Public Utility District No. 1 of Whatcom County

Comprehensive Drinking Water System Plan Update 2021

FINAL DRAFT

JANUARY 2022

Prepared By:
Wilson Engineering, LLC
805 Dupont St #7
Bellingham, WA 98225
360-733-6100
and
Dave Olson
Water System Services, Inc.
6951 Hannegan Rd. #2
Lynden, WA 98264
360-739-5661

Prepared By:

Wilson Engineering, LLC

805 Dupont St #7

Bellingham, WA 98225

360-733-6100

and

Dave Olson

Water System Services, Inc

6912 Hannegan Rd. #105

Lynden, WA 98264

360-739-5661

and substantial portions of Chapter 4:

Thomas D Mortimer, Jr., Attorney

1325 4th Avenue #940

Seattle, WA 98101

This Comprehensive Water System Plan Update was completed under the direction of the professional engineer whose seal and signature appears below, and licensed in the State of Washington under Chapter 18.43 RCW.

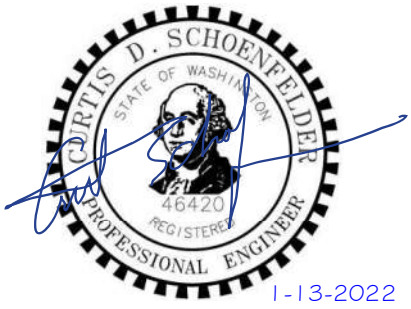


Table of Contents

Glossary of Terms v

List of Acronyms viii

Introduction x

1. Description of Water System 1

1.1 Authority and Management 1
1.2 System Background 2
1.3 Overview of Existing Water Systems 14
1.4 Inventory of Existing Facilities 14
1.5 Related Plans/Documents 17
1.6 Service Area Characteristics 18
1.7 Retail Service Area 20
1.8 Service Area Agreements 21
1.9 Service Area Policies 21
1.10 Satellite Management Agencies 24
1.11 Complaints 25
1.12 Consistency from Local Planning and WRIA 25

2. Basic Planning, Data and Water Demand 34

2.1 Current Population and Service Connections 34
2.2 Water Use Data Collection and Demand Forecast 35
2.3 Water Use Data 35
2.4 Distribution System Leakage 37
2.5 Customer Classes, Large Users, and Seasonal Variations 37
2.6 Average Day Demand 40
2.7 Maximum Day Demand 40
2.8 Peak Hourly Demand (PHD) 41
2.9 Projected Land Use, Population, and Future Demands 41

3. System Analysis 46

3.1 System Design and Construction Standards 46
3.2 Water Quality Standards 48
3.3 Water Quality Analysis 51
3.4 System Analysis 51
3.5 Summary of System Deficiencies and Required Improvements 62

4. Water Resources 64
4.1 PUD Water Supply Source Characteristics 64
4.2 Water Resource Management Plans 67
4.3 Existing Water Rights 71
4.4 Water Right/Service Area Adjustments/Issues 78
4.5 Regional Water Management: North Whatcom County 79
4.6 New Source Development: Grandview System 80
4.7 Water Resource Alternatives 80
4.8 Water Use Efficiency 81
4.9 Water Resource Management Actions 83
5. Source Water Protection 85
5.1 Wellhead Protection Program 85
6. Operations and Maintenance Program 88
6.1 Water System Management and Personnel 88
6.2 Operator Certifications 89
6.3 System Operation and Control 89
6.4 Summary of Operations and Maintenance Deficiencies 91
6.5 Comprehensive Water Quality Monitoring (Regulatory Compliance) Plan 91
6.6 Emergency Response Program 91
6.7 Cross-Connection Control Program 100
6.8 Sanitary Survey Findings 101
6.9 Customer Complaint Response Program 101
6.10 Record Keeping and Reporting 102
7. Distribution Facilities Design and Construction Standards 103
7.1 Project Review Procedures 103
7.2 Policies and Requirements for Outside Parties 103
7.3 Design and Construction Standards 103
7.4 Construction Certification and Follow-up Procedures 103
8. Capital Improvement Program 104
8.1 Prioritizing Potential Improvements 104
8.2 Improvement Schedule and Estimated Project Costs 105
9. Financing and Implementation 107
9.1 Past and Present Financial Status 107
9.2 Available Revenue Sources 107

9.3 Water Rates 108

10. Miscellaneous Documents 110

10.1 Supportive Documents 110
10.2 Agreements 110
10.3 Comments on Water System Plan 110
10.4 Water Rights 110
10.5 Documents Incorporated by Reference 110

