other hazards.	☐

Part 5: Form Completion Information

I am the Cross-Connection Control Specialist (CCS) who granted this exception to mandatory premises isolation and certify that the information provided is complete and accurate to the best of my knowledge.		
Name: Rebecca K. Zorn		CCS Cert. No.: 12209
Signature:		Date: 05/21/2012
Phone: (360) 424-7104	E-mail*: zorn@skagitpud.org	
I am the manager of the PWS and I concur with the granting of this exception to mandatory premises isolation and certify that the information provided is complete and accurate to the best of my knowledge.		
Name: George Sidhu		Title: Engineering Manager
Signature:	Op. Cert. No.:	Date: 05/21/2012

*Required Field. For security reasons, an email address must be provided. DOH will email you to confirm any changes made to your data.

APPENDIX Q

DESIGN AND CONSTRUCTION STANDARDS

RESOLUTIONS

- Resolution 1410 – Extension of Water Line in the Rural Areas
- Resolution 1626-94 – Improvements to the Water System and the Methods of Financing
- Resolution 1744-97 – Cross Connection Control and Backflow Assemblies

DISTRICT STANDARDS

- Design Drawing Standards for Proposed District Distribution Facilities
- District Standard General Notes

PERMITS AND EASEMENTS

- Fire Hydrant Use Permit
- PUD Utility Easement
- PUD Utility Easement (Plat Version)

ENGINEERING REVIEW

- Water Service Information Guide
- Water System Drawing Review Checklist
- Standard Developer Letter
- Developer's Agreement
- Water Service Contract
- Work/Job Order Authorization

CONSTRUCTION DOCUMENTS

- Utility Maintenance Bond
- Deposit in Lieu of Maintenance Bond
- Irrevocable Letter of Credit in Lieu of Maintenance Bond
- Maintenance Agreement for Governmental Agency
- Bill of Sale

STANDARD DETAILS FOR CONSTRUCTION

RESOLUTION NO. 1410

A RESOLUTION ESTABLISHING POLICY FOR THE
EXTENSION OF WATER LINE IN THE RURAL AREAS

WHEREAS, the Board of Commissioners of Skagit County PUD No. 1 judge it advisable that a policy for line extensions for rural areas be established, and

WHEREAS, it is necessary to differentiate between rural and urban, and

WHEREAS, the definition of those two words is found in Webster's New Collegiate Disctionary, copyrighted 1981, and are defined as follows:

RURAL - open land/ of or relating to the country, country people or life or agriculture

URBAN - relating to, characteristic of, or constituting a city.

WHEREAS, it is possible in rural areas to have "platted subdivisions" like those in urban areas; therefor the term "rural platted" means a subdivision in the rural area that is platted and approved by the Skagit County Government. Short plats are also included in this resoltuion, and they are defined as "four lots or less", and

WHEREAS, that area that is not part of a city, town or platted area will be referred to as "rural unplatted".

NOW, THEREFORE BE IT RESOLVED that a water line extension within a "rural platted" area shall follow the procedures as set forth in Resolution No. 1393.

BE IT FURTHER RESOLVED that in "rural unplatted" areas the water line shall be extended one length of pipe beyond the structure of the residence or the structure of the commercial establishment. Also, the diameter size of the water pipe should conform to DSHS standards, and the intent of sizing the line properly is to ensure a sound, well-structured water system that will provide the needed service in future years.

PASSED AND APPROVED by the Board of Commissioners of Public Utility District No. 1 of Skagit County, Washington, in regular session duly met this 22nd day of January, 1985.

President

Secretary

Vice President

RESOLUTION NO. 1626-94

A RESOLUTION OF THE COMMISSION OF PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON PROVIDING FOR IMPROVEMENTS TO THE WATER SYSTEM AND THE METHODS OF FINANCING THEREOF WHEN THE WATER PIPE PLANT IS TO BE INSTALLED BY EITHER THE DISTRICT (OR THE DISTRICT'S CONTRACTOR) OR A PRIVATE DEVELOPER

WHEREAS, various policies of Public Utility District No. 1 of Skagit County, Washington, regarding the installation of water lines have been stated in previous resolutions, and

WHEREAS, Public Utility District No. 1 of Skagit County, Washington, has determined a more equitable and precise policy is needed for the District and its water customers.

NOW, THEREFORE, BE IT RESOLVED that the following policy be adopted:

1. Ownership:

All water lines and appurtenances shall be designed and installed to District requirements and shall be and remain exclusive property of the District for future operation, maintenance and service responsibilities, with the exception of fire hydrants as specified in Section No. 3, j (3) (a). The point of District ownership shall end at the meter, detector check valve or hydrant gate valve, unless otherwise stated on the District's letter of final acceptance. For ownership of double detector check valves refer to Section No. 3. j. (1) (d) (3).

2. Design Responsibility

Water plant plans and specifications shall be prepared by the District's engineers or a private registered professional engineer to design standards of the District. The designer shall consult with the District's Engineer to determine requirements and criteria. Should the Developer want the District to prepare the plans and specifications, the District will determine if the existing workload will allow adequate time for the District's engineers to perform the task. Installation specifications shall include those of the Washington State Standard Specifications for Road, Bridge and Municipal Construction, modifications and other requirements set by the District. The plan shall be for water pipe plant only, not all utilities on one drawing.

3. Design Criteria:

a. General

The following design standards are the minimum allowable by the District for any and all water improvement projects, whether designed by the District or by another engineering firm/agency. The intent is that all projects be designed to the same standard to ensure uniformity of final product and of cost to the financier.

Good design of projects is a goal of the District. Although these standards are intended to apply to physical development within the District, the standards do not apply for all situations. Compliance with these standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for competent work by design professionals. The District may at its sole discretion for any reason require more stringent requirements than would normally be required under these standards.

Waiver of specific design criteria indicated herein must be requested in writing and may be approved only by the District's General Manager. The decision to grant, deny or modify the standards will be based upon evidence that the request can meet the following criteria:

(1) The change will achieve the intended result in comparable or superior design and a better quality of improvement; and

(2) The change will not adversely affect safety and/or operation; and

(3) The change will not adversely affect maintainability.

b. Pipe Sizing

(1) All main extensions and replacements shall be sized by the District based on District hydraulic and pressure requirements to comply with the District's basic water policy, Resolution No. 383 or as amended. The nominal size of these mains shall be a minimum of eight inches in diameter unless otherwise approved in writing by the District's General Manager. In all cases, pipe size shall meet Washington State Department of Health (DOH) minimum standards.

Extensions and replacements to and within the District's system shall be sized:

(a) to provide at least 40 psi, during peak hourly design flow conditions, at every service connection (meter) in the projected pressure zone; or

(b) to provide at least 20 psi, during fire flow and peak hourly design flow conditions, at every service connection in the projected pressure zone (fire flow shall be as required by the Fire Marshal having jurisdiction); or

(c) to flow water no faster than 10 fps in ferrous pipe and 8 fps in non-ferrous pipe under the conditions stated in conditions (a) and (b) above, whichever is more stringent.

(2) Customer/Developer Pipe Size Criteria:

The Customer/Developer will be required to pay for at least the minimum size pipe required to satisfy its flow and velocity requirements and/or minimum pipe size as delineated in Section No. 3. b (1). The District reserves the right to increase the pipe diameter for present or future needs of the District. This determination will be made by the District. If the District chooses to implement this option, the District may pay the difference in cost between the Customer/Developer flow requirements and/or minimum pipe size as delineated in Section No. 3. b (1), or require the Customer/Developer to pay the difference. The financing method and approval of increased pipe sizes will require Commission approval.

c. Materials:

The District's minimum standard is AWWA C151 ductile iron pipe Class 50, polyethylene wrapped. Should soil testing determine that the surrounding soils are corrosive, or that stray electrical current is present, the District may determine AWWA C-900 PVC pressure pipe Class 200 will be required. Tracer wire shall be used over PVC pipe when it is allowed. Tracer wire shall be No. 10 copper wire and shall be brought up in each valve box or attached to the ductile iron pipe at the transition point.

Should a District project be paid for in part with Federal funds or financed with Federal funds, Federal specifications may supersede the District standard for pipe materials. The Federal requirements will not be considered precedent-setting and will not be applicable to non-Federal funded or financed projects. The remaining provisions of this Resolution shall not be affected.

d. Length of Water Main Installation Requirements:

(1) Quantity requirements for rural nonplatted areas are described in Resolution No. 1410. Should that resolution be superseded, the current resolution will apply.

(2) Customer/Developer will be required to install pipe across its entire front footage of its lot/land in urban, city and platted areas. When more than one dwelling or establishment is to be served by a water main, and a public road, street, or private roadway provides access to the dwellings or establishments, the District will require a water main to be installed in front of the dwellings or establishments to the far edge of the property being served.

(3) Any appeals to the Commission shall be scheduled through the General Manager.

e. Water Services, General:

Water services should not exceed 300 feet from the meter to the point of use, in order to maintain adequate pressure. Services over 300 feet in length are permitted; however, the District cannot assure adequate pressure for these services as there are areas within the District where pressures are minimal.

The minimum meter size shall be a 5/8 x 3/4-inch meter or size in accordance with most current Uniform Plumbing Code.

Water mains constructed in platted areas shall include the installation of water services stubbed to common or individual lot corners. New services in nonplatted areas will be located by the customer. Water service installation shall include all materials indicated on the District's appropriate standard detail and conform to Section 9-30 of the Washington 1994 Standard Specifications for Road, Bridge and Municipal Construction including the most current amendments and revisions. Tracer wire shall be attached to all polyethylene pipe. Tracer wire shall be No. 10 copper wire. Tracer wire shall be installed to the end of the service pipe stubbed up approximately three feet at the property corners.

If the Customer/Developer encounters soils with indicators of hydrocarbons or should the District determine the possibility hydrocarbons exist, one inch copper pipe, soft, type K shall be used for one inch and smaller water services. Compression fittings suitable for type K copper pipe shall be used.

One and one-half inch and two inch services shall use 200 psi polyethylene pipe or Schedule 80 PVC on short side and less than 20'-0" in length. Three inch and larger services shall use class 50 ductile iron pipe.

f. Water Service with Meter Costs:

A Customer or Developer must apply for and pay for a water service with meter prior to installation of the meter. In addition to the metered service cost, new water services are required to pay a Systems Development Fee to the District. Refer to Resolution No. 1596-93 or it's successor. The Customer or Developer will be required to pay the System Development Fee and applicable meter installation fee as required by the resolution(s) in effect at the time a water meter is paid for. Water meters and related appurtenances will be installed by the District, the District's contractor, or by the Developer's contractor under District supervision.

g. Water Service Installations:

Water service lines shall be installed across streets and to common lot corner locations concurrent with the water main installation. The service lines will be connected to the pipelines and extended to lot lines with a tail piece extended

above the ground. Meter boxes shall not be installed until lot frontage grades are established and water service actually applied for. Water service stubouts to property corners shall be in place prior to pressure and bacteriological testing of the water main. Water service stubouts from the water line to the property corner(s) shall be part of the pipe installation cost to be borne by the Customer/Developer.

h. Pressure Reducing Valves:

Pressure reducing valves shall be installed on water services by the Customer/Developer when static line pressures exceed 80 psi. At the Customer/Developer's request, the District will calculate or measure the water pressure at the Customer/Developer's point of delivery as an aid to determining whether a reducing valve is required. Pressure reducing valves, when required, shall be installed and maintained by the Customer/Developer. Pressure reducing valves are not to be installed in the meter box.

i. Back flow Prevention:

The District responsibilities include protecting the entire water system from actual and potential contamination. Present state and national regulations require that there shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing non-potable water. Construction shall insure the prevention of back flow of contaminated water into a potable water system. Cross-connection control assemblies shall be installed by the Customer/Developer when deemed necessary or when required by the District. The entire cost of the installation shall be borne by the Customer/Developer, and any assemblies shall remain its ownership and its responsibility. Inspection of such assemblies may be made periodically by District representatives. It shall be the Customer/Developer's responsibility at all times to maintain its cross-connection control assemblies in a fully functioning condition. All DOH requirements must be satisfied. This requirement is in conjunction with and does not supersede Resolution No. 1292. Should Resolution No. 1292 be superseded, the superseding resolution shall apply.

j. Fire Protection:

(1) Commercial:

(a) Fire protection by fire hydrants and/or other means shall be required as determined by the person designated as "fire chief" for the jurisdiction involved. The District will not allow installation of fire hydrant(s) on water mains wherein the potential demand of the hydrant will exceed safe operating velocities as established in Article 3 b. (1) (c) of this Resolution.

(b) Application shall be made by completing and signing a standard application form.

(c) The minimum charge shown on the District's rate schedule (Resolution No. 1603-93 or the superseding resolution) includes water for fire protection use only.

(d) Service charge for new fire protection service connection:

(1) The Customer shall pay the total installation cost of all fire service lines from the Customer's point of use to an existing or new District main with adequate capacity to provide the required fire flows.

(2) The Customer shall pay the cost of the detector check meter plus the cost of installation. Ownership of detector check meters installed in buried vaults outside the Customers building shall be transferred to the District.

(3) Double detector check valves installed within the Customer's building as part of a fire sprinkler system shall have a remote meter reader installed on an outer wall of the building the check valve is installed in and be readily accessible to the District's meter readers. On easements on

private property District ownership and responsibility shall end at the gate valve on the water main at the point the fire service line is connected. On public right-of-ways District ownership and responsibility shall end at the property line.

(4) Notwithstanding the provisions as contained in these schedules for commercial fire protection service, or for other metered service, including water furnished to any fire hydrant or other equipment used, or which may be used for fire protection service connection, it is understood that the District cannot guarantee any minimum quantities of water or pressure of the water to be furnished to any such hydrants or outlets, and the District shall not be liable in any manner for any loss or claim by reason of the quantity of water, or pressure of the same furnished to such hydrant or outlet.

(5) Standby charges for fire protection are addressed in Resolution No. 1603-93. If any of these resolutions are superseded, the superseding resolution shall apply.

(2) Residential:

(a) The installation of fire hydrants in residential areas shall be according to City, County and State regulation. The District will refer to the applicable WAC provisions (WAC 248-57) and/or to the person designated as the "fire chief" to the particular jurisdiction for applicable requirements. The District encourages fire hydrant installation on mains large enough and with adequate supply to provide sufficient fire protection. The District will not allow installation of fire hydrant(s) on water mains wherein the potential demand of the hydrant will exceed safe operating velocities as established in Article 3 b. (1) (c) of this Resolution.

(3) General:

(a) Fire hydrants shall be a cost of the particular project. Final ownership of the hydrant shall be transferred to the District except on private property and not accessible to the public wherein the District may determine that the hydrant ownership shall remain with the Customer/Developer.

(b) It is understood that the District cannot guarantee any minimum quantities of water or pressure of the water to be furnished to any of such hydrants, and the District shall not be liable in any manner for any loss or claim by reason for the quantity or pressure of water furnished to such hydrant.

(c) Only authorized District personnel or firemen in the performance of their duties shall operate fire hydrants connected to the District's water system. The only exception to this requirement is specified within Resolution No. 1457 or the superseding resolution.

k. Tapping of Mains:

All taps made to the existing main shall be made by District crews or under direct supervision of qualified District personnel. Payment shall be made in advance for this work.

4. Water System Improvements Installed by District/District's Contractor

a. Application for Water Line Extension or Other Services:

Upon request, the District will provide to a Customer/Developer a written estimate for the installation of water lines and appurtenances. If the Customer/Developer and the District agree to proceed with the project, the Customer/Developer shall pay in advance to the District the estimated cost of installing the water lines designed by the District Engineering Department. Costs shall include, but not be limited to, material, labor, equipment rental, engineering,

overhead, and right-of-way costs. Permits, easements, environmental and related reports, shoreline permits, railroad and highway crossing permits will be obtained by the District, and any fees levied shall be paid by the Customer/Developer.

Payment may be made in two installments. The first payment shall include, but not be limited to, the estimated cost of materials, engineering, right-of-way cost, permits, easements, environmental and related reports, shoreline permits, railroad and highway crossing permits. The second payment shall be made when the District is in a position to reasonably forecast when it will be able to begin actual on-site construction. The second payment shall be the balance of the estimated cost as described in this section. The District shall contact the Customer/Developer, or his financier if directed, and request the balance of the estimated cost. After all work has been completed, all conditions satisfied, and all accounting completed, the Customer/Developer shall be billed for additional costs incurred over the payment(s), or refunded any unused balance.

If a Customer/Developer cancels a project after the first payment is paid, the Customer/Developer shall be required to pay District costs incurred through the date of written termination of said project. Termination costs may include specialty items if said items cannot be returned to the vendor. Re-stocking charges shall be to the Customer/Developer account. Specialty items that cannot be returned shall become property of Customer/Developer. Cancellation charges shall be deducted from the deposit and the balance refunded. If the cancellation charge is greater than the deposit, the Customer/Developer shall be charged for the difference.

Estimates over sixty days in age are subject to change prior to acceptance of payment. If the District is required to revise the estimated cost of a project more than two times, the District may charge the Customer/Developer the cost of further revisions to the design or estimate.

b. Contracts with District:

Contractors working for the District must enter into a contract with the District for the work involved. The District will prepare the contract documents.

5. Water System Improvements Installed by Customer/Developer

a. Written Estimate for Plan Review and Construction Inspection Services:

Upon request, the District will provide to a Customer/Developer a written estimate for the installation of water lines and appurtenances. If the Customer/Developer and the District agree to proceed with the project, the Customer/Developer shall pay in advance to the District the estimated cost of installing the water lines designed by the District Engineering Department. Costs shall include, but not be limited to, material, labor, equipment rental, engineering, overhead, and right-of-way costs.

b. Developer Damage Agreement:

The Customer/Developer shall sign and return a "Developer's Agreement" form and "Work Order Authorization" furnished by the District that guarantees payment to the District for costs of repairs to District plant damaged by activities of the Customer/Developer or its contractor(s) in the construction of the development. The agreement requires the Customer/Developer to certify that the final grade has been established throughout the construction area of the development and the water plant has been installed to the design grades. The Customer/Developer shall agree to accept financial responsibility to relocate all water plant vertically and horizontally if the grades are changed.

c. Progress Requirement:

Sections 2, 5a, 7, 8, 9a, 9b, 10, 11, 12, and 13 are to be complied with, completed and satisfied before any water plant construction is started. There shall be a pre-construction conference with the District a minimum of 48 hours prior to start of construction.

d. Final Connection:

After acceptance, the District shall complete final connection of the Customer /Developer-installed plant to existing District plant. If the District has already installed tee(s) and valve(s), the Customer/Developer may complete the connections by special agreement and under District inspection. All connecting pipe and fittings shall be sterilized as required in Section 14c and shall be maintained clean and uncontaminated. System flushing shall be performed by qualified District personnel.

e. As-Built Drawings:

The Customer/Developer will furnish to the District one high-quality set of transparent reproducible drawings, (maximum size of 24" by 36") corrected to as-built conditions. The as-built drawing shall show the exact locations of all installed pipe and fittings in relation to survey points, such as street monuments, lot corners, etc.

f. Requirement Prior to Final Connection to Existing System:

Sections 5c, 5g, 14b, 14c, 16 and 17 shall be completed to the District's satisfaction before full and final connection to the District system will be permitted.

g. District Acceptance:

If the plant appears to have been installed in good workmanlike manner, to the approved plans and specifications, pressure and bacteriological tests are passed, and all of the above listed conditions are fully satisfied, the District shall prepare and date a letter of acceptance of the pipe plant installed. This date shall begin the period of warranty.

h. Transfer of Ownership:

The Customer/Developer shall deliver to the District a Bill of Sale or acceptable form, transferring the ownership of all pipe plant within the development to the Public Utility District. The Bill of Sale shall describe lengths and sizes of plant, and the location in general terms such as the name of the plat. In addition, there shall be an itemization of all installed costs of water pipe plant broken down as to descriptions of kind, size and lengths of each type of pipe with unit or lump sum costs for each type, including fittings. The cost itemization shall include a breakdown of the material, labor, construction equipment, engineering, and sales taxes. Water service materials and costs (and meters if installed by the Developer), must be listed separately. Include all private engineer's fees involved with water plant work. Do not include fees paid to the District.

Fire hydrant assemblies (tee, valve, connecting pipe, valve casing and cover, hydrant, blocking and installation) and costs are to be listed separately but not included in cost of project. Hydrants installed under this resolution shall be owned and maintained by the District except as specified in Section No. 3. j. (3) (a).

6. Water System Improvement Financing

a. Formation of a Local Utility District:

Property owners within a defined area may petition the District Commissioners to extend water mains to their properties by formation of an LUD. All engineering, administrative costs, attorney and consultant fees, feasibility studies, title reports, costs of easements, permits, environmental reports, and shoreline permits and other related costs are a part of the LUD costs. LUD's estimated to cost less than $12,000 will generally be considered not feasible. If this method is used, benefited properties will be assessed as provided by law.

b. District Financed Water Plant:

When a water pipeline extension to properties not previously abutting a District pipeline is constructed with District moneys, each Customer/Developer connecting to the extension during the ten years following completion of the construction shall

be required to share in the cost of the original construction. See Section 15 of this Resolution.

7. Plan Approval - Public Utility District:

Two sets of plans and specifications shall be submitted for the District Engineer's approval. One set shall be returned stating corrections, additions or approval as submitted. Two corrected final design sets of water plant plans and specifications shall be furnished to the District Engineer. Plans of sewers, buried wire service, other utilities, street design and final plat shall also be furnished, unless waived by the District Engineer, to illustrate the relationships of other facilities to water pipe plant. Water pipeline survey stationing shall be referenced to roadway center line or right-of-way line. Water lines that are to be installed in areas where finished grades do not exist or where the finished grades may be realigned shall have final grades established prior to installation. Grade and alignment stakes shall be required for the water plant installation.

Developments or projects that are to be phased shall be shown in their entire concept prior to approval of any phase, so the District can be assured that adequate design criteria are established.

8. City Plan Approval - County Permit:

Plans of water plant shall be submitted for approval to the governing agency in which the development is located. Three sets of plans are required for City approvals. One signed set is retained by the City, one signed set submitted to the District and one signed set for the Customer/Developer. Skagit County requires two sets of plans with its standard permit application. One copy of the County permit, or one signed set of plans in the case of a city location, shall be delivered to the District Engineer prior to commencement of work. The project designer shall verify submittal requirements with the permitting agencies.

9. Other Approvals:

a. Permits

All other permits shall be obtained by the waterline installer in the District's name as required by law. These could include, but not be limited to, Washington State Department of Health, Washington State Department of Ecology, Diking Districts, Drainage Districts, game and fish agencies, Highway Department, Department of Natural Resources, State land agencies, gas or oil pipeline companies, railroads, etc. Copies of all permits and/or approvals shall be furnished to the District Engineer prior to commencement of work. All rights shall be granted to or transferred to the District.

b. Materials Submittal Requirement:

Prior to construction, the Customer/Developer or the contractor installing the water system improvements shall submit a list of all brands, sizes, types, grades and standards of materials to be used in the water plant. All pipe, fittings, valves and appurtenances shall be manufactured to AWWA standards. The District may reject certain brands at its discretion. The District will provide approval, disapproval and/or comment by letter.

10. Easement Rights-of-Way:

All plant not to be located on public dedicated rights-of-way shall be on easements dedicated to the District, either shown on the plat or by instrument acceptable to or on the District's standard form, "Water Pipeline Easement". Easements shall be twenty to twenty-five feet in width (except wider under special topographic conditions), or to a width as required by the District. An easement may coincide with another utility easement, except all sanitary sewer lines must be ten feet or more from water lines and other utilities a minimum of five feet. Water lines shall be located no closer than five feet from the edge of easement areas.

11. Deposit:

The District will provide a quotation based on estimated costs for tie-ins to existing District plant and for District inspection and administration of the work performed by other than the District forces. The Developer must request these quotations a minimum

of three weeks in advance of the need for the cost figures. The Developer shall pay a deposit in the amount of the quotation(s) before any work is started. Quotations are subject to change if deposits are not made within sixty days of the quotation. After all work is complete, all conditions satisfied and all accounting completed, the Developer shall be billed for additional costs incurred over the deposit(s) or refunded any unused balance.

12. Contractor Insurance Requirements:

A contractor performing water plant installation shall agree to indemnify and defend and to save the District harmless from any and all claims or liability for damages arising from acts done under the contract. Specific requirements are pursuant to Section 1-07.18, Public Liability and Property Damage Insurance, of the Standard Specifications. Substitute District for State and General Manager for Secretary in Section 1-07.18. Certification by the Contractor that a policy or endorsement to an existing policy satisfying all the requirements set forth above has been obtained from a particular insurance company and is in effect shall be forwarded to the General Manager prior to commencing work on the project.

13. Licenses:

Contractors working for the Customer/Developer or the Customer/Developer installing water plant, shall be licensed and bonded in the State of Washington. A copy of the installing entity's contractor's license shall be forwarded to the District prior to installation of the water plant.

14. Construction Procedures:

The District has adopted the Washington State Department of Transportation/American Public Works Association 1994 Standard Specifications for Road, Bridge, and Municipal Construction, including the APWA Supplement. Should the 1994 edition be revised the most current issue shall be applicable. All construction work of plant or facilities to become final property of the District shall be as specified in the Standard Specifications unless superseded in this resolution or specifically amended by special conditions within the project specifications that are approved by the District's Engineer.

The approved construction plans and specifications shall be followed. No deviations will be allowed without request for change and approval received from the design engineer and District's Engineer. The District reserves the right to order changes in the event of conditions or circumstances discovered during construction; such changes could result from the ability or care shown by the contractor, natural and man-made conditions, or any other reason.

There shall be extreme care in checking and cleaning all pipe and fittings of dirt, debris and/or any foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal plant installed when it is to be left for any period of time; including lunch breaks, coffee breaks and overnight. Pipe and fittings shall be washed before installation if contaminated by dust, smoke, exhaust or any other material. Material contaminated by petroleum products or questionable chemicals shall be rejected. No trench water shall be allowed to enter installed plant.

a. District Inspection:

No work on water pipe plant shall be allowed by other than District personnel without a District inspector being present. The District may refuse acceptance of any such plant installed without District inspection. The District shall be notified a minimum of two full working days in advance of a firm starting date and time to arrange for and schedule the inspector. Work must proceed in a continuous manner. If there are breaks in construction, there must be two working days notice before beginning again. Inspection costs shall be borne by the Customer/Developer.

b. Pressure Testing:

All new plant shall be hydrostatic pressure tested as specified in Sections 7-11.3(11), 7-11.3(11)A, 7-11.3(11)B and 7-11.3(11)C of the Standard Specifications. Exceptions to this requirement must be recommended in writing by the District's Engineer and approved in writing by the District's General Manager. The waterline installer will provide all testing equipment. The final testing performed by other than District personnel shall be in the presence of the District's inspector.

c. Disinfection:

Before being placed into service, all new water mains and repaired portions of or extensions to existing mains shall be chlorinated and a satisfactory bacteriological report obtained. Disinfection procedures are detailed in the Standard Specifications.

The waterline installer shall be responsible for disposal of treated water flushed from mains and shall neutralize the waste water for protection of aquatic life in the receiving water before disposal into any natural drainage channel. The Customer/Developer shall be responsible for disposing of disinfection solution to the satisfaction of State and local authorities.

d. Final Tie-In:

Final tie-in to existing District plant shall not be permitted until after acceptance by the District of all installation. Acceptance shall not be made until all required paper work and acceptable plant installations are complete. A small tubing connection (3/4-inch to maximum of 2-inch size) can be made from District plant to supply water for line filling, pressure testing, sterilization and sterilizing water removal. An approved back flow preventer shall be installed in the 3/4 to 2-inch supply line.

15. Latecomer Provisions:

Additional Customers added to any extension built and paid for by a Customer/Developer during the first ten years after completion of the construction will be required to share in the cost of the original construction. The cost per foot of the extension would be established at the time of the original installation. Prior to connection, the Customer shall pay to the District, in addition to other applicable charges, a latecomer fee equal to the front footage of the pipeline abutting the Customer's property multiplied by one of the following footage charges:

(1) For pipelines eight inches in diameter and smaller: one-half the actual cost per foot of the extension including fire hydrants.

(2) For pipelines larger than eight inches in diameter: one-half the average cost per foot for typical 8-inch diameter water extensions in the water system for the calendar year the oversized main was installed. The cost of the 8-inch water pipeline shall be all inclusive, e.g., includes fittings, fire hydrants, backfill materials and surface restoration. The average cost per foot, for the calendar year 1993, has been established at $22.88. The cost per foot for pipe installed during ensuing years will be adjusted to incorporate inflation as established in the Consumer Price Indexes (1982-84=100) published by the Bureau of Labor Statistics, U.S. Department of Labor.

(3) Water mains that do not have opposing sides for water service connections may be eligible for a different latecomers formula as permitted in Section 29.

If a later Customer/Developer taps off the side of this original extension with a new main pipeline he shall pay on the basis of a 100-foot lot multiplied by the footage cost, or on the basis of one-half the front footage of the water main abutting the Customer's property multiplied by one of the above footage charges, whichever is greater. There shall be no latecomer fees for any main extensions continuing off the end of the original extension. The effective start date for the term of the latecomers agreement is the date of initial permanent use of the new water main, or the acceptance of the installation by the District Commissioners, whichever is later. No waivers shall be permitted.

A Customer/Developer shall not be eligible for latecomers refunds for land owned at the time of water main installation and later sold. The effective start date for the term of the latecomers agreement is the date of initial permanent use of the new water main. No waivers shall be permitted. Latecomer refunds cannot exceed the cost of the original installation.

16. Bond:

A maintenance bond or cash bond for the water plant installed by other than District personnel shall be furnished to the District. For projects of $10,000 or less, the bond shall be not less than fifty percent (50%) of the full installed value of the water plant. For

projects ranging from $10,001 to $25,000, the bond shall be not less than forty percent (40%) of the full installed value of the water plant. For projects in excess of $25,001, the bond shall be not less than twenty five percent (25%) of the full installed value of the water plant. The bond shall be effective for a period of one year from the date of the letter of acceptance of plant by the Public Utility District. This letter shall not be prepared and dated until after satisfaction of all conditions listed herein. The purpose of the bond shall be to guarantee payment to the District for costs of repairs that become necessary during the first year of operation. Further, the bond shall guarantee payment for replacement of any or all of the plant if it is determined failure is excessive and the plant cannot be relied upon for long, trouble-free life. The District shall be sole judge of the adequate performance of such plant.

17. District Representation by Employees:

No inspector, agent, or employee of the District may ask, demand, receive or accept any personal compensation for any service rendered to water consumers or other persons, in connection with supplying or furnishing water by the District. No promise, agreement or representation of any employee or agent of the District with reference to the furnishing of water shall be binding on the District unless the same shall be in writing signed by the General Manager or his authorized agents.

BE IT FURTHER RESOLVED that this resolution shall supersede Resolution Numbers 1291, 1376, 1393, 1472, 1522-91 and 1523-91.

ADOPTED by the Commission of Public Utility District No. 1 of Skagit County, Washington, at a regular meeting held this 31st day of May, 1994.

Lee Bode
President

Vice President

ATTEST

Secretary

RESOLUTION NO. 1744-97

A RESOLUTION OF THE COMMISSION OF PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON, ADOPTING POLICY AND PROCEDURE CONCERNING CROSS CONNECTION CONTROL AND BACKFLOW ASSEMBLIES

WHEREAS, the Board of Commissioners desires to define and regulate the installation of backflow prevention assemblies, and

WHEREAS, it is a State Department of Health requirement that the District protect the potable water system from actual and potential contamination by objectionable and hazardous liquids, solids and gasses, and

WHEREAS, the Board of Commissioners desires to amend and enhance District policies relating to Cross Connection Control,

NOW, THEREFORE, BE IT RESOLVED, by the Board of Commissioners of Public Utility District No. 1 of Skagit County, Washington, as follows:

The installation and maintenance of any cross-connection is prohibited which could endanger any water supply of the District. Existing or future water service to any premises will not be allowed to exist by the District if a cross connection control assembly required by the Department of Health or by the District is not documented in writing to be permanently installed, maintained and tested annually. Water service will be discontinued to any consumer that refuses admittance of District personnel to their premises for the purpose of cross connection control. Water service will not be restored until such conditions or defects are documented to be correct. Expenses incurred to enforce these provisions shall be paid by the consumer before water service is restored.

The control or elimination of cross connections shall be in accordance with the provisions of the Washington Administrative Code, WAC 246-290-490 or subsequent WAC. The policies, procedure, and criteria for determining appropriate levels of protections shall be in accordance with the accepted procedures and practices defined in Cross Connection Control Manual - Pacific Northwest Section - American Waterworks Association, 5th Edition, or any superseding edition. Policies will be interpreted and carried out by a State certified cross connection control specialist or backflow assembly tester, whichever applies. All cross connection control devices must be as approved by the State of Washington.

BE IT FURTHER RESOLVED, this resolution supersedes Resolution No. 1292.

ADOPTED by the Commission of Public Utility District No. 1 of Skagit County, Washington, at a regular open meeting held this 7th day of January, 1997.

Jones E. Atterberry, President

Lee D. Bode, Vice President

ATTEST

Al Littlefield, Secretary

DESIGN DRAWING STANDARDS FOR PROPOSED DISTRICT DISTRIBUTION FACILITIES

The following drawing standards apply to the design of any water distribution facilities that are being submitted to the District for approval. In the case of a project that includes the design of multiple utilities, the Design Engineer may use their own AutoCAD standards and cover sheet layout. However, the District still requires that the design of the water distribution facilities be provided separately from the other utilities, following the format as described below.

DRAWING REQUIREMENTS

1. Drawings shall be prepared using the District's drawing standards, including layer names, line types, line weights, symbols, .ctb file, details, etc. All drawings shall be prepared using the District's title block with the Design Engineer's company logo placed in the space provided. All District standards are available at www.skagitpud.org.

2. Final Drawings shall be submitted on good quality reproducible paper copy, along with an electronic file on Compact Disk (CD) media in AutoCAD drawing format and shall be archived so that all x-references, including title block and border, are a permanent part of the drawing. Drawings submitted in .plt or .pdf format are not acceptable.

COVER SHEET

All plan sets must have a cover sheet, followed by the plan and profile sheets, then followed by the detail sheets. The cover sheet shall be Sheet 1 of the plans and must contain the following:

- Project Title: Title shall be in large, bold text, located on the upper center of the cover sheet. Typical project titles shall describe the District area, or primary street name and street termini.

- Project Description: Describe the type of work the project includes, such as: *Replace 100 feet of 4" A.C. pipe with 100 feet of 8" D.I. pipe*

- The District Construction Order Number (C.O. # _____) and the Work Order Number (W.O. # _____).

- Name and contact information of the Engineer.

- Vicinity Map showing the location of the project within the District.
- Sheet index
- Signature block for approval of appropriate fire district.

PLAN/PROFILE/DETAIL SHEETS

- Design drawings for proposed pipelines are required to show a plan view and a profile view of the pipeline on the same sheet.
- Sheet size shall be 22”x34” unless otherwise approved by the District.
- Drawings shall contain a North arrow on each plan /profile sheet with North oriented to the top or right side of the drawing.
- Drawings shall contain a bar scale on each plan sheet. The horizontal scale shall be 1"=20' unless otherwise approved by the District. The vertical scale shall be as appropriate.
- Paper copies of drawings shall contain the stamp and signature of a registered Professional Engineer on each sheet.
- All dimensions shall be shown in feet, tenths and hundredths of a foot.
- Road centerlines in relation to right-of-way shall be shown. The names of public and private roads shall be shown.
- Existing underground utilities, including water mains shall be shown in the appropriate line type.
- All existing underground utilities shown on the plan view that cross the proposed waterline must be shown on the profile at the surveyed depth. If the depth is unknown, then the utility shall be shown at an assumed depth of three feet with a note that states “depth unknown”.
- Profile portions of water drawings shall show the proposed waterline in relation to other existing utilities. The profile must include rim elevations of all structures and manholes, invert elevations of all pipes connecting to structures and manholes, length of proposed waterline between structures or pipe grade breaks, pipe grade and utility crossings.
- Items to be called-out on the drawings shall include valves, fittings and their connections, and appurtenances such as air vacuum assemblies, blow-offs, flushing assemblies, hydrants and service connections.

- Drawing Callouts should be formatted as follows:

A. Plan View

- Call out the type of pipe, class of pipe, type of joint and restraint if applicable on plan view.
- Fittings and deflections that affect horizontal alignment should be called out in plan view only.
- Use following format on leader lines for fitting callouts:

STA XX + XX, XX' RT or LT
[number] – [size] [material] [fitting], [connection type] (Direction)

Example: STA 25 + 75, 10' RT
1 – 12" x 8" DI TEE, FL
1 – 8" DI GATE VALVE, FLxMJ (W)
1 – 8" DI SPOOL, PExPE (W)
1 – 8" FLEX COUPLING (W)
1 – 12" DI BUTTERFLY VALVE, FLxMJ (N)

B. Profile View

- Fittings and deflections that affect vertical profile should be called out in profile view only.
- Use same fitting callout format as in plan view
- For storm and sanitary callouts on the profile view, use following format:

SSMH [size] or CB [type] [size]
RIM = XX.XX
IE [size] [material] (IN or OUT) (Direction) = XX.XX

Example: SSMH 60"
Rim = 60.75
IE 12" PVC IN (W) = 49.95
IE 12" PVC OUT (N) = 49.00

CB Type 1 48"
Rim = 31.75
IE 6" CONC IN (N) = 27.25
IE 12" CONC OUT (E) = 26.95

- Standard details and other project specific details should be consolidated and placed on sheets at the end of the plan set. Plan/profile sheets and detail sheets shall be cross referenced with the sheet and detail numbers of appropriate details.

- The Districts General Notes shall be included and District standard details shall be used unless a specific detail has not been developed and an alternative has been approved by the District.

- All new District pipelines shall be shown in bold and referenced to and stationed along the centerline of the street or right of way from West to East or South to North. Stationing shall start at most westerly point and increase to the east, or start at most southerly point and increase to the north. Start all stationing at 1+00. Stationing for points of curve, points of tangent and intersections shall be shown. For pipelines located within easements, stationing shall be along pipeline centerline.

- All existing District pipelines shall be shown on the plan view, along with the District CO number and year of installation. Coordination will be required with the District to research existing pipelines and their location.

- Show all existing water meters along the route and specify that the services are to be re-instated with new 1 ¼" PE pipe, unless otherwise specified.

- All new and existing District pipelines shall be drawn utilizing an offset from the existing right-of-way and/or road centerline.

- Road centerlines shall include length and bearings of all straight lines, curve radii, curve delta angles and arc lengths.

- A typical road or street section with roadway prism, ditches, underground utilities, etc. shall be included.

REVISION BLOCK

- Original submittal of plan set to District for review shall be noted in the revision box located on the District title block.

- All design changes made after District approval shall be noted in the revision box and revised plans shall be re-submitted to District for review.

RECORD DRAWINGS

- Upon completion of the project, the original drawings shall be changed to reflect the actual construction of the project and be submitted to the District as **Record Drawings**. Each sheet shall bear the stamp and signature of the Engineer of Record and the words "Record Drawings" shall be prominently shown.

- All changes made during construction shall be noted in the revision box. Plan and profile sheets should be clouded and noted in all areas where revisions have occurred and cross referenced with the revisions entered in the revision box. Revision clouds and notes shall be placed on a "Revision_#" layer so they can be isolated during review.

DESIGN REQUIREMENTS

The following design requirements apply to all new water pipeline construction within the District, regardless of whether the project is being designed for the District, a Developer or another jurisdiction within the District.

- Any new pipelines shall be offset a minimum of 5 feet center to center from existing or retired water pipelines. Department of Health guidelines require a 10-foot horizontal separation and an 18-inch vertical separation between water pipelines and sewer mains. The District requires a minimum 12inch vertical separation between water pipelines and other utilities.

- Include a 1-inch air/vac assembly for a proposed 8-inch pipeline or a 2-inch air/vac assembly for a 12-inch pipeline at any high points as determined by the profile.

- Include a 2-inch flushing assembly for proposed pipelines, 8-inch diameter or less, and a 3-inch flushing assembly for proposed 12-inch pipelines at the ends of new proposed pipelines. For pipelines larger than 12-inch diameter, contact the District for requirements.

SURVEY REQUIREMENTS

The following survey requirements apply to all survey only projects put out for bid and awarded by the District. Contractors doing work for developers or other jurisdictions may use their own survey standards. The District still requires, however, that NAD83/91 horizontal datum and NAVD 88 vertical datum be used.

1. All surveys shall be completed to NAVD 88 vertical datum, and NAD83, Washington State Plane Coordinates, North Zone horizontal datum. A copy of the original survey notes must be submitted to the District for future reference.

2. The Surveyor shall locate and show on the topographic survey drawing the following information located within the road right of way or other project limits as determined by the District:

    - The location of permanent structures including retaining walls, bridges, and culverts.

    - Description, location and elevation of bench marks used in the survey.

- All found monuments and property corners shall be shown. All survey points shall also be provided to the District in digital format.

- Right of way lines and easements shall be shown with appropriate dimensions. Easements shall be labeled with the Auditor's File Number or Book and Page of each referenced document and the name of the owner of the property over which the easement is located.

- Location and the top elevation of soil borings or monitoring wells if ascertainable.

- Road cross-sections including road centerline at 50-foot intervals. The location of curbs, gutter lines, sidewalks and ditch centerlines.

- Intersecting streets shall be shown along with their names, accompanying topography, utilities and other improvements for at least 100 feet on each side of the intersection point.

- Existing contours shall be drawn to show abrupt elevation changes.

- Location, diameter, and species of all trees over an 8-inch diameter. Perimeter outline only of thickly wooded areas unless otherwise directed.

- Electric utilities – the location of power poles, guy wires, anchors, vaults, etc., within the right-of-way or project limits as defined by the District.

- Storm, sanitary or combined sewers – the location of all observable manholes and other structures such as culverts, headwalls, catch basins and clean-outs within road right-of-way. Include elevations of the top of manholes and catch basins. Show type, size, direction of flow and invert elevation of all pipes or culverts.

- Water – the location of any water valves, water line markers, standpipes, meters, regulators, fire hydrants, etc. that are visible within the road right-of-way.

- Gas – the location of all valves, meters, and gas line markers that are visible within the road right-of-way.

- Telephone – the location of all poles, manholes, boxes, etc. that are visible within the road right-of-way.

- Street lighting – the location of all lamp poles, boxes etc.

- Location of any existing buildings, tanks, fences, miscellaneous structures and driveways within the road right-of-way.

- The Surveyor shall provide the survey data in AutoCAD drawing format. All survey points shall consist of point number, elevation and point description.

DISTRICT STANDARD GENERAL NOTES

(Minimum Requirements)

(Engineer's Notes May Be More Stringent)

1. Unless stated otherwise, all work is to be performed in accordance with the most current Washington State Department of Transportation (WSDOT) Standard Specifications for road, bridge and municipal construction and the District requirements as outlined in the District's Water Policy Manual.

2. The contractor shall schedule a pre-construction conference with the District Engineering Department, (360) 424-7104, a minimum of 48 hours prior to construction.

3. All permits necessary for the installation of the proposed water system improvements will be the responsibility of the Developer, Engineer, or Contractor to acquire. A copy of the permit will be submitted to the District, prior to construction. All rights shall be granted to, or transferred to, the District.

4. All tie-ins, shutdown, flushing, and health samples shall be coordinated with the District. The contractor shall not operate any valves.

5. All materials are to be approved by the District prior to construction. A list of materials, indicating the manufacturer, model, and size, for the water system improvements will be submitted to the District and approved before any construction. Refer to District submittal requirements for details.

6. Ductile Iron pipe will be minimum class 50 AWWA C151 per WSDOT standard specifications 9-30.1 and 9-30.1(1). All Ductile Iron water pipe and fittings shall be completely wrapped with a minimum of eight-mil polyethylene pipe encasement and installed in accordance with AWWA C105 and WSDOT standard specifications 7-09.3(17) and 9-30.1(2).

7. All bolts used in buried flanges shall be ASTM A325 Type 3 (corten steel) unfinished, with nuts to ASTM A563C3 or A563DH3 and washers to ASTM F436-1. All bolts, nuts and washers used in exposed or above ground locations shall be ASTM/A307, hot-dip galvanized.

8. All gate valves to be resilient seated gate valves, AWWA C515 or C509 (ductile iron body only) with stainless steel nuts, bolts and trim.

9. All butterfly valves to be rubber seated butterfly valves, AWWA C504 with stainless steel nuts, bolts and trim.

10. Restrained joints may be used in place of concrete blocking as directed by the Project's Design Engineer and accepted by the District.

11. Contact the municipal fire department or Skagit County Fire Marshal for acceptable fire hydrants and Storz adaptor fitting requirements.

12. A #10 solid copper wire with blue insulation is to be installed with/and attached to all new water pipelines and service pipelines. Refer to District Details for installation requirements.

13. Unless otherwise specified, all water pipeline installations require a 36-inch minimum cover and 48-inch typical trench depth to existing or future finish grade and a minimum of 1-foot vertical and 5-foot horizontal clearance between water pipeline and all other utilities unless otherwise specified. Water pipeline horizontal and vertical alignments are required to be staked on a maximum 50-foot interval, or as required by the District.

14. When installing water pipeline across existing or proposed sanitary sewer, a full length of pipe shall be installed with mid-span of the water pipe over the sewer. A minimum 10-foot horizontal separation and 18-inch vertical separation between water pipelines and sanitary sewer pipelines is required, unless an alternative proposal from the design engineer is submitted to and approved by the District.

15. Bedding material for the Ductile Iron pipe shall be select, native, granular material free from wood waste, organic material or other extraneous or objectionable materials and shall be a maximum size of 1 1/2-inches or approved pipe bedding per WSDOT Specification 7-09.3(9) and 9-03.12(3). Pea gravel and buckshot are not acceptable.

16. Backfill trenches in pavement areas with pit-run gravel compacted to at least 95 percent minimum density per WSDOT Specification 7-09.3(11). The contractor shall make all pavement repairs and perform all restoration.

17. Disinfection and flushing of the water pipelines are to be per WSDOT Specifications. Use dechlorination equipment when flushing or, with permission of the appropriate sewer utility, flush into sanitary sewer manholes. Do not flush into or allow chlorinated water to drain into any creek, wetland, or catch basin. The total estimated amount of water used for filling and flushing of the water pipeline is _____.

18. All salvaged usable District owned materials are to be delivered to the District Office at 1415 Freeway Drive, Mount Vernon, or as directed by the District.

19. The utility locations marked on this map are approximate. The contractor is to verify actual location and depth prior to construction. Call the underground utility locate center at 800- 424-5555.

20. All private fire sprinklers or private fire hydrant pipelines are required to be installed with a Washington State Department of Health (WSDOH) approved double check detector assembly(ies) or reduced pressure detector assembly(ies), with a Badger Recordall meter with a remote touch-read pad installed within 6-inches of the vault lid's hinge and brass plugs in the test ports. The meter will be supplied by the District and will be included with the charges in the Work Order.

21. A Washington State approved reduced pressure backflow prevention assembly shall be installed at temporary pipeline connections between the existing pipelines and new water pipelines for filling and flushing of the improvements. The assembly shall have been tested and approved a maximum of every six months and the test report provided to the District. Before connection to the existing water system, all new water pipelines and repaired portions of/or extension to existing pipelines shall be adequately chlorinated and a satisfactory bacteriological report obtained. The District will connect all new pipelines to the existing system, unless the connections by the contractor are approved by the District.

22. Pressure test new pipeline, including fire hydrants and service lines as per WSDOT standards.

Test Date	____________________	Test Pressure	____________________
Time Start	____________________	Time End	____________________
Pressure Drop	____________________	Make-Up Water	____________________
Test Date	____________________	Test Pressure	____________________
Time Start	____________________	Time End	____________________
Pressure Drop	____________________	Make-Up Water	____________________
Test Date	____________________	Test Pressure	____________________
Time Start	____________________	Time End	____________________
Pressure Drop	____________________	Make-Up Water	____________________
Test Date	____________________	Test Pressure	____________________
Time Start	____________________	Time End	____________________
Pressure Drop	____________________	Make-Up Water	____________________
Test Date	____________________	Test Pressure	____________________
Time Start	____________________	Time End	____________________
Pressure Drop	____________________	Make-Up Water	____________________

Public Utility District No. 1 of Skagit County
PO Box 1436 1415 Freeway Drive
Mount Vernon, WA 98273
Phone: (360) 424-7104

Fire Hydrant Use Permit

Provisional permission is given to the undersigned to withdraw water from a fire hydrant located at _____ for the period of _____to _____ (not to exceed 90 days). By signing below, the customer agrees to pay the Public Utility District No. 1 of Skagit County (District) a $200 service deposit, $25 monthly use fee, and monthly water use charges, in accordance with the District's Water Policy Manual. *Local governments and Washington state agencies are not required to provide a deposit.*

The customer agrees to call the District's billing department to report the meter reading every 30 days, from the date this agreement is signed. Bills will be sent out monthly. If the customer does not report the meter reading, the District will estimate the usage and may terminate this agreement. In accordance with the District's Water Policy Manual, late payments will result in fees and/or penalties and may also result in cancellation of this agreement, return of the meter, and delinquent accounts will be sent to a collection agency for payment.

Deposit refunds will be made within 10 business days after return of the meter and will be mailed to the billing address below. The closing balance and any charges for loss or damage to the meter will be deducted from the $200 deposit. If total costs exceed the amount of the deposit, the customer will be billed and agrees to pay in full. The customer agrees to pay the owner of the fire hydrant all costs for repairs to the hydrant as a result of damage caused by the customer.

The customer understands the temporary use of the hydrant meter is for no more than 90 days. The customer will return the meter at the end of 90 days. A one-time 90-day extension may be requested at that time (the meter must be returned for reading and calibration, regardless of whether an extension is requested). Additional extensions may be approved only by the District's General Manager.

The hydrant meter is to be used only at the address identified above. The District reserves the right to limit any customer's use when that use has, or will have, an adverse impact to the District's obligations and responsibilities. A standard hydrant wrench and a District-issued meter assembly, with a gate valve placed on the 2½-inch port, are to be used when operating the hydrant. The hydrant shall be in the fully open position when in use, in order to avoid damage to the hydrant. Water flow shall be regulated by the gate valve on the meter assembly. The meter assembly shall be removed and the hydrant completely closed at the end of each day.

In exchange for permission to operate and obtain water from the hydrant at the location identified above, the Customer agrees to defend, indemnify, and hold harmless the District and its officers, directors, employees, and agents from and against all claims, costs, losses, and damages, including, but not limited to attorney and other professional fees arising out of, connected with, or resulting from, the connection to and for use of the District's water under this agreement.

Comments _____

Permitee Signature _____ **Date** _____

Printed Name _____ Meter # _____ Meter Read _____

Company Name _____ Phone # _____ Security Device ☐

Billing Address _____ Phone # _____ Hose Bib Adaptor ☐

_____ Hydrant Wrench ☐

District Signature _____ **Date** _____

Date deposit was paid on _____ Receipt # _____

RETURNS AND EXTENSIONS

Date Meter Returned _____ **Meter Read** _____ Meter returned undamaged? Yes ___ No ___**Verified by** _____

Extension granted by _____ Date _____ Meter # _____ Read _____ Date to be returned _____

Date Meter Returned _____ **Meter Read** _____ Meter returned undamaged? Yes ___ No ___**Verified by** _____

Additional extension granted by _____, General Manager Date _____

Meter # _____ Read _____ Date to be returned _____

Date Meter Returned _____ **Meter Read** _____ Meter returned undamaged? Yes ___ No ___**Verified by** _____

REFUND OF DEPOSIT

Meter returned undamaged? Yes ___ No ___ Final bill paid in full? Yes ____ No _____ Amount to be refunded $_____

Billing Clerk _____ Date _____ **Route Copy to Accounts Payable**

---

cc: ☐ Customer ☐ Customer Service/Billing ☐ Fire District # _____ Notified _____

RETURN TO:
Public Utility District No. 1 of Skagit County
1415 Freeway Drive
P.O. Box 1436
Mount Vernon, WA 98273-1436

PUD UTILITY EASEMENT

THIS AGREEMENT is made this _____ day of _____, 2013, between _____, hereinafter referred to as "Grantor(s)", and **PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON**, a Municipal Corporation, hereinafter referred to as "District". Witnesseth:

WHEREAS, Grantor(s) are the owners of certain lands and premises situated in the County of Skagit, and

WHEREAS, the District wishes to acquire certain rights and privileges along, within, across, under, and upon the said lands and premises.

NOW, THEREFORE, Grantor(s), for and in consideration of mutual benefits and other valuable consideration, receipt of which is hereby acknowledged, conveys and grants to the District, its successors or assigns, the perpetual right, privilege, and authority to do all things necessary or proper in the construction and maintenance of water, sewer, electrical, and communication lines and/or other similar public service related facilities. This includes the right to construct, operate, maintain, inspect, improve, remove, restore, alter, replace, change the size of, relocate, connect to and locate at any time pipe(s), line(s) or related facilities, along with necessary appurtenances for the transportation and control of water, sewer, electrical, and electronic information on facilities over, across, along, in and under the following described lands and premises in the County of Skagit, State of Washington, to wit:

Tax Parcel Number: Insert P# Here

(ENTER PARCEL'S LEGAL HERE)

on the easement described as follows (See Exhibit A – Easement Map):

(ENTER EASEMENT'S LEGAL HERE)

C.O. _____
W.O. _____

Grantor(s) authorizes the District the right of ingress and egress from said lands of the Grantor(s). The Grantor(s) also gives the District permission to cut, trim and/or remove all timber, trees, brush, or other growth standing or growing upon the lands of the Grantor(s) in the described easement for the purposes of the activities listed above, as well as the right to cut, trim and/or remove vegetation which, in the opinion of the District, constitutes a menace or danger to said pipe(s), line(s) or related facilities, and/or to persons or property by reason of proximity to the line. The Grantor(s) agrees that title to all brush, other vegetation or debris trimmed, cut, and removed from the easement pursuant to this Agreement is vested in the District.

Grantor(s), their heirs, successors, or assigns hereby conveys and agrees not to construct or permit to be constructed structures of any kind on the easement area without written approval of the General Manager of the District. Grantor(s) shall conduct their activities and all other activities on Grantor's property so as not to interfere with, obstruct or endanger the usefulness of any improvements or other facilities, now or hereafter maintained upon the easement or in any way interfere with, obstruct or endanger the District's use of the easement.

The Grantor(s) also agree to and with the District and warrant that the Grantor(s) lawfully own the land aforesaid, has a good and lawful right and power to sell and convey same, that same is free and clear of encumbrances except as indicated in the above legal description, and that Grantor(s) will forever warrant and defend the title to said easement and the quiet possession thereof against the lawful claims and demands of all persons whomsoever.

Any mortgage on said land held by a mortgagee is hereby subordinated to the rights herein granted to the District; but in all other respects the mortgage shall remain unimpaired.

In Witness Whereof, the Grantor(s) hereunto sets his hand and seal this _____ day of _____, 2013.

_____
Print Title

_____ _____
Signature Print Name

(Individual)

STATE OF _____
COUNTY OF _____
I certify that I know or have satisfactory evidence that_____ is the person who appeared before me, and said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.
Date: _____

_____

C.O. _____
W.O. _____

Notary Public in and for the State of _____
My appointment expires: _____

(Corporate, Partnership)

STATE OF _____
COUNTY OF _____
I certify that I know or have satisfactory evidence that_____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the_____ of_____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as_____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that she signed this instrument, on oath stated that she was authorized to execute the instrument and acknowledged it as_____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.
Date:_____

_____
Notary Public in and for the State of _____
My appointment expires:_____

C.O. _____
W.O. _____

PUD UTILITY EASEMENT
(Plat Version)

Easements are granted to Public Utility District No. 1 of Skagit County, Washington, a Municipal Corporation, its successors or assigns, the perpetual right, privilege, and authority enabling the District to do all things necessary or proper in the construction and maintenance of a water, sewer, electrical, and communication lines and/or other similar public service related facilities. This includes the right to construct, operate, maintain, inspect, improve, remove, restore, alter, replace, change the size of, relocate, connect to and locate at any time pipe(s), line(s) or related facilities, along with necessary appurtenances for the transportation and control of water, sewer, electrical and electronic information on facilities over, across, along, in and under the lands as shown on this plat together with the right of ingress and egress from said lands of the Grantor(s). The Grantor(s) also gives the District permission to cut, trim and/or remove all timber, trees, brush, or other growth standing or growing upon the lands of the Grantor(s) in the described easement for the purposes of the activities listed above, as well as the right to cut, trim and/or remove vegetation which, in the opinion of the District, constitutes a menace or danger to said pipe(s), line(s) or related facilities, and/or to persons or property by reason of proximity to the line(s). The Grantor(s) agrees that title to all timber, brush, other vegetation or debris trimmed, cut, and removed from the easement pursuant to this Agreement is vested in the District.

Grantor(s), its heirs, successors, or assigns hereby conveys and agrees not to construct or permit to be constructed structures of any kind on the easement area without written approval of the General Manager of the District. Grantor(s) shall conduct its activities and all other activities on Grantor's property so as not to interfere with, obstruct or endanger the usefulness of any improvements or other facilities, now or hereafter maintained upon the easement or in any way interfere with, obstruct or endanger the District's use of the easement.

Water Service Information Guide

1415 Freeway Drive, Post Office Box 1436 • Mount Vernon WA 98273
360-424-7104 • 360-424-8764 FAX

General Policy Statement
Where Skagit PUD is the water purveyor and there is new construction, a remodel, an addition, revised plumbing, a land division, or change of use on a property, a water service evaluation will be necessary to ensure compliance with current Skagit PUD water policies.

Water Service Availability
Upon receipt of a project proposal description, property identification (County Parcel Number), site plan, water usage demands and fire protection requirements, water service availability can be determined by Skagit PUD. **Costs for water service and/or any water system improvements necessary for the project are to be borne by the customer/developer.**

Water Meter Sizing
For water services other than for single-family residences, applicants are to submit to Skagit PUD a complete list of fixtures with their respective equivalent fixture unit values, and the minimum meter size necessary, based on the most current Uniform Plumbing Code (UPC). This can be completed by the applicants licensed architect, engineer or plumber. The portion(s) of the UPC (Chapter 6, Appendix A, etc.) used for fixture unit values and meter sizing is to be noted on the submittal, along with the preparer's name, signature, license number and phone number. Any irrigation demand shall also be included in these calculations.

Skagit PUD offers a "deduct" meter to customers whose water usage is a factor in determining their sewer bill. A "deduct" meter is intended and available for irrigation of minor landscaping and other incidental uses that will not enter the local sanitary sewer system. A "deduct" meter is installed immediately downstream of the domestic meter and shall not be larger than the domestic meter. The demand to be served by a "deduct" meter shall be included in the calculation for sizing of the domestic meter.

New water services, two-inch and smaller, will include a "check valve" in the meter assembly. Any customer plumbing system provided with a check valve, backflow preventer or pressure regulating device which does not have a bypass feature at its source shall be provided, **by the customer,** with an approved, listed adequately sized pressure relief valve or a means to control expansion (typically being a combination pressure/temperature relief valve and a thermal expansion tank) to satisfy building regulations. Consult with a licensed plumber, the appropriate local building department, and the UPC (Uniform Plumbing Code) for the specific requirements.

Cross Connection Control
Under current state regulations, the water purveyor is to protect the public water system from contamination via cross-connections. The water purveyor's responsibility for cross connection control begins at the water supply and ends at the point of delivery to the consumer's water system, the water meter. The "Authority Having Jurisdiction" (e.g.; City, County) is responsible for cross connection protection within the consumer's water system and property lines.

To protect the public water supply, Skagit PUD may require premise isolation of a facility. Appropriate planning should address the possible requirement of a Reduced Pressure Backflow Assembly (RPBA) or Double Check Valve Assembly (DCVA) to be installed immediately after any metered water service or fire service connection, now or in the future. DCVAs can be installed below ground with brass plugs in the test cocks. RPBAs are to be installed above ground with a minimum of 12-inches of clearance below the assembly to finish grade, and protected from freezing and abuse. If the RPBA is installed in an above ground enclosure, the enclosure must have a drain opening adequately sized to handle the maximum flow of the relief valve.

All backflow prevention assemblies are to be on the Washington State Approved List of Assemblies. Skagit PUD will require copies of the initial test(s) of the required backflow prevention assemblies and the owner will be responsible for subsequent annual testing and providing the test results to Skagit PUD.

Fire Protection
Contact the appropriate city or county fire department for fire protection requirements. Upon request, Skagit PUD can perform a computer generated hydraulic analysis of the existing water system to determine the available fire suppression flows to the development and to determine if water system improvements are necessary to obtain the required fire flow. Allow a minimum of one month for the analysis to be completed.

Project Plan Submittals
Please submit to Skagit PUD's Engineering Department a complete set of civil, architectural, mechanical, plumbing and irrigation plans for review and cost estimating.

Coordination With All Jurisdictions
Skagit PUD encourages you to initiate discussion with the appropriate jurisdictions (e.g.; City, County, State) and Skagit PUD, early in your project design process to determine feasibility. Timeframes for obtaining certain permits and approvals can be lengthy.

WATER SYSTEM DRAWING REVIEW CHECKLIST

www.skagitpud.org

Project Name:_____

Developer/Owner:_____

Engineer:_____

Work Order No.:_____ Review : 1st 2nd 3rd

Reviewed by:_____ **Review Date:**_____

GENERAL INFORMATION:

Complete	Incomplete	N/A	
☐	☐	☐	Cover Sheet with Project Title, Description and Vicinity Map
☐	☐	☐	Drawings to show, Design Firm and Owner shown, Engineer Stamped
☐	☐	☐	Sheet Size 22" x 34" or 24" x 36"
☐	☐	☐	Sheet Index, Legend and District Work Order No. and Contract Order No.
☐	☐	☐	Horizontal Datum NAD 83, Vertical Datum NAVD 88 or Conversion
☐	☐	☐	Waterline Plan and Profile Sheets
☐	☐	☐	District Standard General Notes
☐	☐	☐	District Standard Detail Sheets (most current version)
☐	☐	☐	Drawing submittal version noted in Revision Block
☐	☐	☐	Fire Flow Data Sheet from District
☐	☐	☐	Fire District Signature Block
☐	☐	☐	Existing and Proposed easements shown and called out
☐	☐	☐	Assigned Property addresses and Parcel numbers of subject and adjacent properties
☐	☐	☐	Street names and Right of Way indicated
☐	☐	☐	Description of project and length of water improvements in title block
☐	☐	☐	Complete set of civil plans
☐	☐	☐	Complete set of plumbing plans for non-single family residential

WATER SYSTEM DRAWING REVIEW CHECKLIST

www.skagitpud.org

WATER SERVICE AND BACKFLOW INFORMATION

Complete	Incomplete	N/A	
☐	☐	☐	Every proposed water meter service – location, service size and material
☐	☐	☐	Fixture count and meter sizing – residential and irrigation
☐	☐	☐	Backflow Devices –Type, Size, Location

PLAN AND PROFILE INFORMATION

Complete	Incomplete	N/A	
☐	☐	☐	Plan and profile view of waterline on same sheet
☐	☐	☐	North arrow, Horizontal and Vertical scale
☐	☐	☐	Survey monuments and benchmarks
☐	☐	☐	Contours
☐	☐	☐	All existing waterlines noted with District C.O. # and full year of installation
☐	☐	☐	Show nearest existing mainline valves and all existing meters
☐	☐	☐	Indicate waterline pipe size, material and length
☐	☐	☐	Station centerline of ROW beginning at STA 1+00, increase station from West to East, or from South to North.
☐	☐	☐	New waterline to be dimensioned to ROW, property lines, easements and/or nearest existing waterline
☐	☐	☐	Dimension format and fitting labels per District Standards
☐	☐	☐	Waterline to have 10’ horizontal and 18” vertical separation from sanitary sewer
☐	☐	☐	Waterline to have 5’ horizontal separation from storm sewer
☐	☐	☐	All utilities shown in plan view with conflicts and crossings shown in profile
☐	☐	☐	Show rim and invert elevations for all gravity lines, with pipe material noted
☐	☐	☐	Valves, fittings, connection types, air-vac valves, flushing assemblies, hydrants and services
☐	☐	☐	Restrained pipe lengths, or thrust block location and size shown on drawings
☐	☐	☐	Show pipe elbows and/or deflections (angle or radius, beginning and endpoints)
☐	☐	☐	Indicate proposed road cross section
☐	☐	☐	Show all permanent structures (bridges, walls, etc)
☐	☐	☐	Show all trees and landscaping and check for conflicts with meters
☐	☐	☐	Show any soil borings with labels

❒ **Revise and Resubmit**

STANDARD DEVELOPER LETTER

(Words or paragraphs in italics may not be needed in the letter and can be removed)

DATE

NAME
COMPANY
ADDRESS
CITY

RE:

Dear Mr/Mrs/Ms. :

At your request, the Public Utility District No. 1 of Skagit County (District) has reviewed your plans and specifications to meet the District's required design standards and criteria, as outlined in the District Water Policy. An estimated cost for the District's plan review, administration, *(and)* construction inspection *(and connection work)* of the water system improvements has been determined.

Enclosed are the reviewed plans and specifications showing the necessary changes. The plans and specifications are to be revised and resubmitted for the District's final approval along with the reviewed set of plans. Five sets of approved plans and specifications are to be provided to the District prior to start of construction. A set of plans indicating approval of the fire hydrant locations from the [(Mount Vernon, Sedro Woolley, Burlington or Skagit County Fire Marshals *and* County Road Permit)] is also to be provided.

The current standard service design and bill of materials do not allow for the installation of a residential fire sprinkler system. If a residential fire sprinkler system is required, or desired, then the service line size, the meter location and the bill of materials will need to be reviewed and possibly revised by the District.

A private contractor will construct the water system improvements and the District will inspect the construction (*and make the connections to the existing water system)*, as shown on the plans. The estimated cost for the District's plan review, administration, *(and)* construction inspection (*and connection work)* is $_____.00. The inspection

cost is based on _____ hours of construction to complete the installation of the water system improvements.

The enclosed Work/Job Order Authorization form is to be signed by the owner/developer and returned to the District at the time you wish to proceed, along with the deposit of the estimated cost amount indicated above. The individual signing the Work/Job Order Authorization form is also to be the individual providing the deposit.

In addition to the estimated Work/Job Order cost, a System Development Fee (SDF) and a service installation fee are required for each metered water service. If the metered water service(s) is installed by the developer's private contractor during the mainline installation, the service installation fee may not be necessary.

(TYPE I)

- Present fees for Type-I **standard** metered water services are as follows:

Size	Service Fee	SDF*	Total
5/8-inch	$1,280.00	$4,005.00	$5,285.00
3/4-inch	$1,335.00	$6,010.00	$7,345.00
1-inch	$1,360.00	$10,015.00	$11,375.00

*SDF = System Development Fee

(TYPE II)

- Present fees for Type-II **standard** metered water services are as follows:

Size	Service Fee	SDF*	Total
5/8-inch	$515.00	$4,005.00	$4,520.00
3/4-inch	$575.00	$6,010.00	$6,585.00
1-inch	$600.00	$10,015.00	$10,615.00

*SDF = System Development Fee

(TYPE III)

- Present fees for Type-III **standard** metered water services are as follows:

Size	Service Fee	SDF*	Total
5/8-inch	$320.00	$4,005.00	$4,325.00
3/4-inch	$375.00	$6,010.00	$6,385.00
1-inch	$375.00	$10,015.00	$10,390.00

- *SDF = System Development Fee

The District shall adjust the SDFs on January 1 of each year. Upon request, fees for metered water services larger than 1-inch can be determined by District personnel.

For new water services, 2-inch and smaller, a dual check valve will be included in the meter assembly. The check valves will create a closed pressure zone within the customer's plumbing system. Installation and maintenance of a thermal expansion tank and pressure/temperature relief valve are necessary to satisfy building regulations. Consult with a licensed plumber, the appropriate local building department, and the Uniform Plumbing Code for the specific requirements.

For water services other than for single-family residences, applicants are to submit a complete list of fixtures with their respective equivalent fixture unit values, and minimum meter size necessary, based on the most current Uniform Plumbing Code (UPC). Irrigation demand shall also be included in these calculations. This can be completed by the applicant's licensed architect, mechanical engineer or plumber. The portion(s) of the UPC (Chapter 6, Appendix A, etc.) used for fixture unit values and meter sizing is to be noted on the submittal, along with the preparer's name, signature, license number and phone number.

The District offers a deduct meter to customers whose water usage is a factor in determining their sewer bill. A deduct meter is intended and available for irrigation of minor landscaping and other incidental uses that will not enter the local sanitary sewer system. A deduct meter is installed immediately downstream of the domestic meter and shall not be larger than the domestic meter or 1-inch. The current Type 2 installation fee for a 5/8-inch deduct irrigation meter is $___.00, a 3/4-inch deduct irrigation meter is $ _____.00, and $_____.00 for a 1-inch deduct irrigation meter. Deduct meters do not require a SDF. Deduct meters currently have a meter reading charge of $2.55 per month.

The cost for metered water services 1 1/2-inch and larger is based on the actual cost of materials, labor and equipment to install the service, plus the SDF. An estimated cost for

a metered water service installation, 1 1/2-inch and larger, can be determined by District personnel upon request. The fees would be due upon application for each service.

The District requires a Water Contract for each new meter with a weighting factor of 8 or more (2-inch and larger), or group of meters (regardless of size) whose weighting factors sum 8 or more, as outlined in the District Water Policy. The applicant's projected usage capacity information in the form of maximum intermittent & continuous demands in gallons per minute and maximum day, month & annual usage in gallons is to be submitted for approval. Upon receipt of projected usage capacity information, determination of the size and type of meter(s), District approval, and the name(s) and title(s) of the individual(s) responsible for signing the document, the District will prepare an original Water Service Contract document (draft copy enclosed). The Water Service Contract must be signed in front of a Notary Public and received and signed by the District, along with the required System Development Fee, prior to any water usage through the service(s). The Water Service Contract will be recorded with the Skagit County Auditor's office and a copy of the recorded document will be available to the applicant for their records.

Due to instances of damage to District water plant by workers performing other work for developers, the District requires each developer to sign a Developer's Agreement that guarantees compensation for repairs to damaged water plant caused by the developer or his contractors. The enclosed agreement is to be completed and returned to the District before construction of the water system improvements begins.

A District inspector is to be on site during all work on the proposed water system. If the contractor installs any water facilities without the inspector present or without approval of the inspector, the water facilities may be rejected or required to be exposed for inspection.

The street sub-grade is to be established and completed where the water facilities are to be installed. In addition, the sanitary and storm sewer pipelines are to be installed and their trenches thoroughly compacted, before installation of the water facilities. The water facilities are to be installed before installation of the gas pipelines and wire utilities.

The water facilities are to be accurately surveyed for alignment and grade and staked with offsets by the developer's surveyor on a maximum of 50-foot intervals. Staking of additional finish grades may be required, as directed by the District. Temporary lot corners are to be staked for installation of the water service stubs.

Connection of the proposed water system improvements to the District's existing water facilities is to be coordinated with the District's Inspector. The developer's private

contractor will be responsible for all excavation, shoring, dewatering, traffic control, concrete thrust blocking, backfill, compaction and surface restoration work necessary for the District's connection work as indicated on the plans.

Currently, the static water pressure within the proposed development is approximately __ to ____ pounds per square inch (psi). The water pressure is calculated on a hydraulic grade line of _ feet above mean sea level (AMSL). Pressure over 80 psi is considered higher pressure and the Uniform Plumbing Code states an approved pressure reducing valve preceded by an adequate strainer along with a pressure relief valve be installed on the customer's private plumbing system and the pressure be reduced to a maximum of 80 psi within the plumbing system.

Pressure below 40 psi is considered lower pressure and is less than most people prefer. The customer may wish to consider installation of a booster pump with a low-pressure cut-off switch, pressure tank and pressure relief valve on their private plumbing system and/or over-sizing the pipeline and household plumbing.

The current Washington Administrative Code (WAC) 246-290-490, states the water purveyor is to protect the public water system from contamination via cross connections. The water purveyor's responsibility for cross connection control begins at the water supply and ends at the point of delivery to the consumer's water system, the water meter. Under RCW 19.27, the Administrative Authority (building department) is responsible for cross connection protection within the consumer's water system and property lines.

To protect the public water supply, the District may require premise isolation of a facility based on the highest potential health risk from potential or actual onsite cross connection and/or within the building. Appropriate planning should address the possible requirement of a Reduced Pressure Backflow Assembly (RPBA) or Double Check Valve Assembly (DCVA) to be installed immediately after any metered water service or fire service connection, now or in the future. DCVAs can be installed below ground with brass plugs in the test cocks. RPBAs are to be installed above ground and protected from freezing and abuse and with a minimum of 12-inches of clearance below the assembly to finish grade. If the RPBA is installed in an above ground enclosure, the enclosure must have a drain opening adequately sized to handle the maximum flow of the relief valve.

The District's Cross connection Control Coordinator has reviewed the project plans for cross connection concerns and has the following comments:

1. ***Domestic Water Service.***
   A. *The District is requiring premise isolation on the domestic water service due to the potential health risks from cross connection onsite and within the buildings. A Reduced Pressure Backflow Assembly (RPBA)/Double Check Valve Assembly*

(DCVA) is required to be installed immediately after the domestic meter. The RPBA is to be installed above ground with a minimum of 12-inches of clearance below the assembly to finish grade and protected from freezing and abuse. If the RPBA is in an above ground enclosure, the enclosure must have a drain opening adequately sized to handle the maximum flow of the relief valve. A DCVA can be installed in a below ground vault, with brass plugs in the test ports.

B. *If items (a) & (b) below are satisfactorily addressed, the District will not require premise isolation on the domestic water service at this time. If premise isolation is required now or in the future, the necessary backflow assembly is to be located immediately after the water meter.*
   a) *If **Boilers and/or single wall heat exchangers** are installed the District will require premise isolation with a RPBA.*
   b) *If **sewage pumps** are installed on site the District will require premise isolation with a RPBA.*
   c) ***Floor drains.** If trap primer valves are installed, they require an "approved air gap". Air gaps must be vertically oriented with a distance of at least twice the inside diameter of the inlet pipe, but never less than one inch. Trap primer valves with an internal air gap may **not** meet the requirement of an "approved air gap". An approved air gap fitting may be available from the trap primer valve manufacturer or an approved air gap can be plumbed. Approved air gaps are to be accessible for yearly inspection. If an approved air gap is not installed the District will require premise isolation with a RPBA.*
   d) ***Hose bibs and mop/service sinks** with threaded outlets require an Atmospheric Vacuum Breaker (AVB). If AVBs are not installed the District will require premise isolation with a DCVA.*
   e) *No **other items of concern** were found during the District's initial review of the plans submitted. If plans are revised, there are plumbing changes during construction, or further review and inspection raise other cross connection items of concern, they will need to be addressed prior to providing water service. Premise isolation with a RPBA may be necessary.*

2. ***Deduct Irrigation Meter.** A DCVA is required to be installed immediately after the meter. A DCVA can be installed below ground with brass plugs in the test ports. If the irrigation system has chemical injection, a RPBA will be required. The RPBA is to be installed above ground and protected from freezing and abuse.*
3. ***Fire Service.***
   A. *A Double Check Detector Backflow Assembly (DCDA) for the fire sprinkler system is to be installed within a below ground vault near the property line with brass plugs in the test ports. The assembly will require a Badger Recordall meter, supplied by the District, reading in cubic feet, with the remote read transmitter installed within 6-inches of the hinge side of the vault lid. The*

contractor is to coordinate with the District for inspection of the DCDA and connection to the public water system.

B.

a) If chemical additives are used in any portion of the fire protection system, a Reduced Pressure Detector Assembly (RPDA) is required in lieu of a DCDA. RPDA's are to be installed above ground with a minimum of 12-inches of clearance below the assembly to finish grade, and protected from freezing and abuse. If the RPDA is installed in an above ground enclosure, the enclosure must have a drain opening adequately sized to handle the maximum discharge rate of the relief valve.

b) A Double Check Detector Assembly (DCDA), which is to be located at the property line, within a below ground vault, is required to be installed on the fire sprinkler system. The assembly is to be installed with a Badger Recordall meter, reading in cubic feet, with the remote read transmitter installed 6-inches from and on the hinge side of the vault lid. Brass plugs in the test cocks are also required. The meter will be supplied by the District and be included in the charges on the Work Order.

Contact the authority having jurisdiction (Skagit County, MV, SW, or Burlington Building Department) for their cross connection requirements for the water system within the facility.

Prior to any water usage, the District will inspect the facility for other unforeseen cross connection items of concern.

All backflow prevention assemblies are to be on the Washington State Approved List of Assemblies. District inspection of the installed assemblies will be necessary. The assemblies are to be tested by a Washington State Certified Backflow Assembly Tester (BAT) and copies of the test reports submitted to the District. The building owner will be responsible for following annual testing and providing the test results to the District.

Please submit a complete set of architectural, mechanical, plumbing and irrigation plans for review of any cross connection concerns. After review, any backflow prevention requirements will be forwarded to you, the (Mount Vernon, Burlington, Sedro Woolley, Skagit County) building authority and the developer/engineer.

Upon request, the District can perform a computer generated hydraulic analysis of the existing water system to determine the available fire suppression flows to the development and to determine if water system improvements(s) are necessary to obtain the required fire flow. Please provide the Fire Marshal's fire flow requirement for the analysis. Allow a minimum of one month for the analysis to be completed.

Private fire sprinkler systems, installed by a licensed private contractor, are to be inspected by a District representative during installation from the connection point to the District's system up to and including the backflow prevention assembly. Upon completion of the private fire pipeline, it is to be pressure tested, flushed and a satisfactory health sample(s) taken. Please allow 48 hours notice to schedule an inspector for the installation work, witness the pressure test and take the health sample. The developer is to supply the health sample bottle(s) and the inspector will collect the actual samples(s).

The contractor installing the private fire pipeline to the building sprinkler system is to contact the local fire department for their requirements. The contractor is to contact the District and the (Skagit County, MV, SW, Burl) Fire Marshal before pressure testing and hydro-flow testing the private fire pipeline.

The fire service will be subject to a charge for standby water for fire protection. Currently the monthly charge for a __-inch fire service is $_____._____.

A hydraulic analysis of the District's existing distribution system was performed, at a location _____, to determine its capacity to support fire suppression flows, using a computer-generated hydraulic model of the distribution system, assuming peak hour demands and a fully functional distribution system. The results of the analysis are:

1. *_____ psi static pressure.*
2. *_____ psi residual pressure at ____ gpm.*
3. *_____ psi residual pressure at ____ gpm.*
4. *_____ psi residual pressure at _____ gpm.*

Also, please find enclosed a two page completed fire suppression flow capacity form with the results of the analysis.

The fire suppression flow of _____ gpm is limited by (a minimum of 20-psi residual pressure/water velocity) within the water distribution system, which is located _____ of the Development. This fire flow would result in water velocity in pipelines exceeding the District's design requirements and could cause a catastrophic failure of the water lines due to surge pressures, would violate the District's development regulations and is in no way endorsed by the District. See the attached Statement of Fire Suppression Flow Capacity.

In the District's endeavors to meet capacity and pressure requirements within the water distribution system, and to provide for future system demands, as outlined in the District Water Policy, the District has determined that it is in the District's best interest for the

proposed pipeline on _____ to be upsized from the customers/developers required size of 8-inch pipe to _____-inch, as shown on the plans. Therefore, the developer is required to assume the cost to install a(n) _____-inch pipeline and the District agrees to pay the developer the materials cost difference between _____-inch and _____-inch materials which is estimated to be $_____.00. Prior to construction, the enclosed Water Pipeline Upsizing Agreement is to be completed and returned to District for the General Manager's signature. A copy will be returned for your records.

An Environmental Checklist is to be completed for the installation of all water pipelines over eight (8)-inches in size. The applicant's consultant and/or private engineer is to prepare an Environmental Checklist for submittal to the lead agency for review. The District may be the lead agency, if the Environmental Checklist is to be prepared for the water pipeline(s) only. If an Environmental Checklist is to be prepared for the project, the following statements should be provided to the Lead Agency for inclusion in their Environmental Checklist prior to issuance of their Threshold Determination for the project:

- ***Environmental Health.*** *During the construction phase, any new water pipeline(s) will be disinfected with a chlorine solution. All chlorinated water must be neutralized prior to discharge. The disinfectant water and chlorinated potable water, if discharged in sufficient quantities, may be deleterious to aquatic life.*
- ***Utilities.*** *All water pipelines are sized to provide adequate water volume for domestic and/or fire flow requirements and may require installation of a water pipeline in excess of eight (8) inches in diameter.*

The District requires contractors installing water system improvements to be licensed and bonded within the State of Washington, and a copy of their license is to be submitted to the District prior to construction. The contractor is to submit a certificate of insurance to my attention, showing Public Utility District No 1 of Skagit County, Post Office Box 1436, Mount Vernon, Washington 98273, as the certificate holder and additional insured with respect to _____*(insert project name and address)*_____ and with minimum amounts as indicated on the enclosed example.

A list of materials, indicating the manufacturer, model, and size to be used in the installation of the water system improvements is to be submitted to the District for approval before construction.

All permits necessary for the installation of the proposed water system improvements will be the responsibility of the developer, engineer, or contractor to acquire and submit copies to the District, prior to construction. *The WSDOT/BNSF Railroad permit shall be prepared by the engineer, in the District's name, and signed by a District representative.*

A standard refund agreement will be completed which may provide for some refund of your water pipeline investment if other lateral connections are made to the pipeline extension which the owner/developer financed. The agreement would be for a 10-year period. A customer/developer shall not be eligible for latecomer refunds for land they owned at the time of the water main installation. The amount of the refund and total fees to be collected for other connections will be determined upon completion of the project. Enclosed is a copy of the District's standard refund agreement form.

The following items are required to be completed before construction can begin as outlined in the District Water Policy:

1. Receipt of the enclosed, signed Work Order Authorization form.
2. Receipt of the enclosed, signed Developer's Agreement form.
3. Deposit of the estimated cost.
4. District's stamp and signature approving the water pipeline plans.
5. Fire Department hydrant location approval.
6. Submittal of five sets of approved construction drawings.
7. Certificate of insurance.
8. Copy of Contractor's License.
9. List of materials.
10. Copies of required permits.
11. Pre-construction conference.
12. *Third party easements.*

Upon completion of construction, the following items are to be completed prior to acceptance of the proposed water improvements. Allow a minimum of two weeks from the completion of the following items until the time the project is accepted. Services for your project cannot be purchased or activated until the District Commission accepts the project.

1. A minimum of a 20-foot wide **Easement** (as shown on the plans) is required for installation of the public water pipeline across private property. The easement legal description is to be provided by the project's engineer and submitted to the District for preparation of the easement document. The easement document will be forwarded to you for notarized signatures and is to be returned to the District for recording. A copy of the recorded document will be provided. Alternatively, the easement location and enclosed easement statement can to be shown on the

face of the recorded plat. A copy of the recorded plat is to be provided to the District.

2. A **Bill of Sale** is to be completed to transfer ownership of the water system improvements to the District. The District will prepare the Bill of Sale for the owner/developer's signature(s) after submittal of an itemized list of materials installed, showing item, quantity, unit price and cost, along with a lump sum cost for labor and equipment and the cost for engineering of the water system.
3. The **As–Built** information is to be compiled on a final set of drawings, stamped and signed by an engineer licensed in the State of Washington. They shall be either on a clear top quality photocopy Mylar or on a Computer Disk (CD-R), with a paper copy. A drawing submitted on a CD media shall be in AutoCAD R2010.dwg format, and archived with all x-references, including the title block and borders being a permanent part of the drawing. Drawings submitted in "Plot" format (.plt) are not acceptable.
4. *A **Water Service Contract** is enclosed for your signature.*
5. *A **Backflow Assembly Test Report(s)** will be submitted.*
6. The amount of the **Maintenance Bond** will be based on a percentage of the full installed value of the water plant as stated in the District Water Policy. Enclosed are a standard Maintenance Bond, Deposit in Lieu of a Maintenance Bond and an Irrevocable Letter of Credit in Lieu of a Maintenance Bond either of which you can use.
7. *Enclosed is a **Maintenance Agreement for Governmental Agency.** It is required in an amount equal to the full installed value of the water plant. The Maintenance Agreement will be in effect for a one year from the date of project acceptance by the District Commission. Please let me know if the contractor is responsible, as this would require a different type of Maintenance Agreement.*

The estimated costs herein may be revised, if necessary, to reflect changes in costs and fees at the time you wish to proceed. After final accounting of the work, the owner/developer will be billed additional costs incurred or refunded the unused balance of the deposit.

The comments in this letter are based on information available at the time of writing. Modification to the water system or policy change can make the information provided outdated. A re-evaluation of the comments is necessary one year after the date of this letter.

It is recommended the District be provided with as much lead-time as possible for final plan review to avoid lengthy delays.

Please distribute this letter to all parties involved.

If you have any questions or I can be of further assistance, please contact me.

Sincerely,

Engineer
Title

(Secretary's initials)

Enclosures

cc: Developer
Contractor
District Inspector
Lorna Parent, Skagit County Department of Health
Becky Zorn, Cross Connection Control Coordinator
Building Department (Skagit County, MV, SW, Burlington)
Fire Marshal (Skagit County, MV, SW, Burlington)

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
1415 Freeway Drive
Post Office Box 1436
Mount Vernon, WA 98273

DEVELOPER'S AGREEMENT

_____
NAME OF OWNER OR DEVELOPER

_____
ADDRESS

_____
TELEPHONE

hereinafter referred to as the "Developer", acknowledges awareness of certain water mains and other water plant facilities located within and adjacent to the boundaries of the property being developed by the Developer, known as

_____
DEVELOPMENT

in Skagit County, Washington. These lines are owned, or are intended to be owned after completed construction, by PUBLIC UTILITY DISTRICT NO 1 OF SKAGIT COUNTY, WASHINGTON, hereinafter referred to as the "District".

The Developer certifies that final grade has been established throughout the construction area of the above development. The Developer accepts financial responsibility to re-locate the water lines vertically and/or horizontally if grades are changed.

Also, the Developer agrees that, if any damage or imminent impairment to water plant is caused by Developer, his employees or independent contractors in the construction contemplated by the Developer, the Developer will pay within thirty (30) days of the submission of billing for repair or replacement of facilities so damaged. If such payment is not made within said time limit and District is compelled to bring suit to collect said amount, Developer agrees to pay all court costs and reasonable attorney's fees.

_____ _____
DATE NAME OF OWNER OR DEVELOPER

_____
TITLE

C.O._____
W.O._____

Please Return To:
Public Utility District No. 1 of Skagit County
Post Office Box 1436, 1415 Freeway Drive
Mount Vernon, WA 98273

WATER SERVICE CONTRACT

This Contract is entered into this _____ day of _____, 2013, between Public Utility District No. 1 of Skagit County, hereinafter referred to as the "District" and _____ _____ or its successor or assigns, hereinafter referred to as the "Applicant".

The Applicant is entering into this Contract to secure a water service(s) for the property located at _____ _____, Washington. The parcel is located in the _____ 1/4 of Section _____, Township _____ N, Range _____ E, under Assessor's Tax Number _____, Parcel Number _____. The District owns and operates a water distribution system at the location of the proposed service(s) and is willing to supply water to the Applicant under the following terms and conditions:

1. The District's Water Policy Manual, Section 4.2 (or its successor) requires a Water Service Contract for all new water meters serving a property, when the summed weighting factor of the meter(s) is 8 or more. Said Water Policy Manual also requires the Applicant's projected capacities [flow rate(s) and usage] be listed herein (a copy of the current Water Policy Manual, Section 4.2, has been provided to the Applicant and its terms and conditions are incorporated herein by this reference).

2. Meter installation costs. The Applicant shall be responsible for paying all costs associated with installing water services to the District system as required by the District Water Policy Manual, Appendix A, Table A-8.

3. System Development Fee (SDF): The District and the Applicant agree that the Applicant has the following meter(s) that all serve this property:

Meter size & type	Weighting Factor (*)	Projected Maximum Continuous & Intermittent Flow Rates	Projected maximum daily, monthly & annual usage	SDF
6-inch compound	50	____ gpm continuous ____ gpm intermittent	Maximum day demand: ____ gallons. Peak month (____) demand: ____ gallons. Maximum annual usage: ____ gallons.	$117,500.00

(*) = from District Water Policy Manual Section 4.2

Based on the cumulative weighting factor(s) or meter size(s) and the projected capacities identified above, the Applicant agrees to pay a SDF of $_____.00.

The District may review usage history as needed. If any projected capacity is not put to beneficial use within any 36-month period after contract execution, Applicant agrees that the District has the right to reduce authorized capacity(ies) to the maximum during that three-year period plus ten percent (10%). District will notify Applicant within 90 days of capacity changes, and will record the notification as an amendment to this Contract in accordance with item # 11 below. The District will automatically review usage history every three years for the same.

If Applicant desires an increase in any of the capacities listed in this Contract, as amended, Applicant agrees to contact the District, no less than 120 days before added capacity is needed, to request District approval, and if approved, shall be documented in accordance with item # 11 below.

Per Water Policy Manual Section 4.2, if the Applicant's use through any contract meter exceeds any listed capacity, the District reserves the right to require the Applicant to modify the use to those listed in the Water Contract. If the Applicant has not modified the use through that meter(s) to those listed in the Water Contract within 120 days of the notice requesting the modification of use, the Contract will be amended in writing, in accordance with item # 11 of this contract, and the Applicant will be responsible for any mitigation deemed necessary. Mitigation shall be determined by the District, and may include, but is not limited to, additional charges and/or water system improvements including all associated costs. In consideration for approval of the initial service and as a condition of continued service, Applicant specifically agrees, covenants and contracts to pay any additional charges and/or water system improvement costs when charged. In the event Applicant fails to pay the additional charges and/or water system improvement costs as set forth herein when due, the District shall terminate service under this Contract.

4. Each meter serving other than a single family residence shall be selected: (1) based on the sizing requirements of the most recently adopted IAPMO Uniform Plumbing Code, (2) to have an annual usage of not more than fifty percent (50%) of the safe maximum operating capacity of the meter per year, and (3) if the proposed use generally has a pattern of continuous flow (a relatively consistent flow for six hours or more), to flow not more than 50% of the safe maximum operating capacity of the meter during such periods of continuous flow. The safe maximum operating capacity rating shall be per American Water Works Association (AWWA) Standards for each type and size of meter. If an AWWA Standard does not exist for a certain type and size of meter, the District shall determine the rating.

5. The cost of water shall be at the current water rate schedule at the time of each billing.

6. The District shall not be liable to the Applicant or the Applicant's agent(s) for damages, breach of Contract, or for interruption of service or curtailment of supply for any cause. The Applicant shall hold the District harmless from any claim for damages by third parties, to the extent that the claim arises out of Applicant's negligence.

7. The Applicant agrees that if problems arise related to water system source capacity or hydraulics, water for irrigation or other non-domestic demands can be limited or discontinued. Water for irrigation is recommended during, and may be limited to, "off peak" hours of 10:00 PM to 5:00 AM each day, or such hours as the District may prescribe. The Applicant agrees to adhere to such limitations or recommendations as a condition of service.

8. The Applicant recognizes that all water will contain chlorinous compounds which are dangerous to aquatic life. Depending on hydraulic flows within the distribution system, pH levels may exceed 10. The Applicant shall pursue, with reasonable diligence, the protection of aquatic life onsite and offsite of the Applicant's property and, upon failure to do so, shall hold the District harmless from any damages arising therefrom.

9. Water quality may vary in the future due to the result(s) of the Federal Safe Drinking Water Act or other requirements.

10. The Applicant agrees to install and to maintain a backflow prevention assembly approved for installation in Washington State on all irrigation service(s) and on such other water service(s) as may be required by the District and State/federal health authorities. The type and model of assembly(ies) necessary must be approved by the District.

11. Compliance with this Contract shall be a condition of service through this meter(s) and shall be binding upon Applicant's successors or assigns. Increases in water volumes, meter sizes, meter quantities, and other material changes in water demand or ownership data shall be documented in a written amendment(s) to, or rewriting of, this Contract.

12. Applicant non-compliance with this Contract shall result in cancellation of service.

13. All or part of this Contract may be superseded, deleted, or enhanced by future District regulations.

This Contract and all disputes arising hereunder shall be governed by Washington State Law. Venue shall be in the Superior Court of the State of Washington for Skagit County. In any action hereon the prevailing party, in addition to other remedies, shall be entitled to actual costs and attorney fees.

IN WITNESS WHEREOF, the Parties hereto have executed this Contract effective the day and year first above written.

APPLICANT'S NAME HERE

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY

_____ _____

Robert B. Powell, General Manager

STATE OF _____
COUNTY OF _____

(Corporate, Partnership)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as _____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that she signed this instrument, on oath stated that she was authorized to execute the instrument and acknowledged it as _____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.
Date: _____

_____
Notary Public in and for the State of _____
My appointment expires: _____

STATE OF WASHINGTON
COUNTY OF SKAGIT
I certify that I know or have satisfactory evidence that **Robert B. Powell** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated he was authorized to execute the instrument and acknowledged it as the **General Manager** of **Public Utility District No. 1 of Skagit County** to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.
Date: _____

_____

Notary Public in and for the State of Washington
My appointment expires:_____

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
WORK/JOB ORDER AUTHORIZATION

Work Order No._____
Job Order No._____ Within PTBA (SKAT) ☐ YES ☐ NO
Construction Order No._____

PROJECT NAME:
TYPE TITLE HERE IN ALL CAPS

Description of work to be done: _____

Work Order Estimated Cost	$	0.00
Job Order Estimated Cost	$	0.00
System Development Fee	$	0.00
Project's Estimated Cost	$	0.00

Customer Name:_____
Mailing Address:_____
City, State, Zip:_____
Daytime Telephone No.:_____

Upon receipt and in consideration of the projects estimated cost of **$**_____. Customer hereby authorizes Public Utility District No. 1 of Skagit County to schedule and perform the above-described work.

Customer agrees that if any damage, impact, or imminent impairment to District property is caused by Customer, customer's employees, independent contractors, subcontractors or any other person acting as customer's agent during the construction of this project, Customer will pay for any necessary repairs or replacement of property so damaged.

Customer understands that all project tasks and costs herein are estimated only. Customer also understands that the final actual project cost may be lower or higher than the District estimate. After final accounting of the work, Customer understands that any additional costs incurred will be billed or any unused funds previously received as consideration will be returned to the Customer.

If it is necessary for the District to bill the Customer, Customer agrees to pay in accordance with the District's billing policy. Customer also agrees to pay any additional fees that the District may incur should the collection process be necessary. Customer agrees water may be terminated for non-payment.

_____
Date

_____
Printed Name

_____
Printed Title

Barbara Barthel # 114
Engineering Technician

_____
Signature of Customer

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
WORK/JOB ORDER AUTHORIZATION FOR GOVERNMENTAL AGENCY

Work Order No._____
Job Order No._____ Within PTBA (SKAT) ☐ YES ☐ NO
Construction Order No._____

PROJECT NAME:
TYPE TITLE HERE IN ALL CAPS

Description of work to be done: _____

Work Order Estimated Cost	$	0.00
Job Order Estimated Cost	$	0.00
System Development Fee	$	0.00
Project's Estimated Cost	$	0.00

Customer Name:_____
Mailing Address:_____
City, State, Zip:_____
Daytime Telephone Number:_____

Upon the District's receipt of Work/Job Order Authorization, the Governmental Agency authorizes Public Utility District No. 1 of Skagit County to schedule and perform the above-described work and to bill them, upon completion, for the work performed.

Customer agrees that if any damage, impact, or imminent impairment to District property is caused by Customer, customer's employees, independent contractors, subcontractors or any other person acting as customer's agent during the construction of this project, Customer will pay for any necessary repairs or replacement of property so damaged.

Customer understands that all project tasks and costs herein are estimated only. Customer also understands that the final actual project cost may be lower or higher than the District estimate. After final accounting of the work, Customer understands that any additional costs incurred will be billed.

The customer agrees to pay in accordance with the District's billing policy. Customer also agrees to pay any additional fees that the District may incur should the collection process be necessary.

_____
Date

_____
Printed Name

_____
Printed Title

Barbara Barthel # 114
Engineering Technician

_____
Signature of Customer

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY
UTILITY MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That Principal and Surety executing this Bond are held and firmly bound unto the Public Utility District No. 1 of Skagit County, State of Washington ("District"), in the penal sum of _____**/100 Dollars** (**$_____.00**) for the payment of which Principal and Surety bind themselves and their heirs, executors, administrators, successors and assigns, all jointly and severally, by these presents.

WHEREAS, Principal has undertaken the installation of facilities described as _____

_____

(C.O. # _____; W.O. # _____-_____) in full compliance with the District's standard plans, specifications and standards which the District Engineering Manager has determined to be substantially complete as of Tuesday, _____, 20___.

NOW, THEREFORE, if Principal shall maintain and repair said facilities free from defects in materials or workmanship for a period of not less than **one (1) year after the date of acceptanc**e **of the facilities by the District's Commission**, then this obligation shall be null and void, otherwise to remain in full force and effect.

EMERGENCY REPAIRS:

If in the opinion of the District Engineering Manager, a condition exists which affects life and/or property requiring repair(s) of an emergency nature which preclude prior notification of Principal, the District Engineering Manager shall cause such work to be done with all reasonable dispatch, and notify Principal as soon as practicable of the nature and cost of said emergency repairs. Principal and Surety shall reimburse the District for the costs of any such emergency repairs within thirty (30) days of receipt of invoice from the District therefore.

NON-EMERGENCY REPAIRS:

Non-emergency maintenance and repair(s) shall be promptly performed by Principal upon receipt of written notice from the District Engineering Manager directing the performance of such work. Such notice shall also be sent to Surety. If Principal fails to commence work within seven (7) calendar days of such notice, the District may perform the work at the expense of Principal and/or Surety.

One (1) year after the date of acceptance of the facilities as indicated above, the District shall inspect subject facilities. If subject facilities are in a condition satisfactory to the District Engineering Manager, then this obligation shall be void; otherwise, the District shall give notice to Principal and Surety of necessary maintenance and repair and, in such case, this Bond shall remain in full force and effect until the facilities are finally accepted in writing by the District Engineering Manager.

In the event that Principal and/or Surety fail to perform non-emergency repair(s) or maintenance pursuant to notice from the District, and the District, through its own employees or through contract of services, shall perform the repair(s) or maintenance required, Principal and Surety do hereby agree to reimburse the District for all costs incurred by the District in completion of said work and do further agree to pay an additional sum to the District equal to such District's expenses which shall be stipulated to reimburse the District for its general and administrative expenses to enforce the conditions of this Bond. Principal and Surety do hereby further contract and agree that the prevailing party in any litigation arising out of or relating to this Utility Maintenance Bond shall be awarded its Attorneys' fees and all costs (whether or not otherwise recoverable by statute or Court Rule) incurred in such litigation. The venue for any such litigation shall be in Skagit County, Washington.

SIGNED, sealed and delivered this _____ day of _____, 2013.

_____	_____
PRINCIPAL	SURETY
By:_____	By:_____ Attorney-in-Fact
Washington Contractor's License No:	
_____	_____ (Name of Agent)
_____ Address	_____ Agent's Address
_____ City State Zip	_____ City State Zip
Phone No:_____	Phone No:_____
Fax No:_____	Fax No:_____
E-Mail address:_____	E-Mail address:_____

ATTACH POWER OF ATTORNEY

AGREEMENT
DEPOSIT IN LIEU OF MAINTENANCE BOND

PROJECT NAME: _____

C.O.#: _____ W.O.# _____

THIS AGREEMENT made and entered into in triplicate this ___ day of _____, 2013 by and between _____, hereinafter referred to as "Developer", and _____, hereinafter referred to as "Bank", whose mailing address is _____ and PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON, 1415 Freeway Drive, Post Office Box 1436, Mount Vernon, WA 98273, hereinafter referred to as "District".

WHEREAS, District requires a guaranty by Developer insuring, for a period of one (1) year following the date of District's Letter of Acceptance of the below described facilities, that the facilities are free from defects including materials and workmanship, and

WHEREAS, Developer herein wishes to deposit funds with the Bank named above in lieu of a bond to guaranty maintenance and repair of the below described facilities at the development located at _____ Washington.

IN CONSIDERATION of the mutual covenants set forth below, the undersigned parties do covenant and agree as follows:

1. District agrees that Developer, in lieu of posting a maintenance bond with respect to the water main facilities (hereafter referred to as "facilities") may deposit with the above-named Bank the sum of _____ Dollars ($_____.00) to guaranty that Developer shall maintain and remedy the facilities from defects for a period of one (1) year following the date of the Letter of Acceptance by the District of the facilities. Said Letter of Acceptance can be issued or become effective upon execution of this Agreement.

2. Bank agrees to retain the deposit in lieu of bond upon the following conditions:

   2.1 No withdrawals will be made on the deposit account without the written approval of the District's General Manager or his designated representative.

   2.2 Release of any remaining funds to the Developer, prior to completion of the one (1) year period will not be made without the written approval of the District's General Manager or his designated representative.

   2.3 Funds shall be released to the District for maintenance or repair of defects upon the written demand of the District's General Manager or his designated representative.

   2.4 Signing of this Agreement by the Bank acknowledges receipt of the deposit in the Bank by the Developer, under Account No. _____, for the purposes stated and under the terms and conditions stated herein.

   2.5 Developer shall be responsible for any charges or costs charged by the bank for the deposit in lieu of bond.

3. Developer agrees that it has deposited funds with the Bank and that the sum set forth above is for the purposes stated and in accordance with the terms and conditions stated above.

4. Developer agrees and understands that the purpose of this deposit in lieu of bond is to guaranty the payment to the District of costs of repair that may become necessary during the first year of operation; and that this deposit secures payment for replacement of any or all of the facility if it is determined by the District that the defects are excessive to the point that the facilities cannot be relied upon for a long, trouble-free life.

5. The Developer agrees that, in the event the cost of repair or replacement of defects exceed the amount posted herein, the Developer will be responsible for, and immediately deposit sufficient funds to pay for, the necessary repair or replacement.

6. The District shall notify the Bank of any known condition that, in the District's opinion, constitutes a lawful claim against said funds for repair or replacement deemed necessary. District notification shall be submitted timely and not later that one year from date of acceptance.

7. In the event of a dispute between the Developer and the District over the terms and conditions hereof or any claims pursuant the prevailing party shall be entitled to their attorney fees and costs. This Agreement and all disputes arising hereunder shall be governed by Washington State law. Venue shall be in the Superior Court of the State of Washington for Skagit County.

DEVELOPER:

_____
(TYPED NAME)

Address: _____

_____

By: _____

Its: _____

Date: _____

BANK:

_____
(TYPED NAME)

Address: _____

_____

By: _____

Its: _____

Date: _____

DISTRICT:

PUBLIC UTILITY DISTRICT NO. 1
OF SKAGIT COUNTY, WASHINGTON

By: _____
Robert B. Powell, General Manager

Date: _____

AGREEMENT
IRREVOCABLE LETTER OF CREDIT IN LIEU OF MAINTENANCE BOND

PROJECT NAME: _____

C.O.#: _____ W.O.# _____

THIS AGREEMENT made and entered into in triplicate this ___ day of _____, 2013 by and between _____, hereinafter referred to as "Developer", and _____ _____, hereinafter referred to as "Bank", whose mailing address is _____ _____ and PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON, 1415 Freeway Drive, Post Office Box 1436, Mount Vernon, WA 98273, hereinafter referred to as "District".

WHEREAS, District requires a guaranty by Developer insuring, for a period of one (1) year following the date of District's Letter of Acceptance of the below described facilities, that the facilities are free from defects including materials and workmanship, and

WHEREAS, Developer herein wishes to provide an irrevocable letter of credit from, the Bank named above in lieu of a bond to guaranty maintenance and repair of the below described facilities at the development located at _____ _____, Washington.

IN CONSIDERATION of the mutual covenants set forth below, the undersigned parties do covenant and agree as follows:

District agrees that Developer, in lieu of posting a maintenance bond with respect to the water main facilities (hereafter referred to as "facilities") may provide an irrevocable letter of credit with the above-named Bank for the sum of _____ **Dollars ($_____)** to guaranty that Developer shall maintain and remedy the facilities from defects for a period of one (1) year following the date of the Letter of Acceptance by the District of the facilities. Said Letter of Acceptance can be issued or become effective upon execution of this Agreement.

2. Bank agrees to provide an irrevocable letter of credit upon the following conditions:

   2.1 Release of the irrevocable letter of credit to the Developer, prior to completion of the one (1) year period will not be made without the written approval of the District's General Manager or his designated representative.

   2.2 Funds shall be released to the District for maintenance or repair of defects upon the written demand of the District's General Manager or his designated representative.

   2.3 Signing of this Agreement by the Bank acknowledges creation of an irrevocable letter of credit in the Bank by the Developer, under Account No. _____, for the purposes stated and under the terms and conditions stated herein.

   2.4 Developer shall be responsible for any charges or costs charged by the bank for the irrevocable letter of credit.

3. Developer agrees that an irrevocable letter of credit has been established with the Bank and that the sum set forth above is for the purposes stated and in accordance with the terms and conditions stated above.

4. Developer agrees and understands that the purpose of this irrevocable letter of credit in lieu of maintenance bond is to guaranty the payment to the District of costs of repair that may become necessary during the first year of operation; and that this letter of credit secures payment for replacement of any or all of the facility if it is determined by the District that the defects are excessive to the point that the facilities cannot be relied upon for a long, trouble-free life.

5. The Developer agrees that, in the event the cost of repair or replacement of defects exceed the amount posted herein, the Developer will be responsible for, and immediately deposit sufficient funds to pay for, the necessary repair or replacement.

6. The District shall notify the Bank of any known condition that, in the District's opinion, constitutes a lawful claim against said funds for repair or replacement deemed necessary. District notification shall be submitted timely and not later that one year from date of acceptance.

7. In the event of a dispute between the Developer and the District over the terms and conditions hereof or any claims pursuant the prevailing party shall be entitled to their attorney fees and costs. This Agreement and all disputes arising hereunder shall be governed by Washington State law. Venue shall be in the Superior Court of the State of Washington for Skagit County.

DEVELOPER:

_____
(TYPED NAME)

Address: _____

_____

By: _____

Its: _____

Date: _____

BANK:

_____
(TYPED NAME)

Address: _____

_____

By: _____

Its: _____

Date: _____

DISTRICT: PUBLIC UTILITY DISTRICT NO. 1
OF SKAGIT COUNTY, WASHINGTON

By: _____
Robert B. Powell, General Manager

Date: _____

MAINTENANCE AGREEMENT FOR GOVERNMENTAL AGENCY

WHEREAS: _____

as Principal, who's address is:

_____

_____

Phone: _____

has constructed waterline plant and facilities commonly known as:

Project Title: _____

C. O. # _____ W. O. # _____

WHEREAS, for and in consideration of the services to be received from PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON, the Principal desires to give Public Utility District No. 1 of Skagit County (District) a guarantee that said construction was performed in a workmanlike manner; and,

WHEREAS, the Principal, is a governmental organization; and,

WHEREAS, local governments are permitted to make the most efficient use of their powers by enabling them to cooperate with other local governments and thereby provide services and facilities in a manner that will accord best with geographic, economic, population, and other factors influencing the needs and development of local communities; and

WHEREAS, the commitment of funds to purchase a maintenance bond is deemed to be a non-efficient use of funds; given the cooperative governmental mission of the District and the Principal to the local communities;

NOW, THEREFORE, in lieu of a one year maintenance bond, the Principal does hereby guarantee, indemnify, and hold harmless the District, its officers, employees, and agents from any defect or defects whatsoever in the waterline plant and facilities which may develop or be discovered within one (1) year after the formal written acceptance of the project by the District. To the extent no defects or claims of defects have been discovered, this Agreement shall become null and void without further action by either party one (1) year after the formal written acceptance of the project by the District. The Parties agree that the liability hereunder shall not exceed the sum of $_____ (100% of the value).

The Parties further agree that the District may initiate repairs and perform the work itself or by contract to any vendor at the District's sole discretion. The Principal agrees to reimburse the District within ninety days of invoice by the District. Remedies for non-payment may include termination of water service and/or other legal recourse.

IN WITNESS THEREOF, the parties hereto have executed this agreement as of the ____ day of _____, 2013.

PRINCIPAL:

	PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY, WASHINGTON
_____ Name of Principal	
_____ Signature	_____ Robert B. Powell, General Manager
_____ Printed Name and Title	
Attest:_____	Attest:_____
Date:_____	Date:_____

RETURN TO:
Public Utility District No. 1 of Skagit County
Post Office Box 1436, 1415 Freeway Drive
Mount Vernon, WA 98273

BILL OF SALE

For and in consideration of mutual benefits and other good and valuable consideration, receipt of which is hereby acknowledged, **XXXXXXXXXXXXXXXXX** does herewith transfer, sell, convey and quit claim to the **PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY** the following described personal property situated at **XXXXXXXXXXXXXXXXXXXXXXXXXXX,** Skagit County, Washington.

Quantity	Item Description	Total Cost
2,500'	8-inch Class 50 DI Pipe	$29,882.91
110'	4-inch Class 50 DI Pipe	1,177.85
8	8-inch Gate Valve RW	4,800.00
6	6-inch Gate Valve RW	2,100.00
1	4-inch Gate Valve RW	280.02
1	1-inch Combination Air Valve	500.00
1	2-inch Flushing Assembly	400.00
51	1-inch PE Service Stubs	9,448.78
LS	Miscellaneous	2,131.27
Materials Total		$50,720.83
Labor & Equipment		21,569.74
Subtotal Materials, Labor and Equipment		$72,290.57
Washington State Sales Tax (8.2%)		5,927.83
Engineering		10,000.00
Total		$88,218.40

Seller warrants that he is the owner of the described property and has a good right and full authority to sell the same.

Dated this_____ day of_____, 2013.

_____
Signature

STATE OF _____
COUNTY OF _____

(Individual)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.

Date: _____

_____
Notary Public in and for the State of _____
My appointment expires: _____

OWNER:

_____
Print Title

_____ _____
Signature Print Name

STATE OF _____
COUNTY OF _____

(Corporate, Partnership)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of _____ to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as _____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that she signed this instrument, on oath stated that she was authorized to execute the instrument and acknowledged it as _____ of _____ to be the free and voluntary act for the uses and purposes mentioned in the instrument.

Date: _____

_____
Notary Public in and for the State of _____
My appointment expires: _____

BILL OF MATERIALS

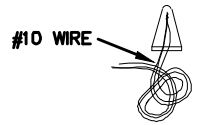
NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		11	ADAPTER, BRASS PAK JOINT, 1"M.I.P.T.X1"PVC, (FORD #C87-44)[a]	4-7
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1	12	UTILITY VAULT 3030-LA W/3030-P COVER (SEE NOTE 4)	1
			13	NIPPLE, 1"x12" BRASS	1
3	CORP., 1" BRASS FB-500[a]	1	14	VALVE, 1" COMBINATION AIR (APCO) (W/ STAINLESS STEEL TRIM)[a]	1
4	NIPPLE, BRASS 1X6	1	15	PIPE, 1" PVC, SCH. 80	
5	CURB STOP, 1" B11-444	1	16	HOSE CLAMP, 3/4" STAINLESS STEEL	1
6	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1	17	BEND, 1", COPPER, 180', WITH INSECT SCREEN	1
			18	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID.	
7	CASING, 6" P.V.C. SEWER PIPE	1	19	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED (PRESSURE TREATED 4' X 4" POST W/MARKER WHERE APPROPRIATE)	1
8	ELL, 1" BRASS, 90', STREET	4			
9	ELL, 1" BRASS, 90'	2	20	NIPPLE, 1"x2" BRASS	2
10	UNION, BRASS 1"	1	21	CONCRETE SUPPORT, MIN. 1 FT. SQUARE x 1-1/4 IN. THICK	1-2

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

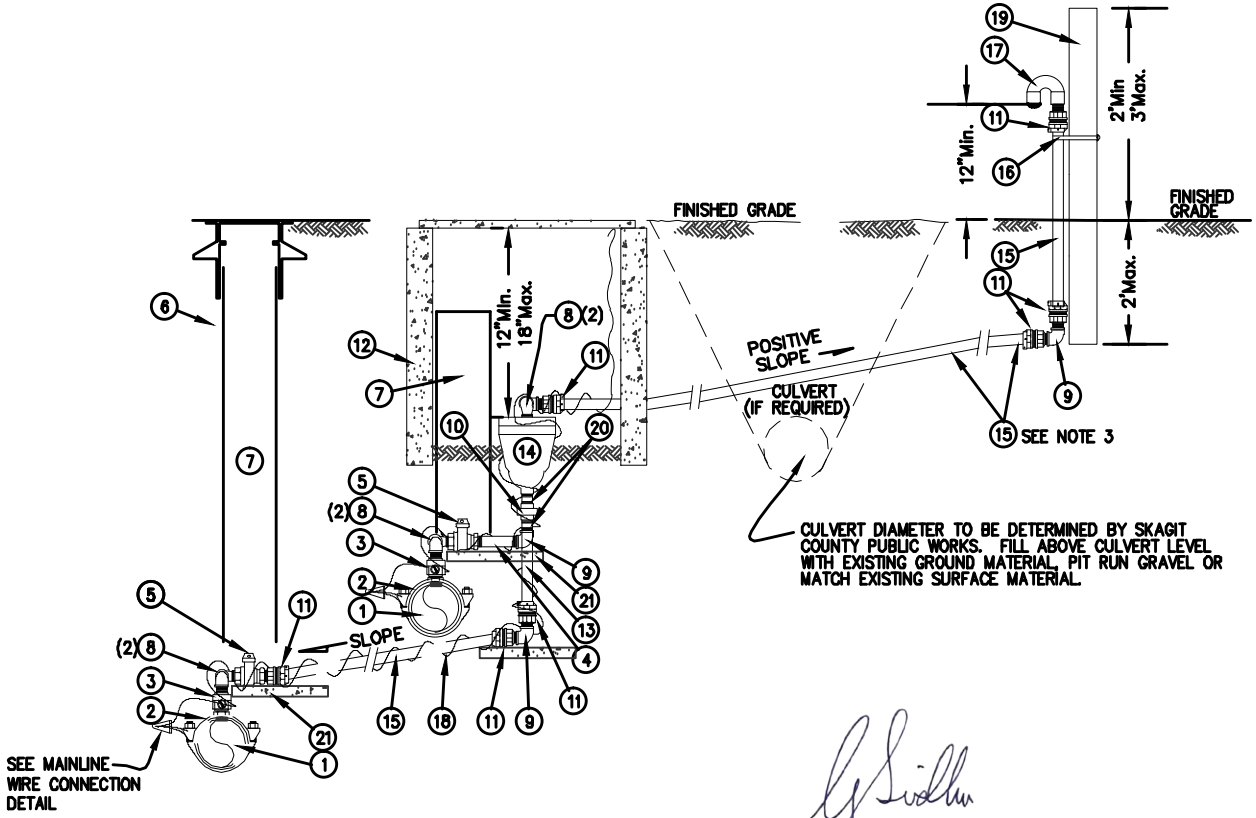
NOTES:

1. CORP TO BE IN FULL "ON" POSITION BEFORE BACKFILL.
2. SET VALVE CASINGS AND VAULT TO FINISHED GRADE. PROVIDE CONCRETE BLOCK SUPPORT UNDER CASING. DO NOT REST ON PIPE. REFER TO DETAIL OF STANDARD VALVE CASING INSTALLATION.
3. INSTALL LINE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLAN.
4. CARSON INDUSTRIES BOX 1730-15 W/COVER 1730-3L MAY BE USED IN LAWN OR LANDSCAPED AREA UPON APPROVAL BY P.U.D.
5. IF THERE IS A GROUND DEPRESSION OR DITCH BETWEEN AIR VALVE LOCATION AND VENT PIPE WHICH AFFECTS THE SLOPE OF THE HORIZONTAL VENT PIPE, INSTALL A CULVERT IF IT IS A DRAINAGE PATH OR FILL WITH DIRT.



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



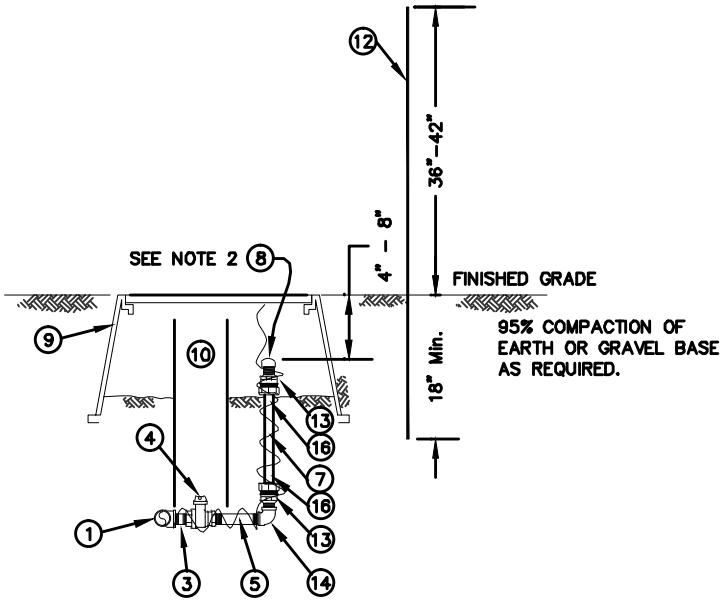
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

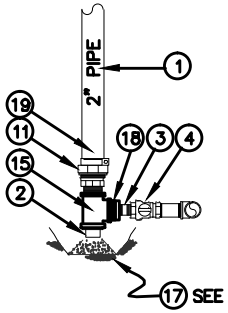
APPROVED ON: MAY 21, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1" COMBINATION AIR VALVE ASSEMBLY

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/21/14	WV1-1
DRAWN BY: CAS	
APPROVED BY: GJS	





BILL OF MATERIALS		
NO.	NOMENCLATURE	REQ'D.
1	PIPE, 2" MAINLINE – P.V.C.*	
2	PLUG, 2" BRASS	1
3	NIPPLE, 1" x 2", BRASS	1
4	VALVE, 1" BALL, B11-444[a]	1
5	NIPPLE, 1" X 6", BRASS	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	
7	PIPE, 1" PE 3408, SIDR 7, 200 P.S.I.	
8	CAP, 1" P.V.C.	1
9	TRAFFIC RATED METER BOX AND LID (MID-STATES PLASTIC, INC. MSBCF 1324-18 NOT FOR THROUGH-WAY TRAFFIC APPLICATION)[a]	1
10	CASING , 6" P.V.C. SEWER PIPE	1
11	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. x 2" P.V.C.	1
12	MARKER, BLUE, CARSONITE #CWV-116	1
13	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. x POLY	2
14	ELL, 1" BRASS, 90°	1
15	TEE, 2" BRASS	1
16	INSERT, STIFFENER, 1" (FORD #72)[a]	2
17	CONCRETE BLOCKING	
18	BUSHING, BRASS 2x1	1
19	INSERT, STIFFENER, 2" (FORD #75) (IF POLY ONLY)	

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

* IF MAINLINE IS P.E., #11 ABOVE WILL CHANGE AND #19 WILL BE REQUIRED.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

NOTES:

1. BLOCK AS PER P.U.D. HORIZONTAL THRUST BLOCKING DETAIL. BEARING AREA TO BE AGAINST UNDISTURBED EARTH AND TO BE DETERMINED BY THE ENGINEER. USE FORMING AS NECESSARY TO PREVENT CONCRETE FROM INTERFERING WITH CAP OR PLUG.
2. PLASTIC THREADED CAPS TO BE HAND TIGHT ONLY.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD
1" FLUSHING ASSEMBLY

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WB1-1
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

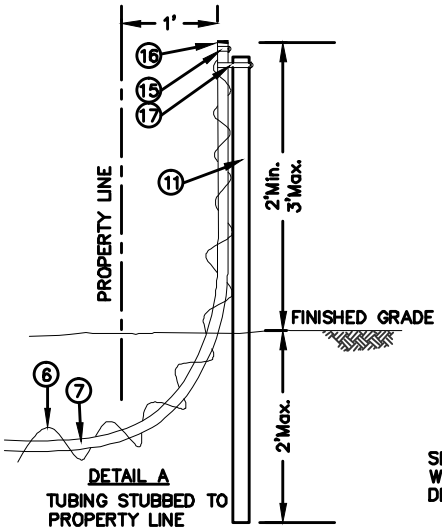
NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		10	METER, BADGER, 1", MODEL M70	1
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1	11	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
3	CORP, 1", (FORD #FB-500)[a]	1	12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1324-15 W/COVER 1324-3L)[a]	1
4	NOT USED		13	EXTENSION, METER BOX, (CARSON INDUSTRIES LLC, L SERIES 1324-15)[a] (IF NECESSARY)	1
5	NIPPLE, BRASS, 1"x 2"	1	14	INSERT, STIFFENER, 1-1/4" (FORD #72)[a]	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID		15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
			16	ADAPTER, 1-1/4" M.I.P.T. x 1-1/4" INSERT W/CAP (GALVANIZED)	1
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.		17	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
8	COPPERSETTER, 1", FORD #VBHC74-18W-11-44[a]	1	18	ADAPTER, BRASS, 1" F.I.P.T. X 1" INSERT	1
9	ADAPTER, BRASS PAK JOINT, M.I.P.T. X 1-1/4" POLY, (FORD #C86-44)[a] [b]	1	19	1" X 1-1/4" BELL REDUCER	2
			20	NIPPLE, BRASS, 1"x 6"	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 1" M X F I.P.T. (IF NEEDED)

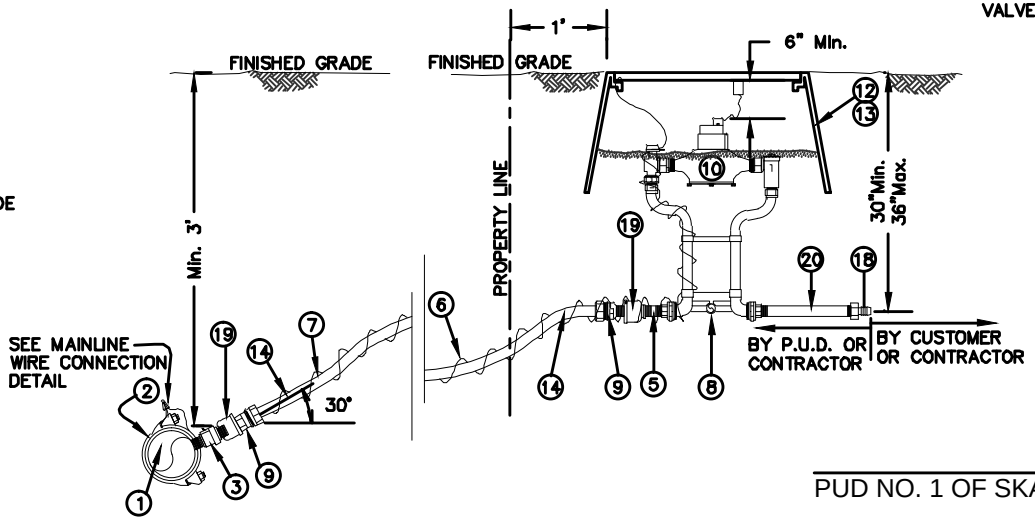
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

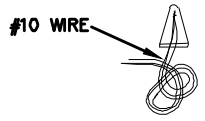
NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18) WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



DETAIL A
TUBING STUBBED TO PROPERTY LINE





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

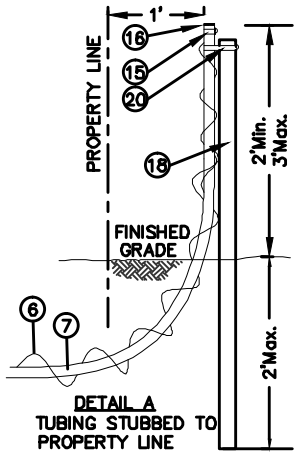
SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS1-1
DRAWN BY: KDM	
APPROVED BY: GJS	

BILL OF MATERIALS

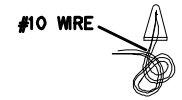
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	CORP, 1", (FORD #FB-500)[a]	1
4	ADAPTER, BRASS PAK JOINT, 1" F.I.P.T. X 1-1/4" POLY, (FORD #C16-44-Q)[a]	1
5	ADAPTER, BRASS, 1" M.I.P.T. x 1-1/4" POLY (FORD C86-34-Q)[a]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID.	
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 1", FORD #VBHC74-18W-11-44[a]	2
9	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. X 1" PVC, (FORD #C87-44)[a] [b]	2
10	METER, BADGER, 1" MODEL M70	2
11	PIPE, 1" PVC SCH 80 (FIELD CUT TO EXACT LENGTH)	±2'
12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1324-15 W/COVER 1324-3L)	2
13	EXTENSION, METER BOX, (CARSON INDUSTRIES LLC, L SERIES 1324-15)[a] (IF NECESSARY)	2
14	TEE, 1" BRASS	1
15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
16	ADAPTER, 1" M.I.P.T x 1-1/4" INSERT W/CAP (GALVANIZED)	1
17	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	2
18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
19	INSERT, STIFFENER, 1-1/4" (FORD #72)[a]	3
20	HOSE CLAMP, 1/1/4" STAINLESS STEEL	1
21	NIPPLE, BRASS, 1"x 6"	3

[a] OR EQUIVALENT APPROVED BY THE DISTRICT [b] ELL, 90° STREET, 1" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



DETAIL A
TUBING STUBBED TO PROPERTY LINE

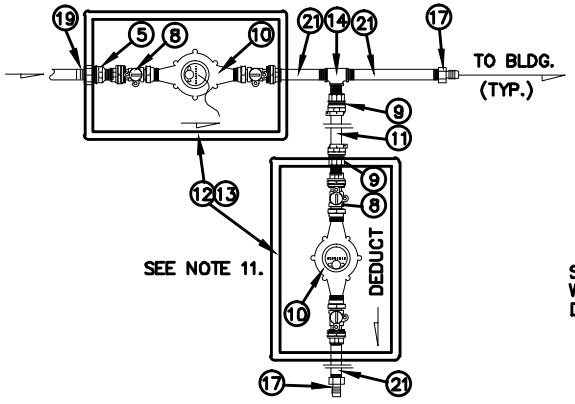


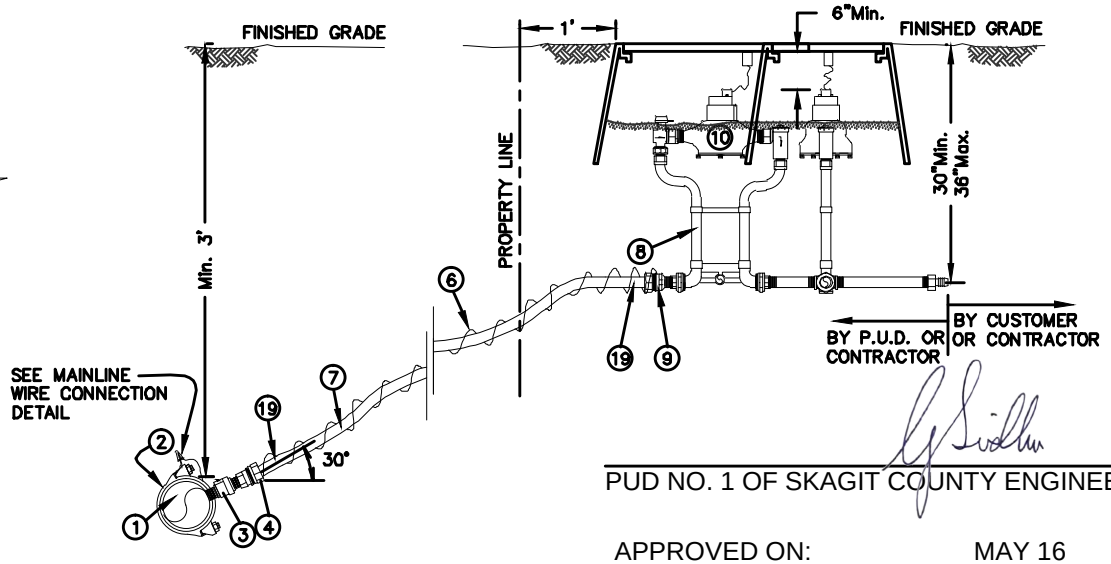
MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE WITH DEDUCT METER

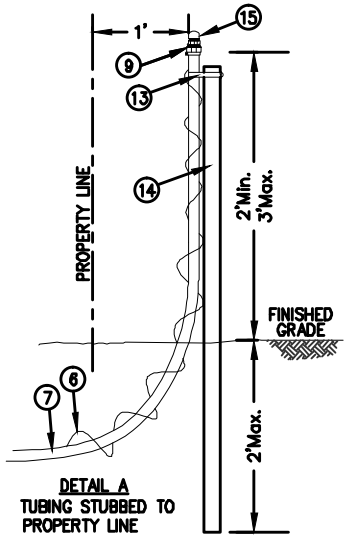
SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS1-2
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	CORP, 1", (FORD #FB-500)[a]	1
4	ADAPTER, BRASS PAK JOINT, 1" F.I.P.T. X 1" COPPER, (FORD #C14-44)[a]	1
5	NIPPLE, BRASS, 1"x 6"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	
7	TUBING, 1-1/4" COPPER, TYPE K	
8	COPPERSETTER, 1", FORD #VBHC74-18W-11-44[a]	1
9	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. X 1-1/4" COPPER, (FORD #C84-44)[a] [b]	2
10	METER, BADGER, 1" MODEL M70	1
11	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1324-15 W/COVER 1324-3L)[a]	1
12	EXTENSION, METER BOX, (CARSON INDUSTRIES LLC, L SERIES 1324-15)[a] (IF NECESSARY)	1
13	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
14	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
15	CAP, 1" (GALVANIZED)	1
16	ADAPTER, BRASS, 1" F.I.P.T. X 1" INSERT	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 1" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



DETAIL A
TUBING STUBBED TO PROPERTY LINE

NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
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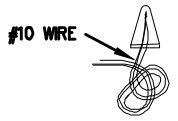
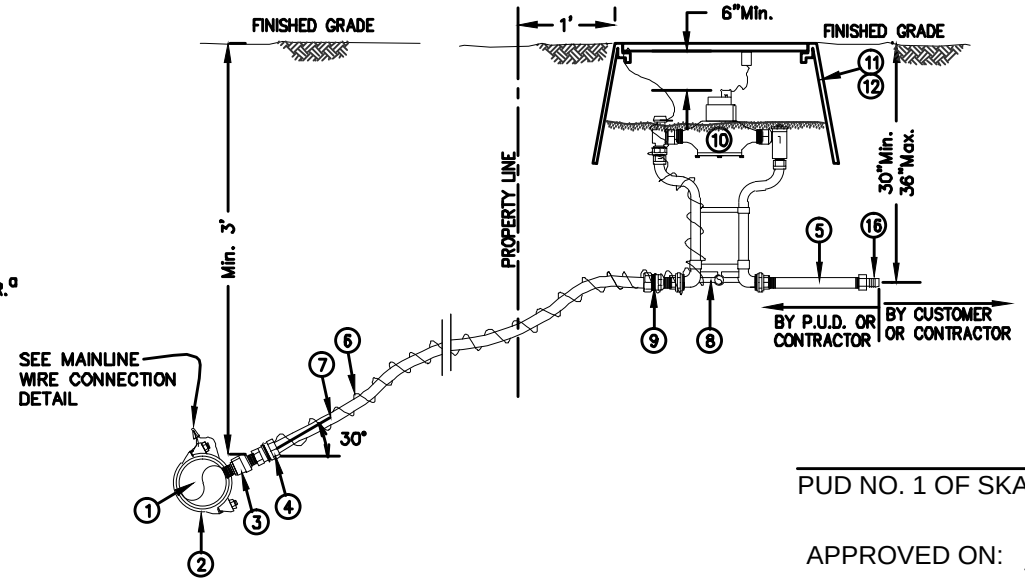
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1" METERED SERVICE WITH COPPER TYPE K SERVICE LINE

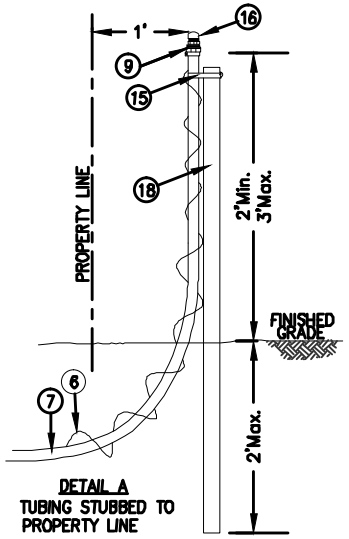
SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS1-3
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE, I.P.T.x I.P.T.	1
4	NIPPLE, BRASS 2X4	1
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. X 2" POLY (FORD #C16-77)[a] [b]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" PE 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 1-1/2", (FORD #VBHH76-12B-11-66)[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X POLY (FORD #C86-77)[a]	2
10	METER, BADGER, 1-1/2" MODEL 120	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	INSERT, STIFFENER, 2" (FORD #75)[a]	2
15	HOSE CLAMP, 3/4" STAINLESS STEEL	1
16	CAP, 2" (GALVANIZED)	1
17	NIPPLE, BRASS 1-1/2"x4"	1
18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
19	BUSHING, BRASS 2" M.I.P.T.x 1-1/2" F.I.P.T.	1
20	NIPPLE, BRASS 1-1/2"x12"	1
21	CAP, 1-1/2" (GALVANIZED)	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.