Table Index

Table 1-1 Sources of Supply 15
Table 1-2 Existing Groundwater Water Rights 15
Table 1-3 Storage 15
Table 1-4 Booster Stations 15
Table 1-5 Pressure Tanks 16
Table 1-6 Pipe Inventory 16
Table 2-1 Existing Land Use and Service Connections, and Proposed Land Use 35
Table 2-2 Historical Water Production (gallons) 36
Table 2-3 Historical Water Consumption (gallons) 36
Table 2-4 Distribution System Leakage 37
Table 2-5 Large and Small Connections Water Use 38
Table 2-6 Large Users Water Use (gallons) 38
Table 2-7 Average Day Demand 40
Table 2-8 Method #1 Estimation of Maximum Day Demand 40
Table 2-9 Projected Average Day, Maximum Day, and Peak Hour Demand 43
Table 3-1 Design Standards 46
Table 3-2 Existing Water Quality Regulations Applicable to the PUD GV-NG Potable System 49
Table 3-3 Future Water Quality Regulations Applicable to the PUD 50
Table 3-4 Existing Groundwater Right Analysis – Existing (2019) Status 51
Table 3-5 Existing Instantaneous Groundwater Rights Analysis 52
Table 3-6 Maximum Annual Withdrawal Existing Groundwater Rights Analysis 52
Table 3-7 Source Capacity Analysis, Based on Well Pump 53
Table 3-8 Source Capacity Analysis, Based on Well Production Capacity 54
Table 3-9 Booster Station Analysis 55
Table 3-10 Storage Analysis 58

Table 4-1	Whatcom PUD Water Rights	71
Table 4-2	Water Demand Forecasts w/ and /o WUE and Projected Water Savings	83
Table 6-1	Grandview-Northgate Operator Certifications	89
Table 6-2	Routine System Operations	90
Table 6-3	Preventative Maintenance Program	91
Table 6-4	Water Facilities Affected by Various Disasters	98
Table 6-5	Emergency Conditions Caused by Various Disasters	98
Table 8-1	Capital Improvement Plan, 20-yr	106
Table 9-1	Water Rate Structure (effective 2019)	108

Figure Index

Figure 1-1	Location Map	1
Figure 1-2	Overall Service Map	26
Figure 1-3	Industrial Water Supply System	27
Figure 1-4	Cherry Point Retail Service Area	28
Figure 1-5	Grandview-Northgate Retail Service Area	29
Figure 1-6	Water Bodies and Terrain	30
Figure 1-7	GV-NG Service Area and Ferndale Annexation Phasing Plan	31
Figure 1-8	Cherry Point / Grandview-Northgate Area Zoning	32
Figure 1-9	Grandview-Northgate Facility Schematic	33
Figure 2-1	Monthly Water Use 2014-2019	39
Figure 5-1	Wellhead Protection Area	87
Figure 6-1	USGS Mt Baker Volcanic Eruption Inundation Zone Map	96

Appendices

A Distribution System Analysis – Hydraulic Modeling
B Water Quality Data & Monitoring Plans
C Design and Construction Standards
D Financial Data
E Wellhead Protection Plan
F Praxair Water System Documents
G Fire System Documents
H Cross-Connection Control Program

Glossary of Terms

The following terms are used in this report. It should be noted that in contracting with customers, some similar terms are used, however contract terms are as defined in the contracts and should not be confused with terms used in this Plan.

Consumption: The volume of water used by the water system's customers, based on customer meter records. The volume is measured at each customer's connection to the distribution system.

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.

Demand: The quantity of water obtained from the water supply source over a given period of time to meet the needs of customers and also includes system losses, and miscellaneous other water uses. Demands are normally discussed in terms of flow rate, such as million gallons per day (mgd) or gallons per minute (gpm). The flow rates can be described in terms of a volume of water delivered during a specific time period. Flow rates pertinent to the analysis and design of water systems are:

> ***Average Day Demand (ADD*)**: The total quantity of water use from all sources of supply as measured or estimated over a calendar year divided by three hundred sixty-five. ADD is typically expressed as gallons per day (gpd) per equivalent residential unit (ERU).
>
> ***Maximum Month Demand (MMD):*** The total volume of water delivered to the water system during the month of maximum water use divided by the number of days in the month.
>
> ***Maximum Day Demand (MDD):*** The highest actual or estimated quantity of water that is, or is expected to be, used over a twenty-four hour period, excluding unusual events or emergencies. MDD is typically expressed as gallons per day per ERU (gpd/ERU).
>
> ***Peak Hourly Demand (PHD):*** The maximum rate of water use that can be expected to occur within a defined service area over a continuous sixty minute time period. PHD is typically expressed in gallons per minute (gpm).