DETAIL A
TUBING STUBBED TO PROPERTY LINE

NOTES

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2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
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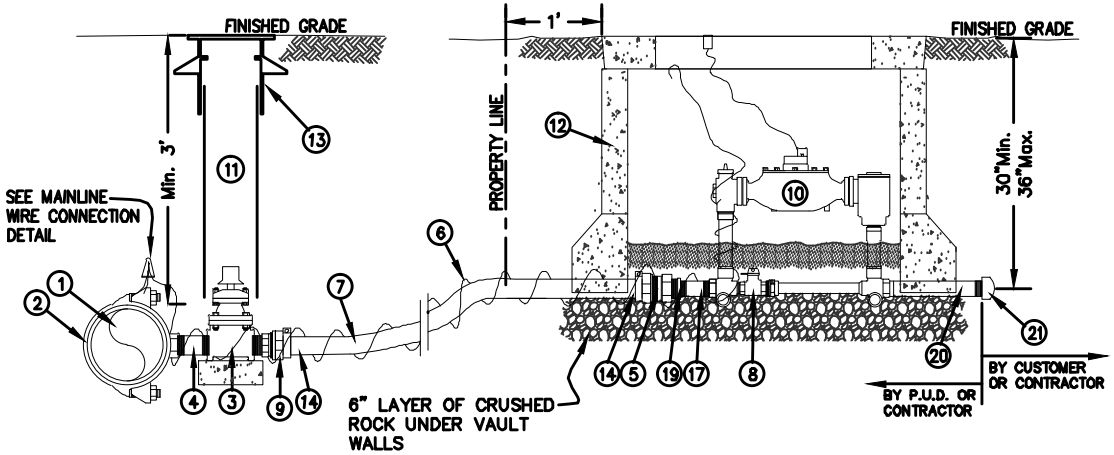
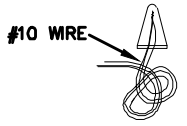




MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1-1/2" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

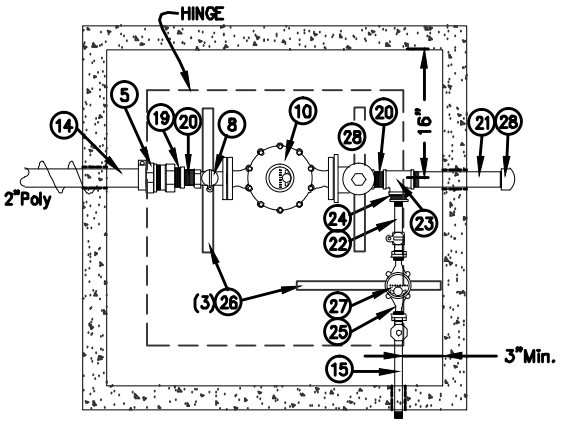
SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS1.5-1
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		15	NIPPLE, BRASS, 3/4"x12" OR 1"x12"	1
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS (FORD #202B)[a]	1	16	CAP, 2" (GALVANIZED)	2
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1	17	HOSE CLAMP, 1-1/2" STAINLESS STEEL	1
4	NIPPLE, BRASS 2X4	1	18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
5	ADAPTER, BRASS PAK, 2" F.I.P.T. x 2" POLY (FORD C16-27)[a] [b]	1	19	BUSHING, BRASS 2" M.I.P.T.x1-1/2" F.I.P.T.	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID		20	NIPPLE, BRASS 1-1/2"xCLOSE	2
7	PIPE, 2" PE 3408, SIDR 7, 200 P.S.I.		21	NIPPLE, BRASS 1-1/2"x12"	1
8	COPPERSETTER, 1-1/2", (FORD #VBHH76-12B-11-66)[a]	1	22	NIPPLE, BRASS 3/4"x6" OR 1"x6"	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X POLY (FORD #C86-77)[a]	2	23	TEE, 1-1/2" BRASS	1
10	METER, BADGER, 1-1/2" MODEL 120	1	24	BUSHING, BRASS 1-1/2"x3/4" OR 1-1/2"x1" M.I.P.T.x F.I.P.T.	1
11	CASING, 6" PVC SEWER PIPE	1	25	COPPERSETTER, 3/4"(FORD #VBHC72-9W-11-33) OR 1"(FORD #VBHC74-18W-11-44)[a]	1
12	UTILITY VAULT 444-LA W/#44-332P COVER[a] (SPRING ASSISTED)	1			
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1	26	STABILIZER, 1'6" TO 24" LENGTH, ROD OR PIPE	3
			27	METER, BADGER, MODEL M25 (5/8") OR M35 (3/4"), BRONZE	1
14	INSERT, STIFFENER, 2" (FORD #75)[a]	2	28	CAP, 1-1/2" (GALVANIZED)	1

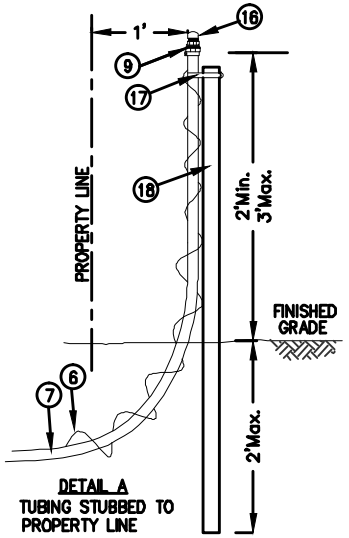
[a] OR EQUIVALENT APPROVED BY THE DISTRICT [b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

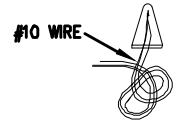


NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE.
3. IF VAULT AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE TUBING INSTALLATION, THEN TUBING IS TO BE STUBBED UP ABOVE FINISH GRADE AND CAPPED. SEE DETAIL A.
4. SUPPORT COPPER SETTERS WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPER SETTER FLUSH AND PLUMB IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
5. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
6. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ. FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ. FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
7. IF THE METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX WITH COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
8. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
9. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END IN A CARSON INDUSTRIES BOX. PAD IS TO BE LOCATED AT THE STREET END OF THE BOX.
10. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2" X 1" JOINT MASTIC.
11. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MINIMUM 3" DRAIN PIPE (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE).
12. NON-SHRINK GROUT OR FOAM SHALL BE INSTALLED AROUND PIPE PENETRATIONS THROUGH VAULT WALL TO ELIMINATE GROUND WATER FLOODING VAULT.
13. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

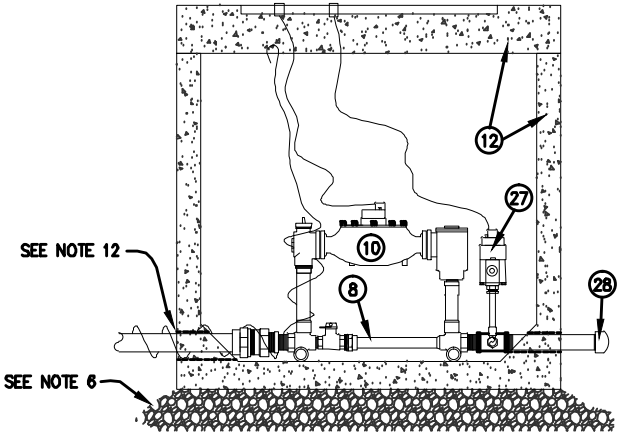


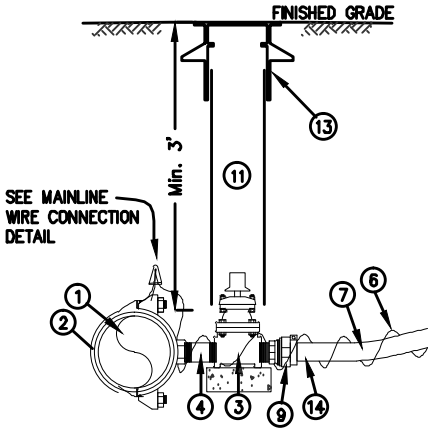
DETAIL A
TUBING STUBBED TO PROPERTY LINE



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]





PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF DOUBLE 1-1/2" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE W/ DEDUCT METER

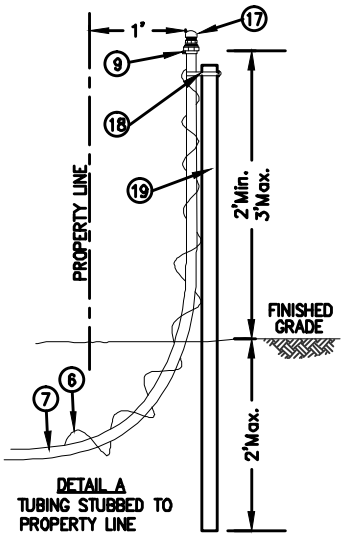
SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS1.5-2
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. X 2" COPPER (FORD #C14-77)[a] [b]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	TUBING, 2" COPPER, TYPE K	
8	COPPERSETTER, 1-1/2", (FORD #VBHH76-12B-11-66)[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X COPPER (FORD #C84-77)[a]	2
10	METER, BADGER, 1-1/2" MODEL M120	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	BUSHING, BRASS 2"x1-1/2" M.I.P.T. X F.I.P.T.	1
15	NIPPLE, BRASS 1-1/2"x4"	1
16	NIPPLE, BRASS 1-1/2"x12"	1
17	CAP, 2" (GALVANIZED)	1
18	HOSE CLAMP, 3/4" STAINLESS STEEL	1
19	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
20	CAP, 1-1/2" (GALVANIZED)	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T (IF NEEDED)

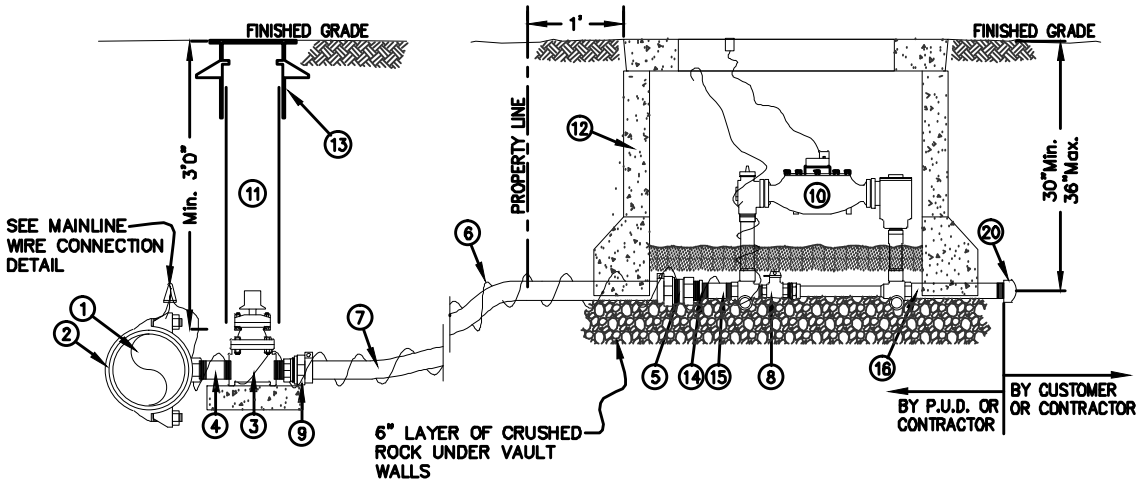
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

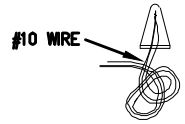


DETAIL A
TUBING STUBBED TO PROPERTY LINE

NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18) WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1-1/2" METERED SERVICE WITH COPPER TYPE K SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS1.5-3
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

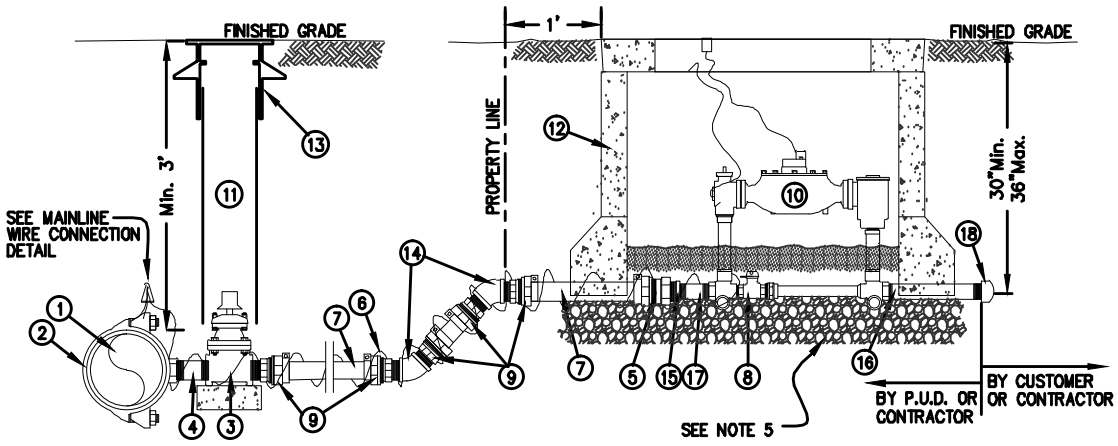
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" CAST IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. X PVC (FORD #C17-77)[a] [b]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" P.V.C., 200 PSI, SCHEDULE 80	
8	COPPERSETTER, 1-1/2", FORD #VBHH76-12B-11-66[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X PVC (FORD #C87-77)[a]	5
10	METER, BADGER, 1-1/2" MODEL 120	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	ELL, BRASS 2", 45° OR 90°	2
15	BUSHING, BRASS 2" M.I.P.T.x 1-1/2" F.I.P.T.	1
16	NIPPLE, BRASS 1-1/2"x12"	1
17	NIPPLE, BRASS 1-1/2"x4"	1
18	CAP, 1-1/2" (GALVANIZED)	1

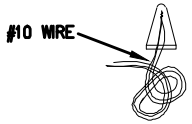
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE.
3. SUPPORT COPPERSETTER WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
4. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
5. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
6. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
7. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
8. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
9. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
10. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MINIMUM 3" DRAIN PIPE. (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE.)
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1-1/2" METERED SERVICE WITH P.V.C. SERVICE LINE

SCALE: 1" = 1'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS1.5-4
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

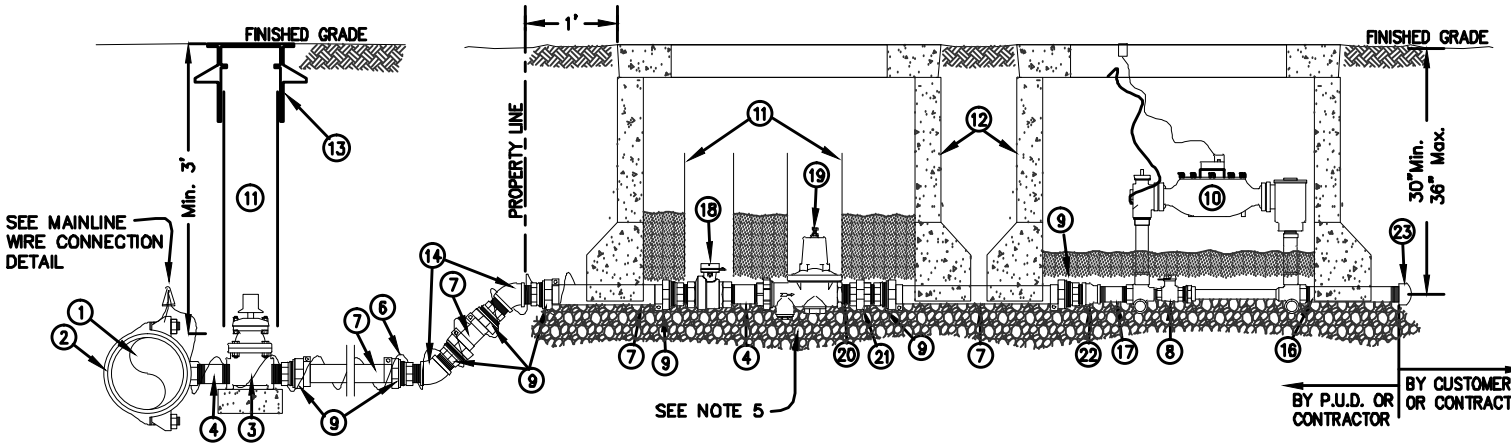
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. X PVC (FORD #C17-77)[a] [b]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" P.V.C., 200 PSI, SCHEDULE 80	
8	COPPERSETTER, 1-1/2", FORD #VBHH76-12B-11-66[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X PVC (FORD #C87-77)[a]	5
10	METER, BADGER, 1-1/2" MODEL 120	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	ELL, BRASS 2", 45° OR 90°	2
15	BUSHING, BRASS 2" M.I.P.T.x 1-1/2" F.I.P.T.	1
16	NIPPLE, BRASS 1-1/2"x12"	1
17	NIPPLE, BRASS 1-1/2"x4"	1
18	CURBSTOP, BRASS 2" (FORD #B11-777-W)[a]	1
19	PRV, WILKINS 2" 600 HLR SC (OUTLET SET @ 120 PSI "HIGH RANGE PRV")	1
20	NIPPLE, BRASS CLOSE 2"	1
21	UNION, BRASS 2"	1
22	REDUCER, BRASS 2"x1-1/2"	1
23	CAP, 1-1/2" (GALVANIZED)	1

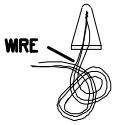
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE.
3. SUPPORT COPPERSETTER WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
4. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
5. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
6. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
7. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
8. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
9. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
10. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MINIMUM 3" DRAIN PIPE. (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE.)
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.
12. NOTIFY CUSTOMER TO RECOMMEND THAT THEY INSTALL A LOW RANGE PRV BEYOND THE METER TO REDUCE THE PRESSURE FROM 120 PSI TO BELOW 80 PSI TO PROTECT THEIR INTERIOR PLUMBING.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 1-1/2" METERED SERVICE WITH P.V.C. SERVICE LINE OFF HIGH PRESSURE MAIN LINE GREATER THAN 150 P.S.I.

SCALE: 1" = 1'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS1.5-5
DRAWN BY: KDM	
APPROVED BY: GJS	

BILL OF MATERIALS

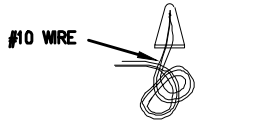
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)	1
3	VALVE, 2" BALL, BRASS, IPTxIPT (FORD #B13-777W)[a]	1
4	NIPPLE, BRASS 2X4	1-2
5	VALVE, 2"DUCTILE IRON, RESILIENT WEDGE	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" P.V.C., SCH. 80 (LENGTHS AS REQUIRED)	
8	ELL, 2" BRASS, 90°, STREET	4
9	ELL, 2" BRASS, 90°	2
10	UNION, 2" BRASS	1
11	CASING, 6" P.V.C. SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/2436P LOCKING STEEL COVER	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	VALVE, 2" COMBINATION AIR (APCO 145C.2 SERIES) W/SST TRIM	1
15	NIPPLE, BRASS, 2"XCLOSE	3
16	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X PVC (FORD #C87-77)[a]	4-7
17	BEND, 2" COPPER, 180°, WITH INSECT SCREEN	1
18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
19	HOSE CLAMP, 2", STAINLESS STEEL	2

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

NOTES:

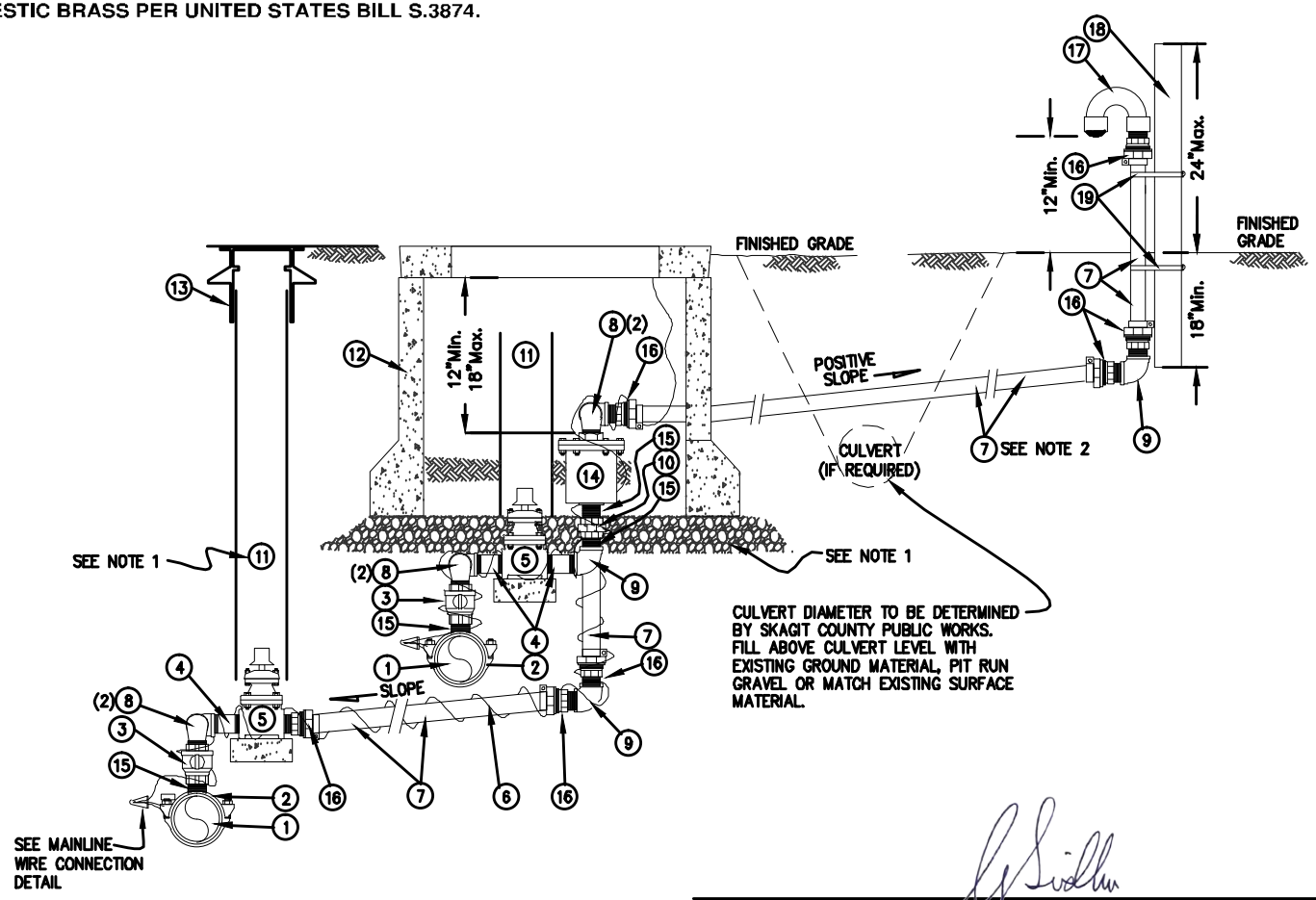
1. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
2. INSTALL LINE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLAN.
3. IF THERE IS A GROUND DEPRESSION OR DITCH BETWEEN AIR VALVE LOCATION AND VENT PIPE WHICH AFFECTS THE SLOPE OF THE HORIZONTAL VENT PIPE, INSTALL A CULVERT IF IT IS A DRAINAGE PATH OR FILL WITH DIRT.



MAINLINE WIRE CONNECTION DETAIL

NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



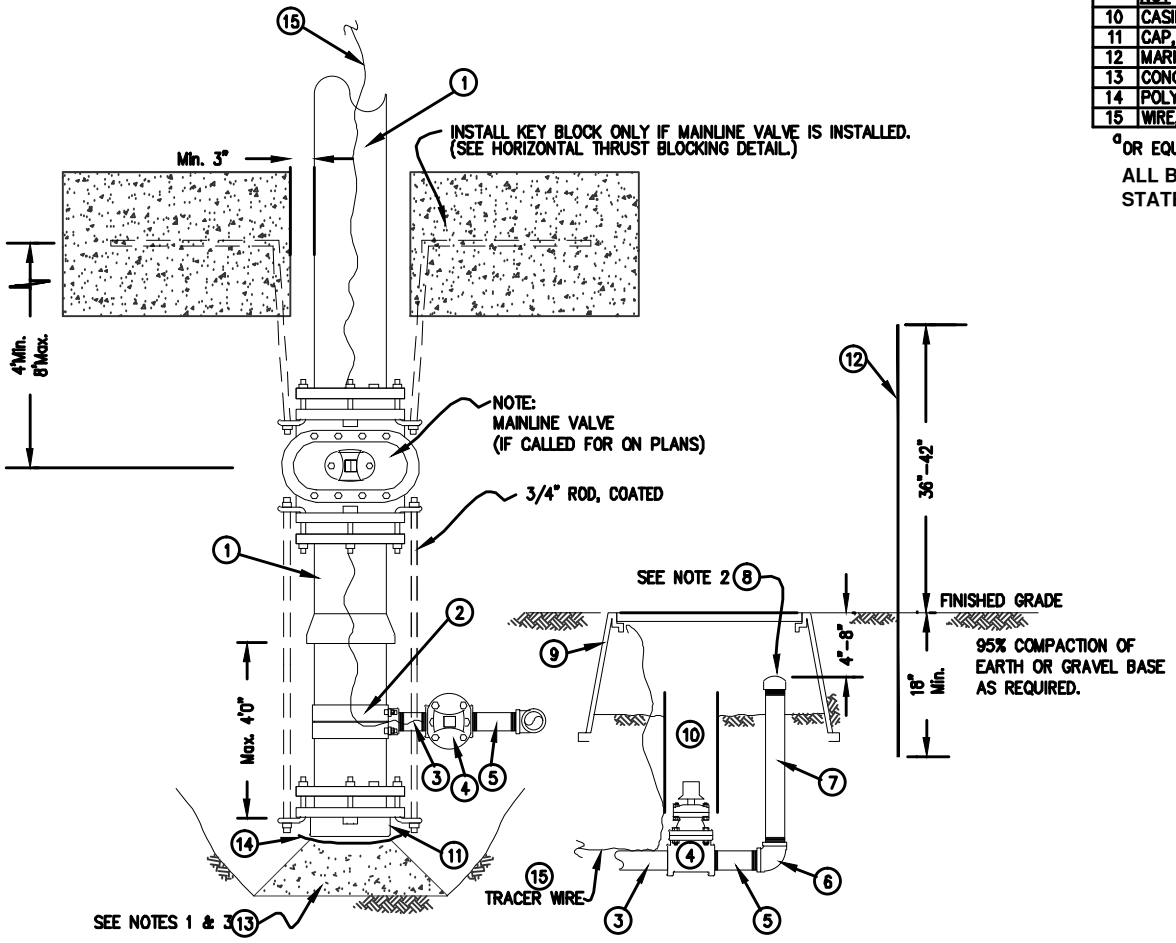
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 21, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" COMBINATION AIR VALVE ASSEMBLY

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/21/14	WV2-1
DRAWN BY: CAS	
APPROVED BY: GJS	



BILL OF MATERIALS		
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN (4", 6", OR 8")	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B) [a]	1
3	NIPPLE, 2" X 4", BRASS	1
4	VALVE, 2" CAST IRON, RESILIENT WEDGE	1
5	NIPPLE, 2" X 6", GALVANIZED	1
6	ELL, 2" 90° GALVANIZED	1
7	PIPE, 2" GALVANIZED, THREAD BOTH ENDS	
8	CAP, 2" PLASTIC, THREADED	1
9	TRAFFIC RATED METER BOX AND LID (MID-STATES PLASTIC, INC. MSBCF 1324-18 NOT FOR THROUGH-WAY TRAFFIC APPLICATION)[a]	1
10	CASING , 6" P.V.C. SEWER PIPE	1
11	CAP, M.J. BLIND	1
12	MARKER, BLUE, CARSONITE #CWV-116	1
13	CONCRETE BLOCKING (OR KEY BLOCK IF REQUIRED)	
14	POLYETHYLENE SHEETING, 8 MIL THICKNESS	
15	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

NOTES:

1. BLOCK AS PER P.U.D. HORIZONTAL THRUST BLOCKING DETAIL. BEARING AREA TO BE AGAINST UNDISTURBED EARTH AND TO BE DETERMINED BY THE ENGINEER. USE FORMING AS NECESSARY TO PREVENT CONCRETE FROM INTERFERING WITH CAP (#11), CLAMP (#2) OR VALVE (#4).
2. PLASTIC THREADED CAP (#8) TO BE HAND TIGHT ONLY.
3. IF A MAINLINE VALVE IS INSTALLED UPSTREAM OF FLUSHING ASSEMBLY, KEY BLOCK VALVE AND CAP. SEE THRUST BLOCKING DETAIL.
4. KEY BLOCK TO BE INSTALLED ONLY IF PIPE IS EXPECTED TO EXTEND WITHIN TEN (10) YEARS OF INSTALLATION. SEE HORIZONTAL THRUST BLOCKING DETAIL.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD
2-INCH FLUSHING ASSEMBLY

SCALE: 1" = 2'
DATE: 3-25-05
REVISED: 5/6/14
DRAWN BY: CAS
APPROVED BY: GJS

STANDARD

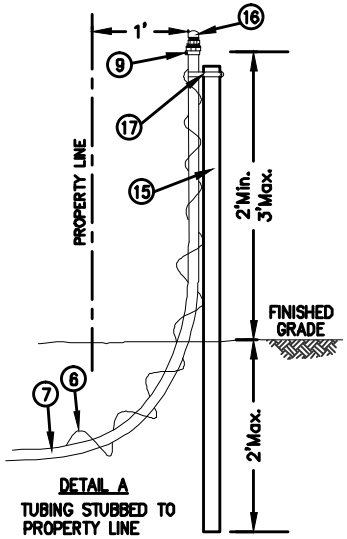
WB2-1

BILL OF MATERIALS

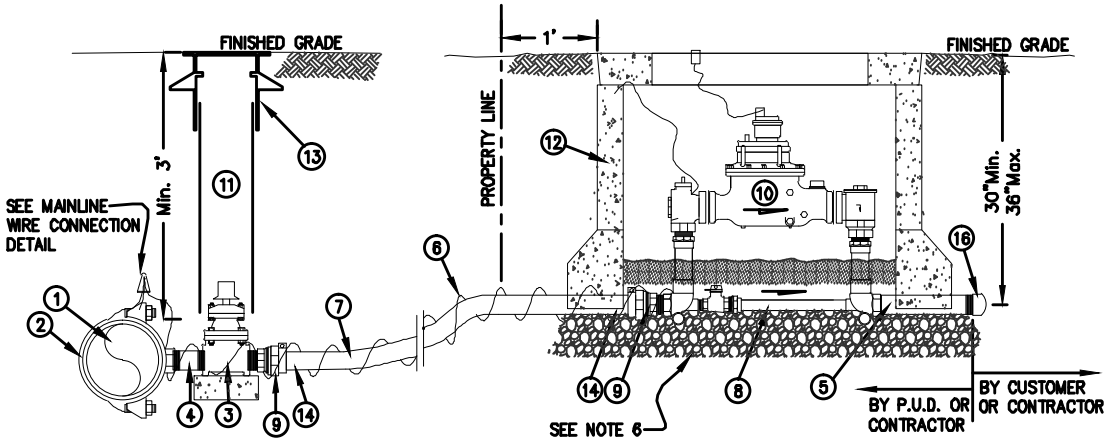
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE, I.P.T.xI.P.T.	1
4	NIPPLE, BRASS 2X4	1
5	NIPPLE, BRASS 2X12	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	
7	PIPE, 2" PE 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 2", FORD #VBHH77-12B-11-77[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X POLY (FORD #C86-77)[a] [b]	3
10	METER, BADGER, 2" MODEL 170	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	INSERT, STIFFENER, 2" (FORD #75)[a]	2
15	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
16	CAP, 2" (GALVANIZED)	1
17	HOSE CLAMP, 2" STAINLESS STEEL	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

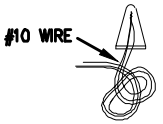


DETAIL A
TUBING STUBBED TO PROPERTY LINE



NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, OR IF CONNECTION IS NOT MADE PRIOR TO CUSTOMER'S PLUMBING, INSTALL A TIGHT FITTING PLUG OR CAP IN OPEN END OF COPPERSETTER AND A TIGHT WRAP OF PLASTIC (ELECTRICAL) TAPE OVER END OF NIPPLE. MAKE WATERTIGHT.
3. IF VAULT AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE TUBING INSTALLATION, THEN TUBING IS TO BE STUBBED UP ABOVE FINISH GRADE AND CAPPED. SEE DETAIL A.
4. SUPPORT COPPERSETTER WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
5. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
6. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
7. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
8. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
9. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
10. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-1
DRAWN BY: CAS	
APPROVED BY: GJS	

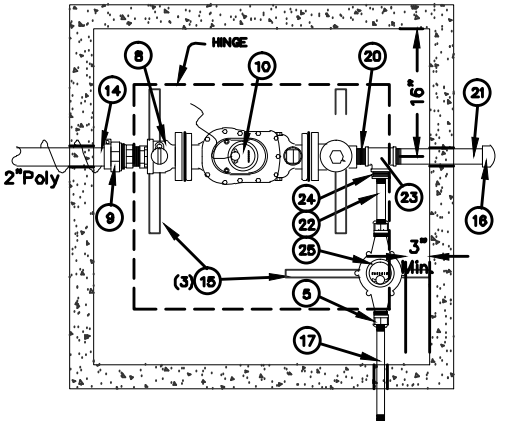
BILL OF MATERIALS

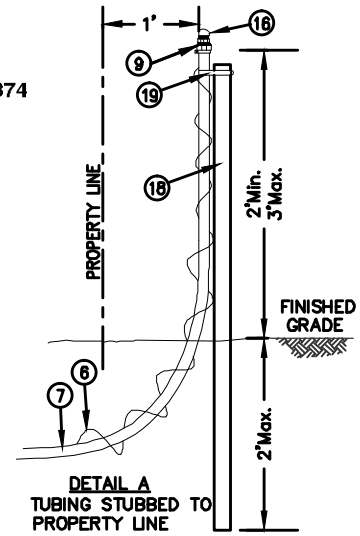
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	COPPERSETTER, 3/4" (FORD #VBHC72-9W-11-33) OR 1" (VBHC74-18W-11-44)[a]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID.	
7	PIPE, 2" PE, 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 2", FORD #VBHH77-12B-11-77	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X POLY[a](FORD #C86-77)[a] [b]	3
10	METER, BADGER, 2" MODEL 170	2
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 444-LA W/#44-332P COVER (SPRING ASSISTED)	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)[a]	1

NO.	NOMENCLATURE	REQ'D.
14	INSERT, STIFFENER, 2" (FORD #75)[a]	2
15	STABILIZER, 1'6" TO 24" LENGTH	3
16	CAP, 2" (GALVANIZED)	2
17	NIPPLE, BRASS 3/4"x12" OR 1"x12"	1
18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
19	HOSE CLAMP, 3/4" STAINLESS STEEL	1
20	NIPPLE, BRASS 2"xCLOSE	1
21	NIPPLE, BRASS 2"x12"	1
22	NIPPLE, BRASS 3/4"x6" or 1"x6"	1
23	TEE, 2" BRASS	1
24	BUSHING, BRASS 2"x3/4" or 2"x1", M.I.P.T. x F.I.P.T.	1
25	METER, BADGER, MODEL M25 (5/8"), M35 (3/4") or M70 (1"), BRONZE	1

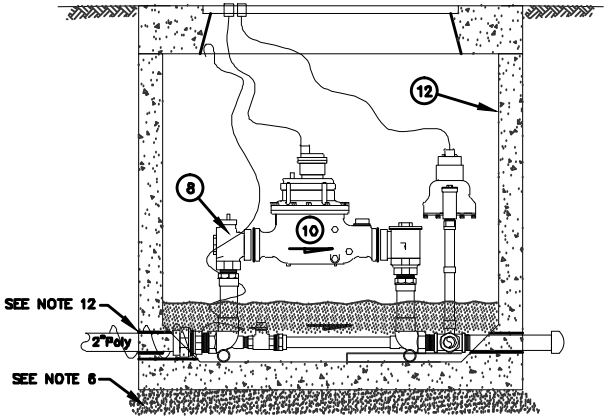
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

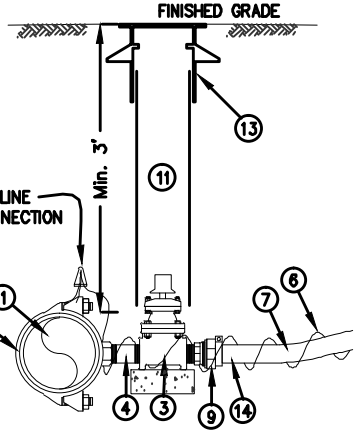
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

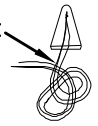




DETAIL A
TUBING STUBBED TO PROPERTY LINE







MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

NOTES:

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWIDE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE.
3. IF VAULT AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE TUBING INSTALLATION, THEN TUBING IS TO BE STUBBED UP ABOVE FINISH GRADE AND CAPPED. SEE DETAIL A.
4. SUPPORT LINESETTERS WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
5. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
6. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
7. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/FLUSH COVER 1730-3L AND 1324-15 BOX W/1324-3L COVER CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
8. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
9. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR THE STREET END. IN A CARSON INDUSTRIES BOX THE PAD IS TO BE LOCATED AT THE STREET END OF THE BOX.
10. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
11. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MINIMUM 3" DRAIN PIPE. (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE.)
12. NON-SHRINK GROUT OR FOAM AROUND PIPE PENETRATIONS THROUGH VAULT WALL TO ELIMINATE GROUNDWATER FLOODING VAULT.
13. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE WITH 5/8", 3/4", OR 1" DEDUCT METER

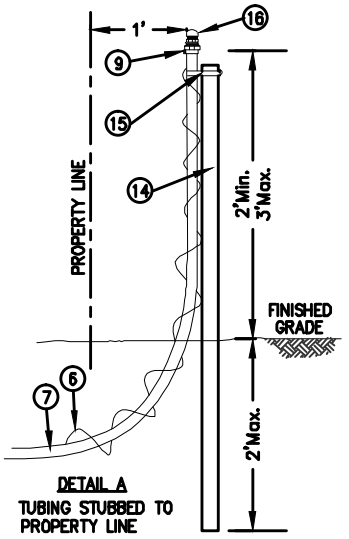
SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-2
DRAWN BY: KDM	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	NIPPLE, BRASS 2"x12"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	TUBING, 2" COPPER, TYPE K	
8	COPPERSETTER, 2", FORD #VBHH77-12B-11-77[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X COPPER (FORD #C84-77)[a] [b]	3
10	METER, BADGER, 2" MODEL 170	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
15	HOSE CLAMP, 3/4" STAINLESS STEEL	1
16	CAP, 2" (GALVANIZED)	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

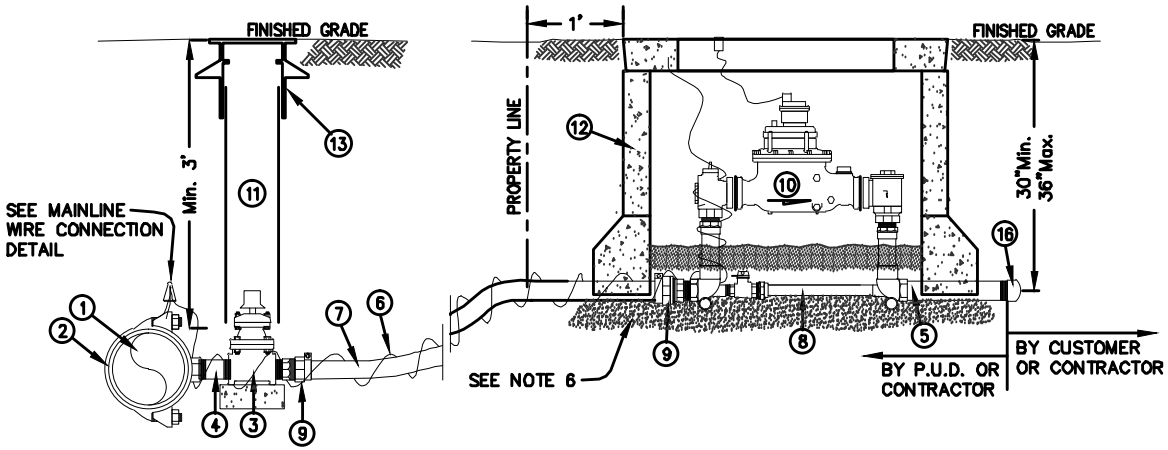
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

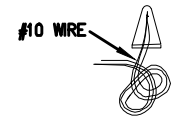


DETAIL A
TUBING STUBBED TO PROPERTY LINE

NOTES

1. WHERE COPPER SERVICE LINES ARE REQUIRED, THE CONTRACTOR/DEVELOPER WILL BE RESPONSIBLE FOR INSTALLATION OF THE COMPLETE WATER SERVICE EXCEPT FOR THE METER.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. IF METER IS NOT INSTALLED IN COPPERSETTER, OR IF CONNECTION IS NOT MADE PRIOR TO CUSTOMER'S PLUMBING, INSTALL A TIGHT FITTING PLUG OR CAP IN OPEN END OF COPPERSETTER AND A TIGHT WRAP OF PLASTIC (ELECTRICAL) TAPE OVER END OF NIPPLE. MAKE WATERTIGHT.
4. SUPPORT COPPERSETTER WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
5. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
6. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
7. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
8. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
9. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
10. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" METERED SERVICE WITH COPPER TYPE K SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-3
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

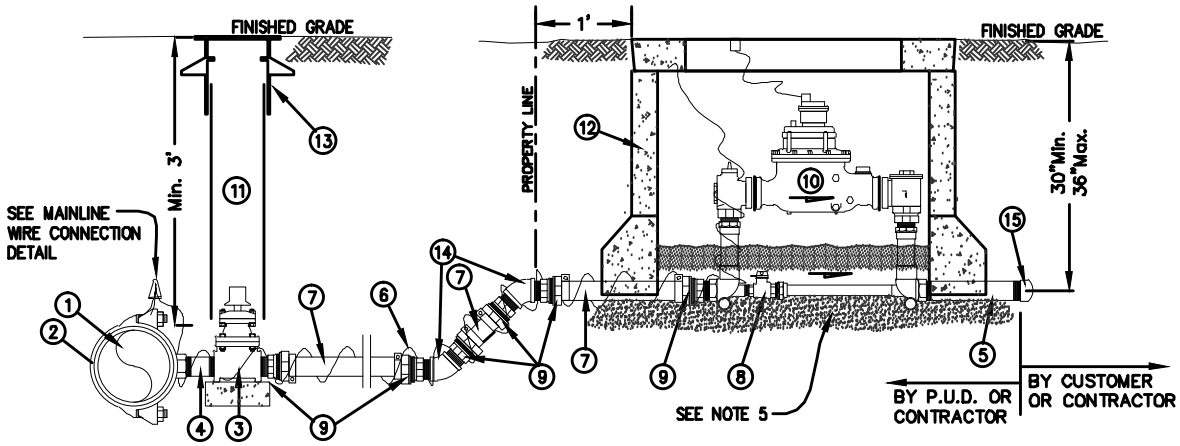
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2X4	1
5	NIPPLE, BRASS 2"x12"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" P.V.C., SCHEDULE 80	
8	COPPERSETTER, 2", FORD #VBHH77-12B-11-77[a]	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X PVC (FORD #C87-77)[a] [b]	6
10	METER, BADGER, 2" MODEL 170	1
11	CASING, 6" PVC OR SEWER PIPE	1
12	UTILITY VAULT 3642-LA W/3642-2436P COVER[a]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	ELL, BRASS 2", 45° OR 90°	2
15	CAP, 2" (GALVANIZED)	1

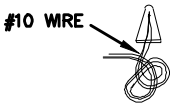
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, OR IF CONNECTION IS NOT MADE PRIOR TO CUSTOMER'S PLUMBING, INSTALL A TIGHT FITTING PLUG OR CAP IN OPEN END OF COPPERSETTER AND A TIGHT WRAP OF PLASTIC (ELECTRICAL) TAPE OVER END OF NIPPLE. MAKE WATERTIGHT.
3. SUPPORT COPPERSETTER WITH 1'6" TO 2' OF ROD OR PIPE THROUGH EACH EYELET. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX. LOCK BYPASS WITH P.U.D.-ISSUED PADLOCK.
4. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
5. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
6. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A CONCRETE UTILITY VAULT WILL BE REQUIRED. IF IN LAWN OR LANDSCAPED AREA, A CARSON INDUSTRIES LLC L SERIES 1730-15 BOX W/COVER 1730-3L CAN BE INSTALLED WITH APPROVAL BY DISTRICT ENGINEER.
7. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
8. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
9. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
10. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" METERED SERVICE WITH P.V.C SERVICE LINE

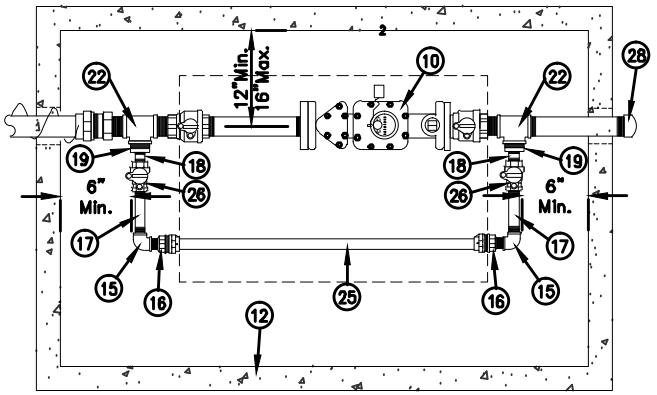
SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-4
DRAWN BY: CAS	
APPROVED BY: GJS	

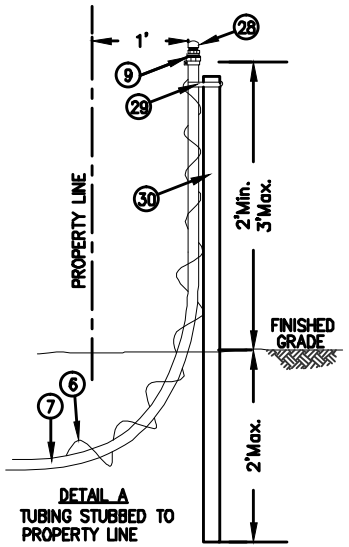
BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		15	ELL, BRASS, 1" 90°	2
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS (FORD #202B)[a]	1	16	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T.xPVC (FORD C87-44)[a]	2
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1	17	NIPPLE, BRASS 1"x6"	2
4	NIPPLE, BRASS 2"x4"	1	18	NIPPLE, BRASS, 1"x2"	2
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. x POLY (FORD C16-77)[a] [b]	1	19	BUSHING, BRASS 2" M.I.P.T. x 1" F.I.P.T.	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID		20	NIPPLE, BRASS 2"xCLOSE	3
7	PIPE, 2" PE, 3408, SIDR 7, 200 P.S.I.		21	NIPPLE, BRASS 2"x12"	2
8	COMPANION FLANGE, BRASS, 2"	1	22	TEE, 2" BRASS	2
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X POLY (FORD #C86-77)[a]	3	23	VALVE, 2" BRASS BALL, FLGxI.P.T. (FORD BF13-777W)[a]	1
10	METER, BADGER, 2" TURBO SERIES 200 ELL*	1	24	VALVE, 2" BRASS BALL, I.P.T.xI.P.T. (FORD BF11-777W)[a]	1
11	CASING, 6" PVC SEWER PIPE	1	25	PIPE, 1" PVC, SCHEDULE 80	
12	UTILITY VAULT 644LA W/#64-2-332P COVER[a] (SPRING ASSISTED)	1	26	CURB STOP, 1" (FORD B11-444W)[a]	2
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1	27	BLOCK, PRECAST CONCRETE, 18"x18"x4" MINIMUM	2
			28	CAP, 2" (GALVANIZED)	1
			29	HOSE CLAMP, 2" STAINLESS STEEL	1
14	INSERT, STIFFENER, 2" (FORD #75)[a]	2	30	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1

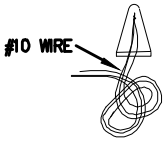
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 2" M X F I.P.T. (IF NEEDED)
* NOT TO BE USED WHERE FLOW RATE OF LESS THAN 3 GPM OCCURS. COMPOUND METER TO BE USED.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



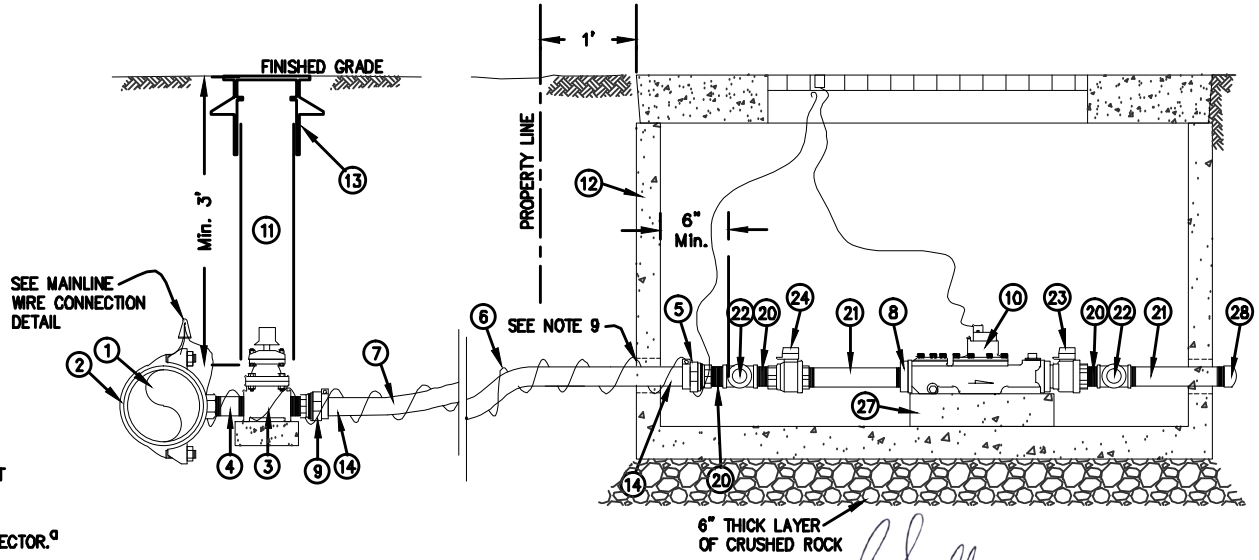


DETAIL A
TUBING STUBBED TO PROPERTY LINE



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



REFER TO SHEET 2/2 FOR NOTES.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" TURBINE METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-5a
DRAWN BY: CAS	
APPROVED BY: GJS	

NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.

2. IF METER IS NOT INSTALLED IN COPPERSETTER, OR IF CONNECTION IS NOT MADE PRIOR TO CUSTOMER'S PLUMBING, INSTALL A TIGHT FITTING PLUG OR CAP IN OPEN END OF COPPERSETTER AND A TIGHT WRAP OF PLASTIC (ELECTRICAL) TAPE OVER END OF NIPPLE. MAKE WATERTIGHT.

3. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.

4. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.

5. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.

6. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.

7. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.

8. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MIN. 3" DRAIN PIPE (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE).

9. APPLY NON-SHRINK GROUT OR FOAM AROUND PIPE PENETRATIONS THROUGH VAULT WALL TO ELIMINATE GROUNDWATER FLOODING VAULT.

10. LOCK BYPASS WITH P.U.D. ISSUED PADLOCK.

11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

REFER TO SHEET 1/2 FOR DETAILS.

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 2" TURBINE METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

SHEET 2/2

SCALE: N/A	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-5b
DRAWN BY: CAS	
APPROVED BY: GJS	

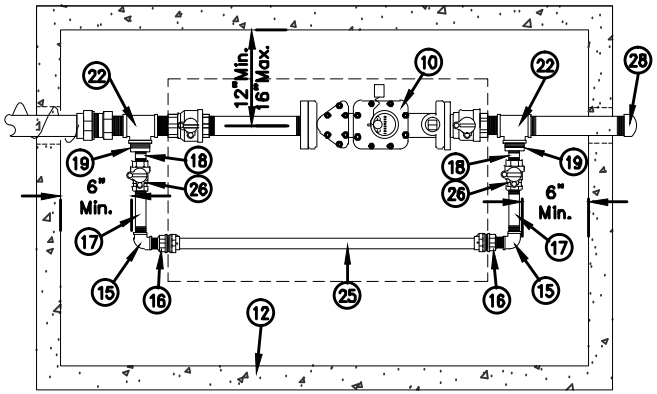
BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS (FORD #202B)[a]	1
3	VALVE, 2" DUCTILE IRON, RESILIENT WEDGE	1
4	NIPPLE, BRASS 2"x4"	1
5	ADAPTER, BRASS PAK JOINT, 2" F.I.P.T. x PVC (FORD C17-77)[a] [b]	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	
7	PIPE, 2" PVC, SCHEDULE 80	
8	COMPANION FLANGE, BRASS, 2"	1
9	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. X PVC (FORD #C87-77)[a]	5
10	METER, BADGER, 2" TURBO SERIES 200 ELL*	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 644LA W/#64-2-332P COVER[a] (SPRING ASSISTED)	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1

NO.	NOMENCLATURE	REQ'D.
14	ELL, BRASS, 2", 45° OR 90°	2
15	ELL, BRASS, 1" 90°	2
16	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T.xPVC (FORD C87-44)[a]	2
17	NIPPLE, BRASS 1"x6"	2
18	NIPPLE, BRASS, 1"x2"	2
19	BUSHING, BRASS 2" M.I.P.T. x 1" F.I.P.T.	2
20	NIPPLE, BRASS 2"xCLOSE	3
21	NIPPLE, BRASS 2"x12"	2
22	TEE, 2" BRASS	2
23	VALVE, 2" BRASS BALL, FLGxI.P.T. (FORD BF13-777W)[a]	1
24	VALVE, 2" BRASS BALL, I.P.T.xI.P.T. (FORD BF11-777W)[a]	1
25	PIPE, 1" PVC, SCHEDULE 80	
26	CURB STOP, 1" (FORD B11-444W)[a]	2
27	BLOCK, PRECAST CONCRETE, 18"x18"x4" MINIMUM	2
28	CAP, 2" (GALVANIZED)	1

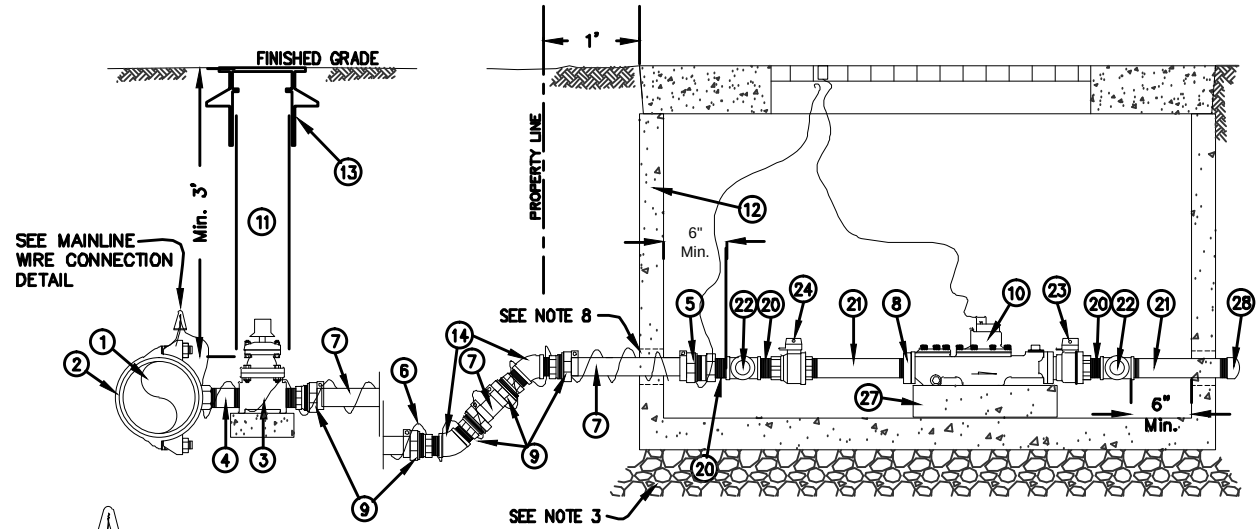
[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] OR EQUIVALENT APPROVED BY THE DISTRICT
* NOT TO BE USED WHERE FLOW RATE OF LESS THAN 3 GPM OCCURS. COMPOUND METER TO BE USED.

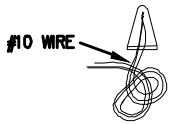
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



NOTES

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
3. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 6 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
4. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
5. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN SIX INCHES OF HINGE NEAR STREET END. IN A CARSON INDUSTRIES BOX, PAD IS TO BE LOCATED AT STREET END OF BOX.
6. SEAL VAULT LIDS AND SEGMENTS WITH 1-1/2"x1" JOINT MASTIC.
7. DRAIN VAULT TO DAYLIGHT WHERE POSSIBLE WITH MIN. 3" DRAIN PIPE (TO BE DETERMINED IN FIELD BY P.U.D. REPRESENTATIVE).
8. APPLY NON-SHRINK GROUT OR FOAM AROUND PIPE PENETRATIONS THROUGH VAULT WALL TO ELIMINATE GROUNDWATER FLOODING VAULT.
9. LOCK BYPASS WITH P.U.D. ISSUED PADLOCK.
10. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.





MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

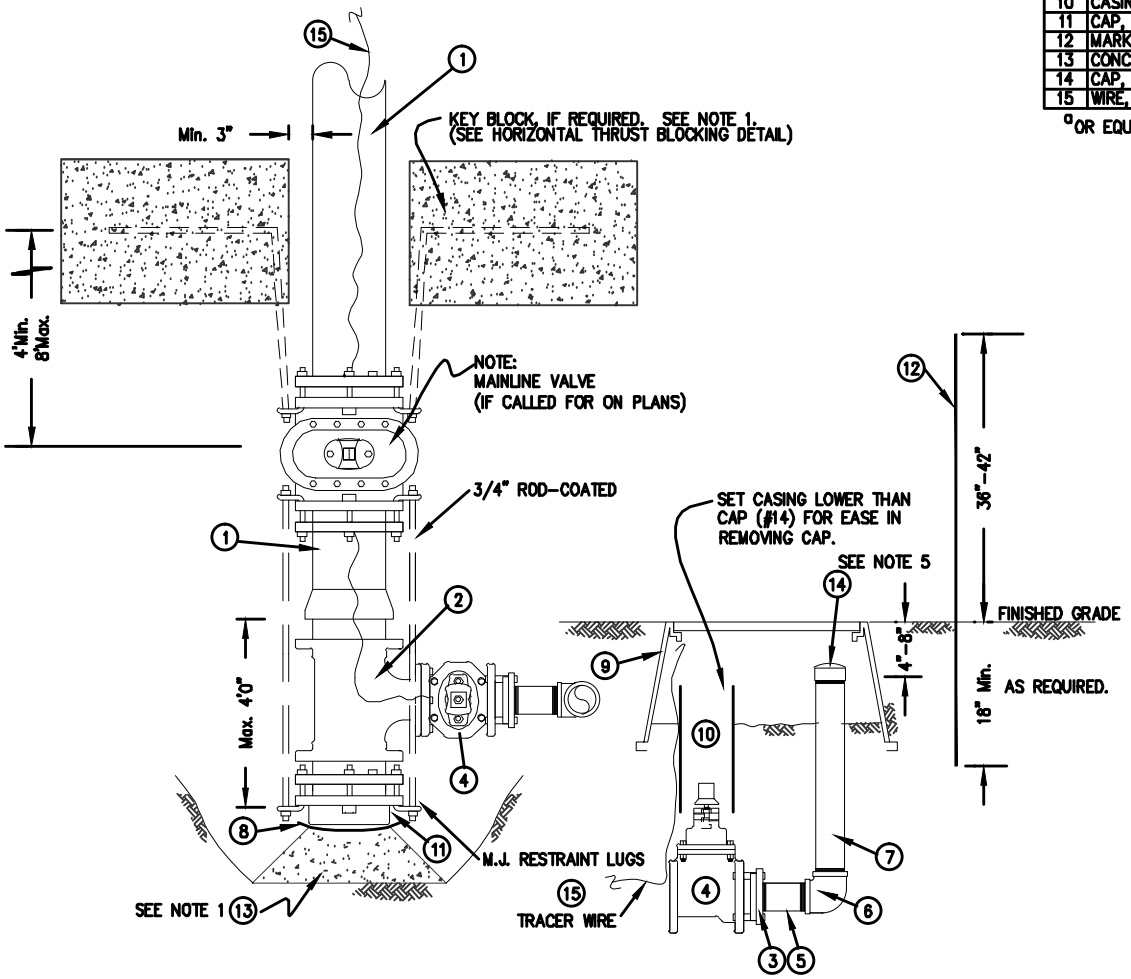
STANDARD INSTALLATION OF 2" TURBINE METERED SERVICE WITH P.V.C. SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS2-6
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN (12")	
2	TEE, WATERMAIN SIZE x 4"FL	1
3	PLUG, 4", TAP 3"	1
4	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	1
5	NIPPLE, 3"x4" GALVANIZED	1
6	ELL, 3" 90° GALVANIZED	1
7	PIPE, 3" GALVANIZED, THREAD BOTH ENDS	
8	POLYETHELENE SHEETING, 8 MIL THICKNESS	
9	TRAFFIC RATED METER BOX AND LID (MID-STATES PLASTIC, INC. MSBCF 1324-18 NOT FOR THROUGH-WAY TRAFFIC APPLICATION)[a]	1
10	CASING , 6" P.V.C. SEWER PIPE	1
11	CAP, PIPE SIZE, M.J. BLIND	1
12	MARKER, BLUE, CARSONITE #CMV-116	1
13	CONCRETE BLOCKING (OR KEY BLOCK IF REQUIRED)	
14	CAP, 3" PLASTIC THREADED	1
15	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN. 18" INTO BOX, NEAR LID	

[a] OR EQUIVALENT APPROVED BY THE DISTRICT



NOTES:

1. BLOCK AS PER P.U.D. HORIZONTAL THRUST BLOCKING STANDARD DETAIL FOR 8" PIPE OR SMALLER. USE KEY BLOCK ARRANGEMENT FOR LARGER THAN 8" PIPE UNLESS PERMANENT DEAD END; THEN STANDARD BLOCKING REQUIRED. BEARING AREA TO BE AGAINST UNDISTURBED EARTH AND TO BE DETERMINED BY THE ENGINEER.
2. USE FORMING AS NECESSARY TO PREVENT CONCRETE FROM INTERFERING WITH CAP (#11), TEE (#2), OR VALVE (#4). IF A VALVE IS INSTALLED UPSTREAM OF BLOW, KEY BLOCK VALVE AND CAP. SEE HORIZONTAL THRUST BLOCKING DETAIL.
3. INSTALL VALVE AS DETERMINED BY DISTRICT ENGINEER.
4. PLASTIC THREAD CAP TO BE HAND TIGHT ONLY.
5. KEY BLOCK TO BE INSTALLED ONLY IF PIPE IS EXPECTED TO EXTEND WITHIN TEN (10) YEARS OF INSTALLATION. SEE HORIZONTAL THRUST BLOCKING DETAIL.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 3-INCH FLUSHING ASSEMBLY

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED 5/16/14	WB3-1
DRAWN BY: KDM	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	TEE, MAINLINEx4"FL OR STAINLESS STEEL TAPPING SLEEVE EQUIVALENT	1
3	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	1
4	NIPPLE, BRASS 2X4	4
5	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. x PVC (FORD C87-77)	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND TO TOP OF LADDER	
7	PIPE, 4" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	
8	CLAMP, SERVICE, 3"D.I. x 2"I.P.T., DOUBLE STAINLESS STEEL STRAP, EPOXY COATED (FORD FC202-425-IP7)[a]	2
9	RESTRAINED FLANGE COUPLING ADAPTER, 3", ROMAC IND[a] INC.	1
10	METER, BADGER, 3" RECORDALL COMPOUND SERIES W/ORION	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 675LA W/#675-TL-2-332P COVER (SPRING ASS'T) AND LADDER (BILCO LADDER-UP SAFETY POST)[a]**	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY V8-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	VALVE, 3" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	2
15	REDUCER, 4" MJx3"MJ, C.I.	2
16	ELL, 2" BRASS, 90°	2
17	PIPE, 2" PVC, SCHEDULE 80 (FIELD CUT TO LENGTH)	

NO.	NOMENCLATURE	REQ'D.
18	PIPE SUPPORT (MATERIAL RESOURCES #S92 OR #S89)[a]	2
19	RETAINER GLAND, 4" EBAA MEG-A-LUG[a]	3
20	PIPE, 3" CL 51 DUCTILE IRON (FIELD CUT TO LENGTH)	
21	RETAINER GLAND, 3" EBAA MEG-A-LUG[a]	4
22	VALVE, 2" BALL, BRASS, I.P.T.x I.P.T., W/PADLOCK WINGS (FORD B11-777-W)[a]	2
23	SPOOL, 3" CL 51 D.I., FLxPE, 15" MINIMUM (FIELD CUT TO LENGTH)	1
24	NIPPLE, BRASS 1 1/2" x 4"	1
25	VALVE, 1 1/2" BALL, I.P.T. x I.P.T., W/PADLOCK WINGS (FORD B11-666-W)	1
26	PLUG, 1-1/2" BRASS	1

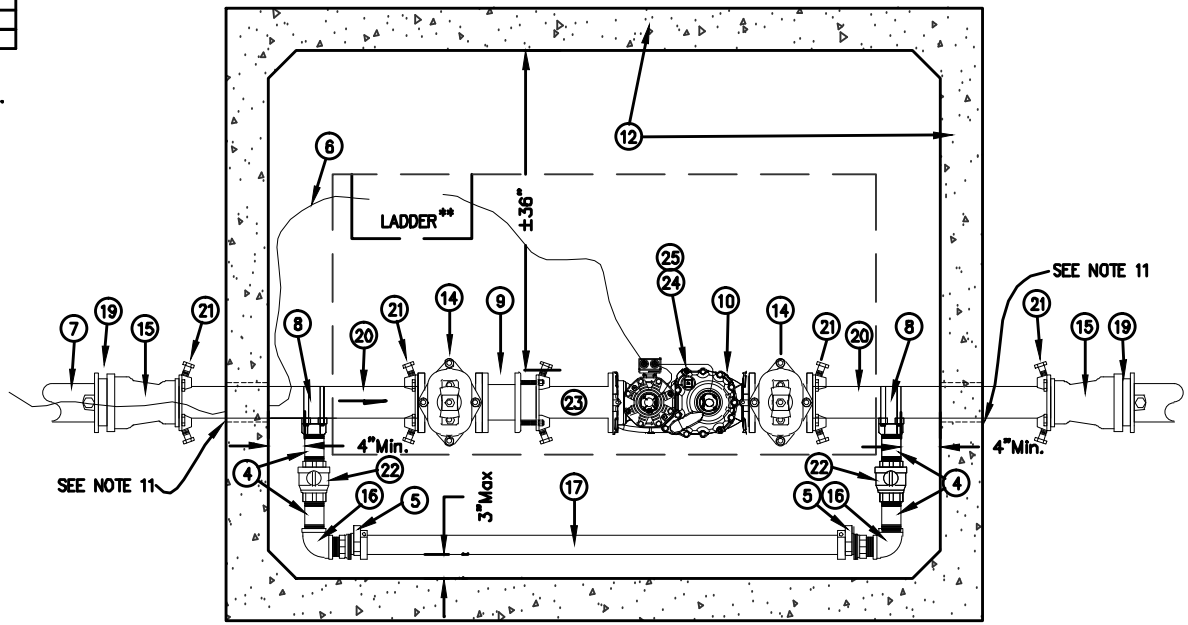
[a]OR EQUIVALENT APPROVED BY THE DISTRICT

**LOCATION OF LADDER TO BE DETERMINED AT INSTALLATION BY P.U.D. REPRESENTATIVE.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES:

1. SET VALVE BOX AND VAULT TO FINISH GRADE. SEE P.U.D. VALVE BOX DETAIL.
2. SEAL VAULT LIDS AND RISERS OF VAULT WITH 1-1/2"x1" JOINT MASTIC. INSTALL 3" PVC PIPE TO DRAIN TO DAYLIGHT IF POSSIBLE.
3. INSTALL SERVICE PIPE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLANS APPROVED BY DISTRICT ENGINEER. USE ELLS, AS NECESSARY, TO MEET ELEVATION OF VAULT.
4. TEE, VALVE AND PIPE MUST BE WRAPPED WITH 8 MIL POLYETHYLENE PIPE ENCASEMENT. IT IS TO BE INSTALLED AS PER D.I.P.R.A. AND IN ACCORDANCE WITH A.W.W.A. C105.
5. BLOCK TEE/TAPPING SLEEVE WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON. IN ADDITION, THE SERVICE PIPE FROM VALVE AT MAIN TO METER AND THE PRIVATE SERVICE LINE FROM METER ON TO PRIVATE PROPERTY SHALL BE RESTRAINED USING MEG-A-LUGS OR "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT). THE LENGTH OF RESTRAINED PIPE ON PRIVATE PROPERTY SHALL BE DETERMINED BY THE DEVELOPER ENGINEER.
6. SET VAULT ON MIN. 6" OF 3/4" MINUS CRUSHED GRAVEL, MECHANICALLY TAMPED TO 95% COMPACTION.
7. FLUSH OUT PIPELINE BEFORE INSTALLING METER. DO NOT ALLOW ANY MUD OR FOREIGN MATERIAL TO ENTER PIPE OR FITTINGS.
8. IF CONNECTION IS NOT COMPLETED TO CUSTOMER'S PIPE, INSTALL M.J., TAP 2", CAP OVER OPEN END OF PIPE OR PLUG, TAP 2", IN VALVE AND FLUSH OUT PIPE AND METER. MAKE WATER TIGHT.
9. METER SENSING PAD IS TO BE LOCATED WITHIN 6" OF HINGE ON VAULT LID AT STREET (INLET) END OF VAULT.
10. 3" AND 4" VALVES SHALL BE A.W.W.A. C509 STANDARD, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE, GATE VALVES. (WHEEL OPERATORS INSIDE VAULT.)
11. NON-SHRINK GROUT/FOAM AROUND PIPE. MAKE WATER TIGHT.
12. 2" BALL VALVES SHALL BE LOCKED UPON INSTALLATION W/P.U.D.-SUPPLIED PADLOCKS.
13. BACKFILL AROUND VAULT SHALL BE FIRMLY TAMPED TO ELIMINATE SETTLEMENT.
14. CONCRETE BLOCK OR EQUIVALENT UNDER VALVE IS TO KEEP VALVE FACE VERTICAL DURING INSTALLATION.
15. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



PLAN VIEW

REFER TO SHEET 2/2 FOR ELEVATION VIEW.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

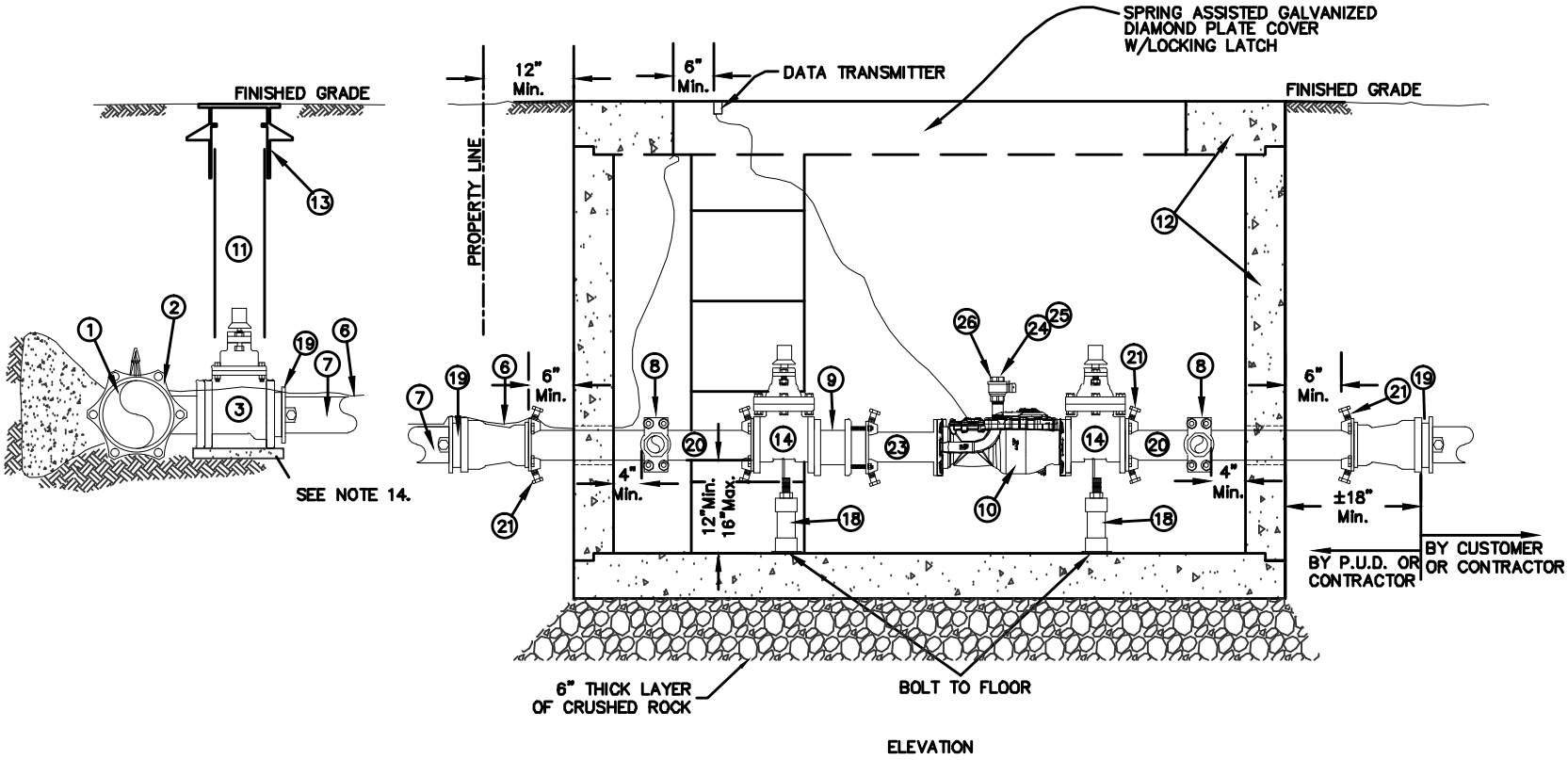
APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 3" COMPOUND METERED SERVICE PLAN VIEW

SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS3-1a
DRAWN BY: CAS	
APPROVED BY: GJS	



ELEVATION

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

REFER TO SHEET 1/2 FOR PLAN VIEW.

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 3" COMPOUND METERED SERVICE ELEVATION VIEW

SHEET 2/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS3-1b
DRAWN BY: CAS	
APPROVED BY: GJS	

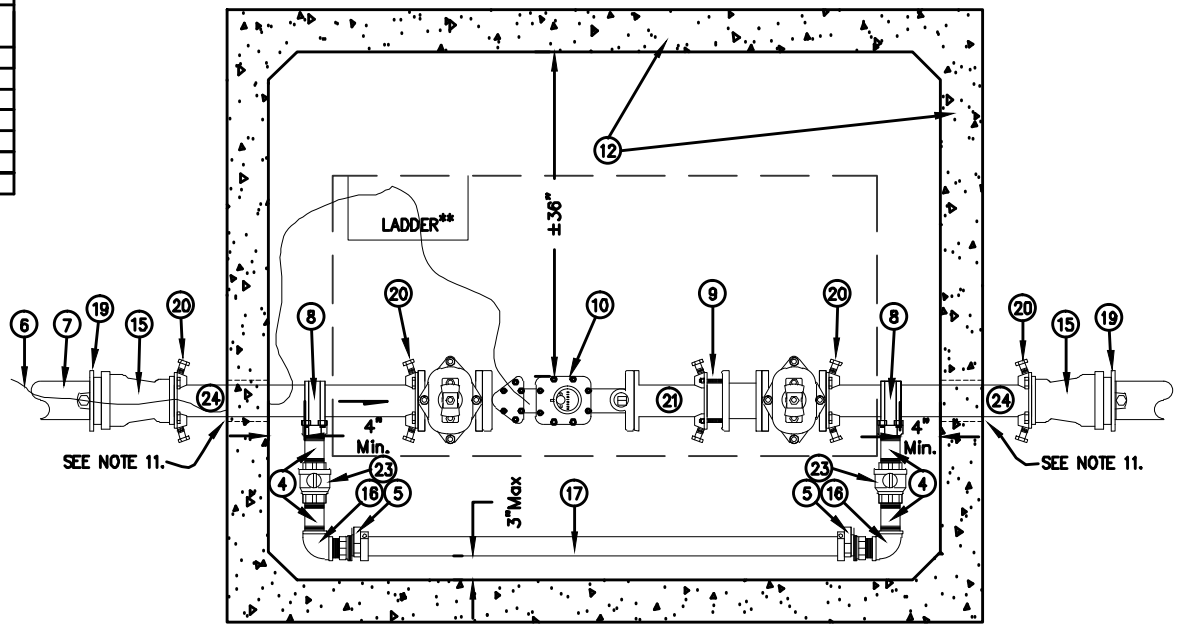
BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	TEE, MAINLINEx4"FL OR STAINLESS STEEL TAPPING SLEEVE EQUIVALENT	1
3	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	1
4	NIPPLE, BRASS 2x4	4
5	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. x PVC (FORD C87-77)[a]	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND TO TOP OF LADDER	
7	PIPE, 4" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	
8	CLAMP, SERVICE, 3"D.I. x 2"I.P.T., DOUBLE STAINLESS STEEL STRAP, EPOXY COATED (FORD FC202-425-IP7)[a]	2
9	RESTRAINED FLANGE COUPLING ADAPTER, 3", ROMAC IND. INC.[a]	1
10	METER, BADGER, 3" TURBO SERIES 450	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 675LA W/#675-TL-2-332P COVER (SPRING ASS'T)[a] AND LADDER (BILCO LADDER-UP SAFETY POST)[a]**	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	VALVE, 3" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	2
15	REDUCER, 4" MJx3"MJ, CONCENTRIC	2
16	ELL, 2" BRASS, 90°	2
17	PIPE, 2" PVC, SCHEDULE 80 (FIELD CUT TO LENGTH)	
18	PIPE SUPPORT (MATERIAL RESOURCES #S92 OR #S89)[a]	2
19	RETAINER GLAND, 4" EBAA MEG-A-LUG[a]	3
20	RETAINER GLAND, 3" EBAA MEG-A-LUG[a]	4

NO.	NOMENCLATURE	REQ'D.
21	SPOOL, 3" CL 51 D.I., FLxPE, (FIELD CUT TO LENGTH)	1
22	PLUG, 2" BRASS (SEE NOTE 8)	1
23	VALVE, 2" BALL, BRASS, I.P.T. x I.P.T., W/PADLOCK WINGS (FORD B11-777-W)[a]	2
24	PIPE, 3" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	

[a]OR EQUIVALENT APPROVED BY THE DISTRICT
**LOCATION OF LADDER TO BE DETERMINED AT INSTALLATION BY P.U.D. REPRESENTATIVE.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



PLAN VIEW

REFER TO SHEET 2/2 FOR ELEVATION VIEW.

NOTES:

1. SET VALVE BOX AND VAULT TO FINISH GRADE. SEE P.U.D. VALVE BOX DETAIL.
2. SEAL VAULT LIDS AND RISERS OF VAULT WITH 1-1/2"x1" JOINT MASTIC. INSTALL 3" PVC PIPE TO DRAIN TO DAYLIGHT IF POSSIBLE.
3. INSTALL SERVICE PIPE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLANS APPROVED BY DISTRICT ENGINEER. USE ELLS, AS NECESSARY, TO MEET ELEVATION OF VAULT.
4. TEE, VALVE AND PIPE MUST BE WRAPPED WITH 8 MIL POLYETHYLENE PIPE ENCASEMENT. IT IS TO BE INSTALLED AS PER D.I.P.R.A. AND IN ACCORDANCE WITH A.W.W.A. C105.
5. BLOCK TEE/TAPPING SLEEVE WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON. IN ADDITION, THE SERVICE PIPE FROM VALVE AT MAIN TO METER AND THE PRIVATE SERVICE LINE FROM METER ON TO PRIVATE PROPERTY SHALL BE RESTRAINED USING MEG-A-LUGS OR "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT). THE LENGTH OF RESTRAINED PIPE ON PRIVATE PROPERTY SHALL BE DETERMINED BY THE DEVELOPER ENGINEER.
6. SET VAULT ON MIN. 6" OF 3/4" MINUS CRUSHED GRAVEL, MECHANICALLY TAMPED TO 95% COMPACTION.
7. FLUSH OUT PIPELINE BEFORE INSTALLING METER. DO NOT ALLOW ANY MUD OR FOREIGN MATERIAL TO ENTER PIPE OR FITTINGS.
8. IF CONNECTION IS NOT COMPLETED TO CUSTOMER'S PIPE, INSTALL M.J., TAP 2", CAP OVER OPEN END OF PIPE OR PLUG, TAP 2", IN VALVE AND FLUSH OUT PIPE AND METER. MAKE WATER TIGHT.
9. METER SENSING PAD IS TO BE LOCATED WITHIN 6" OF HINGE ON VAULT LID AT STREET (INLET) END OF VAULT.
10. 3" AND 4" VALVES SHALL BE A.W.W.A. C509 STANDARD, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE, GATE VALVES. (WHEEL OPERATORS INSIDE VAULT.)
11. NON-SHRINK GROUT/FOAM AROUND PIPE. MAKE WATER TIGHT.
12. 2" BALL VALVES SHALL BE LOCKED UPON INSTALLATION W/P.U.D.-SUPPLIED PADLOCKS.
13. BACKFILL AROUND VAULT SHALL BE FIRMLY TAMPED TO ELIMINATE SETTLEMENT.
14. CONCRETE BLOCK OR EQUIVALENT UNDER VALVE IS TO KEEP VALVE FACE VERTICAL DURING INSTALLATION.
15. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT all TIMES.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

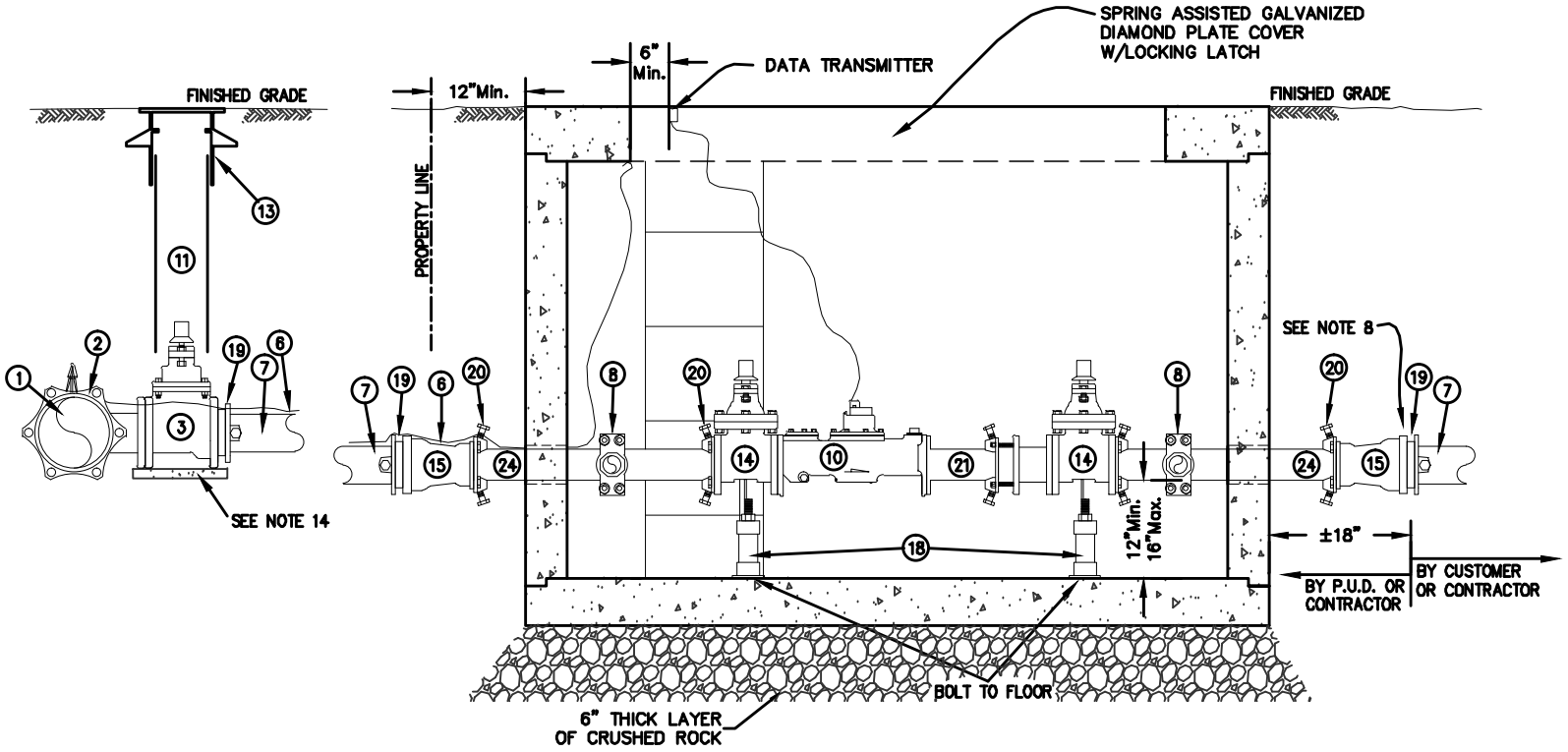
APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 3" TURBINE METERED SERVICE PLAN VIEW

SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS3-2a
DRAWN BY: CAS	
APPROVED BY: GJS	



ELEVATION

REFER TO SHEET 1/2 FOR PLAN VIEW

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 3" TURBINE METERED SERVICE ELEVATION VIEW

SHEET 2/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS3-2b
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

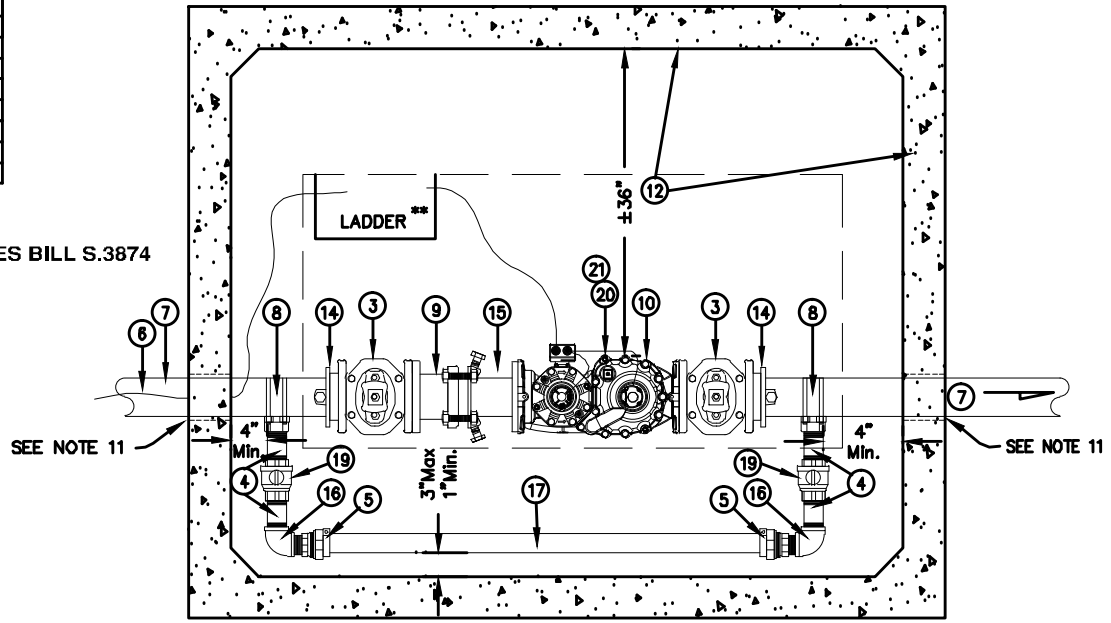
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	TEE, MAINLINEx4"FL OR STAINLESS STEEL TAPPING SLEEVE EQUIVALENT	1
3	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	3
4	NIPPLE, BRASS 2X4	4
5	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. x PVC (FORD C87-77) [a]	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND TO TOP OF LADDER	
7	PIPE, 4" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	
8	CLAMP, SERVICE, 4"D.I. x 2"I.P.T., DOUBLE STRAP, ALL BRASS (FORD 202B) [a]	2
9	RESTRAINED FLANGE COUPLING ADAPTER, 4" ROMAC IND. INC. [a]	1
10	METER, BADGER, 4" RECORDALL COMPOUND SERIES METER W/ORION & SUMMATOR SPLITTER	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 675LA W/#675-TL-2-332P COVER [a] (SPRING ASSISTED) AND LADDER (BILCO LADDER-UP SAFETY POST) [a**]	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	RETAINER GLAND, 4" EBAA MEG-A-LUG [a]	3
15	SPOOL, 4" CL 50 D.I., FLxPE, 12" LONG (FIELD CUT TO LENGTH)	1
16	ELL, 2" BRASS, 90°	2
17	PIPE, 2" PVC, SCHEDULE 80 (FIELD CUT TO LENGTH)	
18	PIPE SUPPORT (MATERIAL RESOURCES #S92 OR S89) [a]	2
19	VALVE, 2" BALL, BRASS, I.P.T. x I.P.T., W/PADLOCK WINGS, (FORD B11-777-W) [a]	2
20	NIPPLE, BRASS 2" x 4"	1
21	BALL VALVE, BRASS 2"	1
22	PLUG, BRASS 2"	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[**] LOCATION OF LADDER TO BE DETERMINED AT INSTALLATION BY PUD REPRESENTATIVE.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES:

1. SET VALVE BOX AND VAULT TO FINISH GRADE. SEE P.U.D. VALVE BOX DETAIL.
2. SEAL VAULT LIDS AND RISERS OF VAULT WITH 1-1/2"x1" JOINT MASTIC. INSTALL 3" PVC PIPE TO DRAIN TO DAYLIGHT IF POSSIBLE.
3. INSTALL SERVICE PIPE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLANS APPROVED BY DISTRICT ENGINEER. USE ELLS, AS NECESSARY, TO MEET ELEVATION OF VAULT.
4. TEE, VALVE AND PIPE MUST BE WRAPPED WITH 8 MIL POLYETHYLENE PIPE ENCASEMENT. IT IS TO BE INSTALLED AS PER D.I.P.R.A. AND IN ACCORDANCE WITH A.W.W.A. C105.
5. BLOCK TEE/TAPPING SLEEVE WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON. IN ADDITION, THE SERVICE PIPE FROM VALVE AT MAIN TO METER AND THE PRIVATE SERVICE LINE FROM METER ON TO PRIVATE PROPERTY SHALL BE RESTRAINED USING MEG-A-LUGS OR "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT). THE LENGTH OF RESTRAINED PIPE ON PRIVATE PROPERTY SHALL BE DETERMINED BY THE DEVELOPER ENGINEER.
6. SET VAULT ON MIN. 6" OF 3/4" MINUS CRUSHED GRAVEL, MECHANICALLY TAMPED TO 95% COMPACTION.
7. FLUSH OUT PIPELINE BEFORE INSTALLING METER. DO NOT ALLOW ANY MUD OR FOREIGN MATERIAL TO ENTER PIPE OR FITTINGS.
8. IF CONNECTION IS NOT COMPLETED TO CUSTOMER'S PIPE, INSTALL M.J., TAP 2", CAP OVER OPEN END OF PIPE OR PLUG, TAP 2", IN VALVE AND FLUSH OUT PIPE AND METER. MAKE WATER TIGHT.
9. METER SENSING PAD IS TO BE LOCATED WITHIN 6" OF HINGE ON VAULT LID AT STREET (INLET) END OF VAULT.
10. 4-INCH VALVES SHALL BE A.W.W.A. C509 STANDARD, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE, GATE VALVES. (WHEEL OPERATORS INSIDE VAULT.)
11. NON-SHRINK GROUT/FOAM AROUND PIPE. MAKE WATER TIGHT.
12. 2" BALL VALVES SHALL BE LOCKED UPON INSTALLATION W/P.U.D.-SUPPLIED PADLOCKS.
13. BACKFILL AROUND VAULT SHALL BE FIRMLY TAMPED TO ELIMINATE SETTLEMENT.
14. CONCRETE BLOCK OR EQUIVALENT UNDER VALVE IS TO KEEP VALVE FACE VERTICAL DURING INSTALLATION.
15. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



PLAN VIEW
REFER TO SHEET 2/2 FOR ELEVATION VIEW.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

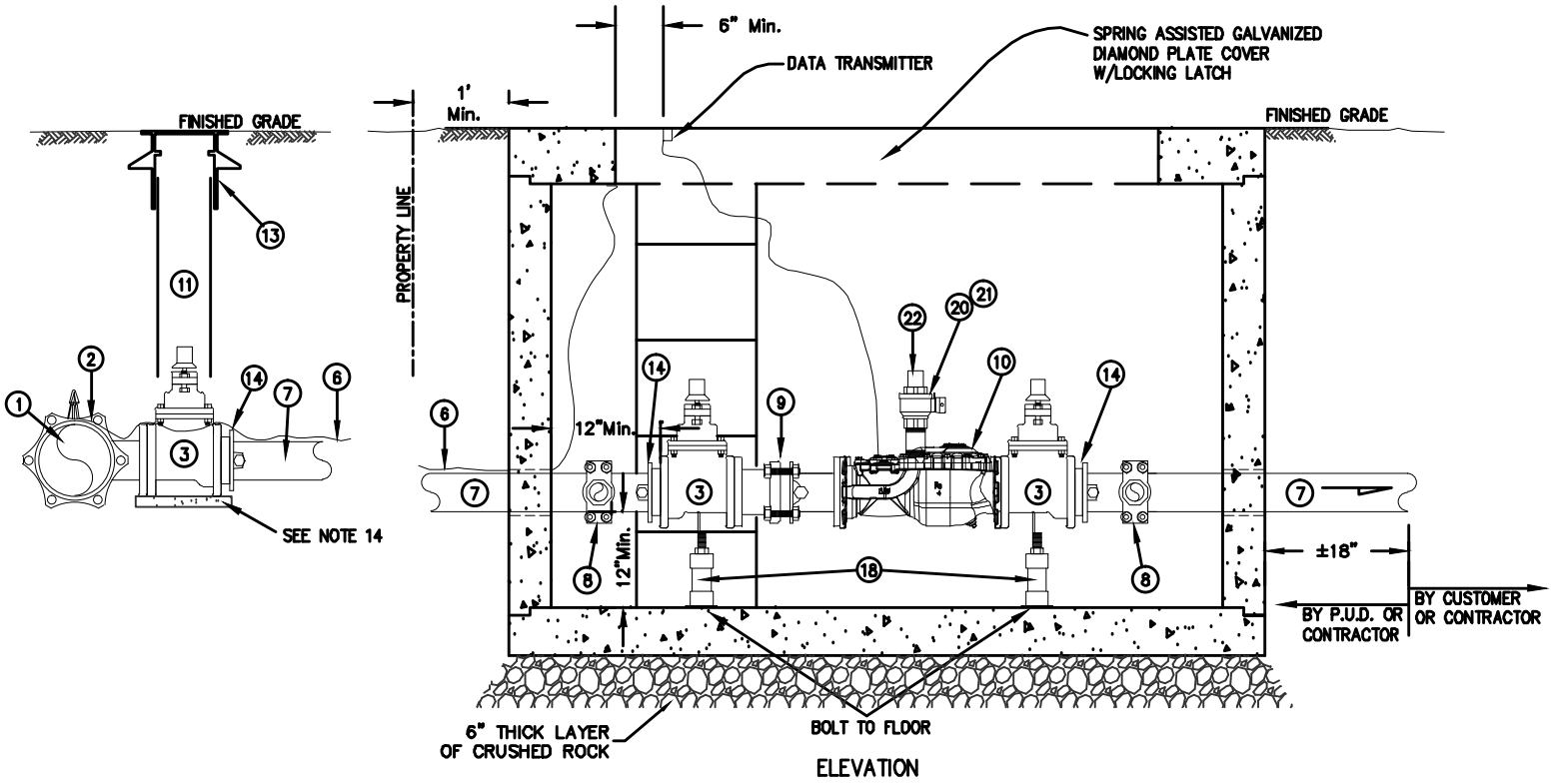
APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 4" COMPOUND METERED SERVICE PLAN VIEW

SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 4-12-05	
REVISED: 5/16/14	WS4-1a
DRAWN BY: CAS	
APPROVED BY: GJS	



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

REFER TO SHEET 1/2 FOR PLAN VIEW.

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 4" COMPOUND METERED SERVICE ELEVATION VIEW

SHEET 2/2

SCALE: 1/2" = 1'	STANDARD
DATE: 4-12-05	
REVISED: 5/16/14	WS4-1b
DRAWN BY: CAS	
APPROVED BY: DJL	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
	WATER MAIN	
2	TEE, MAINLINEx4"FL OR STAINLESS STEEL TAPPING SLEEVE EQUIVALENT	1
3	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	1
4	NIPPLE, BRASS 2x4	4
5	ADAPTER, BRASS PAK JOINT, 2" M.I.P.T. x PVC (FORD C87-77)[a]	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND TO TOP OF LADDER	2
7	PIPE, 4" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	
8	CLAMP, SERVICE, 4"D.I. x 2"I.P.T., DOUBLE STRAP, ALL BRASS (FORD #F202B)[a]	2
9	RESTRAINED FLANGE COUPLING ADAPTER, 4" ROMAC IND. INC.[a]	1
10	METER, BADGER, 4" TURBO SERIES 1000[a]	1
11	CASING, 6" PVC SEWER PIPE	1
12	UTILITY VAULT 675LA W/#675-TL-2-332P COVER[a] (SPRING ASSISTED) AND LADDER (BILCO LADDER-UP SAFETY POST)[a]**	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	VALVE, 4" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	2
15	SPOOL, 4" CL 50 D.I., FLxPE, 12" LONG (FIELD CUT TO LENGTH)	1
16	ELL, 2" BRASS, 90°	2
17	PIPE, 2" PVC, SCHEDULE 80 (FIELD CUT TO LENGTH)	
18	PIPE SUPPORT (MATERIAL RESOURCES #S92 OR #S89)[a]	2
19	RETAINER GLAND, 4" EBAA MEG-A-LUG[a]	3
20	PLUG, 2" BRASS (SEE NOTE 8)	1
21	VALVE, 2" BALL, BRASS, I.P.T. x I.P.T. W/PADLOCK WINGS (FORD B11-777-W)[a]	2

[a]OR EQUIVALENT APPROVED BY THE DISTRICT

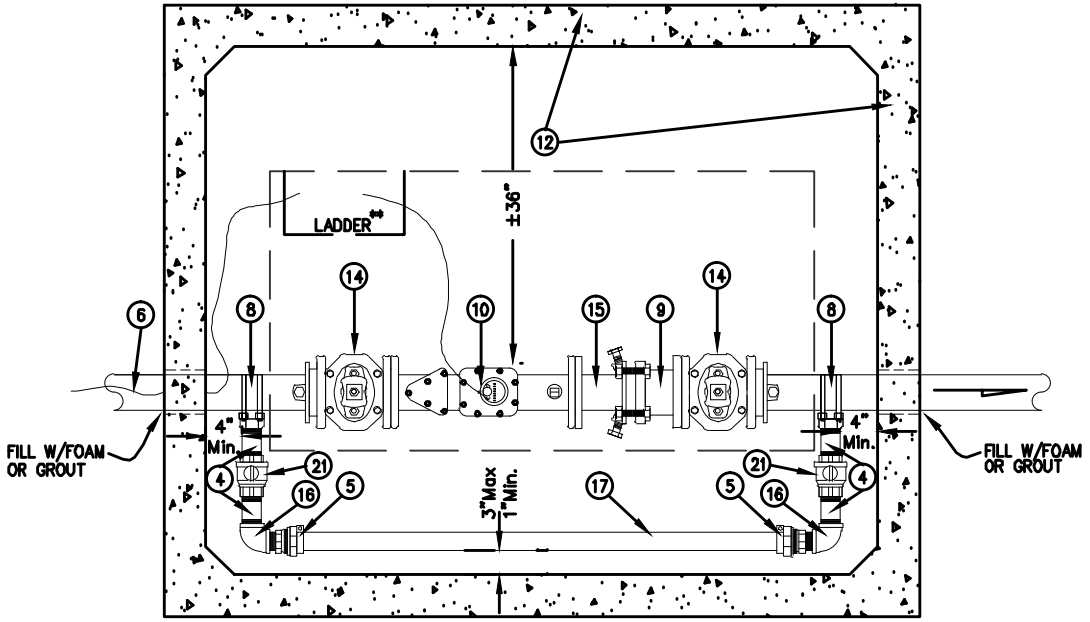
*NOT TO BE USED WHERE FLOW RATE OF LESS THAN 10 GPM OCCURS. COMPOUND METER TO BE USED.

**LOCATION OF LADDER TO BE DETERMINED AT INSTALLATION BY PUD REPRESENTATIVE.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874

NOTES:

1. SET VALVE BOX AND VAULT TO FINISH GRADE. SEE P.U.D. VALVE BOX DETAIL.
2. SEAL VAULT LIDS AND RISERS OF VAULT WITH 1-1/2"x1" JOINT MASTIC. INSTALL 3" PVC PIPE TO DRAIN TO DAYLIGHT IF POSSIBLE.
3. INSTALL SERVICE PIPE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLANS APPROVED BY DISTRICT ENGINEER. USE ELLS, AS NECESSARY, TO MEET ELEVATION OF VAULT.
4. TEE, VALVE AND PIPE MUST BE WRAPPED WITH 8 MIL POLYETHYLENE PIPE ENCASEMENT. IT IS TO BE INSTALLED AS PER D.I.P.R.A. AND IN ACCORDANCE WITH A.W.W.A. C105.
5. IF SERVICE PIPE IS LONGER THAN ONE (1) LENGTH OF PIPE (18'), THEN U.S. PIPE "FIELD-LOK" GASKETS WILL BE INSTALLED IN T.J., OR EBAA "MEG-A-LUG" IN M.J. BELLS.
6. SET VAULT ON MIN. 6" OF 3/4" MINUS CRUSHED GRAVEL, MECHANICALLY TAMPED TO 95% COMPACTION.
7. FLUSH OUT PIPELINE BEFORE INSTALLING METER. DO NOT ALLOW ANY MUD OR FOREIGN MATERIAL TO ENTER PIPE OR FITTINGS.
8. IF CONNECTION IS NOT COMPLETED TO CUSTOMER'S PIPE, INSTALL M.J., TAP 2", CAP OVER OPEN END OF PIPE OR PLUG, TAP 2", IN VALVE AND FLUSH OUT PIPE AND METER. MAKE WATER TIGHT.
9. METER SENSING PAD IS TO BE LOCATED WITHIN 6" OF HINGE ON VAULT LID AT STREET (INLET) END OF VAULT.
10. 4-INCH VALVES SHALL BE A.W.W.A. C509 STANDARD, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE, GATE VALVES. (WHEEL OPERATORS INSIDE VAULT.)
11. NON-SHRINK GROUT/FOAM AROUND PIPE. MAKE WATER TIGHT.
12. 2" BALL VALVES SHALL BE LOCKED UPON INSTALLATION W/P.U.D.-SUPPLIED PADLOCKS.
13. CONCRETE BLOCK OR EQUIVALENT UNDER VALVE IS TO KEEP VALVE FACE VERTICAL DURING INSTALLATION.
14. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



PLAN VIEW

REFER TO SHEET 2/2 FOR ELEVATION VIEW.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

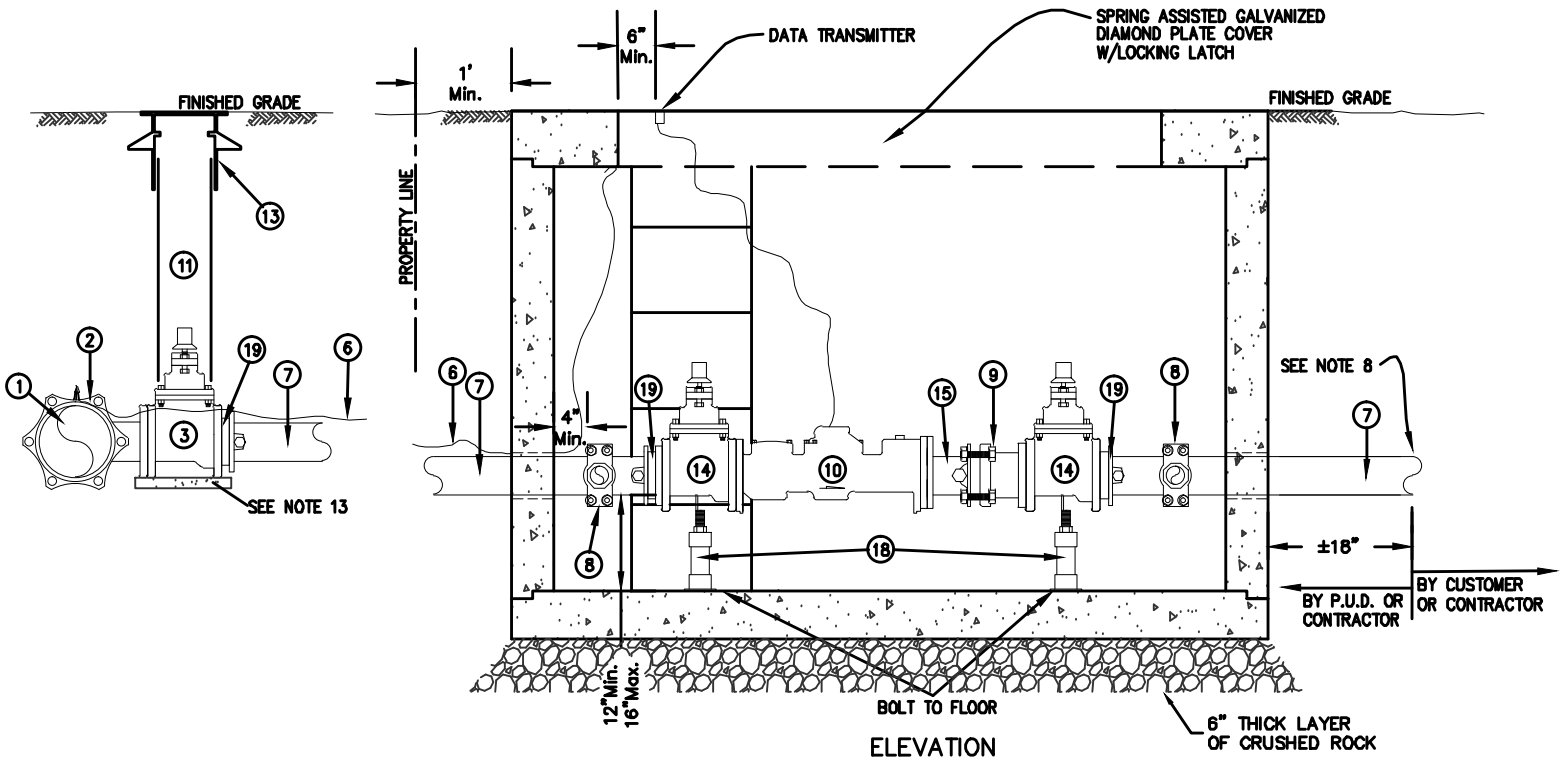
APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 4" TURBINE METERED SERVICE PLAN VIEW

SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS4-2a
DRAWN BY: CAS	
APPROVED BY: GJS	



ELEVATION

REFER TO SHEET 1/2 FOR PLAN VIEW

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 4" TURBINE METERED SERVICE ELEVATION VIEW

SHEET 2/2

SCALE: 1" = 2'	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WS4-2b
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

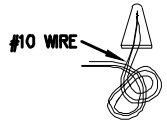
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	CORP, 1", (FORD #FB500-4)[a]	1
4	PAC JOINT, 1-1/4", (C86-55)	2
5	NIPPLE, BRASS, 1"x 2"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 3/4", (FORD #VBHC72-9W-11-44 FP)[a]	1
9	NOT USED	
10	METER, BADGER MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	1
11	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1419-12 W/COVER 1419-3)[a]	1
13	EXTENSION, METER BOX, CARSON INDUSTRIES LLC, L SERIES 1419-6[a]	1
14	INSERT, STIFFENER, 1-1/4" (FORD #72)[a]	2
15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
16	ADAPTER, 1-1/4" M.I.P.T x 11-1/4" INSERT W/CAP (GALVANIZED)	1
17	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
18	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	1
19	1" X 1-1/4" BELL REDUCER	2
20	NIPPLE, BRASS, 1" X 6"	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 3/4" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

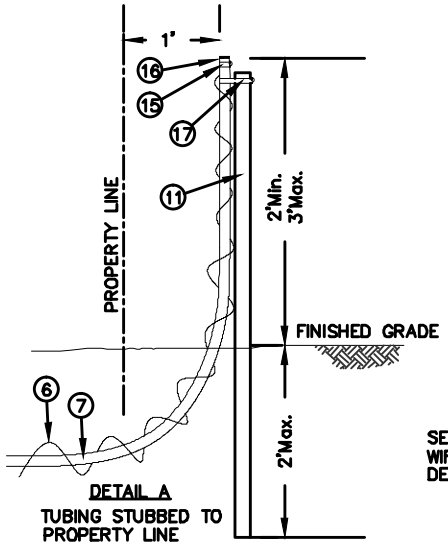
NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

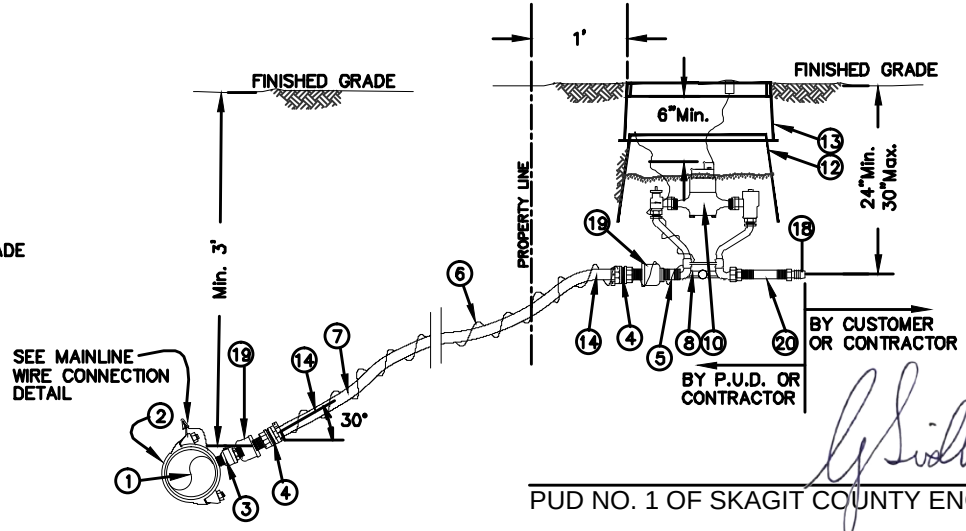


MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



DETAIL A
TUBING STUBBED TO PROPERTY LINE



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF SINGLE 5/8" OR 3/4" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

SCALE: 1"=2'	STANDARD
DATE: 3-01-05	
REVISED: 5/6/14	WS58-1
DRAWN BY: CAS	
APPROVED BY: GJS	

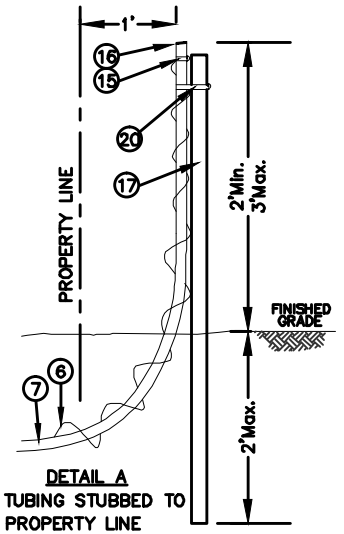
BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		11	PIPE, 1" PVC SCH 80 (FIELD CUT TO EXACT LENGTH)	±2
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B) [a]	1	12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1419-12 W/COVER 1419-3) [a]	2
3	CORP, 1", (FORD #FB-500) [a]	1	13	EXTENSION, METER BOX, CARSON INDUSTRIES LLC, L SERIES 1419-6 [a]	2
4	ADAPTER, BRASS PAK JOINT, 1" F. I.P.T. X 1-1/4" POLY, (FORD #C16-44 [a] W/INSERTS (FORD #72) [a]	1	14	TEE, 1" BRASS	1
			15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
5	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	2	16	ADAPTER, 1-1/4" M.I.P.T. x 1-1/4" INSERT W/CAP (GALVANIZED)	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID		17	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.		18	INSERT, STIFFENER, 1-1/4" (FORD #72) [a]	2
8	COPPERSETTER, 3/4", FORD #VBHC72-9W-11-33 [a]	2	19	ADAPTER, BRASS PAK JOINT, 3/4"M.I.P.T.x1-1/4"POLY (FORD #C86-34) [a] [b]	1
9	ADAPTER, BRASS PAK JOINT, 3/4" M.I.P.T. x 1" PVC (FORD C87-35)	2	20	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
10	METER, BADGER MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	2	21	NIPPLE, BRASS, 1"x 6"	3

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

[b] ELL, 90° STREET, 3/4" M X F I.P.T. (IF NEEDED)

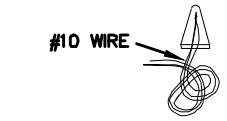
ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.



DETAIL A
TUBING STUBBED TO PROPERTY LINE

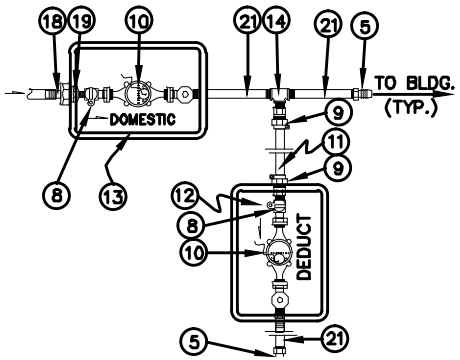
NOTES

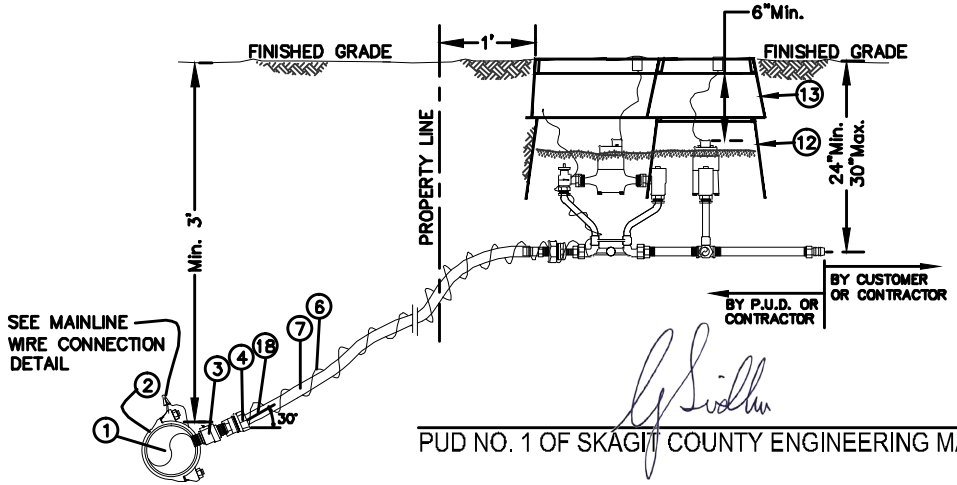
1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18) [a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR. [a]





PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF SINGLE 5/8" OR 3/4" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE W/DEDUCT METER

SCALE: 1"=2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS58-2
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	CORP, 1", (FORD #FB-500)[a]	1
4	ADAPTER, BRASS PAK JOINT, 1" F.I.P.T. X 1-1/4" COPPER, (FORD #C14-44)[a]	1
5	NIPPLE, BRASS, 1"x 6"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX , NEAR LID	
7	TUBING, 1-1/4" COPPER, TYPE K	
8	COPPERSETTER, 3/4", FORD #LSVBBII-233W[a]	1
9	ADAPTER, BRASS PAK JOINT, 3/4" M.I.P.T. X 1-1/4" COPPER, (FORD #C84-34)[a] [b]	2
10	METER, BADGER MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	1
11	EXTENSION, METER BOX, (CARSON INDUSTRIES LLC, L SERIES 1419-6)[a]	1
12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1419-12 W/COVER 1419-3)[a]	1
13	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
14	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
15	CAP, 1" (GALVANIZED)	1
16	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 3/4" M X F, I.P.T. (IF NEEDED)

NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
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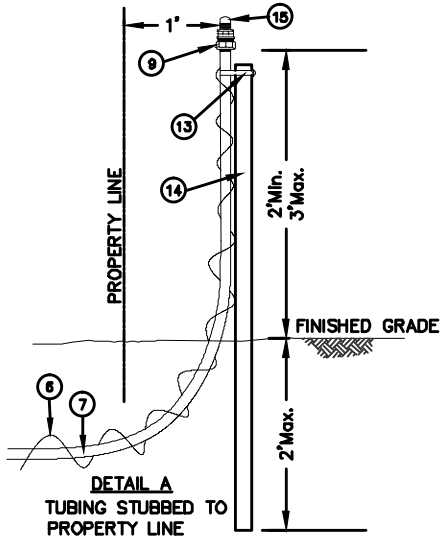
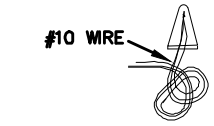
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18) WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED[a] CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

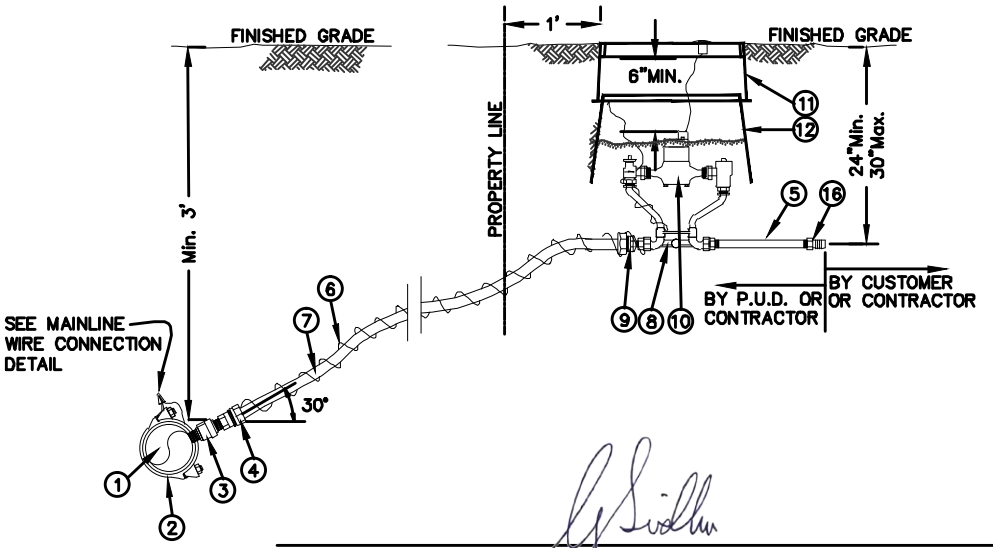


DETAIL A
TUBING STUBBED TO PROPERTY LINE



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF SINGLE 5/8" OR 3/4" METERED SERVICE WITH COPPER TYPE K SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS58-3
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		13	EXTENSION, METER BOX, (CARSON INDUSTRIES LLC 1419-6)[a]	2
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1	14	TEE, 1", BRASS	1
			15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
3	CORP, 1", (FORD #FB-500)	1	16	ADAPTER, 1-1/4" M.I.P.T. X 1-1/4" INSERT W/CAP (GALVANIZED)	1
4	ADAPTER, BRASS PAK JOINT, 1" F.I.P.T. X 1-1/4" POLY, (FORD #C16-44)[a]	1	17	NIPPLE, BRASS, 1"x 6"	2
			18	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
5	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	2	19	ADAPTER, 1" M.I.P.T. X 1" F.I.P.T., BRASS	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOXES, NEAR LID		20	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. X 1" P.V.C., (FORD #C87-44)[a]	2
7	PIPE, 1-1/4" PE, 3408, SIDR 7, 200 P.S.I.				
8	COPPERSETTER, 3/4", (FORD #VBHC72-9W-11-33)[a]	2	21	ELL, 1", 90°, BRASS, F.I.P.T.	1
9	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. X 1-1/4" POLY, (FORD #C86-44)[a] [b]	1	22	INSERT, STIFFENER, 1" (FORD #72)[a]	2
			23	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
10	METER, BADGER MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	2	24	NIPPLE, BRASS, 1"x 4"	2
11	PIPE, 1", P.V.C., SCHEDULE 80				
12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1419-12 W/COVER 1419-3)[a]	2			

[a] OR EQUIVALENT APPROVED BY THE DISTRICT [b] ELL, 90° STREET, 1" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
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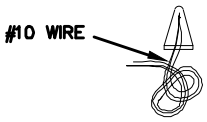
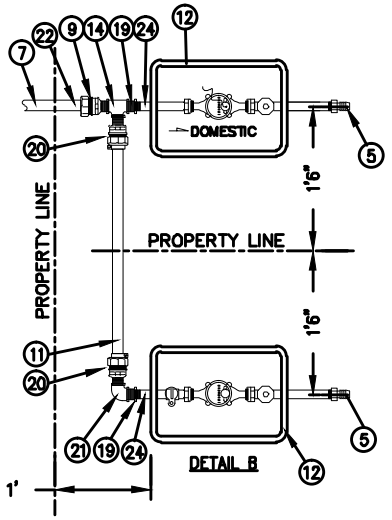
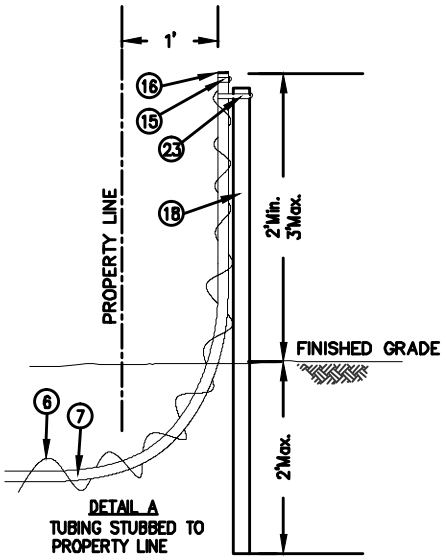
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

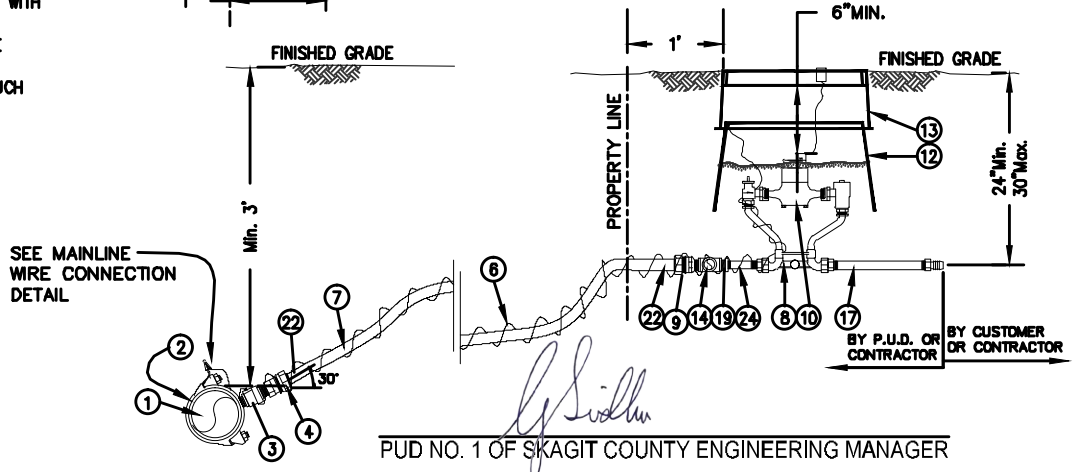


MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR. [a]







PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF DOUBLE 5/8" OR 3/4" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE

SCALE: 1" = 2'	STANDARD
DATE: 3-01-05	
REVISED: 5/16/14	WS58-4
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.	NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN		10	METER, BADGER MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	1
2	CLAMP, SERVICE, DOUBLE STRAP X 1" I.P.T., ALL BRASS, (FORD #202B)[a]	1	11	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
3	CORP, 1", (FORD #FB-500)[a]	1	12	METER BOX & COVER, (CARSON INDUSTRIES LLC, L SERIES 1419-12 W/COVER 1419-3)[a]	1
4	ADAPTER, BRASS PAK JOINT, 1" F.I.P.T. X 1-1/4" POLY, (FORD #C16-44)[a]	1	13	EXTENSION, METER BOX, CARSON INDUSTRIES LLC, L SERIES 1419-6[a]	1
			14	INSERT, STIFFENER, 1-1/4" (FORD #72)[a]	2
5	NIPPLE, BRASS, 1"x 6"	1	15	CLAMP, 1-1/4", ALL STAINLESS - STUB ONLY	2
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID		16	ADAPTER, 1-1/4" M.I.P.T x 1-1/4" INSERT W/CAP (GALVANIZED)	1
			17	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.		18	ADAPTER, BRASS, 1" F.I.P.T. x 1" INSERT	1
8	COPPERSETTER, 3/4", (FORD #VBHC72-9W-11-44)[a]	1	19	CURB STOP, BRASS, 1" B11-444	1
9	ADAPTER, BRASS PAK JOINT, 3/4" M.I.P.T. X 1-1/4" POLY, (FORD #C86-44)[a] [b]	1	20	NIPPLE, BRASS, 1" X 4"	3
			21	PRV, 1" WILKINS 600HR, SC, 1"	2

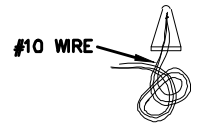
[a] OR EQUIVALENT APPROVED BY THE DISTRICT

[b] ELL, 90° STREET, 3/4" M X F I.P.T. (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

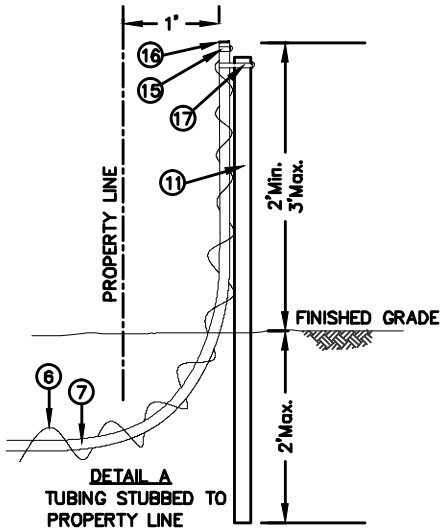
NOTES

1. CORP TO BE IN FULL OPEN POSITION BEFORE BACKFILL.
2. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
3. SERVICE LINE IS TYPICALLY 1'6" TO NORTH OR WEST OF PROPERTY CORNER OR AS OTHERWISE SPECIFIED.
4. WATER SERVICE TUBING INSTALLATION IN PLATTED AREAS WILL BE COMPLETED BY THE CONTRACTOR/DEVELOPER FROM THE PIPELINE TO BEYOND THE PROPERTY LINE. IF METER BOX AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE PIPE INSTALLATION, THEN TUBING IS TO BE STUBBED UP AND COMPLETED AS PER DETAIL A. THE DISTRICT WILL COMPLETE THE ACTUAL METER AND BOX INSTALLATION WHEN NEEDED.
5. IF METER IS NOT INSTALLED IN COPPERSETTER, INSTALL PLUGS IN METER CONNECTIONS. IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A WATERTIGHT WRAP OF ELECTRICAL TAPE OVER END OF NIPPLE. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN BOX.
6. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
7. FILL BOX WITH FINE DIRT TO TOP OF METER.
8. IF THE METER BOX IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS.
9. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
10. IF SERVICE LINE HAS LESS THAN 2'0" OF COVER, CONTACT DISTRICT ENGINEERING DEPARTMENT FOR FREEZE PROTECTION REQUIREMENTS.
11. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

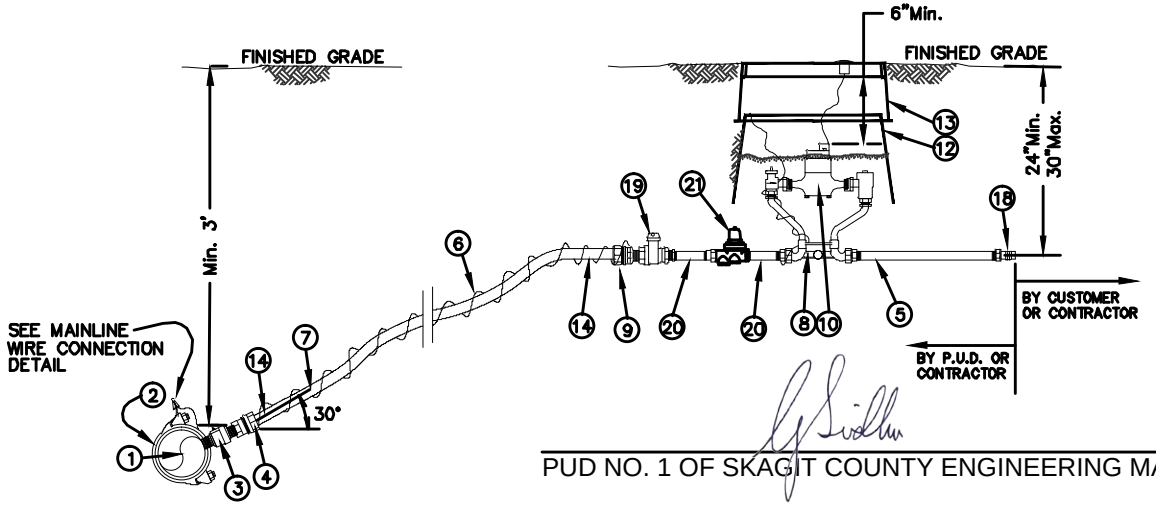


MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH #62325 KING WATERPROOF WIRE CONNECTOR.[a]



DETAIL A
TUBING STUBBED TO PROPERTY LINE



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 21, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF SINGLE 5/8" OR 3/4" EXISTING METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE ON HIGH PRESSURE TRANSMISSION LINE

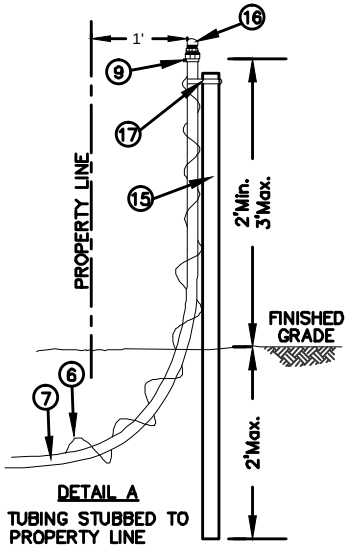
SCALE: 1/2" = 1'	STANDARD
DATE: 5-24-07	
REVISED: 5/21/14	WS58-5
DRAWN BY: CAS	
APPROVED BY: DJL	

BILL OF MATERIALS

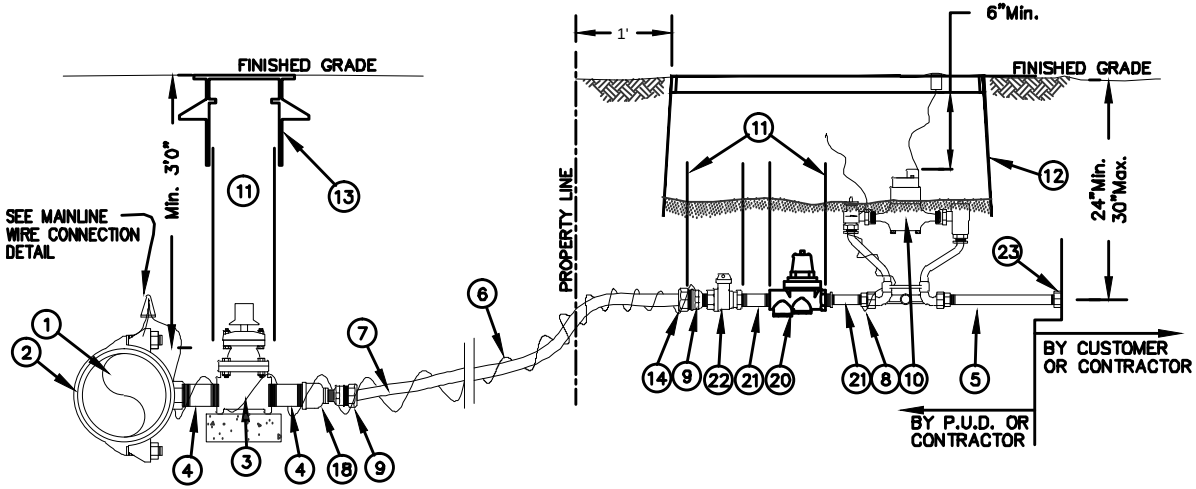
NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	CLAMP, SERVICE, DOUBLE STRAP X 2" I.P.T., ALL BRASS, (FORD #202B)[a]	1
3	VALVE, 2" CAST IRON, RESILIENT WEDGE, I.P.T.xI.P.T.	1
4	NIPPLE, BRASS 2"X4"	2
5	NIPPLE, BRASS 1"X 6"	1
6	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND MIN.18" INTO BOX, NEAR LID	
7	PIPE, 1-1/4" PE 3408, SIDR 7, 200 P.S.I.	
8	COPPERSETTER, 3/4", FORD (VBHC72-9W-11-33)[a]	1
9	ADAPTER, BRASS PAK JOINT, 1" M.I.P.T. X 1-1/4 POLY (FORD #C86-44) [a b]	2
10	METER, BADGER, MODEL M25 (5/8") OR M35 (3/4") BRONZE METER	1
11	CASING, 6" PVC SEWER PIPE	2
12	METER BOX, CARSON IND. MODEL 1730-15 W/1730-3L COVER[a] (LARGE BOX)	1
13	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	1
14	INSERT, STIFFENER, 1-1/4" (FORD #72)[a]	2
15	POST, 4'-0" MIN. METAL FENCE POST W/SPADE REMOVED	1
16	CAP, 1" (GALVANIZED)	1
17	HOSE CLAMP, 1-1/4" STAINLESS STEEL	1
18	REDUCER, 2"X1" BRASS	1
19	NIPPLE, BRASS 3/4"X4"	1
20	PRV, WILKENS 600HR, SC, 1" "HIGH RANGE PRV"	1
21	NIPPLE, BRASS 1"X4"	1
22	CURB STOP, 1" BRASS, B11-444	1
23	ADAPTER, BRASS, 1" F.I.P.T. X 1" INSERT	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
[b] ELL, 90° STREET, 1" BRASS (IF NEEDED)

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874.

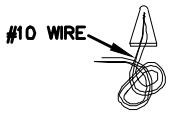


DETAIL A
TUBING STUBBED TO PROPERTY LINE



NOTES:

1. INSTALL SERVICE LINE PERPENDICULAR TO MAIN UNLESS OTHERWISE SHOWN ON WATER CONSTRUCTION PLAN.
2. IF METER IS NOT INSTALLED IN COPPERSETTER, OR IF CONNECTION IS NOT MADE TO CUSTOMER'S PLUMBING, INSTALL A TIGHT FITTING PLUG OR CAP IN OPEN END OF COPPERSETTER AND A TIGHT WRAP OF PLASTIC (ELECTRICAL) TAPE OVER END OF NIPPLE. MAKE WATER TIGHT.
3. IF VAULT AND COPPERSETTER ARE NOT INSTALLED AT TIME OF SERVICE TUBING INSTALLATION, THEN TUBING IS TO BE STUBBED UP ABOVE FINISH GRADE AND CAPPED. SEE DETAIL A.
4. SET COPPERSETTER FLUSH, PLUMB AND CENTERED IN VAULT/BOX.
5. FLUSH OUT SERVICE TUBING AND COPPERSETTER BEFORE INSTALLING METER. DO NOT ALLOW MUD OR FOREIGN MATERIAL TO ENTER ANY TUBING OR FITTINGS.
6. SET VALVE CASING AND VAULT/BOX TO FINISH GRADE. DO NOT REST CASING OR VAULT ON NIPPLES OR PIPE. PLACE 3 INCHES OF 3/4" MINUS CRUSHED GRAVEL, COMPACTED TO 95%, UNDER CONCRETE VAULTS. SUPPORT VALVE CASING WITH 0.2 SQ.FT. OF CONCRETE ON EACH SIDE OF VALVE. SUPPORT 2" VALVE WITH MIN. OF 1 SQ.FT. OF CONCRETE BLOCK ON UNDISTURBED GROUND OR COMPACTED 3/4" CRUSHED GRAVEL.
7. IF METER IS LOCATED IN ASPHALT OR CONCRETE AREA, A TRAFFIC BOX (MID-STATES PLASTICS, INC., MSBCF1324-18)[a] WILL BE REQUIRED. NOT FOR THROUGH-WAY TRAFFIC APPLICATIONS
8. IF THERE IS PETROLEUM-BASED CONTAMINATED SOIL PRESENT, THE PIPELINE SHALL BE OF TYPE K COPPER WITH BRASS AND COPPER FITTINGS. SEE STANDARD P.U.D. COPPER SERVICE DETAIL.
9. METER SENSING PAD TO BE LOCATED IN STEEL LID OF UTILITY VAULT WITHIN 6 INCHES OF HINGE NEAR THE STREET END. IN A CARSON INDUSTRIES BOX PAD IS TO BE LOCATED AT THE STREET END OF BOX.
10. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.
11. SET PRV TO 125 PSI.



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: ALL THREE WIRES ARE TO BE TIED TOGETHER IN AN OVERHAND KNOT APPROXIMATELY 6" FROM WIRE NUT. BARE 5/8" OF WIRES. CONNECT WITH [a] #62325 KING WATERPROOF WIRE CONNECTOR.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 21, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF SINGLE 5/8"OR 3/4" METERED SERVICE WITH 200 P.S.I. POLYETHYLENE SERVICE LINE OFF HIGH PRESSURE MAIN LINE GREATER THAN 150 P.S.I.

SCALE: NTS	STANDARD
DATE: 6-26-07	
REVISED: 8/13/13	WS58-6
DRAWN BY: CAS	
APPROVED BY: GJS	

NOTES:

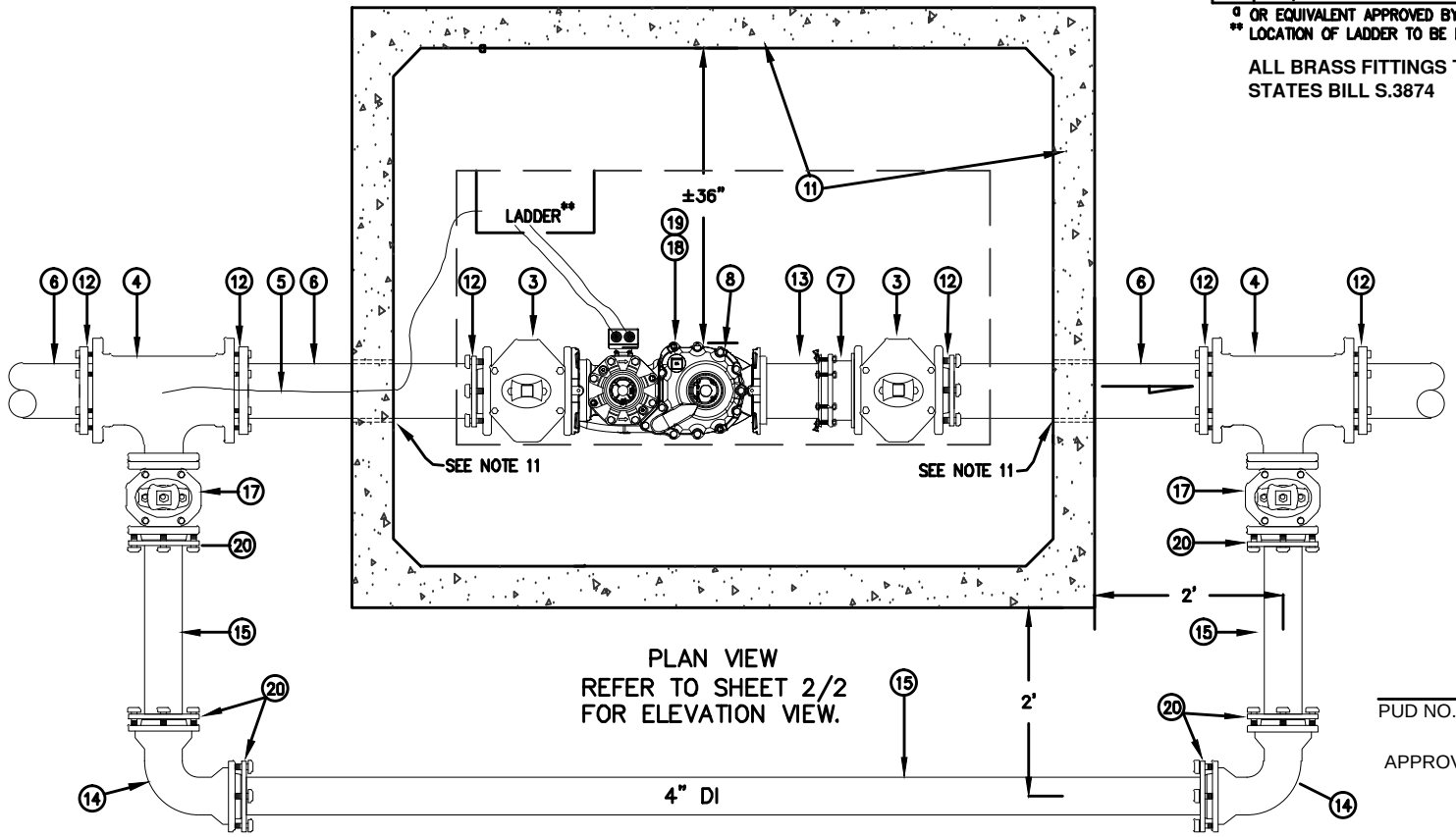
1. SET VALVE BOX AND VAULT TO FINISH GRADE. SEE P.U.D. VALVE BOX DETAIL.
2. SEAL VAULT LIDS AND RISERS OF VAULT WITH 1-1 /2"x1" JOINT MASTIC. INSTALL 3" PVC PIPE TO DRAIN TO DAYLIGHT IF POSSIBLE.
3. INSTALL SERVICE PIPE PERPENDICULAR TO MAIN OR AS SHOWN ON WATER PLANS APPROVED BY DISTRICT ENGINEER. USE ELLS, AS NECESSARY, TO MEET ELEVATION OF VAULT.
4. TEE, VALVE AND PIPE MUST BE WRAPPED WITH 8 MIL POLYETHYLENE PIPE ENCASEMENT. IT IS TO BE INSTALLED AS PER D.I.P.R.A. AND IN ACCORDANCE WITH A.W.W.A. C105.
5. BLOCK TEE/TAPPING SLEEVE WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON. IN ADDITION, THE SERVICE PIPE FROM VALVE AT MAIN TO METER AND THE PRIVATE SERVICE LINE FROM METER ON TO PRIVATE PROPERTY SHALL BE RESTRAINED USING MEG-A-LUGS OR "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT). THE LENGTH OF RESTRAINED PIPE ON PRIVATE PROPERTY SHALL BE DETERMINED BY THE DEVELOPER ENGINEER.
6. SET VAULT ON MIN. 6" OF 3/4" MINUS CRUSHED GRAVEL, MECHANICALLY TAMPED TO 95% COMPACTION.
7. FLUSH OUT PIPELINE BEFORE INSTALLING METER. DO NOT ALLOW ANY MUD OR FOREIGN MATERIAL TO ENTER PIPE OR FITTINGS.
8. IF CONNECTION IS NOT COMPLETED TO CUSTOMER'S PIPE, INSTALL M.J., TAP 2", CAP OVER OPEN END OF PIPE AND FLUSH OUT PIPE AND METER. MAKE WATER TIGHT.
9. METER SENSING PAD IS TO BE LOCATED WITHIN 6" OF HINGE ON VAULT LID AT STREET (INLET) END OF VAULT.
10. 4-INCH VALVES SHALL BE A.W.W.A. C509 STANDARD, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE, GATE VALVES.
11. NON-SHRINK GROUT/FOAM AROUND PIPE. MAKE WATER TIGHT.
12. BACKFILL AROUND VAULT SHALL BE FIRMLY TAMPED TO ELIMINATE SETTLEMENT.
13. CONCRETE BLOCK OR EQUIVALENT UNDER VALVE IS TO KEEP VALVE FACE VERTICAL DURING INSTALLATION.
14. A SHUTOFF VALVE SHALL BE INSTALLED ON CUSTOMER'S PLUMBING AFTER DISTRICT'S METER, PER U.P.C. SUCH VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	WATER MAIN	
2	TEE, MAINLINEx6"FL OR STAINLESS STEEL TAPPING SLEEVE EQUIVALENT	1
3	VALVE, 6" DUCTILE IRON, RESILIENT WEDGE, FLxMJ	3
4	TEE, 6" MJx4" FL	2
5	WIRE, #10 SOLID COPPER, BLUE COATED, EXTEND TO TOP OF LADDER	
6	PIPE, 6" CL 50 DUCTILE IRON (FIELD CUT TO LENGTH)	
7	RESTRAINED FLANGE COUPLING ADAPTER, 6" ROMAC IND. INC.[a]	1
8	METER, BADGER, 6" RECORDALL COMPOUND SERIES METER WITH SUMMATOR SPLITTER WITH ORION RTR TRANSMITTER	1
9	CASING, 6" PVC SEWER PIPE	3
10	UTILITY VAULT 675LA W/#675-TL-2-332P COVER (SPRING[a] ASSISTED) AND LADDER (BILCO LADDER-UP SAFETY POST) [a]**	1
11	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB-007-SKAGIT (SEE P.U.D. DETAIL)	3
12	RETAINER GLAND, 6" ROMAC GRIP RING[a]	6
13	SPOOL, 6" CL 50 D.I., FLxPE, 12" MIN. LONG (FIELD CUT TO LENGTH)	1
14	ELL, 4" MJ 90°	2
15	PIPE, 4" CL52 DI (FIELD CUT TO LENGTH)	
16	PIPE SUPPORT (MATERIAL RESOURCES #S92 OR S89)	2
17	VALVE, 4" FLxMJ, GATE, RW	2
18	NIPPLE, 2"x4", BRASS	1
19	VALVE, 2" BALL, BRASS, IPTxIPT, WITH PADLOCK WINGS (FORD B11-777-W)[a]	1
20	RETAINER GLAND, 4" ROMAC GRIP RING[a]	6
21	PLUG, 2" BRASS	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT
** LOCATION OF LADDER TO BE DETERMINED AT INSTALLATION BY PUD REPRESENTATIVE.

ALL BRASS FITTINGS TO BE LEAD FREE DOMESTIC BRASS PER UNITED STATES BILL S.3874



PLAN VIEW
REFER TO SHEET 2/2
FOR ELEVATION VIEW.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

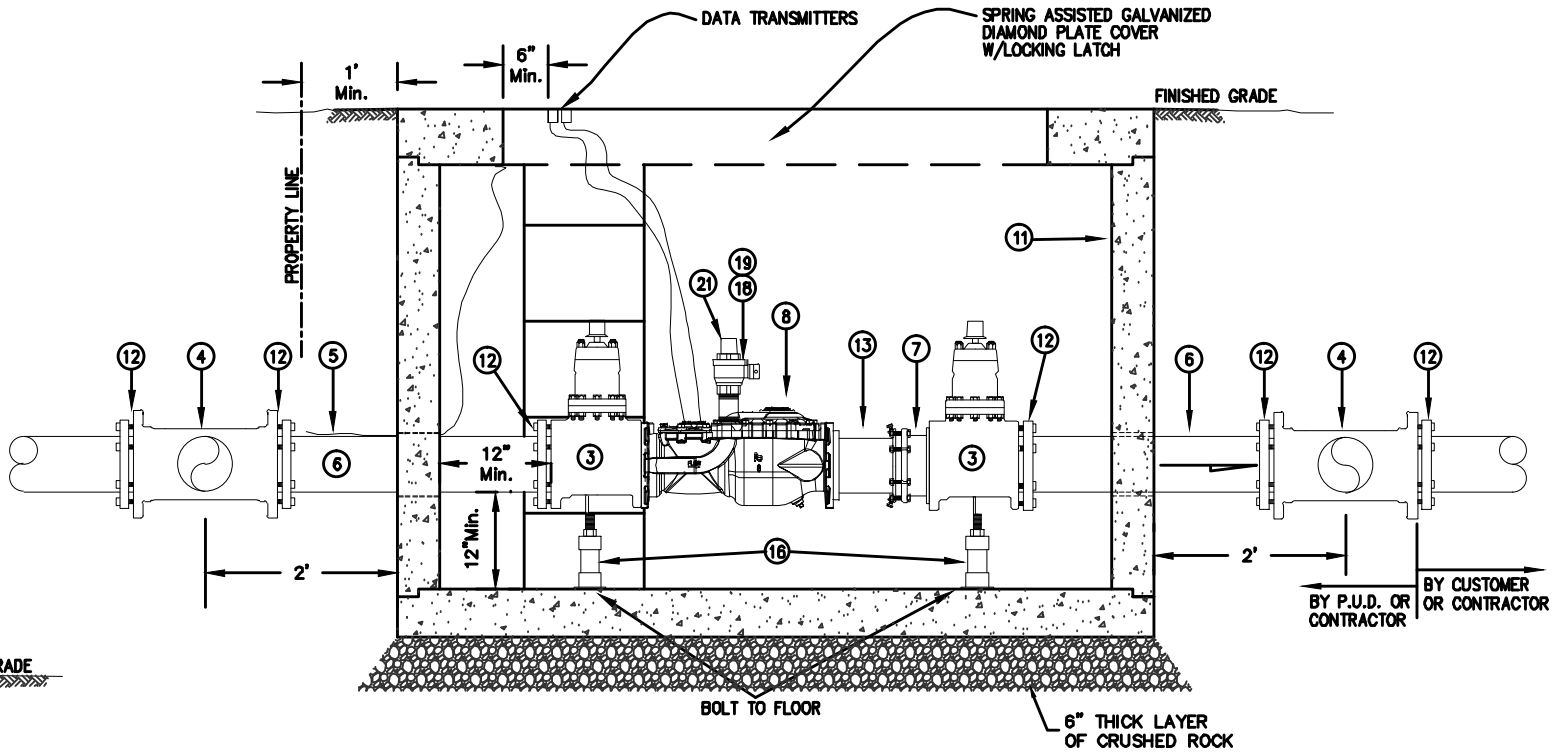
APPROVED ON: MAY 16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 6" COMPOUND METERED SERVICE PLAN VIEW

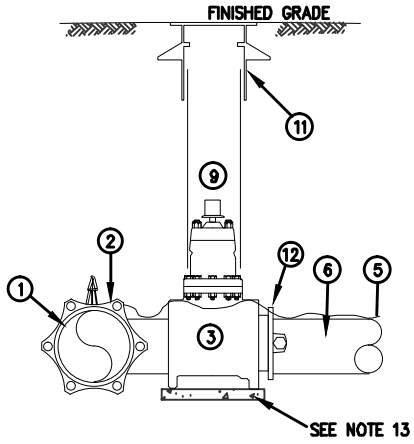
SHEET 1/2

SCALE: 1" = 2'	STANDARD
DATE: 5-7-07	
REVISED: 5/16/14	WS6-1a
DRAWN BY: CAS	
APPROVED BY: GJS	



ELEVATION

REFER TO SHEET 1/2 FOR PLAN VIEW



PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

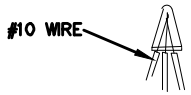
APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF 6" COMPOUND METERED SERVICE ELEVATION VIEW

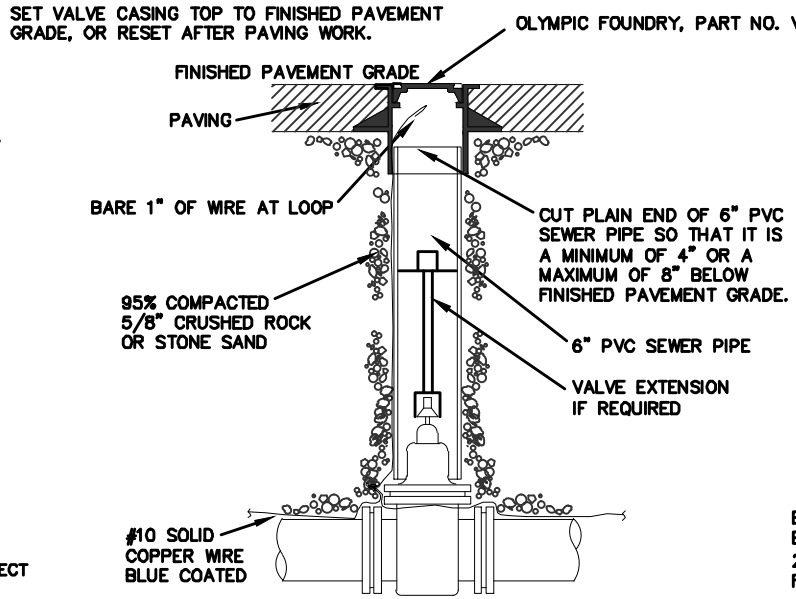
SHEET 2/2

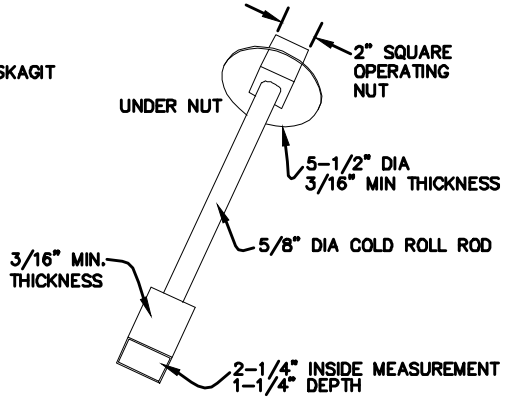
SCALE: 1" = 2'	**STANDARD**
DATE: 5-7-07	
REVISED: 5/16/14	**WS6-1b**
DRAWN BY: CAS	
APPROVED BY: GJS	



MAINLINE WIRE CONNECTION DETAIL
NTS

NOTE: BARE 5/8" OF WIRES. CONNECT WITH #62225 KING WATERPROOF WIRE CONNECTOR.[a]

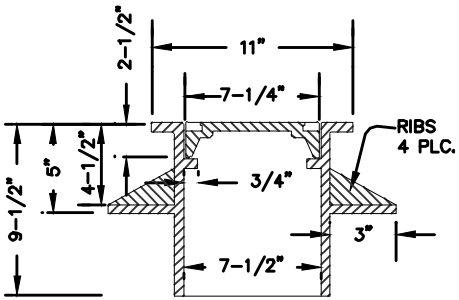




VALVE OPERATING NUT EXTENSION

EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. THE FINISH ELEVATION OF THE OPERATING NUT IS TO BE 2' – 3' BELOW FINISH GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG, ONLY ONE EXTENSION TO BE USED PER VALVE.

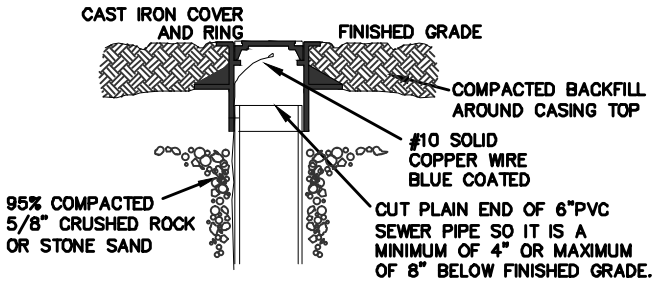
NOTE:
1) ALL EXTENSIONS ARE TO BE MADE OF STEEL SIZED AS NOTED, AND PAINTED WITH TWO COATS OF METAL PAINT. WELD ALL PARTS.
2) A CARSONITE CWV-116 BLUE MARKER POST WILL BE INSTALLED AT ALL VALVE(S) LOCATIONS UNLESS DIRECTED OTHERWISE BY DISTRICT REPRESENTATIVE.



SECTION A–A
OLYMPIC FOUNDRY, PART NO. VB007/SKAGIT CAST IRON VALVE BOX

VALVE CASING IN PAVED AREAS, STREETS AND SIDEWALKS

REFER TO "RECOMMENDED PROCEDURE FOR SETTING VALVE BOXES IN ASPHALT PAVING" (SHEET 2)



VALVE CASING IN UNPAVED AREAS

VALVE CASING EXTENSION

IF THE 6" PVC VALVE CASING PIPE DOES NOT EXTEND HIGH ENOUGH TO SUPPORT THE CAST IRON VALVE BOX, AN EXTENSION CAN BE ADDED FOLLOWING THE PROCEDURE BELOW:

1. CUT A 6" PVC SEWER PIPE 6" – 8" LONGER THAN THE RISE NECESSARY.
2. SPLIT THE 6" PVC SEWER PIPE THE FULL LENGTH.
3. CURL CASING EXTENSION INTO ITSELF AND PLACE INSIDE EXISTING PVC VALVE CASING THE 6"–8" ALLOWED FOR IN STEP 1. INSTALL VALVE BOX.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF CAST IRON VALVE BOX & VALVE OPERATING NUT EXTENSION

SHEET 1/2

SCALE: NTS	STANDARD
DATE: 3-25-05	
REVISED: 5/6/14	WV-1a
DRAWN BY: CAS	
APPROVED BY: GJS	

RECOMMENDED PROCEDURE FOR RAISING AND SETTING CAST IRON VALVE BOX IN ASPHALT PAVING

1. LOCATE BURIED VALVE BOX USING REFERENCE MEASUREMENTS AND/OR ELECTRONIC OR MAGNETIC LOCATOR. MARK LOCATION WITH WHITE PAINT.
2. BREAK OUT SMALL HOLE IN PAVEMENT AND LOCATE THE VALVE BOX COVER.
3. CAREFULLY BREAK OUT AN 18-INCH DIAMETER HOLE WITH 9-INCH RADIUS FROM THE CENTER OF THE VALVE BOX. A CIRCLE TEMPLATE 18 INCHES IN DIAMETER IS HANDY TO MARK OUT THE PERIMETER OF THIS HOLE. USE A CURVED SPADE WITH A JACKHAMMER TO CUT A NEAT VERTICAL FACE HOLE IN THE ASPHALTIC CONCRETE PAVEMENT. DO NOT CRACK OR DAMAGE THE PAVEMENT BEYOND THIS HOLE. IF IT IS SUSPECTED THE VALVE CASING IS NOT VERTICAL OR CENTERED OVER THE VALVE OPERATING NUT, REMOVE JUST ENOUGH PAVEMENT TO ALLOW REMOVAL OF THE VALVE BOX LID SO IT CAN BE DETERMINED IF CASING ADJUSTMENT IS NEEDED. IT IS VERY IMPORTANT TO NOT REMOVE ANY MORE FINISHED PAVEMENT THAN ABSOLUTELY NECESSARY.
4. COMPLETELY REMOVE THE WHOLE VALVE BOX. DO NOT DISTURB THE SURROUNDING EARTH ANY MORE THAN NECESSARY. EXAMINE THE CASING PIPE. MAKE SURE IT IS VERTICAL, SYMMETRICAL AROUND THE VALVE NUT AND CLEAN OF ALL ROCKS, DEBRIS AND DIRT. CLEAN AND CORRECT AS NECESSARY. CHECK WITH A VALVE WRENCH TO VERIFY OPERATION IS SMOOTH.
5. TRIM OR ADD TO THE CASING PIPE (6-INCH PVC PLASTIC OR CONCRETE) AS NEEDED SO THE TOP OF THE CASING PIPE IS A MINIMUM OF 4 INCHES TO MAXIMUM OF 8 INCHES BELOW THE FINISHED PAVEMENT GRADE. THE LID WILL NOT FIT TIGHT IF THE CASING IS HIGHER. VALVE BOX WILL HAVE POOR SUPPORT IF THE CASING PIPE IS LOWER. TO ADD CASING PIPE, USE A PIECE OF 6-INCH PVC PLASTIC SEWER PIPE CUT 12 INCHES LONGER THAN NEEDED. SAW-CUT THIS PIECE ALONG ONE SIDE IN A STRAIGHT LINE THE FULL LENGTH. FOLD THE PIPE OVER THE SAW-CUT AND INSERT IT INSIDE THE CASING PIPE IN THE GROUND. SLIDE UP OR DOWN TO ACHIEVE DESIRED LEVEL.
6. IF THE VALVE OPERATING NUT IS OVER 3 FEET BELOW FINISH PAVEMENT GRADE, INSTALL A STANDARD VALVE OPERATING EXTENSION, PER STANDARD SPECIFICATIONS.
7. USING A 1-INCH ROD OR CAPPED 3/4-INCH PIPE, THOROUGHLY POUND THE EARTH ALL AROUND THE CASING PIPE TO OBTAIN MAXIMUM EARTH COMPACTION.
8. FILL THE VOID BETWEEN THE CASING PIPE AND EARTH WALL UP TO EXACTLY 12 INCHES (1 FOOT) BELOW FINISH PAVEMENT GRADE WITH 5/8-INCH MINUS CRUSHED ROCK AND THOROUGHLY COMPACT USING ROD OR PIPE AS IN STEP 7. KEEP ADDING AND COMPACTING CRUSHED ROCK UNTIL HARD, TIGHT LEVEL SURFACE IS EXACTLY 12 INCHES BELOW PAVEMENT GRADE.
9. INSERT THE VALVE BOX. USING A STRAIGHT BOARD OR ROD, CHECK THAT THE TOP RIM OF THE VALVE BOX IS EXACTLY LEVEL WITH THE FINISHED PAVEMENT. THE BOX MUST SET EVENLY ON THE CRUSHED ROCK BASE. IT MUST NOT ROCK OR WIGGLE. REMOVE THE BOX AND ADJUST THE CRUSHED ROCK AS OFTEN AS NECESSARY TO ACHIEVE EXACT GRADE WITH PAVEMENT AND UNIFORM BOX SUPPORT. PUT CAST IRON LID ON THE BOX. MAKE SURE IT FITS CORRECTLY AND IS FLUSH WITH THE BOX RIM. REPLACE LID IF INCORRECT FIT. REPLACE ENTIRE VALVE BOX IF BOX RIM PREVENTS A SNUG FIT OF THE LID.
10. ADD 5/8-INCH MINUS CRUSHED ROCK UNIFORMLY IN THE SPACE BETWEEN THE VALVE BOX AND OUTSIDE EARTH WALL IN MAXIMUM 4-INCH LIFTS. COMPACT EACH LIFT COMPLETELY WITH 1-INCH ROD OR PIPE AS BEFORE. FILL AND COMPACT THE SPACE UP TO 2 INCHES BELOW FINISHED PAVEMENT GRADE.
11. ADD HOT MIX ASPHALTIC CONCRETE MATERIAL AND THOROUGHLY COMPACT WITH ROD OR PIPE TO THE FINISH PAVEMENT GRADE. SMOOTH OFF THE SURFACE AS MUCH AS POSSIBLE.
12. USING A BRUSH, PAINT THE SURFACE OF THE PATCH WITH ASPHALT TACK MATERIAL, EXTENDING MINIMUM OF 1 INCH OVER PAVEMENT AND ONTO EDGE OF VALVE BOX METAL RIM. DO NOT ALLOW ANY TACK MATERIAL TO FLOW INTO METAL RIM OR ON BOX COVER. USE A BRUSH TO CONTROL APPLICATION OF THIS TACK COAT AND PROVIDE A NEAT SEAL SURFACE.
13. CHECK AGAIN THAT VALVE CASING IS CLEAR, THAT VALVE WRENCH CAN BE PUT ON OPERATING NUT AND VALVE CAN BE OPERATED PROPERLY.
14. SPREAD CLEAN FINE SAND OVER THE TACK COAT SO THAT VEHICLE TIRES WILL NOT LIFT THE TACK MATERIAL BEFORE IT CURES AND SETS UP.
15. EACH VALVE BOX IN A CLUSTER OF TWO TO FOUR VALVES MUST BE ADJUSTED INDEPENDENTLY AS OUTLINED ABOVE. CUTTING OUT TRIANGLES OR SQUARES OF FINISHED PAVEMENT RESULTS IN VALVE BOXES THAT DO NOT REMAIN EVEN WITH PAVEMENT, LEAN TOGETHER, AND BREAK OUT UNDER TRAFFIC BEATING.

CAREFULLY FOLLOWING THIS OUTLINED PROCEDURE RESULTS IN VALVE BOX SETTINGS THAT WILL REMAIN FIRM AND IN PLACE, AND ARE VIRTUALLY UNNOTICED BY THE PUBLIC PASSING OVER THEM IN THEIR VEHICLES.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF CAST IRON VALVE BOX & VALVE OPERATING NUT EXTENSION

SHEET 2/2

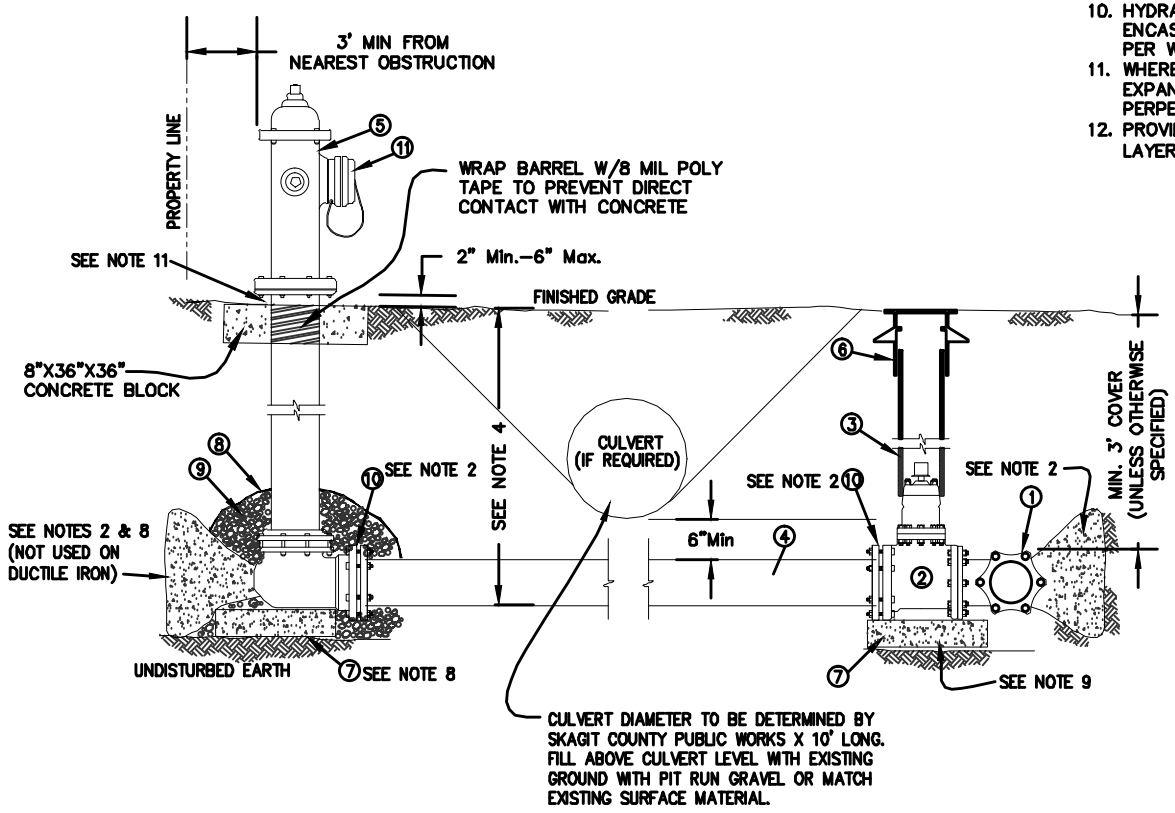
SCALE: NTS	**STANDARD**
DATE: 3-25-05	
REVISED: 5/6/14	**WV-1b**
DRAWN BY: CAS	
APPROVED BY: GJS	

BILL OF MATERIALS

NO.	NOMENCLATURE	REQ'D.
1	TEE WITH FLANGED BRANCH	1
2	6" VALVE WITH FLGxMJ CONNECTIONS (SEE NOTE 6)	1
3	CASING, 6" PVC SEWER PIPE	1
4	PIPE, 6" CLASS 50 DUCTILE IRON, FIELD CUT	
5	FIRE HYDRANT WITH PUMPER PORT, CLOW MEDALLION, OR AS APPROVED BY JURISDICTIONAL FIRE DEPARTMENT DISTRICT	1
6	VALVE BOX, CAST IRON OLYMPIC FOUNDRY VB007/SKAGIT (SEE P.U.D. DETAIL)	1
7	BLOCK, PRECAST CONCRETE, SEE NOTE 8.	1
8	FABRIC, GEOTEXTILE, NON-WOVEN (MIRAFI 140N)[a]	
9	1/4 CY DRAIN ROCK, 1-1/2"-3/4", NO FINES	
10	MEG-A-LUG, 6"/GRIP RING 6"	2
11	HYDRANT ADAPTER STORZ STYLE S-37 W/SC CAP & CABLE, 5"x4"PCT	1

[a] OR EQUIVALENT APPROVED BY THE DISTRICT

SEE SHEET 2/2 FOR WALL REQUIREMENTS FOR HYDRANTS



NOTES:

1. ALL MATERIALS AND BRANDS MUST BE APPROVED BY P.U.D.
2. BLOCK TEE AND HYDRANT WITH POURED CONCRETE ON ALL WATER MAINS OTHER THAN DUCTILE IRON AND ON ALL TAPPING SLEEVES AS REQUIRED PER DISTRICT BLOCKING DETAIL. IN ADDITION, 6" "MEGALUGS" (OR APPROVED EQUIVALENT) ARE TO BE INSTALLED AT VALVE AND HYDRANT M.J. OUTLETS. RESTRAIN ANY JOINTS IN THE PIPELINE WITH "FIELD LOK" GASKETS (OR APPROVED EQUIVALENT) INSTALLED IN THE BELLS OF TYTON JOINT PIPE OR "MEGALUGS" ON M.J. BELLS. NO THRUST BLOCK REQUIRED BEHIND TEE ON 8" DUCTILE IRON OR LARGER MAINS.
3. PROTECTIVE BARRIER POSTS MAY BE NECESSARY AT SOME HYDRANT INSTALLATIONS. CONTACT FIRE DEPARTMENT/DISTRICT FOR SPECIFIC REQUIREMENTS.
4. HYDRANT LENGTH AND TRENCH DEPTH SHALL BE SO AS TO PROVIDE FOR HYDRANT SETTING AT 2" MIN. AND 6" MAX. ELEVATION ABOVE FINISH GRADE.
5. SET HYDRANT VERTICAL. USE LEVEL. COMPACT ALL BACKFILL.
6. VALVE SHALL BE AWWA STANDARD GATE, "O" RING PACKING, NON-RISING STEM, 2" OPERATING NUT, RESILIENT WEDGE.
7. HYDRANT LOCATIONS ARE DETERMINED BY THE FIRE MARSHAL WITH AUTHORITY FOR AREA CONCERNED.
8. CONCRETE BLOCK WILL BE BELOW THE DRAIN HOLES AND DRAIN ROCK. TAKE CARE TO NOT PLUG DRAIN HOLES OR CONTAMINATE DRAIN ROCK.
9. SET MINIMUM 1 SQ.FT. CONCRETE SUPPORT TIGHT UP UNDER VALVE AND HYDRANT.
10. HYDRANT BARREL, LEAD, TEE, AND VALVE MUST BE WRAPPED WITH POLYETHYLENE PIPE ENCASEMENT TAPE WHICH IS A MINIMUM OF 8-MIL THICK. IT MUST BE INSTALLED AS PER W.S.D.O.T. STANDARDS AND IN ACCORDANCE WITH A.W.W.A. C105.
11. WHERE HYDRANTS ARE INSTALLED IN THE SIDEWALK, THERE SHALL BE A MINIMUM 3/8" EXPANSION JOINT AROUND THE BARREL OF THE HYDRANT AND AN EXPANSION JOINT PERPENDICULAR ACROSS THE SIDEWALK, INTERSECTING THE HYDRANT BARREL.
12. PROVIDE A MINIMUM OF 3'-0" LEVEL WORKING AREA AROUND HYDRANT USING 6" THICK LAYER OF 5/8" MINUS CRUSHED ROCK COMPACTED TO 95%

ALL FIRE HYDRANTS SHALL COMPLY WITH THE STANDARDS ISSUED BY THE SKAGIT COUNTY FIRE MARSHAL. HYDRANTS SHALL BE THE DRY BARREL TYPE WITH TWO HOSE OUTLETS WITH AN INSIDE DIAMETER OF 2-1/2 INCHES AND ONE LARGE PUMPER OUTLET WITH AN INSIDE DIAMETER OF 4 INCHES. SMALL PORTS SHALL HAVE NATIONAL STANDARD THREADS MEASURING 3.0625 INCHES OUTSIDE DIAMETER AT 7-1/2 THREADS PER INCH. PUMPER PORTS SHALL BE NO. 3 PACIFIC COAST THREADS MEASURING 4.828 INCHES OUTSIDE DIAMETER AT 6 THREADS PER INCH. THE OPERATING NUT SHALL BE 1-1/4 INCH PENTAGON.

A STORZ QUICK COUPLER CONNECTED TO THE PUMPER PORT MAY BE REQUIRED. CONTACT FIRE DISTRICT/DEPARTMENT.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: May 6, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

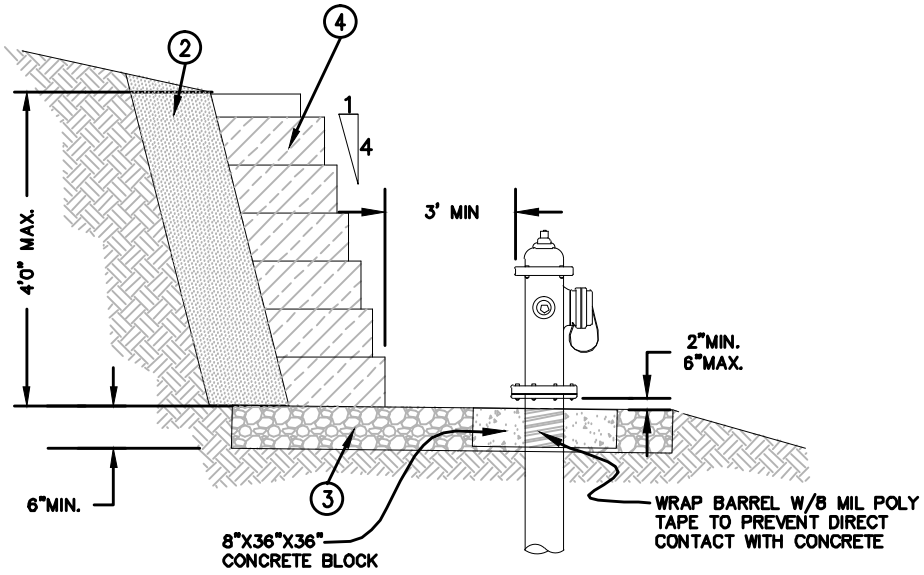
STANDARD INSTALLATION OF FIRE HYDRANT "CENTER STEM TYPE"

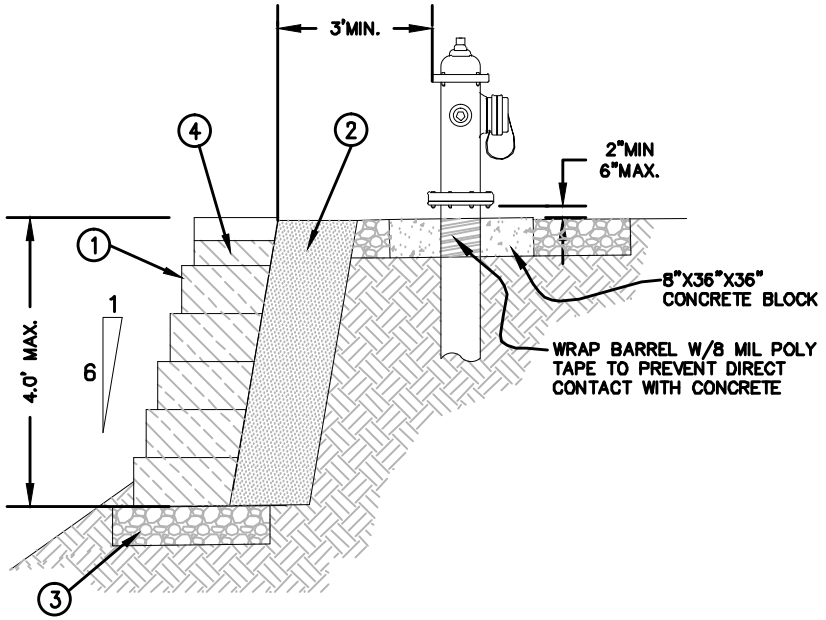
SHEET 1/2

SCALE: NTS	STANDARD
DATE: 3-25-05	
REVISED: 5/6/14	WH-1a
DRAWN BY: CAS	
APPROVED BY: GJS	

LEGEND

1. INSTALL CORNERSTONE F100 BLOCK UNITS WITH CAPS, STACK TO DESIRED HEIGHT (4' MAX.) ADHERE CAPS TO THE BLOCK UNITS WITH A CONCRETE ADHESIVE.
2. COMPACTED SELECT FILL MATERIAL AS REQUIRED BY THE DISTRICT'S INSPECTOR.
3. ESTABLISH A COMPACTED AGGREGATE LEVELING PAD USING 5/8" MINUS CRUSHED ROCK COMPACTED TO 95%. BASE SHALL BE A MINIMUM 6" DEEP PLUS ONE INCH FOR EVERY ONE FOOT OF WALL HEIGHT. PLACE FIRST COURSE OF BLOCKS ON LEVELING SAND.
4. FILL ANY VOIDS IN BLOCKS WITH GRAVEL.





PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

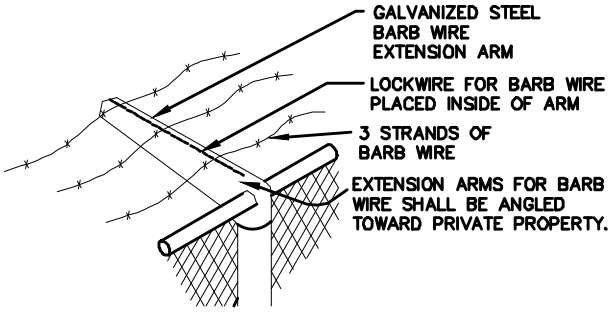
APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

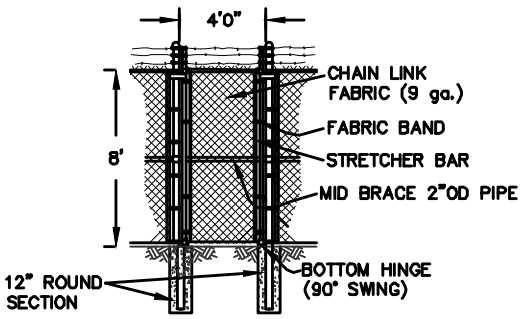
STANDARD INSTALLATION OF FIRE HYDRANT "CENTER STEM TYPE"

SHEET 2/2

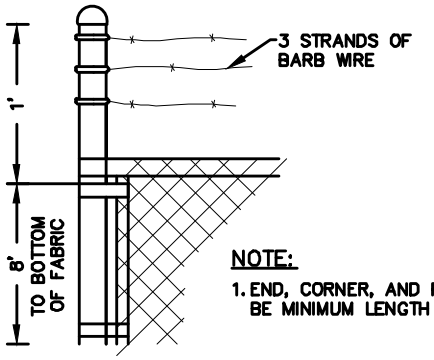
SCALE: NTS	STANDARD
DATE: 3-25-05	
REVISED: 5/27/14	WH-1b
DRAWN BY: KDM	
APPROVED BY: GJS	



LINE POST TOP



MAN GATE



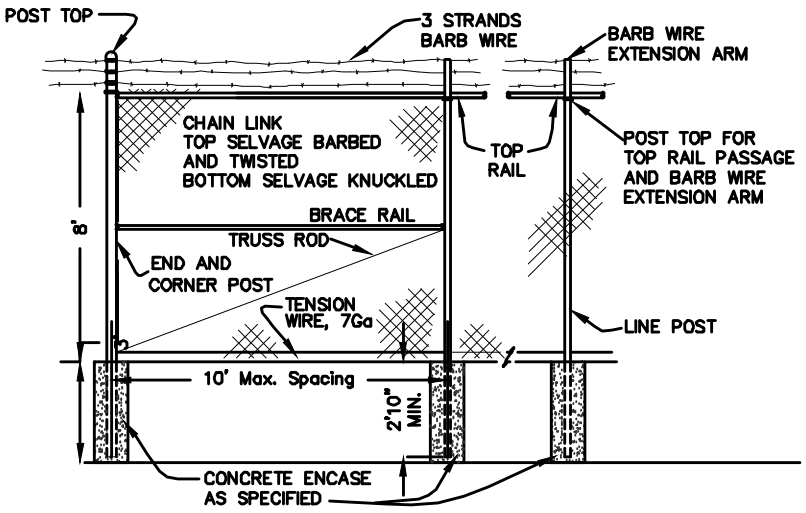
NOTE:

1. END, CORNER, AND PULL POSTS SHALL BE MINIMUM LENGTH OF 9'–10".

END, CORNER, AND PULL POST TOP

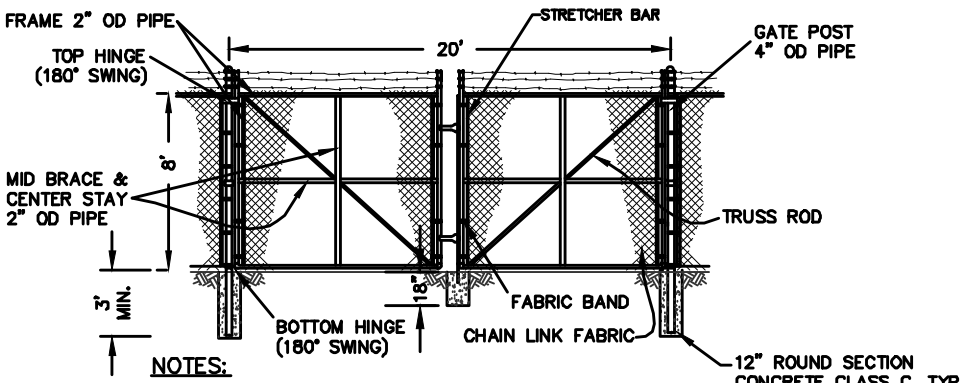
NOTES:

1. FOR ADDITIONAL DETAILS SEE WSDOT STANDARD PLAN L–3.
2. FENCE TO BE PER WSDOT STANDARD SPECIFICATONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, SECTION 8–12.
3. GATE KEEPERS WITH AUTOMATIC LATCH TO BE PROVIDED TO HOLD GATES OPEN.



TYPE 1 FENCE

PER 9–16.1(7) W/9–GAUGE FABRIC, TYP.



NOTES:

1. MINIMUM GATE POST LENGTH SHALL BE 9'10".
2. CHAIN LINK FABRIC TO MATCH FABRIC ON CHAIN LINK FENCE.

DOUBLE SWING GATE

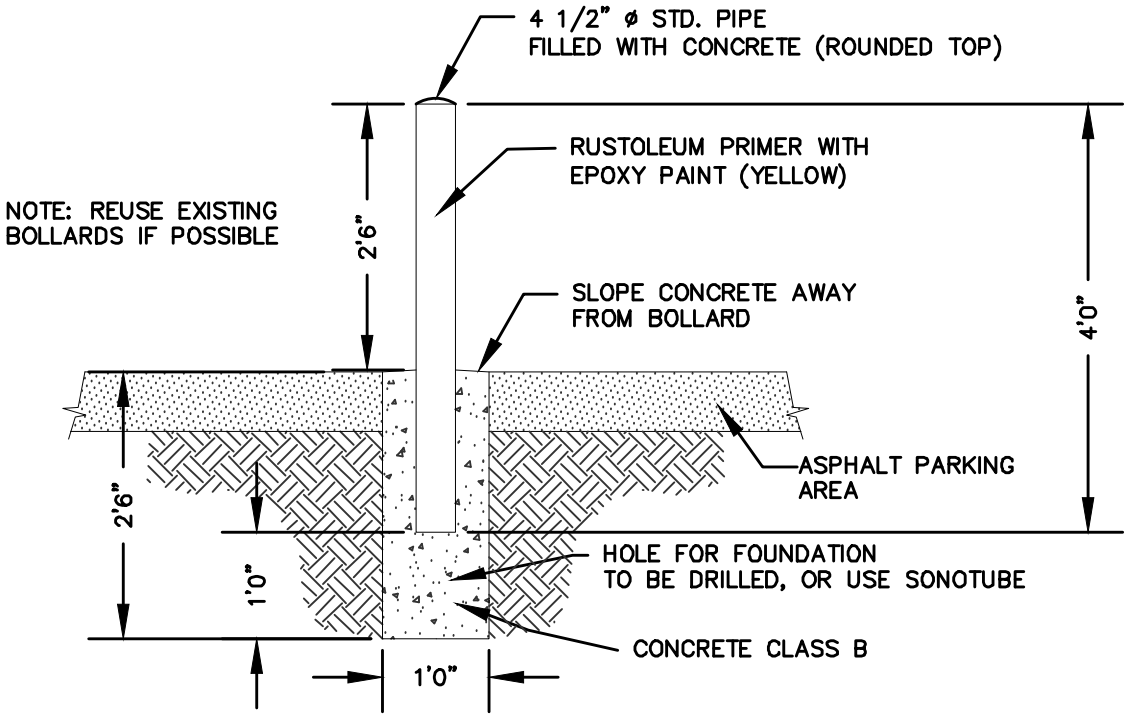
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY16, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

CHAIN LINK FENCE
(TYPE 1 FENCE)

SCALE: NTS	STANDARD
DATE: 3-25-05	
REVISED: 5/16/14	WF-1
DRAWN BY: CAS	
APPROVED BY: GJS	



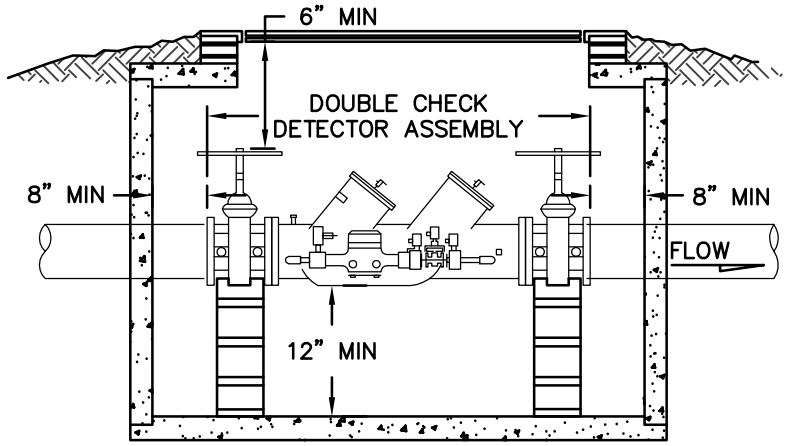
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

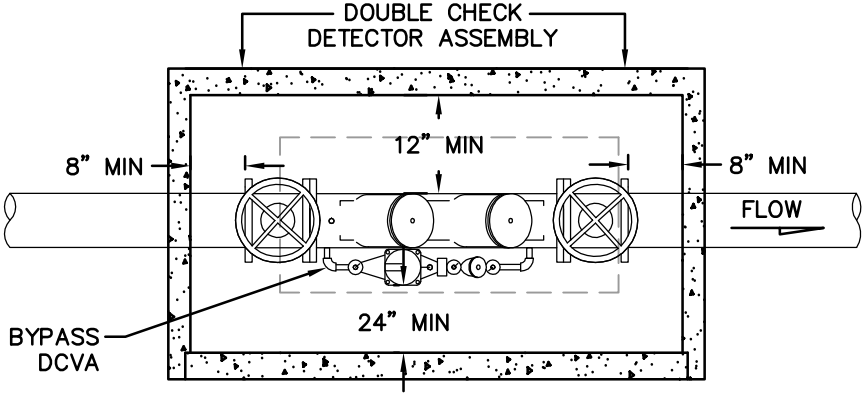
Skagit PUD
PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF CONCRETE BOLLARD

SCALE: NTS	**STANDARD**
DATE: 10/23/12	
REVISED: 5/16/14	**WCB-1**
DRAWN BY: KDM	
APPROVED BY: GJS	



ELEVATION
N.T.S.



PLAN VIEW
N.T.S.

NOTES:

1. REFER TO DRAWING FOR APPROPRIATE CLEARANCES.
2. ALL BACKFLOW PREVENTION ASSEMBLIES ARE TO BE ON THE WASHINGTON STATE APPROVED LIST OF ASSEMBLIES.
3. ALL BACKFLOW PREVENTION ASSEMBLIES ARE TO BE INSTALLED IN THE MANNER FOR WHICH THEY ARE APPROVED. ANY OTHER MANNER OF INSTALLATION MAY DETER THE ASSEMBLY FROM PREVENTING BACKFLOW.
4. THE DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) IS TO BE INSTALLED IMMEDIATELY AFTER THE METERED WATER SERVICE OR FIRE SERVICE CONNECTION, AT A LOCATION APPROVED BY SKAGIT PUD.
5. THE DCDA IS TO BE INSTALLED IN AN APPROPRIATE UNDERGROUND VAULT, AS CALLED OUT FOR IN THE DISTRICT CONSTRUCTION STANDARDS
6. SUFFICIENT DRAINAGE MUST BE PROVIDED TO PREVENT ASSEMBLY FROM BEING SUBMERGED.
7. INSTALLATION OF THE ASSEMBLY IS TO BE INSPECTED BY A SKAGIT PUD CROSS CONNECTION SPECIALIST.
8. IF ASSEMBLY INSTALLATION DOES NOT MEET SKAGIT PUD'S MINIMUM REQUIREMENTS CORRECTIONS MUST BE COMPLETED BEFORE CUSTOMER MAY BEGIN AND OR CONTINUE WATER USAGE.
9. THE OWNER WILL BE RESPONSIBLE FOR THE INITIAL (UPON INSTALLATION) AND SUBSEQUENT ANNUAL TESTING.
10. INITIAL AND SUBSEQUENT ANNUAL TESTING IS TO BE PERFORMED BY A CERTIFIED BACKFLOW ASSEMBLY TESTER (BAT). (LIST OF APPROVED CERTIFIED BATS AVAILABLE UPON REQUEST)
11. SKAGIT PUD WILL REQUIRE COPIES OF ALL TEST(S) OF THE REQUIRED BACKFLOW PREVENTION ASSEMBLIES BEFORE WATER USAGE MAY BEGIN AND/OR CONTINUE.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: JUNE 27, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

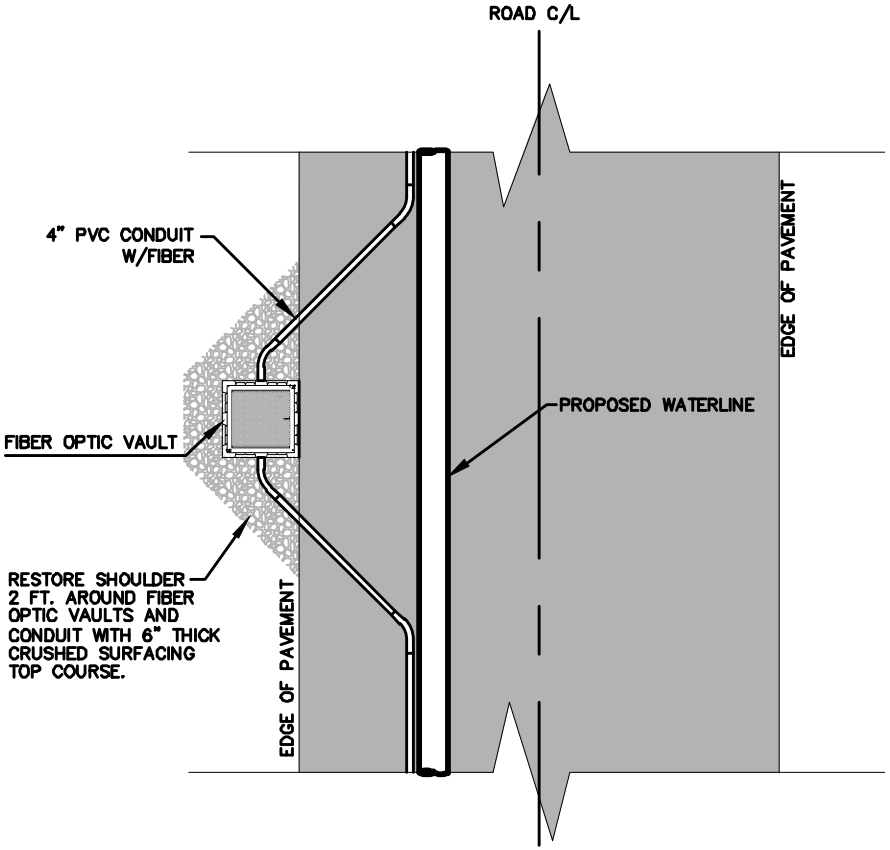
STANDARD DETAIL
BACKFLOW PREVENTION
DOUBLE CHECK DETECTOR ASSEMBLY

SHEET 1/1

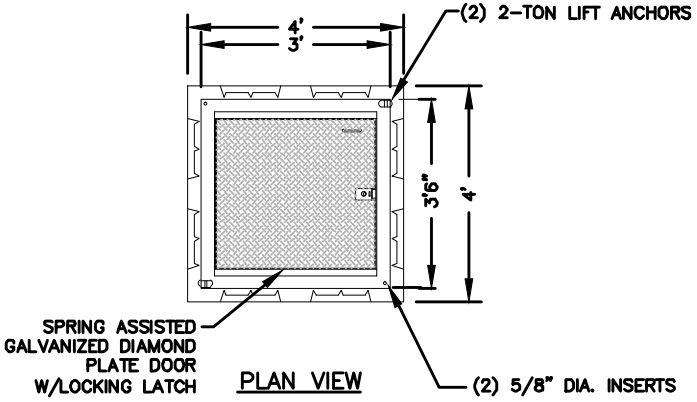
SCALE: N.T.S.	STANDARD
DATE: 11/25/13	
REVISED: 6/27/14	WDCDA-1
DRAWN BY: KDM	
APPROVED BY: GJS	

NOTES

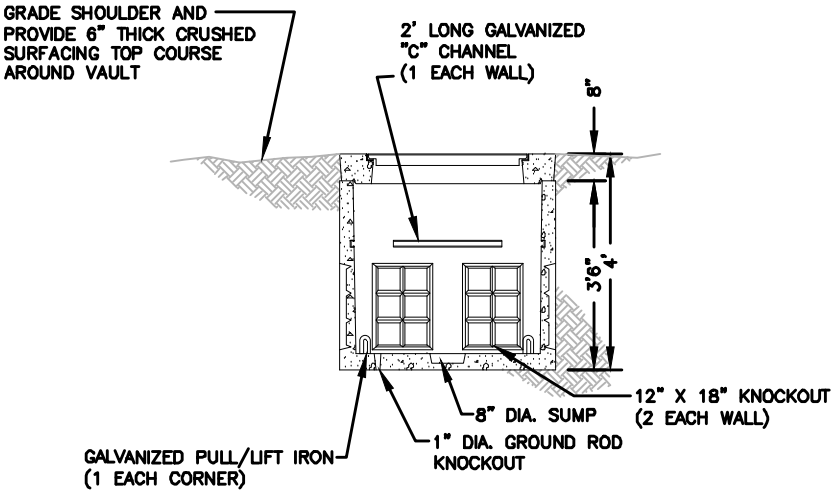
1. VAULTS SHALL BE PRE-CAST CONCRETE MEETING ASTM C478. TOP SLAB SHALL BE DESIGNED TO CARRY HS-20 LOADING.
2. RIGID NON-METALLIC CONDUIT (PVC) FOR FIBER SHALL BE U.L. 651 LISTED, NEMA TC-2, SCHEDULE 40 APPROVED FOR CONCRETE ENCASEMENT. PVC CONDUIT SWEEPS SHALL NOT BE USED.
3. FIBERGLASS CONDUIT FOR FIBER SHALL BE U.L. 1684 LISTED, NEMA TC-14, APPROVED FOR CONCRETE ENCASEMENT. FIBERGLASS CONDUIT SWEEPS SHALL BE A MINIMUM RADIUS OF 36 INCHES.
4. CONDUITS SHALL CONTAIN NO MORE THAN THREE-QUARTER BENDS (270 CUMULATIVE DEGREES) BETWEEN FIBER OPTIC VAULTS.
5. DURING FIBER OPTIC CABLE INSTALLATION, A MINIMUM OF 150 FEET OF SLACK CABLE SHALL BE INSTALLED ON MOUNTING HARDWARE WITHIN EACH FIBER OPTIC VAULT.
6. FIBER OPTIC VAULTS SHALL BE A MAXIMUM OF 2,500 FEET APART.



TYPICAL FIBER OPTIC VAULT LAYOUT



PLAN VIEW



ELEVATION

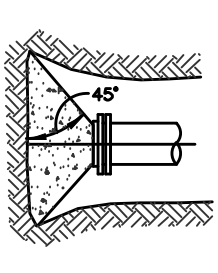
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 16, 2014

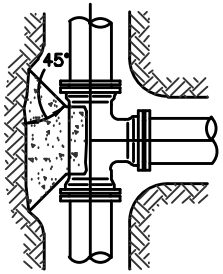
Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD FIBER OPTIC VAULT AND STANDARD FIBER OPTIC VAULT LAYOUT

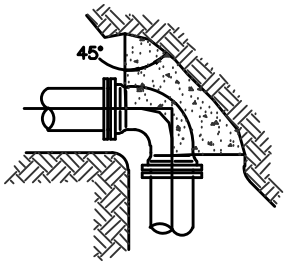
SCALE: NO SCALE	STANDARD
DATE: 10/22/12	
REVISED: 5/16/14	WFO-1
DRAWN BY: KDM	
APPROVED BY: GJS	



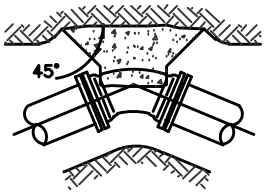
CAP OR PLUG



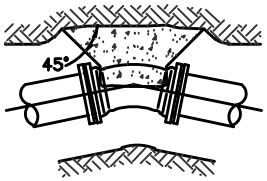
TEE



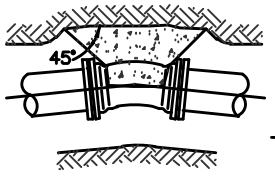
90° BEND



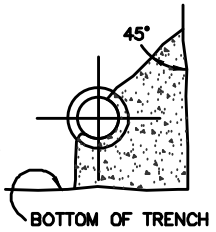
45° BEND



22-1/2° BEND



11-1/4° BEND

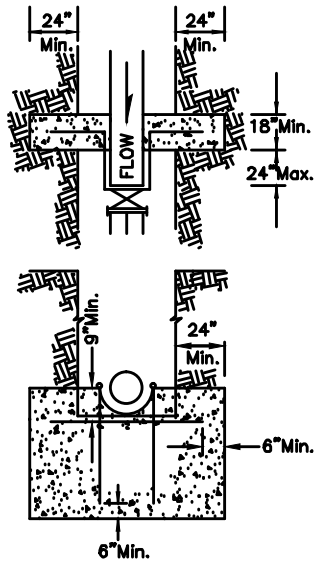


SECTION AT ALL FITTINGS

THRUST BLOCK REQUIREMENTS																	
		BEARING AREA REQUIRED IN SQUARE FEET															
		KEY BLOCK** & TEE/CAP OR PLUG test pressures			90 Degree BEND test pressures			45 Degree BEND test pressures			22.5 Degree BEND test pressures			11.25 Degree BEND test pressures		
PIPE SIZE nominal	PIPE SIZE outside dia.	200 psi	225 psi	250 psi	200 psi	225 psi	250 psi	200 psi	225 psi	250 psi	200 psi	225 psi	250 psi	200 psi	225 psi	250 psi
4	4.80	1.8	2.0	2.3	2.6	2.9	3.2	1.4	1.6	1.7	0.7	0.8	0.9	0.4	0.4	0.4
6	6.90	3.7	4.2	4.7	5.3	5.9	6.6	2.9	3.2	3.6	1.5	1.6	1.8	0.7	0.8	0.9
8	9.05	6.4	7.2	8.0	9.1	10.2	11.4	4.9	5.5	6.2	2.5	2.8	3.1	1.3	1.4	1.6
12	13.20	13.7	15.4	17.1	19.4	21.8	24.2	10.5	11.8	13.1	5.3	6.0	6.7	2.7	3.0	3.4
16	17.40	23.8	26.8	29.7	33.6	37.8	42.0	18.2	20.5	22.7	9.3	10.4	11.6	4.7	5.2	5.8
18	19.50	29.9	33.6	37.3	42.2	47.5	52.8	22.9	25.7	28.6	11.7	13.1	14.6	5.9	6.6	7.3
24	25.80	52.3	58.8	65.3	73.9	83.2	92.4	40.0	45.0	50.0	20.4	22.9	25.5	10.2	11.5	12.8

KEY BLOCKING SPECIFICATION:

MATERIALS SHALL INCLUDE 3/4-INCH RESTRAINING RODS, HEX NUTS AND WASHERS OF HIGH STRENGTH LOW ALLOY STEEL MEETING AWWA C-111-90 COMPOSITION SPECIFICATIONS, ROMAC "DUCTILE LUG" OR 90° EYE BOLTS AND "600" SERIES PIPE RESTRAINING SYSTEM. THRUST RESTRAINT TO BE CALCULATED AT 7500 POUNDS PER BOLT OR AS RECOMMENDED BY ENGINEER. ALL RODS, EYE BOLTS AND PIPE RESTRAINTS ARE TO BE CLEAN. TWO SEPARATE BRUSH COATS OF ASPHALT COATING AS APPROVED BY THE ENGINEER TO BE APPLIED. A 3-INCH MINIMUM CLEARANCE IS REQUIRED BETWEEN WATER PIPE AND CONCRETE. SOIL IS TO BE COMPACTED TO 95%. REBAR TO BE MINIMUM #6 (3/4") SIZE AND HAVE A MINIMUM 9-INCH CLEARANCE FROM ANY CONCRETE SURFACE.



KEY BLOCK

NOTES:

1. ALL CONCRETE BLOCKING SHALL BE POURED AGAINST DRY, UNDISTURBED SUBGRADE. TABLE IS BASED ON 2000 POUNDS PER SQUARE FOOT ALLOWABLE SOIL BEARING. WEAKER SOIL WILL REQUIRE INCREASED BEARING AREA. SEE SOIL BEARING LOAD CHART.
2. KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES. USE FORMING AS NECESSARY.
3. HORIZONTAL ANCHOR BLOCKING CONFIGURATIONS FOR FITTINGS NOT SHOWN SHALL HAVE APPROVAL OF THE P.U.D.
4. THE SQUARE FOOT AREAS REQUIRED FOR BEARING ARE CALCULATED BY THE FOLLOWING FORMULAS:
   FORMULA AT TEE & CAP OR PLUG:
   T = PA
   T ÷ K = BEARING AREA REQUIRED IN SQUARE FEET
   FORMULA AT ALL PIPE BENDS:
   T = 2PA (SIN 1/2 ANGLE) WHERE ANGLE = THE DEGREE BEND OF THE FITTING
   T ÷ K = BEARING AREA REQUIRED IN SQ. FEET
   WHEN:
   T = THRUST IN POUNDS
   P= TEST PRESSURE IN PSI
   A= CROSS-SECTIONAL AREA OF PIPE IN SQ. INCHES
   K= ASSUMED 2000 PSF SOIL BEARING PRESSURE
5. FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT WITH A MIN. OF 8-MIL THICKNESS. IT MUST BE INSTALLED AS PER W.S.D.O.T. STANDARDS AND IN ACCORDANCE WITH A.W.W.A. C105.

BEARING AREA REQUIRED IN SQUARE FEET

THE SAFE SOIL BEARING LOADS SHOWN BELOW ARE FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET.

SOIL	SAFE BEARING LOAD LBS/SQ. FT.
*MUCK, PEAT, ETC.	0
SOFT CLAY, SILT	1,000
SAND, SANDY SILT	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED W/ CLAY	4,000
HARD SHALE	10,000

*IN MUCK OR PEAT, ALL THRUSTS SHALL BE RESTRAINED BY PILES OR TIE RODS TO SOLID FOUNDATIONS OR BY REMOVAL OF MUCK OR PEAT AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THRUSTS.

KEY BLOCK USE

THE INSTALLATION OF A KEY BLOCK IS TO BE CONSIDERED ONLY FOR TEMPORARY BLOCKING FOR 5-10 YEARS. IF THE PIPELINE IS TO REMAIN A DEADEND OR AN EXTENSION IS LIKELY TO BE MORE THAN 10 YEARS AWAY, THEN A STANDARD BLOCK FOR CAP OR PLUG WILL BE INSTALLED. USE OF KEY BLOCK IS TO BE APPROVED BY THE DISTRICT.

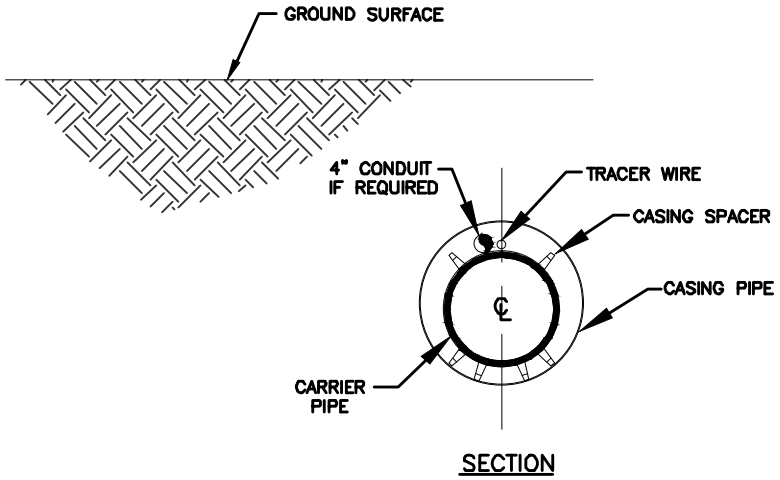
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

HORIZONTAL THRUST BLOCKING DETAILS

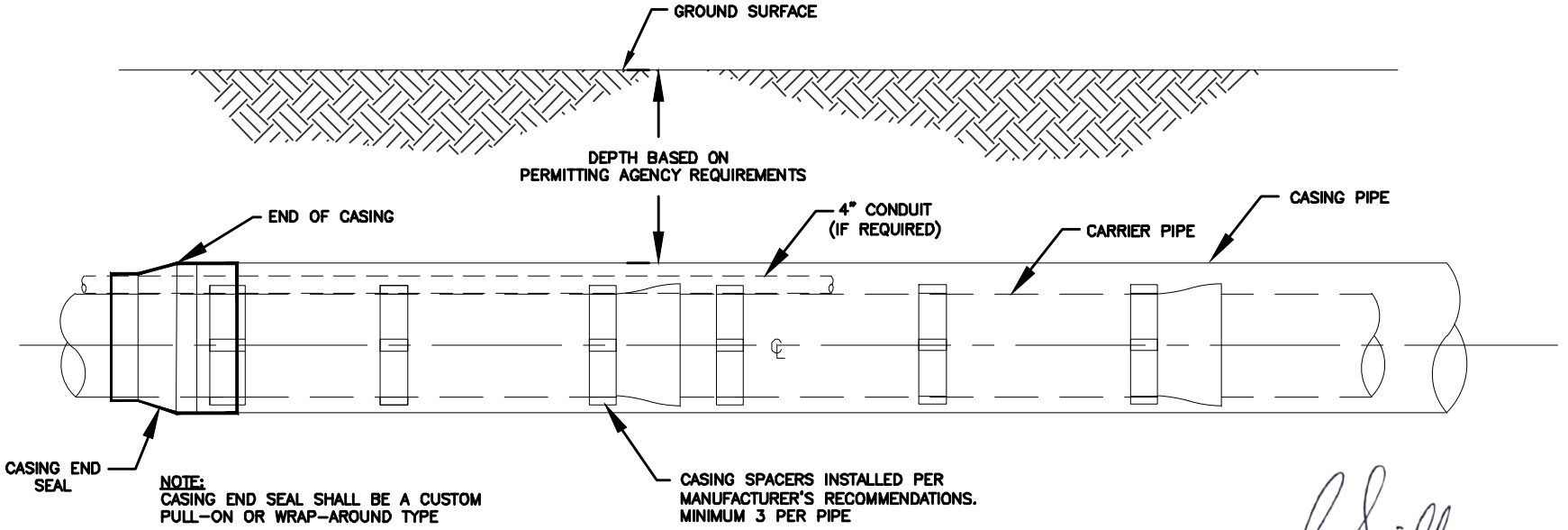
SCALE: NTS	STANDARD
DATE: 3-05-05	
REVISED: 5/6/14	WT-1
DRAWN BY: CAS	
APPROVED BY: GJS	



SECTION

NOTES

1. CASING PIPE DIAMETER AND THICKNESS DEPENDS ON SPECIFIC APPLICATION AND DESIGN LOAD. SUBMIT CASING PIPE DIAMETER AND THICKNESS TO DISTRICT ENGINEERING DEPARTMENT FOR APPROVAL.
2. CASING PIPE SHALL MEET ASTM A36, WITH MINIMUM 35,000 PSI YIELD STRENGTH.
3. SOILS INVESTIGATION REPORT SHALL BE CONDUCTED PRIOR TO CONSTRUCTION AND REPORT SUBMITTED TO DISTRICT FOR REVIEW.
4. CONTRACTOR IS RESPONSIBLE FOR DESIGN JACKING/RECEIVING PITS, INCLUDING DEWATERING.
5. CASING INSTALLATION SHALL BE PERFORMED IN A MANNER THAT WILL NOT INTERFERE WITH, INTERRUPT OR ENDANGER GROUND SURFACE AND OTHER ADJACENT UTILITIES. CONTRACTOR IS RESPONSIBLE FOR ALL SETTLEMENT FROM CASING PIPE INSTALLATION AND SHALL MAKE RESTORATION TO ALL DAMAGED PROPERTY.
6. CASING SPACER SHALL BE CONSTRUCTED OF TYPE 304 STAINLESS STEEL WITH MINIMUM THICKNESS OF 12 GAUGE. RUNNERS SHALL BE MADE OF REINFORCED POLYMER.
7. CASING END SEAL SHALL BE A SYNTHETIC RUBBER SLEEVE ATTACHED WITH STAINLESS STEEL BAND CLAMPS. GROUT MAY BE USED IF APPROVED BY DISTRICT.
8. A CONDUIT FOR FIBER OPTIC CABLE MAY BE REQUIRED TO BE INSTALLED. IN THAT CASE, THE CASING PIPE WILL NEED TO BE LARGER AND THE CASING SPACERS AND END SEALS MAY NEED TO BE MODIFIED.
9. ALL PERMITTING FOR CASING PIPE INSTALLATION TO BE COMPLETED BY CONTRACTOR AND APPROVED PERMITS SHALL BE SUBMITTED TO DISTRICT.
10. ALL CARRIER PIPE WITHIN CASING TO BE POLY ENCASED PER DISTRICT STANDARDS, WITH TRACER WIRE ATTACHED.
11. CARRIER PIPE WITHIN CASING TO BE PRESSURE TESTED SEPARATELY AND PRIOR TO CONNECTING TO PIPE AT EITHER END.
12. ALL CARRIER PIPE WITHIN THE CASING, AND FOR THE APPROPRIATE DISTANCE ON EITHER SIDE, SHALL HAVE RESTRAINED JOINTS.



PROFILE

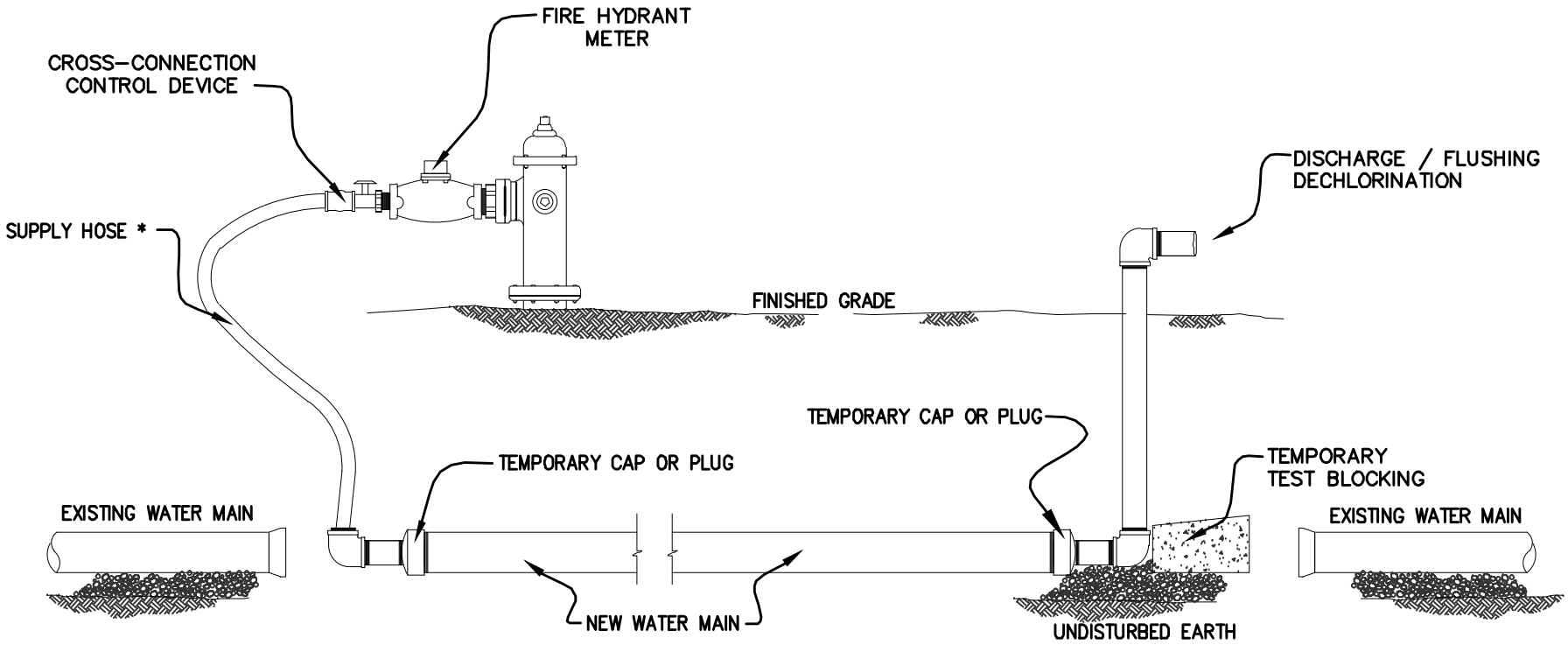
PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 22, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD PIPE CASING INSTALLATION

SCALE: NO SCALE	STANDARD
DATE: 10/22/12	
REVISED: 5/22/14	WC-1
DRAWN BY: KDM	
APPROVED BY: GJS	



* CLEAN POTABLE–WATER HOSE ONLY. THIS HOSE MUST BE REMOVED DURING HYDRSTATIC PRESSURE TEST.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

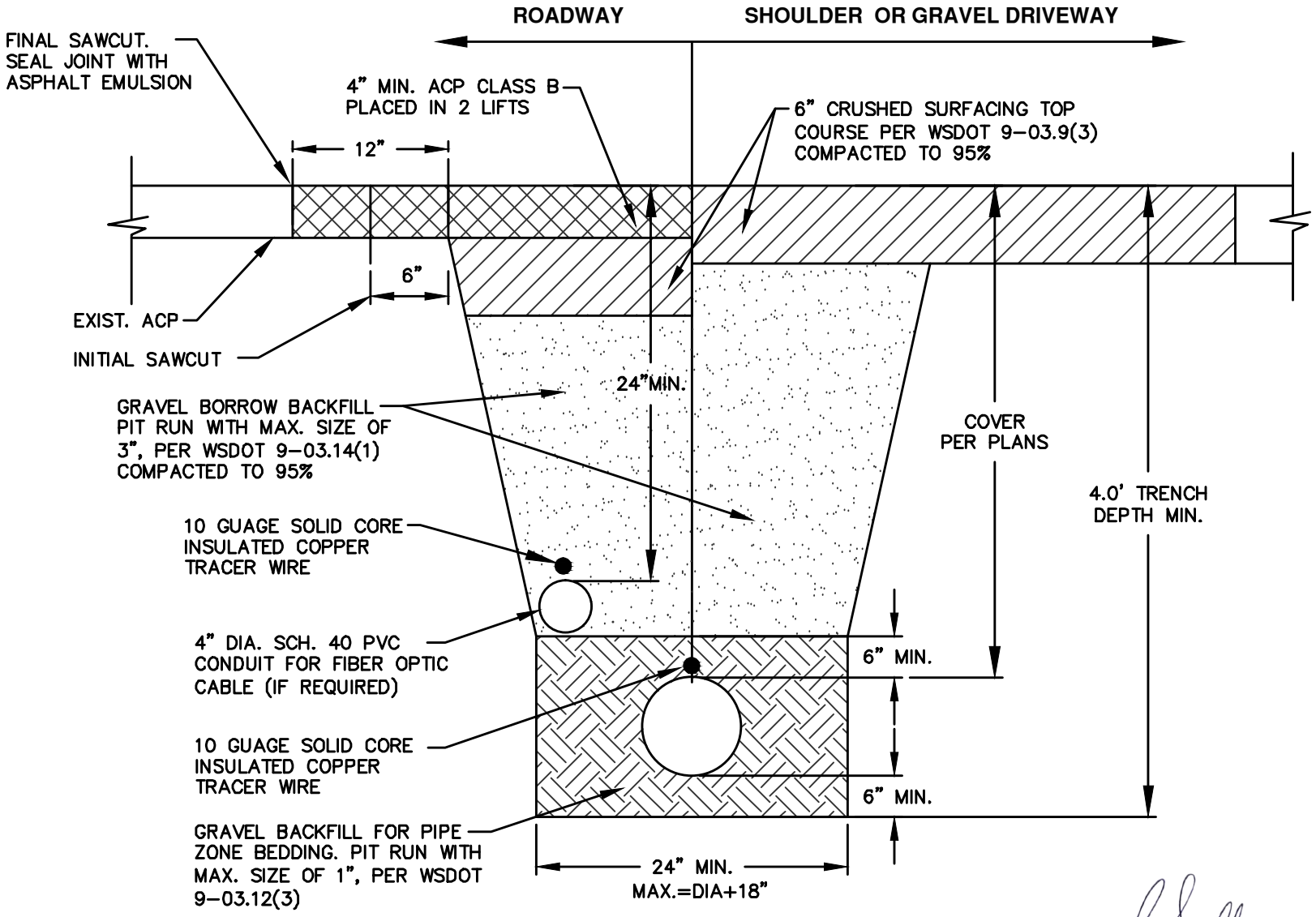
APPROVED ON: MAY 16, 2014

Skagit PUD PUBLIC UTILITY DISTRICT

STANDARD INSTALLATION OF TEMPORARY FLUSHING / TESTING CONNECTION

SHEET 1/1

SCALE: NTS	**STANDARD**
DATE: 3-25-14	
REVISED: 5/16/14	**WBT-1**
DRAWN BY: KDM	
APPROVED BY: GJS	



NOTES:

1. DEPTH OF BEDDING BELOW PIPE DEPENDANT ON SOIL CONDITIONS. CONSULT WITH ENGINEER.
2. ALTERNATE TRENCH BACKFILL MATERIAL TO BE USED ONLY WITH ENGINEER'S APPROVAL.
3. SURFACE RESTORATION TO MATCH EXISTING PAVEMENT / SHOULDER SECTION.

PUD NO. 1 OF SKAGIT COUNTY ENGINEERING MANAGER

APPROVED ON: MAY 6, 2014

Skagit PUD
PUBLIC UTILITY DISTRICT

TYPICAL TRENCH RESTORATION SECTION

SCALE: 1" = 1'	STANDARD
DATE: 11-15-11	
REVISED: 4/18/14	WT1-1
DRAWN BY: KDM	
APPROVED BY: GJS	

APPENDIX R

FINANCIAL SUMMARY

Skagit PUD No. 1
WSP Financial Chapter
Summary

Revenue Requirements	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenues																					
Rate Revenues Under Existing Rates	$ 14,771,377	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573	$ 16,836,181	$ 16,996,088	$ 17,157,945	$ 17,321,102	$ 17,486,209	$ 17,652,617	$ 17,820,974	$ 17,990,632	$ 18,162,239	$ 18,335,797	$ 18,510,655	$ 18,688,113	$ 18,866,871	$ 19,046,929
SDF Revenue Towards Debt	892,023	770,928	801,320	835,819	863,730	900,060	937,450	1,212,208	1,261,651	1,316,207	1,207,871	1,203,529	1,199,012	1,194,320	1,189,453	1,185,912	1,180,609	1,068,630	1,066,180	1,007,715	1,005,571
Rate Stabilization Revenue	500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Rate Revenues	858,087	852,267	871,196	876,605	903,712	909,975	926,039	933,303	943,791	950,978	958,287	965,582	973,014	980,673	988,533	996,216	1,004,199	1,012,042	1,020,221	1,028,218	1,036,292
Total Revenues	**$ 17,021,487**	**$ 17,678,041**	**$ 17,849,567**	**$ 18,013,631**	**$ 18,192,804**	**$ 18,360,853**	**$ 18,541,063**	**$ 18,981,691**	**$ 19,201,530**	**$ 19,425,129**	**$ 19,487,260**	**$ 19,655,321**	**$ 19,824,643**	**$ 19,995,967**	**$ 20,168,618**	**$ 20,344,367**	**$ 20,520,605**	**$ 20,591,327**	**$ 20,774,514**	**$ 20,902,804**	**$ 21,088,791**
Expenses																					
Cash Operating Expenses	$ 11,079,208	$ 11,868,263	$ 12,113,061	$ 12,363,403	$ 12,709,335	$ 12,928,610	$ 13,197,268	$ 13,473,550	$ 13,756,110	$ 14,045,143	$ 14,340,785	$ 14,643,243	$ 14,952,664	$ 15,269,268	$ 15,593,212	$ 15,924,728	$ 16,264,021	$ 16,611,271	$ 16,966,760	$ 17,330,651	$ 17,703,179
Existing Debt Service	2,973,409	2,965,108	2,980,095	2,971,158	2,962,609	2,751,807	2,027,030	2,015,597	2,000,500	1,287,081	602,877	595,548	587,637	579,143	570,067	565,408	554,876	188,761	187,739	-	-
New Debt Service	-	-	150,061	2,125,299	2,118,153	3,130,938	3,123,792	3,444,798	3,437,652	3,430,506	3,423,360	3,416,215	3,409,069	3,401,923	3,394,777	3,387,632	3,380,486	3,373,340	3,366,194	3,359,049	3,351,903
Routine Capital	3,259,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000	5,000,000	5,500,000	6,201,713	6,304,117	6,440,751	6,642,738	6,909,582	7,047,224	7,284,949	7,423,208	7,666,023	7,788,643	7,915,143	8,045,645
Total Expenses	**$ 17,311,618**	**$ 18,133,371**	**$ 18,543,216**	**$ 20,759,860**	**$ 21,090,096**	**$ 22,111,355**	**$ 22,848,090**	**$ 23,933,945**	**$ 24,694,262**	**$ 24,964,443**	**$ 24,671,140**	**$ 25,095,756**	**$ 25,592,109**	**$ 26,159,915**	**$ 26,605,280**	**$ 27,162,717**	**$ 27,622,591**	**$ 27,839,395**	**$ 28,309,337**	**$ 28,604,843**	**$ 29,100,727**
Net Surplus (Deficiency)	**$ (290,130)**	**$ (455,330)**	**$ (693,649)**	**$ (2,746,229)**	**$ (2,897,293)**	**$ (3,750,502)**	**$ (4,307,027)**	**$ (4,952,254)**	**$ (5,492,733)**	**$ (5,539,314)**	**$ (5,183,880)**	**$ (5,440,436)**	**$ (5,767,466)**	**$ (6,163,948)**	**$ (6,436,662)**	**$ (6,818,350)**	**$ (7,101,986)**	**$ (7,248,068)**	**$ (7,534,823)**	**$ (7,702,040)**	**$ (8,011,935)**
% of Rate Revenue	1.96%	2.84%	4.29%	16.85%	17.64%	22.66%	25.83%	29.41%	32.32%	32.28%	29.93%	31.11%	32.67%	34.59%	35.78%	37.54%	38.73%	39.16%	40.32%	40.82%	42.06%
Annual Rate Adjustment	**0.00%**	**0.00%**	**8.00%**	**8.00%**	**8.00%**	**4.00%**	**4.00%**	**4.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**
Cumulative Rate Adjustment	**0.00%**	**0.00%**	**8.00%**	**16.64%**	**25.97%**	**31.01%**	**36.25%**	**41.70%**	**44.53%**	**47.43%**	**50.37%**	**53.38%**	**56.45%**	**59.58%**	**62.77%**	**66.02%**	**69.35%**	**72.73%**	**76.19%**	**79.71%**	**83.30%**
Rate Revenues After Rate Increase	$ 14,771,377	$ 16,054,846	$ 17,471,215	$ 19,013,728	$ 20,691,226	$ 21,683,234	$ 22,723,269	$ 23,856,947	$ 24,565,206	$ 25,295,129	$ 26,046,377	$ 26,820,548	$ 27,617,301	$ 28,438,308	$ 29,283,225	$ 30,153,800	$ 31,050,788	$ 31,973,839	$ 32,925,973	$ 33,905,739	$ 34,229,322
Additional Taxes from Rate Increase	$ -	$ -	$ 65,084	$ 136,413	$ 214,530	$ 258,109	$ 304,038	$ 353,074	$ 380,651	$ 409,219	$ 438,794	$ 469,424	$ 501,124	$ 533,946	$ 567,905	$ 603,056	$ 639,437	$ 677,064	$ 716,022	$ 756,305	$ 763,523
Net Cash Flow After Rate Increase	**(290,130)**	**(455,330)**	**535,431**	**(170,121)**	**1,154,041**	**1,123,805**	**1,434,630**	**1,715,438**	**1,695,735**	**2,188,651**	**3,102,601**	**3,424,479**	**3,696,095**	**3,919,440**	**4,288,027**	**4,570,156**	**4,973,568**	**5,538,053**	**5,987,015**	**6,580,524**	**6,406,936**
Coverage After Rate Increases	3.44	3.83	4.66	2.62	3.11	2.59	3.48	3.37	3.50	3.64	3.78	3.94	4.10	4.26	4.42	4.60	4.77	5.60	5.81	6.04	6.06
Sample Residential Monthly Bill (5/8" meter with 6ccf)	**$ 34.77**	**$ 37.45**	**$ 40.35**	**$ 43.47**	**$ 46.85**	**$ 48.68**	**$ 50.57**	**$ 52.55**	**$ 53.57**	**$ 54.62**	**$ 55.69**	**$ 56.77**	**$ 57.88**	**$ 59.02**	**$ 60.17**	**$ 61.35**	**$ 62.55**	**$ 63.78**	**$ 65.03**	**$ 66.31**	**$ 67.61**
Monthly Increase	$ -	$ 2.68	$ 2.90	$ 3.13	$ 3.38	$ 1.82	$ 1.90	$ 1.97	$ 1.03	$ 1.05	$ 1.07	$ 1.09	$ 1.11	$ 1.13	$ 1.16	$ 1.18	$ 1.20	$ 1.23	$ 1.25	$ 1.28	$ 1.30

Fund Balance	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
REVENUE FUND																					
Beginning Balance	**$ 10,388,210**	**$ 6,348,079**	**$ 5,892,750**	**$ 3,928,181**	**$ 3,616,770**	**$ 3,751,725**	**$ 3,841,835**	**$ 3,947,029**	**$ 4,041,378**	**$ 4,126,170**	**$ 4,218,095**	**$ 4,301,021**	**$ 4,392,499**	**$ 4,499,042**	**$ 4,620,594**	**$ 4,716,758**	**$ 4,835,349**	**$ 4,934,839**	**$ 5,057,770**	**$ 5,157,376**	**$ 5,259,541**
plus: Net Cash Flow after Rate Increase	(290,130)	(455,330)	535,431	(170,121)	1,154,041	1,123,805	1,434,630	1,715,438	1,695,735	2,188,651	3,102,601	3,424,479	3,696,095	3,919,440	4,288,027	4,570,156	4,973,568	5,538,053	5,987,015	6,580,524	6,406,936
less: Transfer of Surplus to Capital Fund	(3,750,000)	-	(2,500,000)	(141,290)	(1,019,085)	(1,033,695)	(1,329,437)	(1,621,089)	(1,610,942)	(2,096,727)	(3,019,675)	(3,333,002)	(3,589,551)	(3,797,889)	(4,191,863)	(4,451,564)	(4,874,078)	(5,415,123)	(5,887,409)	(6,478,359)	(6,302,138)
Ending Balance	**$ 6,348,079**	**$ 5,892,750**	**$ 3,928,181**	**$ 3,616,770**	**$ 3,751,725**	**$ 3,841,835**	**$ 3,947,029**	**$ 4,041,378**	**$ 4,126,170**	**$ 4,218,095**	**$ 4,301,021**	**$ 4,392,499**	**$ 4,499,042**	**$ 4,620,594**	**$ 4,716,758**	**$ 4,835,349**	**$ 4,934,839**	**$ 5,057,770**	**$ 5,157,376**	**$ 5,259,541**	**$ 5,364,338**
Minimum Target Balance	*$ 3,214,418*	*$ 3,397,546*	*$ 3,523,488*	*$ 3,616,770*	*$ 3,751,725*	*$ 3,841,835*	*$ 3,947,029*	*$ 4,041,378*	*$ 4,126,170*	*$ 4,218,095*	*$ 4,301,021*	*$ 4,392,499*	*$ 4,499,042*	*$ 4,620,594*	*$ 4,716,758*	*$ 4,835,349*	*$ 4,934,839*	*$ 5,057,770*	*$ 5,157,376*	*$ 5,259,541*	*$ 5,364,338*
Days	209	181	118	107	108	108	109	109	109	110	109	109	110	110	110	111	111	111	111	111	111
MAJOR CAPITAL FUND																					
Beginning Balance	**$ 2,121,760**	**$ 4,128,246**	**$ 2,942,339**	**$ 975,903**	**$ 11,458,109**	**$ 801,657**	**$ 5,983,942**	**$ 63,635**	**$ 1,558,858**	**$ 2,465,463**	**$ 3,181,951**	**$ 7,582,027**	**$ 10,829,327**	**$ 11,361,392**	**$ 9,201,023**	**$ 14,077,158**	**$ 14,569,216**	**$ 20,678,700**	**$ 22,586,586**	**$ 31,206,565**	**$ 40,569,771**
plus: Grants / Donations / CIAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Additional Proceeds (Costs)	-	-	200,950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Routine Capital	3,259,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000	5,000,000	5,500,000	6,201,713	6,304,117	6,440,751	6,642,738	6,909,582	7,047,224	7,284,949	7,423,208	7,666,023	7,788,643	7,915,143	8,045,645
plus: Revenue Bond Proceeds	-	-	-	16,900,000	-	11,500,000	-	3,700,000	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: PWTF/DWSRF Loan Proceeds	-	-	10,004,050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Other Loan Proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Interest Earnings	4,126	10,321	14,712	7,319	114,581	8,017	59,839	636	15,589	24,655	31,820	75,820	108,293	113,614	92,010	140,772	145,692	206,787	225,866	312,066	405,698
plus: Transfer of Surplus from Rate Stabilization Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer of Surplus from Debt Service Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer of Surplus from System Development Fund	529,859	1,699	11	4,054	2,712	3,151	3,990	3,064	2,341	3,674	164,700	229,387	290,874	360,709	427,156	501,008	579,452	760,710	849,093	982,623	1,062,663
plus: Transfer of Surplus from Revenue Fund	3,750,000	-	2,500,000	141,290	1,019,085	1,033,695	1,329,437	1,621,089	1,610,942	2,096,727	3,019,675	3,333,002	3,589,551	3,797,889	4,191,863	4,451,564	4,874,078	5,415,123	5,887,409	6,478,359	6,302,138
Total Capital Funding Sources	9,664,746	7,440,265	18,962,062	21,328,566	15,894,487	16,646,520	11,877,208	10,388,425	8,687,730	10,792,231	12,702,262	17,660,987	21,460,783	22,543,186	20,959,276	26,455,450	27,591,646	34,727,343	37,337,598	46,894,756	56,385,914
less: Capital Expenditures	(5,536,500)	(4,497,927)	(17,986,159)	(9,870,458)	(15,092,830)	(10,662,577)	(11,813,573)	(8,829,567)	(6,222,267)	(7,610,280)	(5,120,235)	(6,831,660)	(10,099,391)	(13,342,163)	(6,882,118)	(11,886,233)	(6,912,946)	(12,140,757)	(6,131,033)	(6,324,985)	(6,525,073)
Ending Balance	**4,128,246**	**2,942,339**	**975,903**	**11,458,109**	**801,657**	**5,983,942**	**63,635**	**1,558,858**	**2,465,463**	**3,181,951**	**7,582,027**	**10,829,327**	**11,361,392**	**9,201,023**	**14,077,158**	**14,569,216**	**20,678,700**	**22,586,586**	**31,206,565**	**40,569,771**	**49,860,842**
Minimum Target Balance	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*

Notes:

Additional Proceeds (Costs) Consist of the following:	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
PWTF Loan	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF Loan Issuance Cost	-	-	(99,050)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Skagit PUD No. 1
WSP Financial Chapter
Assumptions

Economic & Financial Factors	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
General Cost Inflation	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%
Construction Cost Inflation	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%
Labor Cost Inflation	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%
Benefit Cost Inflation	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Customer Growth	0.80%	0.81%	0.80%	0.81%	0.80%	0.81%	0.81%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.01%	1.00%	1.00%
Anacortes Rate Inflation	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%	5.32%
General Inflation plus Growth	2.89%	2.89%	2.89%	2.90%	2.89%	2.89%	2.89%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.09%	3.10%	3.09%	3.09%
No Escalation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fund Earnings (3-year average of the LGIP)	0.19%	0.25%	0.50%	0.75%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Local / State Excise Tax	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%	5.029%
State B&O Tax	1.65%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%

Accounting Assumptions	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
FISCAL POLICY RESTRICTIONS																					
Min. Rev. Fund Balance Target (months of O&M + Cap. expense)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Minimum Capital Fund Balance Target																					
Select Minimum Capital Fund Balance Target: **2**	**User Input**																				
1 - Defined as % of Plant																					
Plant-in-Service in 2012: $ 193,028,039																					
Minimum Capital Fund Balance - % of plant assets	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
2 - Amount at Right ==>	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ROUTINE CAPITAL																					
Select Routine Capital Funding Strategy: **3**	**User Input**																				
Amount of Annual Cash Funding from Rates																					
1 - Equal to Annual Depreciation Expense	$ 4,350,000	$ 4,439,959	$ 4,799,682	$ 4,997,091	$ 5,298,947	$ 5,512,199	$ 5,748,470	$ 5,925,062	$ 6,049,507	$ 6,201,713	$ 6,304,117	$ 6,440,751	$ 6,642,738	$ 6,909,582	$ 7,047,224	$ 7,284,949	$ 7,423,208	$ 7,666,023	$ 7,788,643	$ 7,915,143	$ 8,045,645
2 - Equal to Depreciation less Annual Debt Principal Payments	$ 1,894,989	$ 1,954,947	$ 2,257,024	$ 1,373,147	$ 1,601,758	$ 1,555,951	$ 2,416,863	$ 2,406,899	$ 2,459,638	$ 3,234,792	$ 3,932,367	$ 3,987,567	$ 4,104,551	$ 4,282,640	$ 4,327,590	$ 4,463,488	$ 4,500,579	$ 4,992,668	$ 5,014,776	$ 5,222,455	$ 5,242,141
3 - Equal to Amount at Right ==>	$ 3,259,000	$ 3,300,000	$ 3,300,000	$ 3,300,000	$ 3,300,000	$ 3,300,000	$ 4,500,000	$ 5,000,000	$ 5,500,000	$ 6,201,713	$ 6,304,117	$ 6,440,751	$ 6,642,738	$ 6,909,582	$ 7,047,224	$ 7,284,949	$ 7,423,208	$ 7,666,023	$ 7,788,643	$ 7,915,143	$ 8,045,645

Capital Financing Assumptions	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
System Development Fee (SDF)																					
System Development Fee	$ 4,005	$ 4,132	$ 4,262	$ 4,397	$ 4,536	$ 4,680	$ 4,828	$ 4,981	$ 5,138	$ 5,301	$ 5,468	$ 5,641	$ 5,820	$ 6,004	$ 6,194	$ 6,390	$ 6,592	$ 6,801	$ 7,016	$ 7,238	$ 7,467
Total Meter Quantity (Estimate Based on WSP)	23,179	23,366	23,554	23,745	23,936	24,129	24,324	24,568	24,814	25,063	25,314	25,568	25,824	26,083	26,344	26,608	26,875	27,144	27,417	27,692	27,969
New Meters Per Year	175	187	188	191	191	193	195	244	246	249	251	254	256	259	261	264	267	269	273	275	277
SDF Revenue	**$ 700,700**	**$ 772,627**	**$ 801,331**	**$ 839,873**	**$ 866,442**	**$ 903,211**	**$ 941,439**	**$ 1,215,272**	**$ 1,263,993**	**$ 1,319,881**	**$ 1,372,571**	**$ 1,432,916**	**$ 1,489,885**	**$ 1,555,029**	**$ 1,616,610**	**$ 1,686,920**	**$ 1,760,061**	**$ 1,829,340**	**$ 1,915,273**	**$ 1,990,337**	**$ 2,068,234**
FUNDING SOURCES																					
Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Additional Proceeds (Costs)																					
PWTF Loan	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF Loan Issuance Cost	-	-	(99,050)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Additional Proceeds	**$ -**	**$ -**	**$ 200,950**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
REVENUE BONDS																					
Term (years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Interest Cost	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Issuance Cost	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Revenue Bond Coverage Requirement: **2.00**																					
PWTF/DWSRF LOANS																					
Term (years)	20	20	22	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Interest Cost	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
OTHER LOANS																					
Term (years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Interest Cost	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Issuance Cost	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Skagit PUD No. 1
WSP Financial Chapter
Operating Revenue and Expenditure Forecast

Revenues	FORECAST BASIS	Budget 2013	Projection 2014	Projection 2015	Projection 2016	Projection 2017	Projection 2018	Projection 2019	Projection 2020	Projection 2021	Projection 2022	Projection 2023	Projection 2024	Projection 2025	Projection 2026	Projection 2027	Projection 2028	Projection 2029	Projection 2030	Projection 2031	Projection 2032	Projection 2033
Rate Revenues																						
Residential-Multiple	Customer Growth	$ 10,390,249	$ 11,312,000	$ 11,403,015	$ 11,495,482	$ 11,587,949	$ 11,681,385	$ 11,775,789	$ 11,893,915	$ 12,013,009	$ 12,133,555	$ 12,255,070	$ 12,378,037	$ 12,501,972	$ 12,627,360	$ 12,753,716	$ 12,881,524	$ 13,010,785	$ 13,141,013	$ 13,273,179	$ 13,406,312	$ 13,540,414
Commercial	Customer Growth	2,720,744	2,962,110	2,985,943	3,010,156	3,034,369	3,058,835	3,083,556	3,114,487	3,145,673	3,177,239	3,209,058	3,241,258	3,273,711	3,306,544	3,339,631	3,373,098	3,406,946	3,441,047	3,475,655	3,510,517	3,545,632
Governmental	Customer Growth	405,913	441,922	445,478	449,090	452,703	456,353	460,041	464,656	469,308	474,018	478,765	483,569	488,411	493,309	498,245	503,238	508,288	513,376	518,539	523,740	528,979
Resale	No Escalation	75,183	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198	81,198
Irrigation	Customer Growth	306,488	333,678	336,363	339,090	341,818	344,574	347,359	350,843	354,356	357,912	361,496	365,124	368,779	372,478	376,205	379,975	383,788	387,630	391,528	395,455	399,411
Potlatch	Customer Growth	32,073	34,918	35,199	35,485	35,770	36,058	36,350	36,714	37,082	37,454	37,829	38,209	38,591	38,978	39,368	39,763	40,162	40,564	40,972	41,383	41,797
Industrial: Sierra Pacific Industries	No Escalation	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463	247,463
Industrial: Draper Valley Farms	No Escalation	297,841	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668	321,668
Industrial: Advanced Refreshment LLC	No Escalation	199,948	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944	215,944
Fire	Customer Growth	95,476	103,946	104,782	105,632	106,481	107,340	108,207	109,293	110,387	111,495	112,612	113,741	114,880	116,032	117,194	118,368	119,556	120,752	121,967	123,190	124,423
[Other]	No Escalation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Rate Revenue		**$ 14,771,377**	**$ 16,054,846**	**$ 16,177,051**	**$ 16,301,207**	**$ 16,425,362**	**$ 16,550,818**	**$ 16,677,573**	**$ 16,836,181**	**$ 16,996,088**	**$ 17,157,945**	**$ 17,321,102**	**$ 17,486,209**	**$ 17,652,617**	**$ 17,820,974**	**$ 17,990,632**	**$ 18,162,239**	**$ 18,335,797**	**$ 18,510,655**	**$ 18,688,113**	**$ 18,866,871**	**$ 19,046,929**
Non-Rate Revenue																						
Special Revenue - Pipe Replacement	Customer Growth	$ 300,000	$ 302,420	$ 304,854	$ 307,326	$ 309,798	$ 312,296	$ 314,819	$ 317,977	$ 321,161	$ 324,384	$ 327,633	$ 330,920	$ 334,234	$ 337,586	$ 340,964	$ 344,381	$ 347,836	$ 351,318	$ 354,851	$ 358,411	$ 361,996
Hydrants	Customer Growth	43,026	43,373	43,722	44,076	44,431	44,789	45,151	45,604	46,061	46,523	46,989	47,460	47,935	48,416	48,901	49,391	49,886	50,386	50,892	51,403	51,917
Misc. Revenues	Customer Growth	87,061	87,764	88,470	89,187	89,905	90,630	91,362	92,279	93,203	94,138	95,081	96,035	96,996	97,969	98,949	99,941	100,944	101,954	102,980	104,012	105,053
Merchandising and Jobbing	No Escalation	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Interest, Penalty Income on LUDs	No Escalation	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Misc. Non Operating Income	No Escalation	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Non Donated Plant	No Escalation	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Services	Customer Growth	160,000	161,291	162,589	163,907	165,225	166,558	167,904	169,588	171,286	173,005	174,737	176,491	178,258	180,046	181,847	183,670	185,513	187,370	189,254	191,152	193,064
[Other]	No Escalation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Non-Rate Revenue		**$ 831,087**	**$ 835,848**	**$ 840,634**	**$ 845,496**	**$ 850,359**	**$ 855,272**	**$ 860,236**	**$ 866,448**	**$ 872,711**	**$ 879,050**	**$ 885,440**	**$ 891,906**	**$ 898,423**	**$ 905,017**	**$ 911,661**	**$ 918,382**	**$ 925,179**	**$ 932,027**	**$ 938,977**	**$ 945,978**	**$ 953,030**
TOTAL REVENUES		**$ 15,602,464**	**$ 16,890,694**	**$ 17,017,685**	**$ 17,146,703**	**$ 17,275,721**	**$ 17,406,090**	**$ 17,537,810**	**$ 17,702,629**	**$ 17,868,798**	**$ 18,036,995**	**$ 18,206,542**	**$ 18,378,115**	**$ 18,551,040**	**$ 18,725,991**	**$ 18,902,293**	**$ 19,080,621**	**$ 19,260,976**	**$ 19,442,682**	**$ 19,627,090**	**$ 19,812,849**	**$ 19,999,959**

Expenditures	FORECAST BASIS	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Excise Taxes	*Calculated*	$ 760,000	$ 752,607	$ 758,633	$ 764,756	$ 770,878	$ 777,065	$ 783,315	$ 791,137	$ 799,022	$ 807,004	$ 815,050	$ 823,192	$ 831,398	$ 839,700	$ 848,066	$ 856,529	$ 865,087	$ 873,710	$ 882,461	$ 891,276	$ 900,155
Supply																						
Salaries General	General Cost Inflation	$ 31,041	$ 33,044	$ 33,728	$ 34,427	$ 35,139	$ 35,867	$ 36,609	$ 37,367	$ 38,140	$ 38,930	$ 39,736	$ 40,558	$ 41,398	$ 42,255	$ 43,129	$ 44,022	$ 44,933	$ 45,863	$ 46,813	$ 47,782	$ 48,771
Water Purchased from Others	Anacortes Rate Inflation	277,600	292,376	307,939	324,330	341,594	359,776	378,927	399,097	420,340	442,714	466,279	491,099	517,239	544,771	573,768	604,309	636,476	670,354	706,037	743,618	783,200
Water Purchased from Others	General Cost Inflation	100,000	102,070	104,183	106,339	108,540	110,787	113,080	115,421	117,810	120,249	122,738	125,279	127,872	130,519	133,220	135,978	138,793	141,666	144,598	147,591	150,646
Power Purchased for Pumping	General Cost Inflation	520,000	530,764	541,750	552,964	564,410	576,093	588,018	600,190	612,614	625,294	638,238	651,449	664,934	678,698	692,746	707,086	721,722	736,661	751,910	767,474	783,360
Power Purchased for Pumping	General Cost Inflation	15,000	15,310	15,627	15,951	16,281	16,618	16,962	17,313	17,672	18,037	18,411	18,792	19,181	19,578	19,983	20,397	20,819	21,250	21,690	22,139	22,597
Power Purchased for Pumping	General Cost Inflation	6,500	6,635	6,772	6,912	7,055	7,201	7,350	7,502	7,658	7,816	7,978	8,143	8,312	8,484	8,659	8,839	9,022	9,208	9,399	9,593	9,792
Power Purchased for Pumping	General Cost Inflation	7,500	7,655	7,814	7,975	8,141	8,309	8,481	8,657	8,836	9,019	9,205	9,396	9,590	9,789	9,992	10,198	10,409	10,625	10,845	11,069	11,298
Power Purchased for Pumping	General Cost Inflation	4,500	4,593	4,688	4,785	4,884	4,985	5,089	5,194	5,301	5,411	5,523	5,638	5,754	5,873	5,995	6,119	6,246	6,375	6,507	6,642	6,779
Power Purchased for Pumping	General Cost Inflation	8,000	8,166	8,335	8,507	8,683	8,863	9,046	9,234	9,425	9,620	9,819	10,022	10,230	10,442	10,658	10,878	11,103	11,333	11,568	11,807	12,052
Power Purchased for Pumping	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Power Purchased for Pumping	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Power Purchased for Pumping	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	70,000	71,449	72,928	74,438	75,978	77,551	79,156	80,795	82,467	84,174	85,917	87,695	89,510	91,363	93,254	95,185	97,155	99,166	101,219	103,314	105,452
Materials/Supplies/Srvcs Wells	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs Dam Operation & Maint	General Cost Inflation	40,000	40,828	41,673	42,536	43,416	44,315	45,232	46,168	47,124	48,100	49,095	50,111	51,149	52,208	53,288	54,391	55,517	56,666	57,839	59,036	60,258
Miscellaneous Expense	General Cost Inflation	20,000	20,414	20,837	21,268	21,708	22,157	22,616	23,084	23,562	24,050	24,548	25,056	25,574	26,104	26,644	27,196	27,759	28,333	28,920	29,518	30,129
Treatment																						
Salaries General	General Cost Inflation	830,154	881,183	899,423	918,040	937,043	956,440	976,237	996,445	1,017,071	1,038,124	1,059,613	1,081,546	1,103,934	1,126,784	1,150,108	1,173,915	1,198,215	1,223,017	1,248,333	1,274,173	1,300,548
Chemicals for Water Treatment	General Cost Inflation	455,000	464,418	474,032	483,844	493,859	504,082	514,516	525,166	536,037	547,133	558,458	570,018	581,817	593,860	606,153	618,700	631,507	644,579	657,921	671,540	685,440
Chemicals for Water Treatment	General Cost Inflation	3,200	3,266	3,334	3,403	3,473	3,545	3,619	3,693	3,770	3,848	3,928	4,009	4,092	4,177	4,263	4,351	4,441	4,533	4,627	4,723	4,821
Chemicals for Water Treatment	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Chemicals for Water Treatment	General Cost Inflation	3,000	3,062	3,125	3,190	3,256	3,324	3,392	3,463	3,534	3,607	3,682	3,758	3,836	3,916	3,997	4,079	4,164	4,250	4,338	4,428	4,519
Chemicals for Water Treatment	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Chemicals for Water Treatment	General Cost Inflation	600	612	625	638	651	665	678	693	707	721	736	752	767	783	799	816	833	850	868	886	904
Materials/Supplies/Srvcs General	General Cost Inflation	65,000	66,345	67,719	69,121	70,551	72,012	73,502	75,024	76,577	78,162	79,780	81,431	83,117	84,837	86,593	88,386	90,215	92,083	93,989	95,934	97,920
Materials/Supplies/Srvcs Pumps	General Cost Inflation	2,500	2,552	2,605	2,658	2,714	2,770	2,827	2,886	2,945	3,006	3,068	3,132	3,197	3,263	3,331	3,399	3,470	3,542	3,615	3,690	3,766
Materials/Supplies/Srvcs General Supplies	General Cost Inflation	18,000	18,373	18,753	19,141	19,537	19,942	20,354	20,776	21,206	21,645	22,093	22,550	23,017	23,493	23,980	24,476	24,983	25,500	26,028	26,566	27,116
Materials/Supplies/Srvcs Small Tools	General Cost Inflation	2,000	2,041	2,084	2,127	2,171	2,216	2,262	2,308	2,356	2,405	2,455	2,506	2,557	2,610	2,664	2,720	2,776	2,833	2,892	2,952	3,013
Materials/Supplies/Srvcs Utilities	General Cost Inflation	7,000	7,145	7,293	7,444	7,598	7,755	7,916	8,079	8,247	8,417	8,592	8,770	8,951	9,136	9,325	9,518	9,715	9,917	10,122	10,331	10,545
Materials/Supplies/Srvcs Info Tech	General Cost Inflation	2,500	2,552	2,605	2,658	2,714	2,770	2,827	2,886	2,945	3,006	3,068	3,132	3,197	3,263	3,331	3,399	3,470	3,542	3,615	3,690	3,766
Materials/Supplies/Srvcs Bldgs,Furniture,Grounds	General Cost Inflation	20,000	20,414	20,837	21,268	21,708	22,157	22,616	23,084	23,562	24,050	24,548	25,056	25,574	26,104	26,644	27,196	27,759	28,333	28,920	29,518	30,129
Materials/Supplies/Srvcs Water Quality Testing	General Cost Inflation	14,000	14,290	14,586	14,888	15,196	15,510	15,831	16,159	16,493	16,835	17,183	17,539	17,902	18,273	18,651	19,037	19,431	19,833	20,244	20,663	21,090
Professional Services-General	General Cost Inflation	10,000	10,207	10,418	10,634	10,854	11,079	11,308	11,542	11,781	12,025	12,274	12,528	12,787	13,052	13,322	13,598	13,879	14,167	14,460	14,759	15,065
Professional Services-Technology	General Cost Inflation	10,000	10,207	10,418	10,634	10,854	11,079	11,308	11,542	11,781	12,025	12,274	12,528	12,787	13,052	13,322	13,598	13,879	14,167	14,460	14,759	15,065
Transmission and Distribution																						
Salaries General	General Cost Inflation	1,943,240	2,262,091	2,308,915	2,356,709	2,405,492	2,455,284	2,506,107	2,557,983	2,610,932	2,664,977	2,720,141	2,776,446	2,833,917	2,892,578	2,952,453	3,013,568	3,075,947	3,139,618	3,204,606	3,270,940	3,338,647
Materials/Supplies/Srvcs General	General Cost Inflation	50,000	51,035	52,091	53,170	54,270	55,394	56,540	57,711	58,905	60,124	61,369	62,639	63,936	65,259	66,610	67,989	69,396	70,833	72,299	73,796	75,323
Materials/Supplies/Srvcs General	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs General	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Cross Connection	General Cost Inflation	2,500	2,552	2,605	2,658	2,714	2,770	2,827	2,886	2,945	3,006	3,068	3,132	3,197	3,263	3,331	3,399	3,470	3,542	3,615	3,690	3,766
Materials/Supplies/Locating	General Cost Inflation	5,000	5,103	5,209	5,317	5,427	5,539	5,654	5,771	5,891	6,012	6,137	6,264	6,394	6,526	6,661	6,799	6,940	7,083	7,230	7,380	7,532
Materials/Supplies/Srvcs Pumps	General Cost Inflation	10,000	10,207	10,418	10,634	10,854	11,079	11,308	11,542	11,781	12,025	12,274	12,528	12,787	13,052	13,322	13,598	13,879	14,167	14,460	14,759	15,065
Materials/Supplies/Srvcs Pumps	General Cost Inflation	27,000	27,559	28,129	28,712	29,306	29,913	30,532	31,164	31,809	32,467	33,139	33,825	34,525	35,240	35,970	36,714	37,474	38,250	39,041	39,850	40,674
Materials/Supplies/Reservoirs and Standpipes	General Cost Inflation	50,000	51,035	52,091	53,170	54,270	55,394	56,540	57,711	58,905	60,124	61,369	62,639	63,936	65,259	66,610	67,989	69,396	70,833	72,299	73,796	75,323
Materials/Supplies/Reservoirs and Standpipes	General Cost Inflation	8,000	8,166	8,335	8,507	8,683	8,863	9,046	9,234	9,425	9,620	9,819	10,022	10,230	10,442	10,658	10,878	11,103	11,333	11,568	11,807	12,052
Materials/Supplies/Service Lines	General Cost Inflation	70,000	71,449	72,928	74,438	75,978	77,551	79,156	80,795	82,467	84,174	85,917	87,695	89,510	91,363	93,254	95,185	97,155	99,166	101,219	103,314	105,452

Skagit PUD No. 1
WSP Financial Chapter
Operating Revenue and Expenditure Forecast

		Budget	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection
Materials/Supplies/Trans and Dist	General Cost Inflation	115,000	117,380	119,810	122,290	124,822	127,405	130,043	132,734	135,482	138,286	141,149	144,070	147,053	150,097	153,203	156,375	159,612	162,916	166,288	169,730	173,243
Materials/Supplies/Trans and Dist	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Materials/Supplies/Trans and Dist	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Trans and Dist	General Cost Inflation	3,000	3,062	3,125	3,190	3,256	3,324	3,392	3,463	3,534	3,607	3,682	3,758	3,836	3,916	3,997	4,079	4,164	4,250	4,338	4,428	4,519
Materials/Supplies/Trans and Dist	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Meter repairs	General Cost Inflation	30,000	30,621	31,255	31,902	32,562	33,236	33,924	34,626	35,343	36,075	36,821	37,584	38,362	39,156	39,966	40,793	41,638	42,500	43,379	44,277	45,194
Materials/Supplies/Srvcs General Supplies	General Cost Inflation	9,000	9,186	9,376	9,571	9,769	9,971	10,177	10,388	10,603	10,822	11,046	11,275	11,508	11,747	11,990	12,238	12,491	12,750	13,014	13,283	13,558
Materials/Supplies/Srvcs Postage, Shipping	General Cost Inflation	5,000	5,103	5,209	5,317	5,427	5,539	5,654	5,771	5,891	6,012	6,137	6,264	6,394	6,526	6,661	6,799	6,940	7,083	7,230	7,380	7,532
Materials/Supplies/Srvcs Small Tools	General Cost Inflation	40,000	40,828	41,673	42,536	43,416	44,315	45,232	46,168	47,124	48,100	49,095	50,111	51,149	52,208	53,288	54,391	55,517	56,666	57,839	59,036	60,258
Materials/Supplies/Srvcs Utilities	General Cost Inflation	33,000	33,683	34,380	35,092	35,818	36,560	37,317	38,089	38,877	39,682	40,504	41,342	42,198	43,071	43,963	44,873	45,802	46,750	47,717	48,705	49,713
Materials/Supplies/Srvcs Utilities	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs Utilities	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Materials/Supplies/Srvcs Utilities	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs Utilities	General Cost Inflation	1,700	1,735	1,771	1,808	1,845	1,883	1,922	1,962	2,003	2,044	2,087	2,130	2,174	2,219	2,265	2,312	2,359	2,408	2,458	2,509	2,561
Materials/Supplies/Srvcs Utilities	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs Utilities	General Cost Inflation	750	766	781	798	814	831	848	866	884	902	921	940	959	979	999	1,020	1,041	1,062	1,084	1,107	1,130
Materials/Supplies/Srvcs/Technology	General Cost Inflation	30,000	30,621	31,255	31,902	32,562	33,236	33,924	34,626	35,343	36,075	36,821	37,584	38,362	39,156	39,966	40,793	41,638	42,500	43,379	44,277	45,194
Materials/Supplies/Srvcs/Technology	General Cost Inflation	2,000	2,041	2,084	2,127	2,171	2,216	2,262	2,308	2,356	2,405	2,455	2,506	2,557	2,610	2,664	2,720	2,776	2,833	2,892	2,952	3,013
Materials/Supplies/Srvcs/Technology	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs/Technology	General Cost Inflation	750	766	781	798	814	831	848	866	884	902	921	940	959	979	999	1,020	1,041	1,062	1,084	1,107	1,130
Materials/Supplies/Srvcs/Fire Hydrants	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Materials/Supplies/Srvcs Bldgs,Furniture,Grounds	General Cost Inflation	29,500	30,111	30,734	31,370	32,019	32,682	33,359	34,049	34,754	35,473	36,208	36,957	37,722	38,503	39,300	40,114	40,944	41,791	42,656	43,539	44,441
Materials/Supplies/Srvcs Safety Expense	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Materials/Supplies/Srvcs Water Quality Testing	General Cost Inflation	7,500	7,655	7,814	7,975	8,141	8,309	8,481	8,657	8,836	9,019	9,205	9,396	9,590	9,789	9,992	10,198	10,409	10,625	10,845	11,069	11,298
Professional Services-Engin/Acctg/Legal	General Cost Inflation	10,000	10,207	10,418	10,634	10,854	11,079	11,308	11,542	11,781	12,025	12,274	12,528	12,787	13,052	13,322	13,598	13,879	14,167	14,460	14,759	15,065
Equipment & Transportation Expense Trans Dist	General Cost Inflation	125,000	127,587	130,228	132,924	135,676	138,484	141,351	144,276	147,263	150,311	153,423	156,598	159,840	163,148	166,526	169,973	173,491	177,082	180,748	184,489	188,308
Customer																						
Salaries General	General Cost Inflation	443,151	511,117	521,697	532,496	543,518	554,769	566,253	577,974	589,937	602,149	614,613	627,335	640,321	653,575	667,104	680,913	695,007	709,394	724,078	739,066	754,364
Salaries General - Related to Meters/Services	General Cost Inflation	443,497	443,497	452,677	462,047	471,612	481,374	491,338	501,508	511,889	522,485	533,300	544,339	555,607	567,108	578,847	590,829	603,058	615,542	628,283	641,288	654,562
Materials/Supplies/Srvcs General	General Cost Inflation	4,000	4,083	4,167	4,254	4,342	4,431	4,523	4,617	4,712	4,810	4,910	5,011	5,115	5,221	5,329	5,439	5,552	5,667	5,784	5,904	6,026
Materials/Supplies/Srvcs General Supplies	General Cost Inflation	65,000	66,345	67,719	69,121	70,551	72,012	73,502	75,024	76,577	78,162	79,780	81,431	83,117	84,837	86,593	88,386	90,215	92,083	93,989	95,934	97,920
Materials/Supplies/Srvcs Postage, Shipping	General Cost Inflation	83,000	84,718	86,472	88,262	90,089	91,953	93,857	95,800	97,783	99,807	101,873	103,981	106,134	108,331	110,573	112,862	115,198	117,582	120,016	122,501	125,036
Materials/Supplies/Srvcs Utilities	General Cost Inflation	5,000	5,103	5,209	5,317	5,427	5,539	5,654	5,771	5,891	6,012	6,137	6,264	6,394	6,526	6,661	6,799	6,940	7,083	7,230	7,380	7,532
Materials/Supplies/Srvcs/Technology	General Cost Inflation	9,000	9,186	9,376	9,571	9,769	9,971	10,177	10,388	10,603	10,822	11,046	11,275	11,508	11,747	11,990	12,238	12,491	12,750	13,014	13,283	13,558
Bad Debt Expense	General Cost Inflation	35,000	35,724	36,464	37,219	37,989	38,776	39,578	40,397	41,234	42,087	42,958	43,848	44,755	45,682	46,627	47,592	48,577	49,583	50,609	51,657	52,726
Administrative, Engineering & General																						
Salaries General	General Cost Inflation	3,264,526	3,463,296	3,534,985	3,608,157	3,682,845	3,759,078	3,836,889	3,916,311	3,997,376	4,080,120	4,164,577	4,250,782	4,338,771	4,428,581	4,520,251	4,613,818	4,709,322	4,806,803	4,906,301	5,007,859	5,111,520
Materials/Supplies/Srvcs General	General Cost Inflation	2,500	2,552	2,605	2,658	2,714	2,770	2,827	2,886	2,945	3,006	3,068	3,132	3,197	3,263	3,331	3,399	3,470	3,542	3,615	3,690	3,766
Materials/Supplies/Srvcs/General Engineering	General Cost Inflation	40,500	41,338	42,194	43,067	43,959	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs/Insur chgs on claims	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Materials/Supplies/Srvcs Maint Contracts	General Cost Inflation	18,000	18,373	18,753	19,141	19,537	19,942	20,354	20,776	21,206	21,645	22,093	22,550	23,017	23,493	23,980	24,476	24,983	25,500	26,028	26,566	27,116
Materials/Supplies/Srvcs Memberships	General Cost Inflation	75,000	76,552	78,137	79,754	81,405	83,090	84,810	86,566	88,358	90,187	92,054	93,959	95,904	97,889	99,915	101,984	104,095	106,249	108,449	110,693	112,985
Materials/Supplies/Srvcs General Supplies	General Cost Inflation	60,000	61,242	62,510	63,804	65,124	66,472	67,848	69,253	70,686	72,149	73,643	75,167	76,723	78,311	79,932	81,587	83,276	84,999	86,759	88,555	90,388
Materials/Supplies/Srvcs Postage, Shipping	General Cost Inflation	12,000	12,248	12,502	12,761	13,025	13,294	13,570	13,851	14,137	14,430	14,729	15,033	15,345	15,662	15,986	16,317	16,655	17,000	17,352	17,711	18,078
Materials/Supplies/Srvcs Security	General Cost Inflation	4,500	4,593	4,688	4,785	4,884	4,985	5,089	5,194	5,301	5,411	5,523	5,638	5,754	5,873	5,995	6,119	6,246	6,375	6,507	6,642	6,779
Materials/Supplies/Srvcs Small Tools	General Cost Inflation	1,000	1,021	1,042	1,063	1,085	1,108	1,131	1,154	1,178	1,202	1,227	1,253	1,279	1,305	1,332	1,360	1,388	1,417	1,446	1,476	1,506
Materials/Supplies/Srvcs Utilities	General Cost Inflation	100,000	102,070	104,183	106,339	108,540	110,787	113,080	115,421	117,810	120,249	122,738	125,279	127,872	130,519	133,220	135,978	138,793	141,666	144,598	147,591	150,646
Materials/Supplies/Srvcs/Technology	General Cost Inflation	100,000	102,070	104,183	106,339	108,540	110,787	113,080	115,421	117,810	120,249	122,738	125,279	127,872	130,519	133,220	135,978	138,793	141,666	144,598	147,591	150,646
Materials/Supplies/Srvcs Software and Licenses	General Cost Inflation	185,000	188,829	192,738	196,728	200,800	204,956	209,199	213,529	217,949	222,461	227,065	231,766	236,563	241,460	246,458	251,559	256,767	262,081	267,506	273,044	278,696
Materials/Supplies/Srvcs Education and Training	General Cost Inflation	80,000	81,656	83,346	85,071	86,832	88,630	90,464	92,337	94,248	96,199	98,190	100,223	102,297	104,415	106,576	108,782	111,034	113,333	115,678	118,073	120,517
Materials/Supplies-Bldgs, Furniture,Grounds	General Cost Inflation	130,000	132,691	135,438	138,241	141,103	144,023	147,005	150,048	153,153	156,324	159,559	162,862	166,233	169,674	173,187	176,771	180,431	184,165	187,977	191,869	195,840
Materials/Supplies/Srvcs Safety Expense	General Cost Inflation	65,000	66,345	67,719	69,121	70,551	72,012	73,502	75,024	76,577	78,162	79,780	81,431	83,117	84,837	86,593	88,386	90,215	92,083	93,989	95,934	97,920
Professional Services-General	General Cost Inflation	250,000	255,175	260,457	265,848	271,351	276,968	282,701	288,553	294,526	300,622	306,845	313,197	319,680	326,297	333,051	339,945	346,982	354,164	361,495	368,978	376,616
Prof Svc Other Engineering	General Cost Inflation	7,500	7,655	7,814	7,975	8,141	8,309	8,481	8,657	8,836	9,019	9,205	9,396	9,590	9,789	9,992	10,198	10,409	10,625	10,845	11,069	11,298
Rental General	General Cost Inflation	1,500	1,531	1,563	1,595	1,628	1,662	1,696	1,731	1,767	1,804	1,841	1,879	1,918	1,958	1,998	2,040	2,082	2,125	2,169	2,214	2,260
Equipment & Transportation Expense General	General Cost Inflation	85,000	86,759	88,555	90,388	92,259	94,169	96,118	98,108	100,139	102,212	104,327	106,487	108,691	110,941	113,237	115,581	117,974	120,416	122,908	125,453	128,049
Equipment & Transportation Expense Small Tools	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Equipment & Transportation Expense Bldgs Grds	General Cost Inflation	500	510	521	532	543	554	565	577	589	601	614	626	639	653	666	680	694	708	723	738	753
Insurance Expense Property	General Cost Inflation	117,000	119,422	121,894	124,417	126,992	129,621	132,304	135,043	137,838	140,691	143,603	146,576	149,610	152,707	155,868	159,094	162,387	165,749	169,180	172,682	176,256
Insurance Expense Liability	General Cost Inflation	315,000	321,520	328,176	334,969	341,902	348,980	356,203	363,577	371,103	378,784	386,625	394,628	402,796	411,134	419,644	428,331	437,197	446,247	455,484	464,912	474,536
Insurance Expense Other	General Cost Inflation	7,000	7,145	7,293	7,444	7,598	7,755	7,916	8,079	8,247	8,417	8,592	8,770	8,951	9,136	9,325	9,518	9,715	9,917	10,122	10,331	10,545
Advertising Expense	General Cost Inflation	40,000	40,828	41,673	42,536	43,416	44,315	45,232	46,168	47,124	48,100	49,095	50,111	51,149	52,208	53,288	54,391	55,517	56,666	57,839	59,036	60,258
Miscellaneous Expense	General Cost Inflation	3,000	3,062	3,125	3,190	3,256	3,324	3,392	3,463	3,534	3,607	3,682	3,758	3,836	3,916	3,997	4,079	4,164	4,250	4,338	4,428	4,519
Transportation Expense Transferred	General Cost Inflation	(150,000)	(153,105)	(156,274)	(159,509)	(162,811)	(166,181)	(169,621)	(173,132)	(176,715)	(180,373)	(184,107)	(187,918)	(191,808)	(195,778)	(199,831)	(203,967)	(208,189)	(212,498)	(216,897)	(221,387)	(225,969)
Admin Expense Transferred	General Cost Inflation	(550,000)	(561,385)	(573,005)	(584,866)	(596,973)	(609,330)	(621,942)	(634,816)	(647,957)	(661,369)	(675,059)	(689,033)	(703,295)	(717,853)	(732,712)	(747,879)	(763,360)	(779,161)	(795,289)	(811,751)	(828,554)
Admin Stores Expense Transferred	General Cost Inflation	(245,000)	(250,071)	(255,248)	(260,531)	(265,924)	(271,429)	(277,047)	(282,782)	(288,635)	(294,610)	(300,708)	(306,933)	(313,286)	(319,771)	(326,390)	(333,146)	(340,042)	(347,081)	(354,265)	(361,598)	(369,083)
Other Expenses																						
Misc. Non Operating Expense	No Escalation	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Other Taxes	No Escalation	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
New Employees	General Cost Inflation	-	80,000	81,656	83,346	175,071	178,695	182,394	186,170	190,023	193,957	197,972	202,069	206,252	210,522	214,879	219,327	223,867	228,501	233,231	238,059	242,986
Add'l O&M from CIP	*From CIP*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Cash O&M Expenditures		**$ 11,079,208**	**$ 11,868,263**	**$ 12,113,061**	**$ 12,363,403**	**$ 12,709,335**	**$ 12,928,610**	**$ 13,197,268**	**$ 13,473,550**	**$ 13,756,110**	**$ 14,045,143**	**$ 14,340,785**	**$ 14,643,243**	**$ 14,952,664**	**$ 15,269,268**	**$ 15,593,212**	**$ 15,924,728**	**$ 16,264,021**	**$ 16,611,271**	**$ 16,966,760**	**$ 17,330,651**	**$ 17,703,179**
Depreciation Expense in 2013	$ 4,350,000																					
Depreciation Expense	*Last year's plus annual additions from CIP*	$ 4,350,000	$ 4,439,959	$ 4,799,682	$ 4,997,091	$ 5,298,947	$ 5,512,199	$ 5,748,470	$ 5,925,062	$ 6,049,507	$ 6,201,713	$ 6,304,117	$ 6,440,751	$ 6,642,738	$ 6,909,582	$ 7,047,224	$ 7,284,949	$ 7,423,208	$ 7,666,023	$ 7,788,643	$ 7,915,143	$ 8,045,645
TOTAL EXPENSES		**$ 15,429,208**	**$ 16,308,221**	**$ 16,912,742**	**$ 17,360,494**	**$ 18,008,282**	**$ 18,440,810**	**$ 18,945,738**	**$ 19,398,612**	**$ 19,805,617**	**$ 20,246,855**	**$ 20,644,902**	**$ 21,083,993**	**$ 21,595,403**	**$ 22,178,849**	**$ 22,640,436**	**$ 23,209,677**	**$ 23,687,229**	**$ 24,277,294**	**$ 24,755,403**	**$ 25,245,794**	**$ 25,748,824**

Skagit PUD No. 1
WSP Financial Chapter
Capital Improvement Program

Project Costs and O&M Impacts in Year:	2013

(Project costs are escalated using Construction Cost Inflation assumptions)

No	Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Annual O&M Impact	Inflate Project Costs?	Useful Life (Years)	Specific Funding Source (1-District Funds, 2-Grants & Developer Donations)
1	**2013 Budget - Routine Operating Capital Outlays**																							Yes	50	1 District Funds
2	Computer Software	300,000																						Yes	50	1 District Funds
3	Equipment	-																						Yes	50	1 District Funds
4	Annual Plant Replacement	-																						Yes	50	1 District Funds
5	**2013 Capital Improvement Plan**																							Yes	50	1 District Funds
6	Fir Island Road Pipeline	1,900,000																						Yes	50	1 District Funds
7	Dukes Hill Pump Station		150,000																					Yes	50	1 District Funds
8	Cedar Hills Booster Station		60,000																					Yes	50	1 District Funds
9	WTP Chemical Feed System Replacement		125,000																					Yes	50	1 District Funds
10	Document Management Software		200,000																					Yes	50	1 District Funds
11	WTP Dry Scrubber Retrofit		125,000																					Yes	50	1 District Funds
12	Water Loss Control Action Plan		70,000																					Yes	50	1 District Funds
13	E. Division Tank, Pump Station and Piping			10,000,000																				Yes	50	1 District Funds
14	Josh Wilson Road Improvements			200,000	1,300,000																			Yes	50	1 District Funds
15	Josh Wilson Fiber				130,000																			Yes	50	1 District Funds
16	Old Highway 99 Fiber				60,000																			Yes	50	1 District Funds
17	North 30th St and Digby Road Pipelines			2,400,000																				Yes	50	1 District Funds
18	Transmission Line, Judy - MV (Phase 2)		200,000	800,000	4,000,000	9,300,000																		Yes	50	1 District Funds
19	Computer Server Hardware					175,000	175,000																	Yes	50	1 District Funds
20	McLean Road Pipeline					300,000	4,400,000																	Yes	50	1 District Funds
21	Cascade Ridge Reservoir					50,000	150,000																	Yes	50	1 District Funds
22	Cascade Ridge Fiber						250,000																	Yes	50	1 District Funds
23	Best Road Pipeline						300,000	2,100,000																Yes	50	1 District Funds
24	Burklund Road Pipeline						300,000	3,100,000																Yes	50	1 District Funds
25	Big Lake Reservoir						50,000	350,000																Yes	50	1 District Funds
26	North Fork Skagit River Crossing							500,000	2,300,000															Yes	50	1 District Funds
27	Pleasant Ridge Area Reservoir							100,000	400,000															Yes	50	1 District Funds
28	SW - Burlington Fiber							150,000	600,000															Yes	50	1 District Funds
29	Judy - SW Transmission Line (Skagit River)								300,000	700,000														Yes	50	1 District Funds
30	Bayview Ridge Reservoir to Allen West Rd									400,000	2,000,000													Yes	50	1 District Funds
31	N Sedro Woolley Reservoir #2									250,000	250,000	250,000	1,250,000											Yes	50	1 District Funds
32	Badger ORION 5/8 Meter Transmitter Replac.													2,500,000										Yes	50	1 District Funds
33	Judy - SW Transmission Line (Sedro Woolley)												100,000	700,000	5,100,000									Yes	50	1 District Funds
34	Burlington Reservoir													250,000	300,000	700,000	3,650,000							Yes	50	1 District Funds
35	Mount Vernon - County Reservoir															250,000	300,000	700,000	3,650,000					Yes	50	1 District Funds
36	Annual Pipe and Vehicle Replacement	3,336,500	3,430,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000		Yes	50	1 District Funds
37																								Yes	50	1 District Funds
	Total Capital Projects	**$ 5,536,500**	**$ 4,360,000**	**$ 16,900,000**	**$ 8,990,000**	**$ 13,325,000**	**$ 9,125,000**	**$ 9,800,000**	**$ 7,100,000**	**$ 4,850,000**	**$ 5,750,000**	**$ 3,750,000**	**$ 4,850,000**	**$ 6,950,000**	**$ 8,900,000**	**$ 4,450,000**	**$ 7,450,000**	**$ 4,200,000**	**$ 7,150,000**	**$ 3,500,000**	**$ 3,500,000**	**$ 3,500,000**				
	Projects by Grants / Developer Donations																									
	Projects by District Funds																									

Skagit PUD No. 1
WSP Financial Chapter
Capital Improvement Program

Project Costs and O&M Impacts in Year:	2013

(Project costs are escalated using Construction Cost Inflation assumptions)

TOTAL FORECASTED PROJECT COSTS

No	Description	TOTAL ESCALATED COSTS	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	**2013 Budget - Routine Operating Capital Outlays**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	Computer Software	300,000	300,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Annual Plant Replacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	**2013 Capital Improvement Plan**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Fir Island Road Pipeline	1,900,000	1,900,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Dukes Hill Pump Station	154,745	-	154,745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Cedar Hills Booster Station	61,898	-	61,898	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	WTP Chemical Feed System Replacement	128,954	-	128,954	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Document Management Software	206,327	-	206,327	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	WTP Dry Scrubber Retrofit	128,954	-	128,954	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Water Loss Control Action Plan	72,214	-	72,214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	E. Division Tank, Pump Station and Piping	10,642,698	-	-	10,642,698	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Josh Wilson Road Improvements	1,640,173	-	-	212,854	1,427,319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Josh Wilson Fiber	142,732	-	-	-	142,732	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Old Highway 99 Fiber	65,876	-	-	-	65,876	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	North 30th St and Digby Road Pipelines	2,554,247	-	-	2,554,247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Transmission Line, Judy - MV (Phase 2)	15,983,325	-	206,327	851,416	4,391,750	10,533,833	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Computer Server Hardware	402,705	-	-	-	-	198,217	204,488	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	McLean Road Pipeline	5,481,208	-	-	-	-	339,801	5,141,407	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Cascade Ridge Reservoir	231,909	-	-	-	-	56,634	175,275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Cascade Ridge Fiber	292,125	-	-	-	-	-	292,125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	Best Road Pipeline	2,882,030	-	-	-	-	-	350,550	2,531,480	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	Burklund Road Pipeline	4,087,497	-	-	-	-	-	350,550	3,736,947	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Big Lake Reservoir	480,338	-	-	-	-	-	58,425	421,913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	North Fork Skagit River Crossing	3,463,016	-	-	-	-	-	-	602,733	2,860,282	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Pleasant Ridge Area Reservoir	617,987	-	-	-	-	-	-	120,547	497,440	-	-	-	-	-	-	-	-	-	-	-	-	-
28	SW - Burlington Fiber	926,981	-	-	-	-	-	-	180,820	746,161	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Judy - SW Transmission Line (Skagit River)	1,271,139	-	-	-	-	-	-	-	373,080	898,059	-	-	-	-	-	-	-	-	-	-	-	-
30	Bayview Ridge Reservoir to Allen West Rd	3,160,231	-	-	-	-	-	-	-	-	513,177	2,647,054	-	-	-	-	-	-	-	-	-	-	-
31	N Sedro Woolley Reservoir #2	2,753,703	-	-	-	-	-	-	-	-	320,735	330,882	341,349	1,760,737	-	-	-	-	-	-	-	-	-
32	Badger ORION 5/8 Meter Transmitter Replac.	3,632,874	-	-	-	-	-	-	-	-	-	-	-	-	3,632,874	-	-	-	-	-	-	-	-
33	Judy - SW Transmission Line (Sedro Woolley)	8,803,573	-	-	-	-	-	-	-	-	-	-	-	140,859	1,017,205	7,645,509	-	-	-	-	-	-	-
34	Burlington Reservoir	7,719,060	-	-	-	-	-	-	-	-	-	-	-	-	363,287	449,736	1,082,580	5,823,457	-	-	-	-	-
35	Mount Vernon - County Reservoir	8,215,163	-	-	-	-	-	-	-	-	-	-	-	-	-	-	386,636	478,640	1,152,158	6,197,729	-	-	-
36	Annual Pipe and Vehicle Replacement	95,389,974	3,336,500	3,538,506	3,724,944	3,842,781	3,964,346	4,089,756	4,219,133	4,352,603	4,490,296	4,632,344	4,778,886	4,930,064	5,086,024	5,246,918	5,412,902	5,584,137	5,760,788	5,943,028	6,131,033	6,324,985	6,525,073
37		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Capital Projects	**$ 183,793,660**	**$ 5,536,500**	**$ 4,497,927**	**$ 17,986,159**	**$ 9,870,458**	**$ 15,092,830**	**$ 10,662,577**	**$ 11,813,573**	**$ 8,829,567**	**$ 6,222,267**	**$ 7,610,280**	**$ 5,120,235**	**$ 6,831,660**	**$ 10,099,391**	**$ 13,342,163**	**$ 6,882,118**	**$ 11,886,233**	**$ 6,912,946**	**$ 12,140,757**	**$ 6,131,033**	**$ 6,324,985**	**$ 6,525,073**
	Projects by Grants / Developer Donations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Projects by District Funds	183,793,660	5,536,500	4,497,927	17,986,159	9,870,458	15,092,830	10,662,577	11,813,573	8,829,567	6,222,267	7,610,280	5,120,235	6,831,660	10,099,391	13,342,163	6,882,118	11,886,233	6,912,946	12,140,757	6,131,033	6,324,985	6,525,073

Skagit PUD No. 1
WSP Financial Chapter
Existing Debt Input

Existing Debt Service - Revenue Bonds	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Use Bond Reserve to Make Final Payments?	No																				
If Yes, Enter Payment Amount:	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2008 Public Bond (Refunding 1998)																					
Annual Interest Payment	$ 187,213	$ 158,613	$ 128,813	$ 98,813	$ 64,600	$ 28,900	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	715,000	745,000	775,000	805,000	840,000	680,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 902,213	$ 903,613	$ 903,813	$ 903,813	$ 904,600	$ 708,900	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2009 A Revenue Bonds																					
Annual Interest Payment	$ 30,700	$ 22,700	$ 17,200	$ 8,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	200,000	200,000	210,000	220,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 230,700	$ 222,700	$ 227,200	$ 228,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2009 B Revenue Bonds																					
Annual Interest Payment	$ 202,901	$ 202,901	$ 202,901	$ 202,901	$ 202,901	$ 193,335	$ 182,995	$ 172,099	$ 157,539	$ 142,397	$ 126,963	$ 110,656	$ 93,766	$ 76,294	$ 58,240	$ 39,603	$ 20,093	$ -	$ -	$ -	$ -
Annual Principal Payment	-	-	-	-	230,000	235,000	240,000	250,000	260,000	265,000	280,000	290,000	300,000	310,000	320,000	335,000	345,000	-	-	-	-
Federal Tax Credit Payment (35% per year)	(71,015)	(71,015)	(71,015)	(71,015)	(71,015)	(67,667)	(64,048)	(60,235)	(55,139)	(49,839)	(44,437)	(38,730)	(32,818)	(26,703)	(20,384)	(13,861)	(7,032)	-	-	-	-
Total Annual Payment	$ 131,886	$ 131,886	$ 131,886	$ 131,886	$ 361,886	$ 360,668	$ 358,947	$ 361,864	$ 362,400	$ 357,558	$ 362,526	$ 361,926	$ 360,948	$ 359,591	$ 357,856	$ 360,742	$ 358,060	$ -	$ -	$ -	$ -
TOTAL REVENUE BONDS																					
Annual Interest Payment	$ 420,813	$ 384,213	$ 348,913	$ 310,513	$ 267,501	$ 222,235	$ 182,995	$ 172,099	$ 157,539	$ 142,397	$ 126,963	$ 110,656	$ 93,766	$ 76,294	$ 58,240	$ 39,603	$ 20,093	$ -	$ -	$ -	$ -
Annual Principal Payment	915,000	945,000	985,000	1,025,000	1,070,000	915,000	240,000	250,000	260,000	265,000	280,000	290,000	300,000	310,000	320,000	335,000	345,000	-	-	-	-
Total Annual Payment	$ 1,335,813	$ 1,329,213	$ 1,333,913	$ 1,335,513	$ 1,337,501	$ 1,137,235	$ 422,995	$ 422,099	$ 417,539	$ 407,397	$ 406,963	$ 400,656	$ 393,766	$ 386,294	$ 378,240	$ 374,603	$ 365,093	$ -	$ -	$ -	$ -
Use of Debt reserve for Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Debt Reserve Target on Existing Revenue Bonds	1,337,501	1,337,501	1,337,501	1,337,501	1,337,501	1,137,235	422,995	422,099	417,539	407,397	406,963	400,656	393,766	386,294	378,240	374,603	365,093	-	-	-	-

Existing Debt Service - PWTF Loans	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Public Works Trust Fund Loan No. 1																					
Annual Interest Payment	$ 24,409	$ 21,697	$ 18,985	$ 16,273	$ 13,561	$ 10,848	$ 8,136	$ 5,424	$ 2,712	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	542,424	542,424	542,424	542,424	542,424	542,424	542,424	542,424	542,424	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 566,833	$ 564,121	$ 561,409	$ 558,697	$ 555,985	$ 553,273	$ 550,561	$ 547,848	$ 545,136	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Public Works Trust Fund Loan No. 2																					
Annual Interest Payment	$ 28,125	$ 25,312	$ 22,500	$ 19,687	$ 16,875	$ 14,062	$ 11,250	$ 8,437	$ 5,625	$ 2,812	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	562,494	562,494	562,494	562,494	562,494	562,494	562,494	562,494	562,494	562,494	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 590,619	$ 587,807	$ 584,994	$ 582,182	$ 579,369	$ 576,557	$ 573,744	$ 570,932	$ 568,119	$ 565,307	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Public Works Trust Fund Loan No. 3																					
Annual Interest Payment	$ 7,402	$ 15,216	$ 14,371	$ 13,526	$ 12,680	$ 11,835	$ 10,990	$ 10,144	$ 9,299	$ 8,454	$ 7,608	$ 6,763	$ 5,917	$ 5,072	$ 4,227	$ 3,381	$ 2,536	$ 1,691	$ 845	$ -	$ -
Annual Principal Payment	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	169,070	-	-
Total Annual Payment	$ 176,473	$ 184,287	$ 183,441	$ 182,596	$ 181,751	$ 180,905	$ 180,060	$ 179,215	$ 178,369	$ 177,524	$ 176,679	$ 175,833	$ 174,988	$ 174,143	$ 173,297	$ 172,452	$ 171,607	$ 170,761	$ 169,916	$ -	$ -
PWTF Loan for E. Division Street Tank																					
Annual Interest Payment	$ -	$ -	$ 3,000	$ 2,824	$ 2,647	$ 2,471	$ 2,294	$ 2,118	$ 1,941	$ 1,765	$ 1,588	$ 1,412	$ 1,235	$ 1,059	$ 882	$ 706	$ 529	$ 353	$ 176	$ -	$ -
Annual Principal Payment	-	-	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	17,647	-	-
Total Annual Payment	$ -	$ -	$ 20,647	$ 20,471	$ 20,294	$ 20,118	$ 19,941	$ 19,765	$ 19,588	$ 19,412	$ 19,235	$ 19,059	$ 18,882	$ 18,706	$ 18,529	$ 18,353	$ 18,176	$ 18,000	$ 17,824	$ -	$ -
TOTAL PWTF LOANS																					
Annual Interest Payment	$ 59,936	$ 62,226	$ 58,856	$ 52,309	$ 45,763	$ 39,216	$ 32,670	$ 26,124	$ 19,577	$ 13,031	$ 9,196	$ 8,175	$ 7,153	$ 6,131	$ 5,109	$ 4,087	$ 3,065	$ 2,044	$ 1,022	$ -	$ -
Annual Principal Payment	1,273,989	1,273,989	1,291,636	1,291,636	1,291,636	1,291,636	1,291,636	1,291,636	1,291,636	749,212	186,717	186,717	186,717	186,717	186,717	186,717	186,717	186,717	186,717	-	-
Total Annual Payment	$ 1,333,925	$ 1,336,215	$ 1,350,492	$ 1,343,945	$ 1,337,399	$ 1,330,852	$ 1,324,306	$ 1,317,760	$ 1,311,213	$ 762,243	$ 195,914	$ 194,892	$ 193,870	$ 192,848	$ 191,827	$ 190,805	$ 189,783	$ 188,761	$ 187,739	$ -	$ -

Skagit PUD No. 1
WSP Financial Chapter
Existing Debt Input

Existing Debt Service - Other Loans	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
DWSRF Clearwell																					
Annual Interest Payment	$ 14,380	$ 12,782	$ 11,185	$ 9,587	$ 7,989	$ 6,391	$ 4,793	$ 3,196	$ 1,598	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	106,520	106,520	106,520	106,520	106,520	106,520	106,520	106,520	106,520	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 120,900	$ 119,302	$ 117,704	$ 116,106	$ 114,508	$ 112,911	$ 111,313	$ 109,715	$ 108,117	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF Skagit View Village LUD																					
Annual Interest Payment	$ 549	$ 488	$ 427	$ 366	$ 305	$ 244	$ 183	$ 122	$ 61	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	4,068	4,068	4,068	4,068	4,068	4,068	4,068	4,068	4,068	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 4,618	$ 4,557	$ 4,496	$ 4,435	$ 4,374	$ 4,313	$ 4,252	$ 4,191	$ 4,129	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF Skagit View Village LUD																					
Annual Interest Payment	$ 5,363	$ 4,767	$ 4,171	$ 3,575	$ 2,980	$ 2,384	$ 1,788	$ 1,192	$ 596	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	39,728	39,728	39,728	39,728	39,728	39,728	39,728	39,728	39,728	-	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 45,091	$ 44,495	$ 43,899	$ 43,303	$ 42,707	$ 42,111	$ 41,516	$ 40,920	$ 40,324	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF Transmission																					
Annual Interest Payment	$ 16,581	$ 14,923	$ 13,265	$ 11,607	$ 9,948	$ 8,290	$ 6,632	$ 4,974	$ 3,316	$ 1,658	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	110,538	110,538	110,538	110,538	110,538	110,538	110,538	110,538	110,538	110,538	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 127,119	$ 125,461	$ 123,803	$ 122,145	$ 120,487	$ 118,829	$ 117,171	$ 115,513	$ 113,854	$ 112,196	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
DWSRF WTP																					
Annual Interest Payment	$ 775	$ 698	$ 620	$ 543	$ 465	$ 388	$ 310	$ 233	$ 155	$ 78	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	5,168	5,168	5,168	5,168	5,168	5,168	5,168	5,168	5,168	5,168	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 5,943	$ 5,866	$ 5,788	$ 5,711	$ 5,633	$ 5,556	$ 5,478	$ 5,401	$ 5,323	$ 5,246	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL OTHER LOANS																					
Annual Interest Payment	$ 37,649	$ 33,658	$ 29,668	$ 25,678	$ 21,687	$ 17,697	$ 13,707	$ 9,716	$ 5,726	$ 1,736	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	266,022	266,022	266,022	266,022	266,022	266,022	266,022	266,022	266,022	115,706	-	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ 303,671	$ 299,680	$ 295,690	$ 291,700	$ 287,709	$ 283,719	$ 279,729	$ 275,738	$ 271,748	$ 117,442	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Total Existing Debt Service	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
TOTAL EXISTING LOANS																					
Annual Interest Payment	$ 518,398	$ 480,097	$ 437,437	$ 388,500	$ 334,951	$ 279,148	$ 229,372	$ 207,939	$ 182,842	$ 157,163	$ 136,160	$ 118,831	$ 100,919	$ 82,425	$ 63,349	$ 43,690	$ 23,158	$ 2,044	$ 1,022	$ -	$ -
Annual Principal Payment	2,455,011	2,485,011	2,542,658	2,582,658	2,627,658	2,472,658	1,797,658	1,807,658	1,817,658	1,129,918	466,717	476,717	486,717	496,717	506,717	521,717	531,717	186,717	186,717	-	-
Total Annual Payment	$ 2,973,409	$ 2,965,108	$ 2,980,095	$ 2,971,158	$ 2,962,609	$ 2,751,807	$ 2,027,030	$ 2,015,597	$ 2,000,500	$ 1,287,081	$ 602,877	$ 595,548	$ 587,637	$ 579,143	$ 570,067	$ 565,408	$ 554,876	$ 188,761	$ 187,739	$ -	$ -

Skagit PUD No. 1
WSP Financial Chapter
Revenue Requirements Analysis

Cash Flow Sufficiency Test	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
EXPENSES																					
Cash Operating Expenses	$ 11,079,208	$ 11,868,263	$ 12,113,061	$ 12,363,403	$ 12,709,335	$ 12,928,610	$ 13,197,268	$ 13,473,550	$ 13,756,110	$ 14,045,143	$ 14,340,785	$ 14,643,243	$ 14,952,664	$ 15,269,268	$ 15,593,212	$ 15,924,728	$ 16,264,021	$ 16,611,271	$ 16,966,760	$ 17,330,651	$ 17,703,179
Existing Debt Service	2,973,409	2,965,108	2,980,095	2,971,158	2,962,609	2,751,807	2,027,030	2,015,597	2,000,500	1,287,081	602,877	595,548	587,637	579,143	570,067	565,408	554,876	188,761	187,739	-	-
New Debt Service	-	-	150,061	2,125,299	2,118,153	3,130,938	3,123,792	3,444,798	3,437,652	3,430,506	3,423,360	3,416,215	3,409,069	3,401,923	3,394,777	3,387,632	3,380,486	3,373,340	3,366,194	3,359,049	3,351,903
Routine Capital	3,259,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000	5,000,000	5,500,000	6,201,713	6,304,117	6,440,751	6,642,738	6,909,582	7,047,224	7,284,949	7,423,208	7,666,023	7,788,643	7,915,143	8,045,645
Total Expenses	$ 17,311,618	$ 18,133,371	$ 18,543,216	$ 20,759,860	$ 21,090,096	$ 22,111,355	$ 22,848,090	$ 23,933,945	$ 24,694,262	$ 24,964,443	$ 24,671,140	$ 25,095,756	$ 25,592,109	$ 26,159,915	$ 26,605,280	$ 27,162,717	$ 27,622,591	$ 27,839,395	$ 28,309,337	$ 28,604,843	$ 29,100,727
REVENUES																					
Rate Revenue	$ 14,771,377	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573	$ 16,836,181	$ 16,996,088	$ 17,157,945	$ 17,321,102	$ 17,486,209	$ 17,652,617	$ 17,820,974	$ 17,990,632	$ 18,162,239	$ 18,335,797	$ 18,510,655	$ 18,688,113	$ 18,866,871	$ 19,046,929
System Development Fee to Debt	892,023	770,928	801,320	835,819	863,730	900,060	937,450	1,212,208	1,261,651	1,316,207	1,207,871	1,203,529	1,199,012	1,194,320	1,189,453	1,185,912	1,180,609	1,068,630	1,066,180	1,007,715	1,005,571
Rate Stabilization Transfer	500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Revenue	831,087	835,848	840,634	845,496	850,359	855,272	860,236	866,448	872,711	879,050	885,440	891,906	898,423	905,017	911,661	918,382	925,179	932,027	938,977	945,978	953,030
Operating Fund & Debt Reserve Fund Interest Earnings	27,000	16,419	30,562	31,109	53,353	54,703	65,803	66,855	71,080	71,928	72,847	73,676	74,591	75,657	76,872	77,834	79,020	80,015	81,244	82,240	83,262
Total Revenue	$ 17,021,487	$ 17,678,041	$ 17,849,567	$ 18,013,631	$ 18,192,804	$ 18,360,853	$ 18,541,063	$ 18,981,691	$ 19,201,530	$ 19,425,129	$ 19,487,260	$ 19,655,321	$ 19,824,643	$ 19,995,967	$ 20,168,618	$ 20,344,367	$ 20,520,605	$ 20,591,327	$ 20,774,514	$ 20,902,804	$ 21,088,791
NET CASH FLOW (DEFICIENCY)	**$ (290,130)**	**$ (455,330)**	**$ (693,649)**	**$ (2,746,229)**	**$ (2,897,293)**	**$ (3,750,502)**	**$ (4,307,027)**	**$ (4,952,254)**	**$ (5,492,733)**	**$ (5,539,314)**	**$ (5,183,880)**	**$ (5,440,436)**	**$ (5,767,466)**	**$ (6,163,948)**	**$ (6,436,662)**	**$ (6,818,350)**	**$ (7,101,986)**	**$ (7,248,068)**	**$ (7,534,823)**	**$ (7,702,040)**	**$ (8,011,935)**

Coverage Sufficiency Test	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
EXPENSES																					
Cash Operating Expenses (less Capital Outlay)	$ 11,039,208	$ 11,828,263	$ 12,073,061	$ 12,323,403	$ 12,669,335	$ 12,888,610	$ 13,157,268	$ 13,433,550	$ 13,716,110	$ 14,005,143	$ 14,300,785	$ 14,603,243	$ 14,912,664	$ 15,229,268	$ 15,553,212	$ 15,884,728	$ 16,224,021	$ 16,571,271	$ 16,926,760	$ 17,290,651	$ 17,663,179
Revenue Bond Debt Service	1,335,813	1,329,213	1,333,913	2,834,368	2,836,355	3,656,020	2,941,780	3,269,036	3,264,476	3,254,333	3,253,900	3,247,593	3,240,703	3,233,231	3,225,177	3,221,540	3,212,029	2,846,937	2,846,937	2,846,937	2,846,937
Revenue Bond Coverage Requirement at 2	1,335,813	1,329,213	1,333,913	2,834,368	2,836,355	3,656,020	2,941,780	3,269,036	3,264,476	3,254,333	3,253,900	3,247,593	3,240,703	3,233,231	3,225,177	3,221,540	3,212,029	2,846,937	2,846,937	2,846,937	2,846,937
Total Expenses	$ 13,710,835	$ 14,486,689	$ 14,740,887	$ 17,992,139	$ 18,342,045	$ 20,200,651	$ 19,040,828	$ 19,971,622	$ 20,245,062	$ 20,513,810	$ 20,808,585	$ 21,098,428	$ 21,394,071	$ 21,695,730	$ 22,003,565	$ 22,327,808	$ 22,648,080	$ 22,265,144	$ 22,620,633	$ 22,984,525	$ 23,357,052
ALLOWABLE REVENUES																					
Rate Revenue	$ 14,771,377	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573	$ 16,836,181	$ 16,996,088	$ 17,157,945	$ 17,321,102	$ 17,486,209	$ 17,652,617	$ 17,820,974	$ 17,990,632	$ 18,162,239	$ 18,335,797	$ 18,510,655	$ 18,688,113	$ 18,866,871	$ 19,046,929
System Development Fee	700,700	772,627	801,331	839,873	866,442	903,211	941,439	1,215,272	1,263,993	1,319,881	1,372,571	1,432,916	1,489,885	1,555,029	1,616,610	1,686,920	1,760,061	1,829,340	1,915,273	1,990,337	2,068,234
Other Revenue	831,087	835,848	840,634	845,496	850,359	855,272	860,236	866,448	872,711	879,050	885,440	891,906	898,423	905,017	911,661	918,382	925,179	932,027	938,977	945,978	953,030
Interest Earnings - All Funds	31,126	26,740	45,274	38,428	167,934	62,719	125,642	67,491	86,669	96,583	104,667	149,497	182,884	189,271	168,882	218,605	224,712	286,802	307,110	394,306	488,959
Total Revenue	$ 16,334,290	$ 17,690,061	$ 17,864,290	$ 18,025,004	$ 18,310,097	$ 18,372,020	$ 18,604,892	$ 18,985,392	$ 19,219,460	$ 19,453,458	$ 19,683,780	$ 19,960,528	$ 20,223,810	$ 20,470,291	$ 20,687,785	$ 20,986,147	$ 21,245,749	$ 21,558,824	$ 21,849,473	$ 22,197,492	$ 22,557,152
Coverage Realized	3.96	4.41	4.34	2.01	1.99	1.50	1.85	1.70	1.69	1.67	1.65	1.65	1.64	1.62	1.59	1.58	1.56	1.75	1.73	1.72	1.72
COVERAGE SURPLUS (DEFICIENCY)	**$ 2,623,455**	**$ 3,203,371**	**$ 3,123,403**	**$ 32,865**	**$ (31,948)**	**$ (1,828,631)**	**$ (435,937)**	**$ (986,230)**	**$ (1,025,602)**	**$ (1,060,352)**	**$ (1,124,805)**	**$ (1,137,900)**	**$ (1,170,261)**	**$ (1,225,439)**	**$ (1,315,780)**	**$ (1,341,661)**	**$ (1,402,331)**	**$ (706,320)**	**$ (771,160)**	**$ (787,033)**	**$ (799,901)**

Maximum Revenue Deficiency	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Sufficiency Test Driving the Deficiency	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*
Maximum Deficiency From Tests	$ 290,130	$ 455,330	$ 693,649	$ 2,746,229	$ 2,897,293	$ 3,750,502	$ 4,307,027	$ 4,952,254	$ 5,492,733	$ 5,539,314	$ 5,183,880	$ 5,440,436	$ 5,767,466	$ 6,163,948	$ 6,436,662	$ 6,818,350	$ 7,101,986	$ 7,248,068	$ 7,534,823	$ 7,702,040	$ 8,011,935
less: Net Revenue From Prior Rate Increases	-	-	-	(1,238,514)	(2,595,729)	(4,082,277)	(4,911,638)	(5,796,262)	(6,731,020)	(7,256,925)	(7,801,451)	(8,365,469)	(8,949,278)	(9,553,817)	(10,179,383)	(10,826,988)	(11,497,333)	(12,190,711)	(12,908,699)	(13,651,179)	(13,781,461)
Revenue Deficiency	$ 290,130	$ 455,330	$ 693,649	$ 1,507,716	$ 301,564	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Plus: Adjustment for State Excise Tax	15,363	24,111	36,731	79,838	15,969	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue Deficiency	**$ 305,494**	**$ 479,441**	**$ 730,380**	**$ 1,587,554**	**$ 317,533**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Rate Increases	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Rate Revenue with no Increase	$ 14,771,377	$ 16,054,846	$ 16,177,051	$ 16,301,207	$ 16,425,362	$ 16,550,818	$ 16,677,573	$ 16,836,181	$ 16,996,088	$ 17,157,945	$ 17,321,102	$ 17,486,209	$ 17,652,617	$ 17,820,974	$ 17,990,632	$ 18,162,239	$ 18,335,797	$ 18,510,655	$ 18,688,113	$ 18,866,871	$ 19,046,929
Revenues from Prior Rate Increases	-	-	-	1,304,097	2,733,180	4,298,446	5,171,724	5,220,908	5,270,495	5,320,687	5,371,282	5,422,482	5,474,085	5,526,293	5,578,904	5,632,119	5,685,939	5,740,163	5,795,193	5,850,626	5,906,462
Rate Revenue Before Rate Increase (Incl. previous increases)	14,771,377	16,054,846	16,177,051	17,605,303	19,158,543	20,849,264	21,849,297	22,057,088	22,266,583	22,478,632	22,692,384	22,908,691	23,126,702	23,347,267	23,569,535	23,794,358	24,021,736	24,250,818	24,483,305	24,717,496	24,953,390
Required Annual Rate Increase	2.07%	2.99%	4.51%	9.02%	1.66%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Number of Months New Rates Will Be In Effect	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Info: Percentage Increase to Generate Required Revenue	*2.07%*	*2.99%*	*4.51%*	*9.02%*	*1.66%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Policy Induced Rate Increases	0.00%	0.00%	8.00%	8.00%	8.00%	4.00%	4.00%	4.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
ANNUAL RATE INCREASE	**0.00%**	**0.00%**	**8.00%**	**8.00%**	**8.00%**	**4.00%**	**4.00%**	**4.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**	**2.00%**
CUMULATIVE RATE INCREASE	**0.00%**	**0.00%**	**8.00%**	**16.64%**	**25.97%**	**31.01%**	**36.25%**	**41.70%**	**44.53%**	**47.43%**	**50.37%**	**53.38%**	**56.45%**	**59.58%**	**62.77%**	**66.02%**	**69.35%**	**72.73%**	**76.19%**	**79.71%**	**83.30%**

Impacts of Rate Increases	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Rate Revenues After Rate Increase	$ 14,771,377	$ 16,054,846	$ 17,471,215	$ 19,013,728	$ 20,691,226	$ 21,683,234	$ 22,723,269	$ 23,856,947	$ 24,565,206	$ 25,295,129	$ 26,046,377	$ 26,820,548	$ 27,617,301	$ 28,438,308	$ 29,283,225	$ 30,153,800	$ 31,050,788	$ 31,973,839	$ 32,925,973	$ 33,905,739	$ 34,229,322
Full Year Rate Revenues After Rate Increase	*14,771,377*	*16,054,846*	*17,471,215*	*19,013,728*	*20,691,226*	*21,683,234*	*22,723,269*	*23,856,947*	*24,565,206*	*25,295,129*	*26,046,377*	*26,820,548*	*27,617,301*	*28,438,308*	*29,283,225*	*30,153,800*	*31,050,788*	*31,973,839*	*32,925,973*	*33,905,739*	*34,913,909*
Additional State Taxes Due to Rate Increases	-	-	65,084	136,413	214,530	258,109	304,038	353,074	380,651	409,219	438,794	469,424	501,124	533,946	567,905	603,056	639,437	677,064	716,022	756,305	763,523
Net Cash Flow After Rate Increase	(290,130)	(455,330)	535,431	(170,121)	1,154,041	1,123,805	1,434,630	1,715,438	1,695,735	2,188,651	3,102,601	3,424,479	3,696,095	3,919,440	4,288,027	4,570,156	4,973,568	5,538,053	5,987,015	6,580,524	6,406,936
Coverage After Rate Increase	3.44	3.83	4.66	2.62	3.11	2.59	3.48	3.37	3.50	3.64	3.78	3.94	4.10	4.26	4.42	4.60	4.77	5.60	5.81	6.04	6.06
Coverage After Rate Increase (For ALL Debt)	1.55	1.72	1.99	1.46	1.74	1.61	1.99	2.02	2.10	2.51	3.05	3.19	3.32	3.46	3.59	3.74	3.90	4.48	4.65	5.12	5.14

Skagit PUD No. 1
WSP Financial Chapter
Fund Activity

Funds	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
REVENUE FUND																					
Beginning Balance	$ 10,388,210	$ 6,348,079	$ 5,892,750	$ 3,928,181	$ 3,616,770	$ 3,751,725	$ 3,841,835	$ 3,947,029	$ 4,041,378	$ 4,126,170	$ 4,218,095	$ 4,301,021	$ 4,392,499	$ 4,499,042	$ 4,620,594	$ 4,716,758	$ 4,835,349	$ 4,934,839	$ 5,057,770	$ 5,157,376	$ 5,259,541
plus: Net Cash Flow after Rate Increase	(290,130)	(455,330)	535,431	(170,121)	1,154,041	1,123,805	1,434,630	1,715,438	1,695,735	2,188,651	3,102,601	3,424,479	3,696,095	3,919,440	4,288,027	4,570,156	4,973,568	5,538,053	5,987,015	6,580,524	6,406,936
less: Transfer of Surplus to Capital Fund	(3,750,000)	-	(2,500,000)	(141,290)	(1,019,085)	(1,033,695)	(1,329,437)	(1,621,089)	(1,610,942)	(2,096,727)	(3,019,675)	(3,333,002)	(3,589,551)	(3,797,889)	(4,191,863)	(4,451,564)	(4,874,078)	(5,415,123)	(5,887,409)	(6,478,359)	(6,302,138)
Ending Balance	**$ 6,348,079**	**$ 5,892,750**	**$ 3,928,181**	**$ 3,616,770**	**$ 3,751,725**	**$ 3,841,835**	**$ 3,947,029**	**$ 4,041,378**	**$ 4,126,170**	**$ 4,218,095**	**$ 4,301,021**	**$ 4,392,499**	**$ 4,499,042**	**$ 4,620,594**	**$ 4,716,758**	**$ 4,835,349**	**$ 4,934,839**	**$ 5,057,770**	**$ 5,157,376**	**$ 5,259,541**	**$ 5,364,338**
Minimum Target Balance (2.5 mo O&M + Depreciation)	*3,214,418*	*3,397,546*	*3,523,488*	*3,616,770*	*3,751,725*	*3,841,835*	*3,947,029*	*4,041,378*	*4,126,170*	*4,218,095*	*4,301,021*	*4,392,499*	*4,499,042*	*4,620,594*	*4,716,758*	*4,835,349*	*4,934,839*	*5,057,770*	*5,157,376*	*5,259,541*	*5,364,338*
Info: No of Days of Cash Operating Expenses	*209*	*181*	*118*	*107*	*108*	*108*	*109*	*109*	*109*	*110*	*109*	*109*	*110*	*110*	*110*	*111*	*111*	*111*	*111*	*111*	*111*
MAJOR CAPITAL FUND																					
Beginning Balance	$ 2,121,760	$ 4,128,246	$ 2,942,339	$ 975,903	$ 11,458,109	$ 801,657	$ 5,983,942	$ 63,635	$ 1,558,858	$ 2,465,463	$ 3,181,951	$ 7,582,027	$ 10,829,327	$ 11,361,392	$ 9,201,023	$ 14,077,158	$ 14,569,216	$ 20,678,700	$ 22,586,586	$ 31,206,565	$ 40,569,771
plus: Grants / Donations / CIAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Additional Proceeds (Costs)	-	-	200,950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Routine Capital	3,259,000	3,300,000	3,300,000	3,300,000	3,300,000	3,300,000	4,500,000	5,000,000	5,500,000	6,201,713	6,304,117	6,440,751	6,642,738	6,909,582	7,047,224	7,284,949	7,423,208	7,666,023	7,788,643	7,915,143	8,045,645
plus: Revenue Bond Proceeds	-	-	-	16,900,000	-	11,500,000	-	3,700,000	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: PWTF/DWSRF Loan Proceeds	-	-	10,004,050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Other Loan Proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Interest Earnings	4,126	10,321	14,712	7,319	114,581	8,017	59,839	636	15,589	24,655	31,820	75,820	108,293	113,614	92,010	140,772	145,692	206,787	225,866	312,066	405,698
plus: Transfer of Surplus from Rate Stabilization Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer of Surplus from Debt Service Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus: Transfer of Surplus from System Development Fund	529,859	1,699	11	4,054	2,712	3,151	3,990	3,064	2,341	3,674	164,700	229,387	290,874	360,709	427,156	501,008	579,452	760,710	849,093	982,623	1,062,663
plus: Transfer of Surplus from Revenue Fund	3,750,000	-	2,500,000	141,290	1,019,085	1,033,695	1,329,437	1,621,089	1,610,942	2,096,727	3,019,675	3,333,002	3,589,551	3,797,889	4,191,863	4,451,564	4,874,078	5,415,123	5,887,409	6,478,359	6,302,138
Total Capital Funding Sources	**9,664,746**	**7,440,265**	**18,962,062**	**21,328,566**	**15,894,487**	**16,646,520**	**11,877,208**	**10,388,425**	**8,687,730**	**10,792,231**	**12,702,262**	**17,660,987**	**21,460,783**	**22,543,186**	**20,959,276**	**26,455,450**	**27,591,646**	**34,727,343**	**37,337,598**	**46,894,756**	**56,385,914**
less: Capital Expenditures	(5,536,500)	(4,497,927)	(17,986,159)	(9,870,458)	(15,092,830)	(10,662,577)	(11,813,573)	(8,829,567)	(6,222,267)	(7,610,280)	(5,120,235)	(6,831,660)	(10,099,391)	(13,342,163)	(6,882,118)	(11,886,233)	(6,912,946)	(12,140,757)	(6,131,033)	(6,324,985)	(6,525,073)
Ending Balance	**$ 4,128,246**	**$ 2,942,339**	**$ 975,903**	**$ 11,458,109**	**$ 801,657**	**$ 5,983,942**	**$ 63,635**	**$ 1,558,858**	**$ 2,465,463**	**$ 3,181,951**	**$ 7,582,027**	**$ 10,829,327**	**$ 11,361,392**	**$ 9,201,023**	**$ 14,077,158**	**$ 14,569,216**	**$ 20,678,700**	**$ 22,586,586**	**$ 31,206,565**	**$ 40,569,771**	**$ 49,860,842**
Minimum Target Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SYSTEM DEVELOPMENT FUND																					
Beginning Balance	$ 721,182	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
plus: System Development Fee	700,700	772,627	801,331	839,873	866,442	903,211	941,439	1,215,272	1,263,993	1,319,881	1,372,571	1,432,916	1,489,885	1,555,029	1,616,610	1,686,920	1,760,061	1,829,340	1,915,273	1,990,337	2,068,234
less: Transfer to Pay Debt Service	(892,023)	(770,928)	(801,320)	(835,819)	(863,730)	(900,060)	(937,450)	(1,212,208)	(1,261,651)	(1,316,207)	(1,207,871)	(1,203,529)	(1,199,012)	(1,194,320)	(1,189,453)	(1,185,912)	(1,180,609)	(1,068,630)	(1,066,180)	(1,007,715)	(1,005,571)
less: Transfer of Surplus to Major Capital Fund	(529,859)	(1,699)	(11)	(4,054)	(2,712)	(3,151)	(3,990)	(3,064)	(2,341)	(3,674)	(164,700)	(229,387)	(290,874)	(360,709)	(427,156)	(501,008)	(579,452)	(760,710)	(849,093)	(982,623)	(1,062,663)
Ending Balance	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
RATE STABILIZATION FUND																					
Beginning Balance	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
less: Transfer to Revenue Fund	(500,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
less: Transfer of Surplus to Major Capital Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Balance	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
DEBT SERVICE FUNDS																					
Beginning Balance	$ 219,687	$ 219,687	$ 219,687	$ 219,687	$ 1,718,541	$ 1,718,541	$ 2,738,472	$ 2,738,472	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623	$ 3,066,623
plus: Reserve Funding from New Debt	-	-	-	1,498,855	-	1,019,931	-	328,152	-	-	-	-	-	-	-	-	-	-	-	-	-
less: Transfer of Surplus to Major Capital Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
less: Use of Reserves for Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Balance	**$ 219,687**	**$ 219,687**	**$ 219,687**	**$ 1,718,541**	**$ 1,718,541**	**$ 2,738,472**	**$ 2,738,472**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**	**$ 3,066,623**
Minimum Target Balance	*1,337,501*	*1,337,501*	*1,337,501*	*2,836,355*	*2,836,355*	*3,656,020*	*2,941,780*	*3,269,036*	*3,264,476*	*3,254,333*	*3,253,900*	*3,247,593*	*3,240,703*	*3,233,231*	*3,225,177*	*3,221,540*	*3,212,029*	*2,846,937*	*2,846,937*	*2,846,937*	*2,846,937*
TOTAL BEGINNING FUND BALANCE	**$ 13,950,839**	**$ 10,696,012**	**$ 9,054,775**	**$ 5,123,770**	**$ 16,793,419**	**$ 6,271,923**	**$ 12,564,249**	**$ 6,749,136**	**$ 8,666,859**	**$ 9,658,256**	**$ 10,466,669**	**$ 14,949,672**	**$ 18,288,449**	**$ 18,927,058**	**$ 16,888,239**	**$ 21,860,538**	**$ 22,471,189**	**$ 28,680,163**	**$ 30,710,979**	**$ 39,430,564**	**$ 48,895,935**
TOTAL ENDING FUND BALANCE	**$ 10,696,012**	**$ 9,054,775**	**$ 5,123,770**	**$ 16,793,419**	**$ 6,271,923**	**$ 12,564,249**	**$ 6,749,136**	**$ 8,666,859**	**$ 9,658,256**	**$ 10,466,669**	**$ 14,949,672**	**$ 18,288,449**	**$ 18,927,058**	**$ 16,888,239**	**$ 21,860,538**	**$ 22,471,189**	**$ 28,680,163**	**$ 30,710,979**	**$ 39,430,564**	**$ 48,895,935**	**$ 58,291,803**
CHANGE	**$ (3,254,827)**	**$ (1,641,236)**	**$ (3,931,005)**	**$ 11,669,649**	**$(10,521,496)**	**$ 6,292,326**	**$ (5,815,113)**	**$ 1,917,723**	**$ 991,398**	**$ 808,413**	**$ 4,483,003**	**$ 3,338,777**	**$ 638,609**	**$ (2,038,818)**	**$ 4,972,299**	**$ 610,650**	**$ 6,208,974**	**$ 2,030,816**	**$ 8,719,585**	**$ 9,465,371**	**$ 9,395,868**
Cash O&M Expenditures	*11,079,208*	*11,868,263*	*12,113,061*	*12,363,403*	*12,709,335*	*12,928,610*	*13,197,268*	*13,473,550*	*13,756,110*	*14,045,143*	*14,340,785*	*14,643,243*	*14,952,664*	*15,269,268*	*15,593,212*	*15,924,728*	*16,264,021*	*16,611,271*	*16,966,760*	*17,330,651*	*17,703,179*
Net Liquidity (Days)	*352*	*278*	*154*	*496*	*180*	*355*	*187*	*235*	*256*	*272*	*380*	*456*	*462*	*404*	*512*	*515*	*644*	*675*	*848*	*1,030*	*1,202*

APPENDIX S

SATELLITE SYSTEMS

SATELLITE SYSTEM PROGRAM

SATELLITE SYSTEM SANITARY SURVEYS

- Fidalgo Island
- Alger
- Cedargrove
- Marblemount
- Mountain View
- Potlatch Beach
- Rockport
- Skagit View Village

Satellite System Program

1.1 *Authority*

Public Utility District No. 1 of Skagit County (District) functions as the primary Satellite Management Agency (SMA) for Skagit County per the CWSP. The District provides satellite service inside Skagit County (and outside the County in limited cases) to all areas not already designated as the service area of another State-approved water utility. The District's goal as SMA is to maximize water availability and maintain satisfactory water quality, as well as to assist other public water systems (water systems serving 2 or more service connections) with technical and administrative tasks. The District runs a Satellite System Program, operating both large and small District-owned systems, assisting troubled and failing water systems, and providing other water systems by contract with various services. By operating more than one water system, economies of scale make it possible for the District to employ qualified personnel, provide good system management and operation, and meet the stringent standards required by the Safe Drinking Water Act.

The regulations and liability associated with providing adequate water service are becoming too complex, restrictive and expensive for many communities, homeowner associations and individually-owned utilities. Small public water systems are often unwilling or unable to develop and sustain the operating revenues that will finance needed capital improvements and operational/maintenance activities in a manner that is affordable to their customers, nor the Operating and Capital Cash Reserves required by the State to meet the test of financial viability. It is not the District's intent to take over all small public water systems in Skagit County, but rather to support them in cooperation with the Skagit County Health Department (SCH). The District appreciates the pride many system owners display and believes they should continue service so long as their product meets drinking water quality standards and their physical water system meets DOH/SCH requirements.

This Satellite System Program is fashioned to allow some flexibility of service to water systems based on their viability. In addition, the District's eligibility for State and federal funding assistance and its ability to issue bonds helps to assure reliable and high quality service at minimum cost for District-owned systems.

1.2 *Satellite System Program Services*

The following outline of the District's Satellite System Program provides current and potential customers with the philosophy, objectives and procedures associated with available services. A model contract for satellite management services is included in Appendix P.

The Satellite System Program provides four primary options of services for water systems:

a. Ownership Service: Ownership and operation of the remote water system by the District.

b. Management and Operation Service: Management and operation of the remote public water system by the District for the system owner, or

c. Contract Service: Delegation by the District of the system management and operation to the system owner or a third party; this option still requires the SMA to ensure that all functions of the system comply with applicable regulations.

d. Support Assistance: Support to existing viable systems for technical, professional or special services by the District.

Many water systems may be operating well and producing good quality water, but need help with monitoring or the cost of supplies; Support Assistance may be the best for them. Other water systems may not want to stay in operation or, because of inability to meet water quality requirements, may be forced by the courts to turn their system over to someone else; Ownership Service may be their best option. New systems may be served by Ownership, Management and Operation, or Contract Service by the District.

These options are designed to respond to the needs of differing water systems and to support a program of reliable water system operation throughout the County. Decisions on establishing a level of service will depend on CWSP Guidelines, direction from the County or State Health Departments, individual system needs, plans for improvement and growth pressures, as well as the ability of the District to provide the desired services in a cost-effective manner. Each situation will be carefully examined by the District with the Applicant interested in Satellite System service or support.

Existing systems that do not meet water quality standards would benefit the most from Ownership Service. The District may be required to assume specific regulatory liabilities for systems that transfer ownership; the interests of all District customers will be considered before any such transfer. The District will provide Ownership Service only for those systems that comply with its minimum water quality, construction and reliability standards. Systems initially failing to meet these standards must either be brought up to standards or pay the cash equivalent of such an upgrade prior to transfer of ownership, in accordance with this Satellite System Program policy. Different construction and reliability standards will be assigned to Group A and Group B systems as appropriate.

Systems requesting assistance must provide unrestricted access of system facilities to District staff. All system facilities must be on system-owned property or located on legal rights-of-way or easements.

Figure 10.1 indicates the procedures which the District uses in evaluating requests for either remote service (either Ownership, Management & Operation or Contract Service) or Support Assistance. There are some common steps in each process regardless of which option is requested.

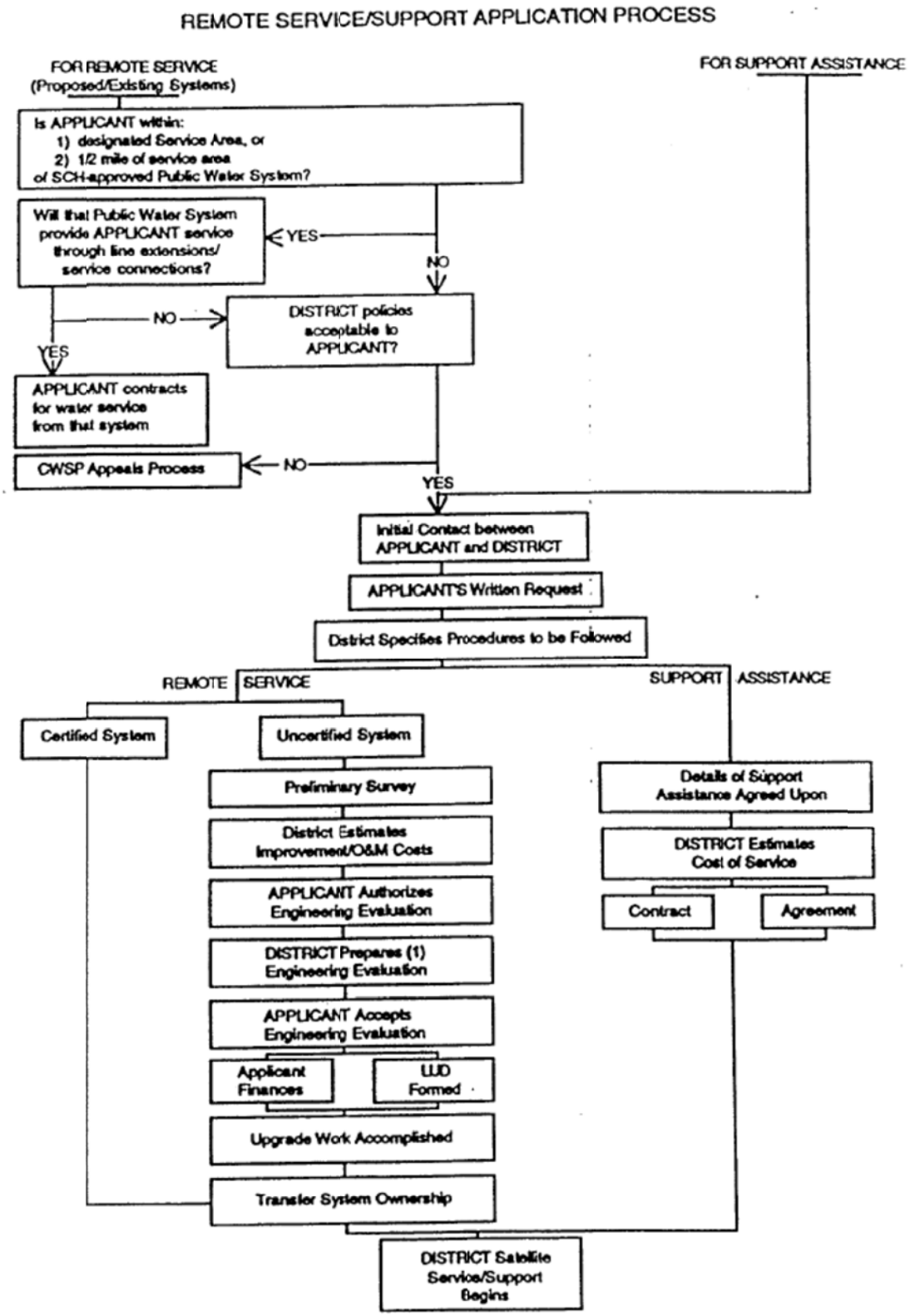
- Initial contact between the Applicant and the District: the Applicant can discuss needs of the water system and receive a copy of District policies and procedures pertaining to Applicant's requests. The Applicant may contact the District on its own or by SCH or DOH referral.

- Applicant's written request: this initiates the District's formal evaluation of the system's needs, capabilities and deficiencies. The Applicant's request should include specific data and background information on the system using the Small System Survey forms in Exhibit H of this Plan.

- District procedures: The District will inform the Applicant of the procedures required for service or support, as indicated below.

The District's Point of Contact for initiating SMA service is the Engineering Department, located at the District's Mount Vernon office at 1415 Freeway Drive.

Figure 1.1


REMOTE SERVICE/SUPPORT APPLICATION PROCESS
FOR REMOTE SERVICE
(Proposed/Existing Systems)
FOR SUPPORT ASSISTANCE
Is APPLICANT within:
1) designated Service Area, or
2) 1/2 mile of service area
of SCH-approved Public Water System?
Will that Public Water System provide APPLICANT service through line extensions/ service connections?
YES
NO
NO
YES
DISTRICT policies acceptable to APPLICANT?
APPLICANT contracts for water service from that system
CWSP Appeals Process
NO
YES
Initial Contact between APPLICANT and DISTRICT
APPLICANT'S Written Request
District Specifies Procedures to be Followed
REMOTE SERVICE
SUPPORT ASSISTANCE
Certified System
Uncertified System
Preliminary Survey
District Estimates Improvement/O&M Costs
APPLICANT Authorizes Engineering Evaluation
DISTRICT Prepares (1) Engineering Evaluation
APPLICANT Accepts Engineering Evaluation
Applicant Finances
LUD Formed
Upgrade Work Accomplished
Transfer System Ownership
Details of Support Assistance Agreed Upon
DISTRICT Estimates Cost of Service
Contract
Agreement
DISTRICT Satellite Service/Support Begins

1.2.1 Ownership Service

1.2.1.1 Policy

a. Applicants adjacent to or within another established public water system's designated service area will be referred to that water system for Ownership service before the District will accept a request for Ownership service from the applicant (see Figure 10.1). If the adjacent water system denies the applicant service, the applicant may apply for Ownership service from the District.

b. Ownership Service can be provided for both Group A and Group B public water systems. The District will own and operate all new satellite Group A public water systems proposed within its satellite service area. The District will not typically own Group B public water systems. Instead:

(1) the District will typically waive SMA service to all two (2) connection Group B public water systems;

(2) the District will review potential for SMA management and operation (M&O) service to new Group B public water systems with more than two (2) connections. In general, the District will not provide M&O service to Group B water systems; and

(3) unique exceptions will be considered on the recommendation of a governmental agency or the system owner.

c. The District considers a new system to be feasible based on the balance of its projected revenues to active service count, projected rate of growth to buildout, and operational requirements. An economic viability assessment will be performed on each system to be considered for ownership service. Ownership systems which are likely to be considered financially feasible include, but are not limited to:

- those inside or within 1/2-mile of a UGA or rural village served by the District; or
- those where a District water main is anticipated to be within 1⁄2-mile of the system within 20 years of the date the system begins operation.
- In all cases, land use regulations shall govern the creation of new developments and determine the density therein.

d. Ownership Service requires transfer of ownership and operational responsibilities from either a new or existing water system to the District. The District shall assume complete responsibility for the water system following transfer.

e. The Applicant is subject to all District written policies and Resolutions, including but not limited to rates and fees, design and construction standards and line extension policies.

f. The Applicant is responsible for all costs of upgrade and transfer of system ownership to the District. The District will assist the Applicant in obtaining funding. The District will not make cash payments to acquire an existing or new system. Transfer of ownership will occur at no cost to the District.

g. Water systems that have been certified per WAC 246-290 as being designed and constructed in accordance with District, SCH and Washington State Department of Health (DOH) standards shall be considered "certified"; all other systems shall be considered "uncertified". Certified and Uncertified systems shall follow the respective Review and Approval Procedures indicated below to implement the Ownership Service option. For Uncertified systems, this shall include survey and evaluation of the system and completion of all upgrades to minimum District standards prior to transfer of ownership to the District.

h. The District reserves the right to contract any or all of the survey and evaluation procedures and/or the final design of a water system to a professional other than the District who, in the mutual judgment of the District and SCH, is qualified.

1.2.1.2 Review and Approval Procedures

a. Certified Existing Systems

(1) Systems that are certified per WAC 246-290 to meet District, SCH and DOH standards for design and construction will not be subject to the survey, evaluation and upgrade process.

(2) Systems that may desire Ownership Service by the District or connection to another District system at some future date should meet the following requirements during design and construction:

- Design and install the system per the District's current urban design standards or rural design standards, as the District considers appropriate. See Section 4.
- Coordinate inspection of construction of the new system with the District.
- Prior to transfer of ownership to the District, have the system designer certify per RCW 248-54 that the system has been constructed per the approved design and that it meets District, SCH and DOH standards.

(3) Transfer of water system ownership to the District shall follow the procedures outlined in the paragraph below.

b. Uncertified Existing Systems

(1) For "uncertified" systems, a preliminary survey will be conducted by the District to establish the existing status of the water system. See Appendix H. The District may require a preliminary deposit prior to conducting the survey. The deposit will be applied toward the final cost of improvements tallied at the completion of work. If the Applicant withdraws the request for service for any reason at any time during the process, the District will retain a portion or all of the deposit to help cover costs.

(2) Based on the data collected from this survey, the District will estimate the costs for required improvements and routine operation and maintenance (O&M).

(3) A meeting or other appropriate method will be used to review the survey data and preliminary cost estimate with the Applicant. The Applicant may either withdraw the request for Ownership Service or continue the process by authorizing the District to prepare an engineering evaluation to more accurately determine the work and costs required to improve the system to and maintain the system at required standards.

(4) The District engineering evaluation shall include a detailed analysis of the system's operation, required capital improvements and projected O&M costs. It will also contain a preliminary financing plan for improvements based on:

(a) Minimum improvements required to meet water quality, construction and reliability standards;

(b) Required improvements to upgrade the system to District standards;

(c) Additional improvements for storage, metering and fire flow (if not already required).

(5) After review of the engineering evaluation with the Applicant, the Applicant may withdraw the request for Ownership Service or, with assistance from the District, pursue required improvements to the water system. Improvements required to meet minimum District standards, particularly those associated with water quality, safety and reliability, shall be completed prior to transfer of ownership. Less critical improvements may, at the District's option, be deferred until normal repair or replacement occurs.

(6) Improvement may be financed by the Applicant through rate surcharges, customer assessments, system development charges, and/or District-arranged financing. District-arranged financing may include State and/or federal grants, Local Utility District (LUD) bonds or other similar arrangements.

(7) If necessary and found to be economically feasible, the District Commissioners may require the formation of an LUD in accordance with RCW 54. Once an LUD is formed and improvements completed, ownership of specified facilities, equipment and data shall be transferred to the District.

(8) After completion of the improvements, the Applicant and the District shall pursue transfer of ownership. The District's attorney will establish the appropriate authorization and legal instruments for the transfer of system ownership to the District. The items required for transfer or ownership may include, but are not limited to:

(a) Bill of Sale
(b) Title Report and Property Deeds
(c) Assignment of Easement and Franchises
(d) New Easements, if required
(e) Assignment of Water Rights
(f) Authorization to Collect Rates and Fees
(g) Hold Harmless Agreement
(h) List of Owners, Customers and Service and Mailing Addresses
(i) Maps, Records, Equipment Manuals and Data
(j) Other information

c. New Systems

(1) Levels of Ownership Service. Service can be provided to a Satellite System through several scenarios, depending on whether the system will "stand alone" permanently or has potential for connecting to an existing District system ("temporary stand-alone"), and whether fire protection will be required for the development by the Fire Marshal in that jurisdiction. The District will own and operate the remote system in either case.

(2) Permanent Stand-Alone System. A "permanent stand-alone system" is a remote system which is so far removed from another District system that there is no

possibility of future connection/intertie. The permanent system shall be designed and built to meet or exceed District requirements as outlined in Figure 10.2 and "Ownership System Design Standards", below.

(3) Temporary Stand-Alone System. A "temporary stand-alone system" is a remote system which is more than 1/2-mile from a District water main that has the capacity to support the demand of the remote system but has a strong potential for hook-up within 20 years of the date the remote system starts operation. The system can be developed in one of two ways:

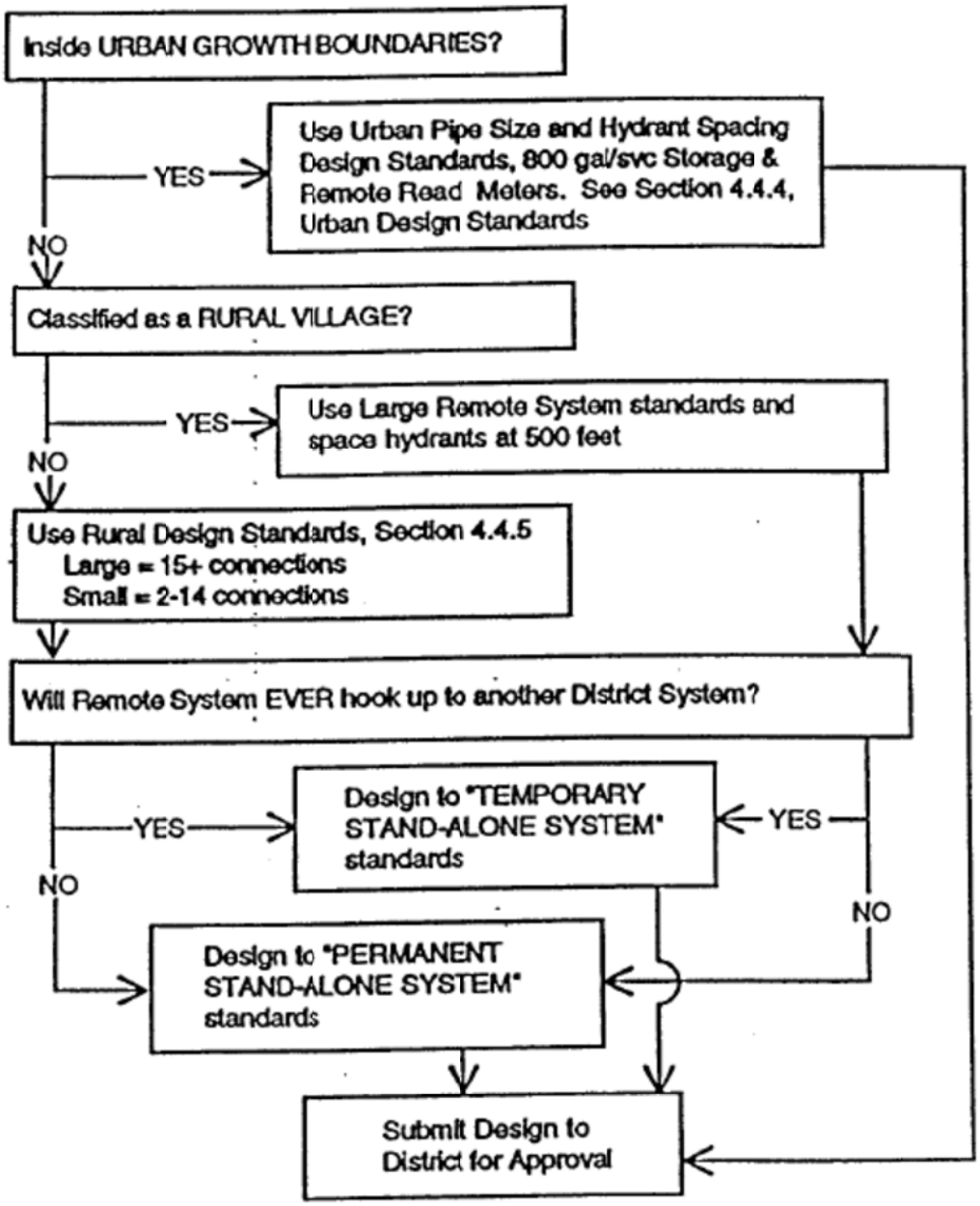
- Completed to match current standards of the adjacent District system, allowing the eventual tie-in and integration into the adjacent District system without major modification of the remote system; or
- Completed to minimum stand-alone standards with the written agreement of the developer that all or portions of the remote system will be upgraded to meet or exceed the standards of the adjacent District system at some future date prior to tie-in to the adjacent District system; selection of this option requires the developer to provide to the District the equivalent cash value of the intended future upgrade at the time the District accepts the system. The equivalent cash value shall be based on the District's estimated cost of the upgrade; present worth is subject to negotiation between the developer and the District.

NOTE: Even though it will eventually be integrated into the adjacent District system, a Temporary Stand-Alone System must by definition be designed and constructed as a complete system to provide all the necessary service to its customers until such time as it is connected to the adjacent system. See "Ownership System Design Standards", below.

(4) Ownership System Design Standards. Each Ownership System shall be designed by a Professional Engineer registered in the State of Washington and shall follow the sizing guidelines provided by the Washington State Department of Health. Each Ownership System shall be designed according to the District design standards, Appendix C of the Water Code. See also Figure 10.2.

Specific material and construction requirements and standard details are available in Section 4 and the District's Water Code.

Figure 1.2


Inside URBAN GROWTH BOUNDARIES?
YES
Use Urban Pipe Size and Hydrant Spacing Design Standards, 800 gal/svc Storage & Remote Read Meters. See Section 4.4.4, Urban Design Standards
NO
Classified as a RURAL VILLAGE?
YES
Use Large Remote System standards and space hydrants at 500 feet
NO
Use Rural Design Standards, Section 4.4.5
Large = 15+ connections
Small = 2-14 connections
Will Remote System EVER hook up to another District System?
YES
Design to "TEMPORARY STAND-ALONE SYSTEM" standards
YES
NO
NO
Design to "PERMANENT STAND-ALONE SYSTEM" standards
Submit Design to District for Approval

1.2.2 Management and Operation Service

1.2.2.1 Policy

The District will not typically provide management and operation (M&O) service to a water system. In those cases when M&O service is provided, it will be under the terms of an SMA M&O service agreement. Each such "Satellite Service Agreement" will address:

- Detailed description of the area served and owners' names, including a single point of contact regarding the Satellite Water System (SWS);
- Background leading to SWS formation and the District's involvement;
- Terms, including:
    - construction/improvement and ownership of the water system by the SWS, per that system's or per State and County Health Department standards, whichever is greater, at the cost of the SWS;
    - operation of the water system by the District (or a designated third party agreeable to both the SWS and the SMA, as delegated by the SMA) per State and County Health Department standards at the cost of the SWS;
- if operated by a third party, a compliance inspection of the water system by the SMA, at the cost of the SWS, to be performed at least annually; the SWS shall correct any deficiencies within a stated timeframe agreed between the SWS and SMA; the SMA shall correct any deficiencies not corrected in the timeframe specified and bill the SWS for such work;
- payment of charges by the SWS to the SMA for operation, scheduled inspections, administrative management, water quality sampling/testing, and/or all other work performed by the SMA; waiver of lien rights; method of recovering any delinquent SMA billings from SWS; and future expansion of the SWS.
- Hold harmless clause;
- Duration of the agreement (until the SWS is abandoned or connects to another District water system);
- Other factors deemed necessary; and
- Signatures of District and SWS representatives, notarized as required.

1.2.2.2 Rates and Charges

Rates and charges for management and operation services shall be set as follows:

- For management and operation services, water rates and charges shall be subject to negotiation between the District and the SWS and ratification by the District Commission;
- Any compliance inspection fee shall be calculated and charged on a case by case basis to recover District labor and vehicle expenses; and
- Any fee for water quality testing shall be set by the General Manager on a case by case basis to recover the laboratory costs and District labor and vehicle expenses.

1.2.3 Contract Service

1.2.3.1 Policy

The District may offer contract services to any water system to which the District has waived SMA service and/or does not have an SMA relationship. The District and such water system shall agree to scope of services and compensation by written contract prior to the District providing any contract

services. The contract should include the same basic elements as indicated above for a Satellite Service Agreement.

1.2.3.2 Rates and Charges

Rates and charges for contract services shall be set as follows:

- For contract services, water rates and charges shall be subject to negotiation between the District and the water system and ratification by the District Commission;
- Any compliance inspection fee shall be calculated and charged on a case by case basis to recover District labor and vehicle expenses; and
- Any fee for water quality testing shall be set by the General Manager on a case by case basis to recover the laboratory costs and District labor and vehicle expenses.

1.2.4 Support Assistance Service

1.2.4.1 Policy

a. The Support Assistance program provides general assistance for improving water service within the District's satellite service area. The intent of the program is to allow small water systems to remain independent and operate at reasonable expenditure levels. The District is willing to evaluate any form of assistance to help a water system improve its level of service. Primarily, the program is designed to support smaller water systems on a limited or non-recurring basis.

b. "Limited" Support Assistance can include, but is not limited to:
   (1) Leadership and support to small utilities to ensure their views are considered in formulating local and state regulatory actions.
   (2) Opportunities for operator training and information system support;
   (3) Administration of programs for joint purchasing of equipment and supplies to achieve economies of scale (public agencies only);
   (4) Other information resources.

c. "Non-recurring" Support Assistance can include, but is not limited to:
   (1) Loan of equipment or supplies to a system to handle a special circumstance (public agencies only, except that the District may support a privately-owned utility in case(s) of emergency, in the interest of public health and safety);
   (2) Providing engineering/or technical expertise to a system that lacks necessary staff for certain tasks (public agencies only);
   (3) Providing financial management/grant procurement assistance.

1.2.4.2 Review and Approval Procedures

a. The Applicant shall first establish the utility's eligibility for support and the scope of the service(s) desired.

b. The District shall provide an estimate of cost(s) for the service(s) requested.

c. The District and the Applicant shall execute a written agreement or formal contract that specifies the exact responsibilities (staffing, equipment, supplies, etc.) and charges for

the service(s) that the District will provide. This process will be expedited in case(s) of emergency.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
20435 72nd Ave. S. , Suite 200, K17-12 • Kent, Washington 98032 -2358

August 23, 2010

DAVID JOHNSON JR
SKAGIT COUNTY PUD 1 FIDALGO
PO BOX 1436
MT VERNON WA 98273-1436

Subject: Skagit County PUD No 1-Fidalgo Island (ID#00932)
Skagit County
Routine Sanitary Survey

Dave

Dear Mr. Johnson:

On June 14 and 18, 2010 I met with Dave Ostergaard, Mike Fox and other PUD staff and conducted a sanitary survey of the Fidalgo Island system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time District staff devoted to showing me your water system and answering my questions.

The attached reports contain several recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by October 1, 2010.

The fee for this survey has been consolidated with the fee for the Judy Reservoir system, which was conducted concurrently.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary, Water Quality Monitoring Requirements, Photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Sanitary Survey File

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: June 14 & 18, 2010

NAME OF SYSTEM: Skagit PUD-Fidalgo Island (ID#00932Y)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Dave Ostergaard, Mike Fox

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

Source/Treatment. This water system is located in west Skagit County and serves about 650, mostly residential connections. The source of supply is filtered surface water purchased from the City of Anacortes and delivered through three interties. No additional treatment is provided by the District.

Distribution. The distribution system is primarily ductile iron and asbestos cement. The system has five storage tanks at four locations and maintains five pressure zones. During this survey we inspected the Bridgeway and Similk tanks. The Bridgeway tanks were installed in the 1950's. The foundation of the northern tank has settled and caused cracking in the concrete walls. PUD staff have made improvements to the hatch and overflow since the previous survey. The Similk wood stave tank was installed in 1956 and has required significant efforts by the operators to keep it in working order. It currently has some minor leaks and a damaged stave.

Water Quality. This system is in compliance with all primary drinking water quality standards and is up-to-date with all of the monitoring requirements, as summarized in the attached table.

Design Approval/Planning. The District's most recent water system plan was approved by the department on November 12, 2008. According to the water system plan, the system is adequate for the projected growth. This system has a green operating permit, indicating that it is considered by the department to be adequate.

---------- RECOMMENDATIONS/DIRECTIVES ----------

1. The Bridgeway tanks should be scheduled for replacement due to their age and vulnerability to earthquake damage. In the interim, please install a screen or flap valve on the drain line discharge.

2. The Similk wood stave tank should be scheduled for replacement due to its high maintenance needs and vulnerability to earthquake damage. In the interim, please inspect the roof of the tank to ensure that all openings are screened, and that the mesh size is sufficient to exclude insects.

3. The District should evaluate measures such as fencing, intrusion alarms and telemetry to improve security at its reservoir sites.

WATER QUALITY MO[illegible]ORING COMPLIANCE

System Name: Skagit PUD Fidalgo ID#: 00932 County: Skagit

System Type: (A-Comm.) A-TNC, A-NTNC, B Population: 1655

DISTRIBUTION MONITORING

Type of Sample	# Samples	Frequency	Sample Location	Most Recent on File	Notes
Coliform bacteria	2	monthly	per your coliform monitoring plan ✓	5/24/2010	No positive samples past 2 yrs
Lead & Copper	10	3 years	customer's taps in high risk homes	Sept 2008 Pb_{90}=.002 Cu_{90}=.035	Next due Jun-Sep 2011
Chlorine Residual	1	daily	representative points in distribution system	May 2010	same time and location as coliform samples
Asbestos	1	9 years	in the distribution system	10/5/1999 (ND)	for systems with A/C pipe due 2010
D/DDB Stage 1 – TTHM & HAA5	Not required	under Stage 1			
D/DDB Stage 2	IDSE Std Mon Report approved by EPA			12/16/2009	Compliance mon. starts 2012 (Q4)

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

March 14, 2011

DAVE OSTERGAARD
OPERATIONS MANAGER
SKAGIT CO PUD
PO BOX 1436
MOUNT VERNON WA 98273-1436

Subject: Skagit PUD-Alger (ID#01400)
Skagit County
Routine Sanitary Survey

Dave

Dear Mr. Ostergaard:

On February 28, 2011 I met with you and other PUD staff and completed a sanitary survey of the Alger water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you all devoted to showing me your water system and answering my questions.

The attached report contains a number of recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by April 30, 2011.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2016.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The surveys for Alger, Cedargrove and Rockport were completed concurrently. The total cost for all three surveys is $1,836. The Office of Drinking Water has used state and federal funds to pay $918 of this amount. An itemized invoice showing the remaining amount due of $918 is enclosed.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary, Photos, Invoice)

cc (with enclosures): Lorna Parent, Skagit County Health Department
Mike Fox, Skagit PUD

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: February 28, 2011 (Follow-up meeting March 9, 2011)

NAME OF SYSTEM: Skagit PUD-Alger Water System (ID#01400K)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Mike Fox (operator), Dave Ostergaard (operations manager), Becky Zorn (CCS)

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system is located about 15 miles north of Mount Vernon next to the border with Whatcom County. It serves about 109 residential connections and 12 non-residential connections. The District formed two local utility districts (LUDs) to replace the majority of the old system and assumed ownership in 1999. The District has long term plans to merge this system with the Judy Reservoir system through the Bow Hill pump station. Although there have been past discussions regarding the possibility of extending wholesale service to the Lake Samish area in Whatcom County, the commissioners do not currently support this.

Source. The source of supply (AER350) is a 51-foot deep flowing artesian well drilled in 1960. According to the driller's log, the casing is perforated between 35 and 46 feet and has no surface seal. The 100-foot sanitary control area is undeveloped forest land with no evident sources of contamination. County records show that the well is located 322 feet from a closed County landfill. The installed submersible pump has a capacity of about 40 gpm and is controlled by a discharge pressure set point (86 psi = pump on) and timer (minimum run time of 540 minutes). The District holds water rights of 100 gpm and 100 acre-ft per year for this well.

There are no provisions for backup power at the well site. The existing SCADA system allows monitoring of pump status, and adjustment of pressure set point, but no control of the treatment system.

Treatment. The well is treated for manganese removal with chlorine oxidation and filtration using a manganese oxide media (ATEC). The chlorine feed pump is not flow-paced, but is wired to the well pump circuit. The filters are backwashed once per day, on a timer, and the backwash water is discharged to an adjacent infiltration pond. Samples of the treated water collected in September, 2010 had undetectable levels of iron and manganese.

The well has naturally occurring ammonia and the District maintains a total chlorine residual throughout the distribution system. With the lack of a free chlorine residual, there is not sufficient contact time to provide 4-log (99.99%) virus inactivation, if required in the future.

Distribution. The distribution system is divided into three pressure zones: the lower zone served directly from the well and storage tank and two small pumped zones. The system has 4.9 miles of ductile iron distribution piping, from 4 to 16 inches in diameter, installed in 1999. According to the hydraulic analysis in the District's plan, the main pressure zone provides adequate fire flows for the commercial and residential zoning. The system is completely metered.

All of the District's remote systems were flushed this year, using unidirectional flushing. Valves were located and exercised and the District conducted leak detection at that time. The District does not currently have a routine flushing/valve exercise program due to staffing limitations. The District has an active cross connection control program. The current priority for the program is working with local permitting authorities to make sure each new permit triggers a hazard evaluation. Routine testing of the cross connection control devices at Alger are tracked along with the main Judy reservoir system. *(no deficiencies found)*

Finished Water Storage. The system has a single 132,000 gallon Mt. Baker silo concrete storage reservoir located in fenced enclosure. The operators climb and inspect the top of the tank two to three times per year. This was most recently done approximately one week prior to our visit. The interior of the reservoir was last inspected by divers in 2007. It is on a five year inspection schedule and is being scheduled for this year. *(no deficiencies found)*

Pumping Facilities & Controls. The District operates two pumping facilities: the Cimmaron Ridge and the Appaloosa pump stations. The Cimmaron pump station is located adjacent to the storage reservoir and serves about one dozen homes. One of the two pumps (#2) has a variable frequency drive (VFD) and is set to maintain a constant discharge pressure of 90 psi. The second pump (#1) is controlled by a pressure switch. The combined capacity of the two pumps is about 71 gpm. Five bladder-style pressure tanks provide pump protection. The pump station has provision for a portable backup generator.

The Appaloosa pump station serves about 20 homes and has a single VFD pump. The pump is set to maintain a constant discharge pressure of 70 psi. A bladder-style pressure tank provides pump protection. The pump station has provision for a portable backup generator.

Water Quality Monitoring/Reporting. Drinking water provided by the system meets all primary and secondary drinking water standards and the District is in compliance with all drinking water monitoring requirements. Since the previous survey in 2005, the system has had no coliform monitoring or MCL violations. During the survey, the District provided an updated coliform monitoring plan for the system. *(no deficiencies found)*

System Management & Operation. The District is governed by three elected commissioners. The system has a green operating permit, indicating that it is considered by the Department to be in substantial compliance with regulatory requirements. The water system plan for the entire PUD service area was approved by the Department in November, 2008. The water system plan demonstrates that the system is adequate for buildout conditions within the original LUD boundaries: 219 equivalent residential connections. The capacity is limited by the installed well pump capacity.

The operators visit the system two to three times per week. *(no deficiencies found)*

Operator Certification. Mike is a certified water distribution manager (WDM1) and meets the water distribution specialist (WDS) certification required for this system. Becky Zorn is the certified cross connection control specialist (CCS) that oversees the District's cross connection control program. During the survey we discussed the Department's treatment plant rating process and determined that the plant most likely requires a certified basic treatment operator (BTO). The Department is currently updating its operator certification program regulations and guidance. One of the goals of this process is to clarify the relationship of the BTO and WTPO classifications. We will complete the formal rating of this treatment plant when that issue is completely resolved. In the interim, Mike is clearly qualified and capable of continuing to operate the treatment system.

Previous Survey Deficiencies. The most recent sanitary survey was completed in February, 2005. The following deficiencies were found:

- Update coliform monitoring plan to include better representation of routine sites and identify repeat sample sites *(completed)*
- Evaluate distribution chlorine residual & increase if necessary *(completed)*
- Evaluate need for O&M manual *(included in updated water system plan)*

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Alger system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. Thank you for the revised coliform monitoring plan. Please provide an additional map showing the distribution system west of the freeway. I recommend that you add a third routine sample site, possibly along old highway 99, to better represent the distribution system. All of your coliform monitoring plans should note the Groundwater Rule requirement for a raw water source sample in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system. *(Monitoring/Reporting)*

2. I recommend that you make provisions for backup power at the well site to improve reliability. *(Source)*

3. The well is over 50 years old and lacks a surface seal. The District should evaluate the need to replace this well based on the anticipated time frame for merging Alger with the Judy system. *(Source)*

4. To ensure that the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every three months is recommended. *(Treatment)*

5. Please provide current photos of the reservoir hatch, hatch seal and air vent. *(Storage)*

6. Cimmaron Ridge pump station: re-evaluate the number of pressure tanks now that a VFD pump is being used; provide a pressure relief valve on each pressure tank (on the tank side of the shutoff valve) per L&I requirements; and screen the relief valve that discharges outside the pump house. *(Pumping Facilities and Controls)*

7. Appaloosa pump station: Provide a pressure relief valve on the pressure tank (on the tank side of the shutoff valve); evaluate pump capacity for summer demands. *(Pumping Facilities and Controls)*

Thank you for photos documenting the new source water tap, screened relief valve discharge and screened backwash discharge at the treatment building and the screened air relief discharge at the Appaloosa pump station that you completed following my visit.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

March 18, 2011

DAVE OSTERGAARD
OPERATIONS MANAGER
SKAGIT CO PUD
PO BOX 1436
MT VERNON WA 98273-1436

Subject: Skagit PUD-Cedargrove (ID#119174)
Skagit County
Routine Sanitary Survey

Dave
Dear Mr. Ostergaard:

On February 28, 2011 I met with you and other PUD staff and completed a sanitary survey of the Cedargrove water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you all devoted to showing me your water system and answering my questions.

The attached report contains a number of recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by April 30, 2011.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2016.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The cost for this survey is included in the invoice for the Alger system.

Sincerely

Nancy Feagin
Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary, Photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Mike Fox, Skagit PUD

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: February 28, 2011 (Follow-up meeting March 9, 2011)

NAME OF SYSTEM: Skagit Co PUD-Cedargrove Water System (ID#119174)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Mike Fox (operator), Dave Ostergaard (operations manager), Becky Zorn (CCS)

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system is located on the south side of the Skagit River near Concrete. It serves 184 residential connections and 1 non-residential connection. The District formed a local utility district (LUD), reconstructed the system and assumed ownership in 1991.

Source. The source of supply (AET032) is a 170-foot deep well drilled in 1989. According to the driller's log, the casing is screened between 155 and 165 feet and has a surface seal. The 100-foot sanitary control area is undeveloped with no evident sources of contamination. The installed submersible pump has a capacity of 175 gpm. The well has provision for a portable backup generator. The existing SCADA system allows monitoring of pump status and adjustment of pressure set point, but no control of the treatment system.

The District holds water rights of 262 gpm and 53.8 acre-ft per year for this well.

Treatment. The well is treated for iron and manganese removal with chlorine oxidation and filtration using a manganese oxide media (ATEC). Samples of the treated water collected in September 2010 had no detectible iron and 0.007 mg/L, well below the secondary standard. The District maintains a free chlorine residual throughout the distribution system. The well pumps directly to distribution, providing minimal contact time to the first customer if disinfection is required in the future.

Distribution. The distribution system has a single pressure zone. The distribution piping consists of 4, 6, 8 and 10-inch ductile iron pipe and provides a residential level of fire flow. The system is completely metered.

All of the District's remote systems were flushed this year, using unidirectional flushing. Valves were located and exercised and the District conducted leak detection at that time. The District does not currently have a routine flushing/valve exercise program due to staffing issues. The current priority for the cross connection control program is working with local permitting authorities to make sure each new permit triggers a hazard evaluation.

Finished Water Storage. The system has a single 270,000 gallon bolted steel glass-lined Aquastore storage reservoir. The operators climb and inspect the tops of the tanks every two to three months. This was most recently done immediately following this visit and photos provided. The interior of the reservoir is on a five year inspection schedule was last inspected by divers in 2006.

Pumping Facilities & Controls. There are no booster pumping facilities.

Water Quality Monitoring/Reporting. Drinking water provided by the District meets all primary and secondary drinking water standards and is in compliance with all drinking water monitoring requirements. Since the previous survey in 2006, the system has had no coliform monitoring or MCL violations.

System Management & Operation. The District is governed by three elected commissioners. The system has a green operating permit, indicating that it is considered by the Department to be in substantial compliance with regulatory requirements. The water system plan for the entire PUD service area was approved by the Department in November, 2008. The water system plan demonstrates that the system is adequate for build-out conditions within the original LUD boundaries: 466 equivalent residential connections with water rights as the limiting factor.

Operator Certification. Mike is a certified water distribution manager (WDM1). Becky Zorn is the certified cross connection control specialist (CCS). During the survey we discussed the Department's treatment plant rating process and determined that the plant most likely requires a certified basic treatment operator (BTO). The Department is currently updating its operator certification program regulations and guidance. One of the goals of this process is to clarify the relationship of the BTO and WTPO classifications. We will complete the formal rating of this treatment plant when that issue is completely resolved. In the interim, Mike is clearly qualified and capable of continuing to operate the treatment system.

Previous Survey Deficiencies. The most recent sanitary survey was completed in March, 2006. The following deficiencies were identified during the previous survey:

- Update certified operator in DOH records *(completed)*
- Screen reservoir overflow/drain discharge *(completed)*
- Document ATEC filter efficiency *(completed)*
- Update coliform monitoring plan to include repeat sample sites *(completed)*
- O&M manual *(covered in water system plan)*

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Cedargrove system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. Thank you for the revised coliform monitoring plan. All of your coliform monitoring plans should note the Groundwater Rule requirement for a raw water source sample in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system. *(Monitoring/Reporting)*

2. The District should evaluate measures to improve monitoring and security at all its reservoir sites. Security measures such as intrusion alarms, surveillance and water quality monitoring systems should be considered in the context of the District's overall vulnerability assessment and emergency response program. *(Finished Water Storage)*

3. Please contact our certification program staff at 1-800-525-2536 and let them know that Todd Bos no longer works for your utility. *(Operator Certification)*

4. Correct freezing problem with upriver distribution sample taps. *(Distribution)*

5. To ensure that the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every three months is recommended. *(Treatment)*

Thank you for photos of the reservoir hatch & vent and items you completed following my visit:

- installation of a new raw water sampling tap
- screening of the air vac valve discharge
- screening of the filter backwash discharge

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

June 12, 2012

MICHAEL FOX
SKAGIT CO PUD - MARBLEMOUNT
PO BOX 1436
MT VERNON, WA 982731436

Subject: Skagit Co PUD-Marblemount Water System (ID# AA642)
Skagit County
Routine Sanitary Survey

Mike
Dear Mr. Fox:

On May 30, 2012 Bob James and I met with you and other PUD staff and conducted a sanitary survey of the Marblemount water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you devoted to showing us your water system and answering our questions.

Please review the attached report and call me at if you have any corrections, comments or questions. All of the items listed in the recommendation section of the summary should be completed. Please send a status report on your progress with these recommendations by August 1, 2012.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2017.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The total cost of this survey is $1,020. The Office of Drinking Water has used state and federal funds to pay $510 of this amount. An itemized invoice showing the remaining amount due of $510 is enclosed. Please remit your complete payment in the form of a check or money order within thirty days of the date of this letter to: **WDOH, Revenue Section, PO Box 1099, Olympia WA 99507-1099.**

Sincerely,

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations
(253) 395-6765

Enclosures (System Inspection/Meeting Summary; photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: May 30, 2012

NAME OF SYSTEM: Skagit Co PUD-Marblemount Water System (ID#AA642)

COUNTY: Skagit

THOSE ATTENDING: Mike Fox, Joe Dralle, Emilia Blake, Nancy Feagin & Bob James

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system serves the unincorporated community of Marblemount located on the North Cascades Highway about 50 miles east of Mount Vernon. It is the easternmost system operated by the PUD. Currently there are about 18 residential and 14 non-residential services, with a residential population of 30. Construction of this system was completed in 2006, replacing at least ten existing small public water systems that had inadequate setbacks and poor well construction.

Source. The source of supply is a 163-foot deep drilled well with an installed capacity of 100 gpm. This source has been rated by the department as having a low susceptibility to contamination. A condition of the water right permit issued by the Department of Ecology requires that 11 gpm of well water be returned to the stream whenever the Skagit River Mount Vernon stream gage drops below a set level. Since this system began operation, approximately one half of the well production has been used to augment streamflows.

Treatment. The water quality from this well is excellent and no treatment is provided.

Distribution. The system has 1.9 miles of 8-inch water mains. The majority of the system is C-900 PVC. The distribution system is adequate for domestic demands and a rural level of fire flow.

Storage. A 64,000 gallon Mount Baker-style concrete storage tank provides gravity storage to the entire system. The tank is currently in excellent condition with only a small amount of visible sediment. PUD has established a 5 to 7 year rotation for cleaning storage tanks, and has scheduled this tank for cleaning in 2013.

Pumping Facilities and Controls. Other than the well pump, there are no pumping facilities.

Water Quality Monitoring and Reporting. There have been no coliform monitoring or MCL violations since the previous survey in 2008. The PUD is currently in compliance with all water quality testing requirements and the water meets all primary and secondary standards. Two sample stations have been installed for distribution water quality monitoring.

System Management and Operation. This system has a green operating permit, which indicates that the system is considered to be in substantial compliance with drinking water regulations and adequate for existing uses and adding new service connections up to the approved limit. The PUD has a current water system plan that was approved by the Department in November, 2008. The plan indicates that the system is adequate for up to 43 equivalent residential connections (ERUs), with capacity limited by the annual quantity on the water right permit. Since there were no metered water use data from the system at that time, the analysis was based on an estimated annual demand of 400 gallons per day (gpd) per equivalent residential connection (ERU). Given water use patterns in rural Skagit County, this was likely a conservative estimate.

The system is monitored remotely using SCADA. Alarms setpoints include high and low reservoir levels, pump failure and power outage. Emergency chlorination of the well is feasible; however, the design of the system provides minimal contact time. Although coliform regrowth has not been a problem to date, the design of the system could cause stagnation of the water in the tank.

The well pump is wired for a portable generator. PUD does not own a portable generator and plans to obtain one from a local rental company if necessary. Mike estimates the system could operate for 3 to 5 days from gravity storage.

Operator Certification. Mike Fox is the certified operator for this system, and Becky Zorn is the cross connection control specialist. All of PUD's field staff are certified at the WDM2 level or above.

Previous Survey Deficiencies. The previous survey was completed in 2008 and identified two items needing follow-up action:

1. Screen the discharge end of the storage tank overflow/drain line. **(completed)**
2. Place a BAT test tag on the double check valve assembly protecting the fire truck filling hydrant. Becky Zorn provided records indicating that testing of all four backflow devices is up-to-date. **(completed)**

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Marblemount system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. Add a third coliform sample site at the east end of the system. Update the coliform monitoring plan to include a map and designated repeat sample sites. Discuss policy issues with management.
2. Replace the source water sample tap at the well with a smooth-nosed model with no interior or exterior threads. This will help prevent false positive samples.
3. Screen the discharge pipe on the air vac valve at the well site.
4. Remove yellow jacket nests from reservoir vent and hatch.

5. Eliminate the gap under the fencing around the storage reservoir
6. Re-evaluate system design capacity using metered water usage.
7. Revise design standards for remote systems to (1) facilitate future disinfection treatment and (2) minimize water age.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

June 8, 2012

MIKE FOX
DISTRIBUTION SUPERINTENDANT
SKAGIT CO PUD
PO BOX 1436
MT VERNON, WA 98273-1436

Subject: Skagit PUD-Mountain View Subdivision (ID#03774)
Skagit County
Routine Sanitary Survey

Mike

Dear Mr. Fox:

On April 16, 2012 I met with you and we completed a sanitary survey of the Mountain View water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you devoted to showing me your water system and answering my questions.

The attached report contains several recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by August 1, 2012.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2015.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The total cost of this survey is $1,020. The Office of Drinking Water has used state and federal funds to pay $510 of this amount. An itemized invoice showing the remaining amount due of $510 is enclosed. Please remit your complete payment in the form of a check or money order within thirty days of the date of this letter to: **WDOH, Revenue Section, PO Box 1099, Olympia WA 99507-1099.**

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Sanitary Survey File

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: April 16, 2012

NAME OF SYSTEM: Skagit Co PUD-Mountain View Subdivision Water System (ID#03774)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Mike Fox (operator)

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system is located east of Mount Vernon and the PUD's 645 HGL pressure zone at Eaglemont. It serves 14 residential connections with a population of about 30 residents. The system was installed by a private developer. The District assumed ownership in 1993 with the intention of eventually incorporating it into the main Judy Reservoir system. The system was reclassified as group A community public water system in 2011.

Source. The source of supply (AEH770) is a 380-foot deep well drilled in 1991. It is located in a dog-house style addition to the treatment building. According to the driller's log, the well has a surface seal and is screened from 370 to 380 feet. Covenants have been filed on the 100-foot sanitary control area, located on two adjacent residential properties.

The installed submersible pump has a capacity of 47 gpm. The District holds water rights of 41 gpm and 3.8 acre-ft per year for this well.

Treatment. The well is treated for manganese removal using an ion exchange water softener. A sample of the treated water collected in April 2011 had no detectible iron or manganese.

Distribution. The distribution piping consists of two parallel 3 inch diameter PVC water mains, one on each side of the road. Each line has two pressure reducing valves installed, separating the distribution system into three pressure zones. The system is completely metered and fire flows are not provided.

Finished Water Storage. The system has no gravity storage.

Pumping Facilities & Controls. There are no booster pumping facilities.

Water Quality Monitoring/Reporting. Coliform bacteria were detected in the system in December 2011 resulting in a non-acute MCL violation. No obvious source of contamination was identified and follow up sampling was negative for coliform bacteria.

Drinking water provided by the District currently meets all primary and secondary drinking water standards. Due to the small size of the system the District has found it difficult to obtain a sufficient number of volunteers to complete the required lead and copper tap samples. Despite this challenge, the system is currently in compliance with all drinking water monitoring requirements.

System Management & Operation. The District is governed by three elected commissioners. The system has a green operating permit, indicating that it is considered by the Department to be in substantial compliance with regulatory requirements. The water system plan for the entire PUD service area was approved by the Department in November, 2008. The water system plan demonstrates that the Mountain View system is currently at capacity.

Operator Certification. Mike is a certified water distribution manager (WDM1). Becky Zorn is the certified cross connection control specialist (CCS).

Previous Survey Deficiencies. This is the first routine sanitary survey for this system.

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Mountain View system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. Please provide a revised coliform monitoring plan, incorporating Groundwater rule requirements. *(Monitoring/Reporting)*

2. The well casing needs to be provided with an inverted screened vent. *(Source)*

Thank you for photo of the lock on the wellhead access hatch that you installed following my visit.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

May 10, 2012

MICHAEL R FOX, MANAGER
SKAGIT COUNTY PUD NO 1
PO BOX 1436
MT VERNON, WA 982731436

Subject: Skagit PUD-Potlatch Beach Water System (ID#69034L)
Skagit County
Routine Sanitary Survey

Mike
Dear Mr. Fox:

On March 14, 2012 Bob James and I met with you and completed a sanitary survey of the Potlatch Beach water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you devoted to showing us your water system and answering our questions.

The attached report contains several recommendations and/or deficiencies that require your attention. The most significant is the need to upgrade the level of disinfection. Call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. Please send a status report on your progress with these recommendations by July 1, 2012.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2017.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The total cost of this survey is $1,020. The Office of Drinking Water has used state and federal funds to pay $510 of this amount. An itemized invoice showing the remaining amount due of $510 is enclosed. Please remit your complete payment in the form of a check or money order within thirty days of the date of this letter to: **WDOH, Revenue Section, PO Box 1099, Olympia WA 99507-1099.**

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Dave Ostergaard, Skagit County PUD

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: March 14, 2012

NAME OF SYSTEM: Skagit PUD-Potlatch Beach (ID#69034)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Bob James, Mike Fox

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system serves Potlatch Beach Division 1, a 56-lot waterfront subdivision on the west shore of Guemes Island. There are currently about 32 residential services, with a population of 70 residents. PUD assumed ownership in the late 1990's at the request of the homeowner's association when their wells were experiencing severe sea water intrusion.

Source. The source of supply is treated seawater from Bellingham channel. The intake is a 10 foot-deep beach well combined with a buried infiltration pipe that extends out into the tidelands about 60 feet from the well. PUD has not had any clogging problems since the intake was installed in 1999, however, the well pump has failed multiple times due to corrosion. It was out of service in November 2009 through Jan 2010 and again immediately following this survey.

PUD maintains an emergency well (AAE847, S02-well #1) that is flushed monthly.

Treatment. The treatment system consists of a multimedia pressure filter, five 5-micron spiral-wound cartridge filters, reverse osmosis membranes, calcite contactor and hypochlorite disinfection (see attached schematic). Chlorine is injected after the clearwell to avoid damaging the membranes. The piping between the injection point and the first customer only provides about 97 gallons of contact storage. At the current flowrate of 17 gpm, this results in about 5.7 minutes of contact time prior to the first customer.

The treatment building has a remote camera that can rotate and zoom in on the monitoring displays and equipment. PUD staff use this to monitoring the plant from the mainland and can control and shut down the plant remotely if needed.

The treatment system has a capacity of 24,000 gallons per day (gpd). With peak summer demands under 4000 gpd, the system has substantial excess capacity.

Distribution. The system has one mile of 2 and 4-inch PVC piping. The distribution system is adequate for domestic demands but cannot support fire flow due to the size of the water mains.

Finished Water Storage. In addition to the small 1500 gallon clearwell at the treatment plant, the system has a 30,000 gallon Mount Baker style concrete storage tank. This facility provides gravity storage to lots 1-20.

Pumping Facilities and Controls. The upper lots, 21-56 are served by a small single-pump booster station.

Water Quality Monitoring and Reporting. The PUD is currently in compliance with all water quality testing requirements and the treated water meets all primary and secondary standards. Two sample stations have been installed for distribution water quality monitoring, one on the pumped line and one on the gravity line.

System Management and Operation. The design of the system has been reviewed and approved by the Department. The PUD has a current water system plan that was approved by the Department in November, 2008. The plan indicates that the system is adequate for up to 182 residential connections. Capacity is limited by the available storage capacity.

Operator Certification. The treatment plant has been rated by the Department as a level 2 plant. Dale Wardell, is listed as the certified water treatment plant operator for this system.

Previous Survey Deficiencies. The most recent survey was completed in 2007 and identified nine items needing follow-up action:

1. Obtain certification for day to day operators. **(not completed)**
2. Install a splash block on the reservoir overflow and a flap valve or screen on the drain line discharge. **(not completed)**
3. Establish chloride and/or conductivity trigger levels for membrane replacement. PUD has set the treatment criteria based on the secondary standard for chlorides, 250 mg/L. *(completed)*
4. Install a ASME pressure relief valve at pump station; consider backup power. **(need confirmation on prv, backup power under consideration)**
5. Revise monthly reports to include RO treatment data. *(completed)*
6. Establish emergency well procedures. PUD currently collects a monthly coliform and annual nitrate sample from this well. *(completed)*
7. Revise coliform monitoring plan. *(completed)*
8. Report on cross connection control program implementation status. Becky Zorn has completed the initial assessment. Educational materials are provided to residents using the consumer confidence report. *(completed)*
9. Complete stage 1 disinfection by-products monitoring. *(completed)*

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Potlatch Beach system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

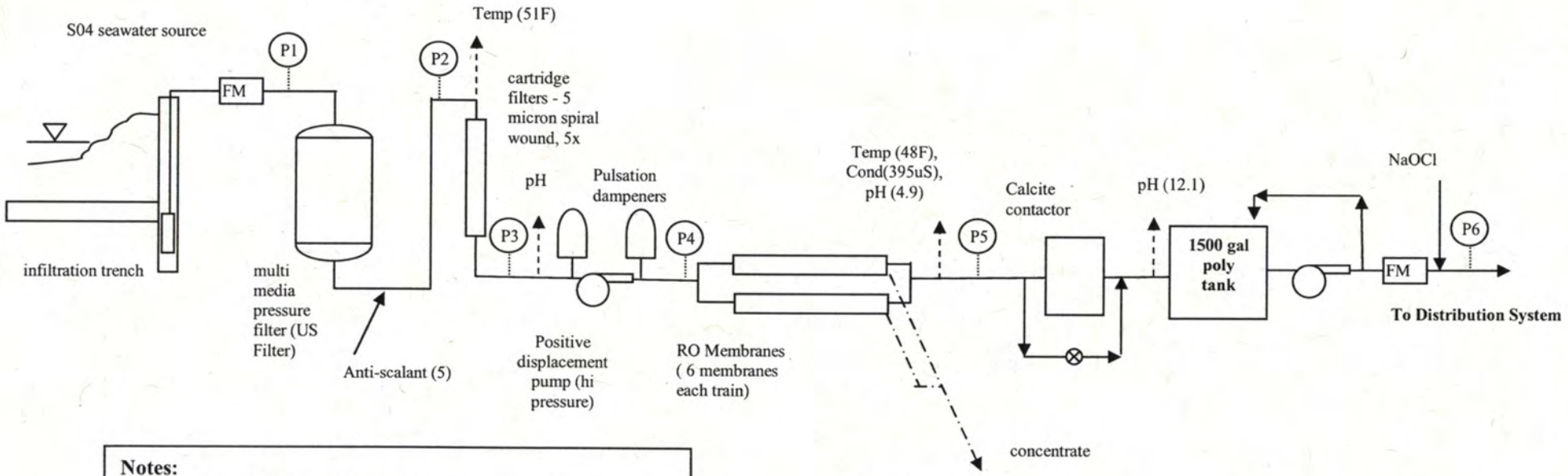
1. Complete items 1 and 2 above.
2. Confirm that the prv has been installed in the booster pump house (item 4 above).
3. Because seawater sources are vulnerable to contamination by viruses and to provide a multiple barrier of protection the level of disinfection treatment needs to be increased to

provide at least 99.99% (4-log) virus inactivation. Please submit a project report by September 1, 2012 to address this issue.

4. Evaluate alternatives to resolve the pump corrosion issue.
5. Please send a copy of your revised coliform monitoring plan that includes the new sample stations and incorporates the new groundwater rule requirements.
6. Complete a written monitoring plan for stage 1 disinfection by products. I gave Darlene a template she can use for that purpose.
7. Secure the well cap on the emergency well *(completed following the survey)*.

As I mentioned during the survey, we are planning to make some changes to the RO report form in the near future. Please stay tuned for more information.

Skagit PUD-Potlatch Beach (ID#69034)
Treatment Plant Schematic



Notes:

1. 20 gpm design flow (permeate)
2. multimedia filter backwashed with untreated seawater, when pressure drop abt 20 psi
3. cartridge filter housing replaced
4. membranes replaced 9/2004 (FilmTech SW30HR LE-400i)
5. Antiscalant: King Lee Tech Pretreat Plus 0100 (UL app)
6. check calcite level and top off every 2-3 mos
7. Flow no longer splits at calcite contactor
8. Add ¼ cup baking soda into clearwell each week
9. Plant on when clearwell at 700 gal, plant off at 1400 gal
10. Finished water pump recirculates 2/3 flow back to clearwell
11. chlorine feed pumps at constant rate when booster pump energized. Target chlorine residual: 0.2-0.4 mg/L
12. Chlorine contact: 149 LF, 4 in diam HDPE, 97 gal, 5.7 min at current flowrate

Alarm Setpoints (from design documents):

Inlet pressure (P3) low: 20 psig (plant can't operate at low tide)
Inlet temperature High: 85 F
High pressure pump discharge pressure (P4) high: 1100 psig
Permeate Conductivity High: 800 uS/cm
Permeate pressure (P5) high: 80 psig

Flowrates:
Raw water-77gpm
Permeate-15 gpm
Concentrate-46 gpm
Finished water-17 gpm

Pressure Gage Readings (psig)
P1-63 psi
P2-44 psi
P4-660 psi
P6-45 psi

03/14/12 NF

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

March 14, 2011

DAVE OSTERGAARD
OPERATIONS MANAGER
SKAGIT CO PUD
PO BOX 1436
MT VERNON WA 98273-1436

Subject: Skagit PUD-Rockport (ID#73600)
Skagit County
Routine Sanitary Survey

Dave
Dear Mr. Ostergaard:

On February 28, 2011 I met with you and other PUD staff and completed a sanitary survey of the Rockport water system. The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. I appreciate the time you all devoted to showing me your water system and answering my questions.

The attached report contains a number of recommendations and/or deficiencies that require your attention. Please call me at (253) 395-6765 if you have any corrections, comments or questions regarding this report. I would appreciate a status report on your progress with these recommendations by April 30, 2011.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2016.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The cost for this survey is included in the invoice for the Alger system.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations

Enclosures (System Inspection/Meeting Summary, Photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department
Mike Fox, Skagit PUD
Dave C. Johnson, Regional Mgr, Washington State Parks

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20435 72nd Avenue South, Suite 200, Kent, Washington 98032-2358

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: February 28, 2011 (Follow-up meeting March 9, 2011)

NAME OF SYSTEM: Skagit PUD-Rockport Water System (ID#736006)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Mike Fox (operator), Dave Ostergaard (operations manager), Becky Zorn (CCS)

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. This system is located about 45 miles east of Mount Vernon along the North Cascades Highway. It serves the unincorporated town of Rockport with about 54 residential connections and 6 non-residential (commercial) connections. The District reconstructed the system and assumed ownership in 1991, replacing the old untreated surface water supply.

Source. The source of supply (AET032) is a 344-foot deep well drilled in 1976 at Rockport State Park. According to the driller's log, the casing is screened between 334 and 339 feet and has a surface seal. The 100-foot sanitary control area lies completely within the park and there are no evident sources of contamination. The installed submersible pump has a capacity of about 35 gpm. The well has provision for a portable backup generator. The existing SCADA system allows monitoring of pump status and adjustment of pressure set point, but no control of the treatment system (see below).

The District holds water rights of 95 gpm and 19 acre-ft per year for this well.

The District shares use of the well with Rockport State Park (ID# SP740). State Parks has shut down the camping area and is currently day-use only. The State Park has its own storage reservoir and currently serves a restroom and caretaker's residence. According to DOH records, PUD is the satellite management agency for the park system; however, it appears that the roles and responsibilities of each party are not well documented.

Treatment. The well is treated for manganese removal with chlorine oxidation and filtration using a manganese oxide media (ATEC). Samples collected in September, 2010 showed that the treated water had iron at 0.21 mg/L and manganese at 0.029 mg/L, both below the secondary standard. The District maintains a free chlorine residual throughout the distribution system. According to DOH files, the system has about 4500 feet of 4- inch diameter transmission line between the well and storage tank. If disinfection is required in the future, it appears that there would be sufficient contact time to provide 4-log (99.99%) inactivation of viruses to the townsite residents. Contact time to the state park may not be adequate, and would need to be evaluated based on the installed facilities. *(no deficiencies found)*

Distribution. The distribution system consists of a single pressure zone. There are 2.7 miles of 4, 6 and 8 inch diameter PVC distribution piping, installed in 1999. According to the hydraulic analysis in the District's plan, the system provides adequate fire flows for the residential zoning. The system is completely metered.

All of the District's remote systems were flushed this year, using unidirectional flushing. Valves were located and exercised and the District conducted leak detection at that time. The District does not currently have a routine flushing/valve exercise program due to staffing limitations. The District has an active cross connection control program. The current priority for the program is working with local permitting authorities to make sure each new permit triggers a hazard evaluation.

Finished Water Storage. A single 60,000 gallon Mt. Baker silo (concrete) storage reservoir provides gravity storage to the entire system. The operators climb and inspect the top of the tank two to three times per year. This was done immediately following our visit and photos provided. The interior of the reservoir is on a five year inspection schedule and is due to be inspected by divers this year.

Pumping Facilities & Controls. There are no booster pumping facilities.

Water Quality Monitoring/Reporting. Drinking water provided by the District meets all primary and secondary drinking water standards. The system is in compliance with all drinking water monitoring requirements, with the exception of disinfection by-products. The District provided an updated coliform monitoring plan during the survey. Since the previous survey in 2006, the system has had no coliform monitoring or MCL violations.

During the survey, the sample tap on Highway 20 was found to be frozen.

System Management & Operation. The District is governed by three elected commissioners. The system has a green operating permit, indicating that it is considered by the Department to be in substantial compliance with regulatory requirements. The water system plan for the entire PUD service area was approved by the Department in November, 2008. The water system plan demonstrates that the system is adequate for up to 100 residential connections and the 6 existing non-residential connections, limited by existing water rights. *(no deficiencies found)*

Operator Certification. Tod Bos is still listed in DOH records as the certified operator for this system. Mike has taken over since Tod retired. He is a certified water distribution manager (WDM1) and meets the water distribution specialist (WDS) certification required for this system. Becky Zorn is the certified cross connection control specialist (CCS) that oversees the cross connection control program. During the survey we discussed the Department's treatment plant rating process and determined that the plant most likely requires a certified basic treatment operator (BTO). The Department is currently updating its operator certification program regulations and guidance. One of the goals of this process is to clarify the relationship of the BTO and WTPO classifications. We will complete the formal rating of this treatment plant when that issue is completely resolved. In the interim, Mike is clearly qualified and capable of continuing to operate the treatment system.

Previous Survey Deficiencies. The most recent sanitary survey was completed in February, 2006. The following deficiencies were identified in the previous survey:

- Submit treatment plans to DOH for review/approval *(complete)*
- Evaluate Howard Miller steelhead park peaks & demands *(included in water system plan)*
- Verify distance from well to nearest septic tank drainfield *(campground closed)*

---------- RECOMMENDATIONS/DIRECTIVES ----------

The Rockport system is very well operated and maintained with excellent professional oversight. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. A screened vent should be installed on the well casing to allow controlled entry of air when the submersible pump turns on.

2. The fence at the reservoir site needs to be repaired. The District should evaluate measures to improve monitoring and security at all its reservoir sites. Security measures such as intrusion alarms, surveillance and water quality monitoring systems should be considered in the context of the District's overall vulnerability assessment and emergency response program.

3. Please meet with State Parks and clarify roles and responsibilities for their system. Now that Rockport State Park is day use only, can the State Park system be incorporated into the PUD system?

4. Thank you for the revised coliform monitoring plan. All of your coliform monitoring plans should note the Groundwater Rule requirement for a raw water source sample in addition to your normal repeat samples whenever coliform bacteria are found in the distribution system. *(Monitoring/Reporting)*

5. Correct freezing problem with upriver distribution sample taps.

6. Please contact our certification program staff at 1-800-525-2536 and let them know that Todd Bos no longer works for your utility.

7. Locate the missing TTHM & HAA5 sample results for 2008, or re-sample in August 2011.

8. To ensure that the treatment system continues to operate properly, both raw and finished water should be routinely sampled for iron and manganese. Every three months is recommended. *(Treatment)*

Thank you for photos of the reservoir hatch and vent and photos documenting items you completed following my visit:

- installation of a new raw water sampling tap
- sealing of the well casing
- screening of the air relief valve discharge

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310, Kent Washington 98032-2388

June 3, 2013

MICHAEL FOX
SKAGIT VIEW VILLAGE WATER SYSTEM
PO BOX 1436
MT VERNON, WA 982731436

Subject: Skagit PUD-Skagit View Village Water System (ID# 96879)
Skagit County
Routine Sanitary Survey

Mike

Dear Mr. Fox:

On May 22, 2013 Bob James and I met with you and we completed a sanitary survey of the Skagit View Village water system.

The purpose of the sanitary survey program is to identify potential problems and assist you in complying with the Drinking Water Regulations. We appreciate the time you devoted to showing us your water system and answering our questions. Please review the attached report and call me at if you have any corrections, comments or questions. You are responsible for correcting all of the deficiencies noted in the attached survey report. Please send a status report on your progress with these recommendations by August 1, 2013.

Based on the criteria in WAC 246-290-416, your next survey is due in the calendar year 2018.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The total cost of this survey is $ 1020. The Office of Drinking Water has used state and federal funds to pay $ 510 of this amount. An itemized invoice showing the remaining amount due of $ 510 is enclosed.

Sincerely

Nancy Feagin

Nancy Feagin, P.E.
Regional Engineer
Northwest Drinking Water Operations
(253) 395-6765

Enclosures (system inspection/meeting summary, photos)

cc (with enclosures):
Lorna Parent, Skagit County Health Department

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310, Kent Washington 98032-2388

SYSTEM INSPECTION/MEETING SUMMARY

DATE OF VISIT: May 22, 2013

NAME OF SYSTEM: Skagit View Village (ID#96879)

COUNTY: Skagit

THOSE ATTENDING: Nancy Feagin, Bob James, Mike Fox (water distribution manager)

REASON FOR INSPECTION: Routine Sanitary Survey

---------- OBSERVATIONS ----------

General. The system is located in the Skagit River valley near the Town of Concrete. The service area contains about 70 existing homes with a mix of full and part-time residents. Potential buildout within the boundaries of the LUD service area is 128 equivalent residential connections (ERUs).

Source. The source of supply is a 54 foot deep drilled well (AET015) with an installed capacity of 50 gpm. The well pumps directly to the distribution system and is controlled by a pressure transducer at the base of the storage tank. PUD holds water rights for up to 38.4 acre-ft/year and an instantaneous quanity of 200 gpm, of which 80 gpm is interruptible.

Treatment. The source water has elevated levels of iron (up to 0.50 mg/L) and manganese (up to 0.045 mg/L), and contains naturally occurring carbon dioxide which makes it corrosive to copper plumbing. The treatment system as currently configured was installed in 2010 and addresses all three of these issues. It consists of an ATEC® iron and manganese removal system (chlorine injection followed by filtration with pyrolucite media), and a limestone contactor for corrosion control. The calcite contactor was designed to reach a target pH of 7.5. Although actual pH measurements fall below that goal, lead and copper samples collected from customers' taps in 2010, 2011 and 2012 were below the EPA action levels. Iron and manganese testing during the past year shows levels of iron and manganese in the treated water at or below the detection limit. These results indicate that the treatment system is functioning as intended.

Distribution. The distribution system consists of a single pressure zone, with 2.6 miles of 4, 6, 8 and 12-inch ductile iron piping. A rural residential level of fireflow is available. The distribution systems of all of PUD's remote systems were flushed in 2011; however, due to staffing limitations PUD does not have a program of routine flushing and exercising valves.

Finished Water Storage. The system has one 26 foot diameter, 40 foot tall Mount Baker concrete storage reservoir with a capacity of 157,000 gallons. The reservoir is located south of the South Skagit Highway and provides gravity storage to the system. PUD staff inspected the top of the

reservoir approximately one week prior to the survey and provided photos of the hatch and vent. The reservoir is scheduled for an internal inspection and cleaning this summer. It will be the first cleaning since the reservoir was placed into service in 2006.

Pumping Facilities and Controls. Other than the submersible well pump, there are no pumping facilities. The system has a transfer switch and is wired to accept a portable generator. PUD relies on a local rental company to provide the portable generator when needed.

Water Quality Monitoring and Reporting. The system is currently in compliance with all water quality testing requirements and the treated water meets all primary and secondary standards.

System Management and Operation. Ownership of this system was transferred to PUD in 2004. The PUD is governed by a board of three elected commissioners. The system is covered by the PUD's water system plan, which was approved by the Department in 2008. According to the engineering evaluation contained in the plan, the system has sufficient capacity for up to 128 equivalent residential units, with the limiting factor being the connection limit on the water right permit.[1] Storage capacity is the limiting factor for the system's *physical* capacity. The system has a green operating permit, indicating that it is considered to be in substantial compliance with the drinking water regulations. The department considers systems in this category as adequate for existing uses and adding new service connections up to the number of approved service connections.

Operators visit the system twice per week. In addition, the system is monitored remotely via telemetry. Parameters include well pump status, chlorine residual, pH and reservoir level. Alarms trigger a call to the on-call operator.

Operator Certification. The system is required to have a certified water distribution specialist operating the system. Mike Fox, holds a water distribution manager 1 and fills the mandatory certified operator position for the system.

Previous Survey Deficiencies. The most recent survey was completed in August, 2010 and identified the following items needing follow-up action:

1. Revise the coliform monitoring plan to include the new sample stations. *(completed)*

2. Complete a second round of lead and copper tap sampling during the second half of 2010. *(completed)*

3. Send copies of the as-built distribution system plans. *(completed)*

4. Install a screen or flap valve on the backwash discharge line *(completed)*.

5. Begin recording pump house chlorine levels on the field data sheet. *(completed)*

6. Replace the operator interface screen on the telemetry panel. *(completed)*

---

[1] Connection limits contained within water rights documents may no longer be valid due to the Municipal Water Law. Please contact the Department of Ecology for information.

7. Connect the well level probe to the telemetry system. *(completed)*

---------- RECOMMENDATIONS/DIRECTIVES ----------

PUD provides excellent management and oversight of this system. The following measures are necessary to comply with regulations, safeguard the water quality in your system and improve management of the system:

1. Seal the opening in the reservoir overflow discharge or replace it with a flap valve. ✓ Done
2. Replace the reservoir hatch seal, as it is showing signs of deterioration. Sent Pics
3. Complete the remaining elements of your draft revised coliform monitoring plan.
4. Develop a system-wide program for routine flushing and exercising of distribution system valves. ✓
5. Continue to explore options to assure availability of portable generators and fuel during emergency conditions. ✓