Distribution System Leakage (DSL): The annual amount of water calculated from the difference between the measured amount of water supplied into the system and the measured amount of water taken out of the system for consumption and other authorized uses. Authorized uses include both metered and unmetered water uses. Water use that is unmetered must be estimated to be classified as an authorized use. Examples of common unmetered water uses include the use of hydrants for flushing, fire fighting, and construction. The calculated DSL volume consists primarily of water loss through leaks in the water system, but may also include meter inaccuracies, meter reading errors, water theft, and reservoir overflows.

Emergency Storage: Another term commonly used for standby storage. The volume of stored water available for use during a loss of source capacity, power, or similar short-term emergency.

Equalizing Storage: The volume of storage needed to supplement supply to consumers when the peak hourly demand exceeds the total source pumping capacity.

Equivalent Residential Units (ERU's): One ERU represents the amount of water used by one single family residence for a specific water system. The demand of other customer classes can be expressed in

terms of ERU's by dividing the demand of each of the other customer classes by the demand represented by one ERU.

Fire Flow: The maximum rate and duration of water flow needed to suppress a fire under WAC 246-293-640 or as required under local fire protection authority standards.

Fire Storage: Fire storage is reservoir capacity required to sustain fire flows over a given period of time.

Head: A measure of pressure or force exerted by water. Head is measured in feet and can be converted to pounds per square inch (psi) by dividing feet by 2.31.

Head Loss or Pressure Loss: A reduction in pressure caused by pipeline wall friction, bends, physical restrictions, or obstructions as water moves through a pipeline.

Hydraulic Elevation: The height of a free water surface above a defined datum; the height above a datum to which water in a pressure pipeline would rise in a vertical open-end pipe.

Industrial Grade Water: Industrial grade water is surface water, which has been treated in the PUD conventional water treatment process to meet the requirements of industrial, irrigation and agricultural water users. For purposes of this Plan, industrial grade water is non-potable water.

Maximum Contaminant Level (MCL): The maximum permissible level of contaminant in the water that the purveyor delivers to any public water system user, measured at the locations identified under WAC 246-290-310.

Non-revenue Water: Non-revenue water is water produced (and metered at the source) and sent to the distribution system that is not metered as sales to customers. Some of the non-revenue water is for authorized uses such as, system flushing, fire training and firefighting, while some is unauthorized uses such as theft and leakage.

Non-potable Water: Non-potable water is partially treated water produced by the PUD's conventional water treatment plants. The water is suitable for a variety of uses including industrial water use; irrigation use; fire fighting use or as a water supply for further treatment to produce potable water. Another type of non–potable water is the Grandview fire system, which is separate from the Grandview potable system, and is used only for fire protection.

Overall Service Area: The overall water service area boundary includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham, Washington.

Peaking Factor: A peaking factor is a dimension-less parameter used to express the relationship among maximum day demand, peak-hour demand, and maximum month demand as a ratio to the average day demand. The peaking factor used for planning and design purposes is often based on the most severe peaking trends observed on a historical basis.

Potable Water Supply/System: Potable water supply/system is water and the system to deliver the water that is suitable for human consumption and meets all of the drinking water requirements of the Washington Department of Health and the Environmental Protection Agency.

PUD: PUD is the Public Utility District No. 1 of Whatcom County.

Purveyor: An agency, subdivision of the State, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, persons, or other entity owning or operating a public water system. Purveyor also means the authorized agents of such entities.

Remote/Satellite System: A public water system, located within the designated service area of a utility, which is detached from the primary facilities of the utility. A remote system has its own source of supply, unless it connects to the utility's primary source and distribution facilities.

Retail Water Service Area: The PUD's Retail Water Service Area is the area identified in the Whatcom County Coordinated Water System Plan, as amended in which the PUD provides potable water service directly to end user customers. The retail water service area is equivalent to the water service area as envisioned in the Water System Coordination Act, RCW 70.116.

Service (Pressure) Zone: A service zone is a water subsystem operating at a common hydraulic elevation.

Standby Storage: The volume of stored water available for use during a loss of source capacity, power, or similar short-term emergency.

Turbidity: Turbidity is a measure of suspended particles in water and is measured in nephelometric turbidity units (NTU).

Water Service Area: When not identified as the Wholesale Water Service Area, is the area in which the PUD provides service directly to end user customers. As used in this Plan, the Water Service Area has the same meaning as **Retail Water Service Area**.

Water Utility: Water utility is the business function of the PUD associated with providing both potable and non-potable water to customers.

Wholesale Water Service Area: The portion of Whatcom County identified in the Whatcom County Coordinated Water System Plan, as amended, in which the PUD may provide water to existing purveyors which may have current or anticipated future water supply needs. Wholesale water service is provided to purveyors who continue to provide direct service to their end user customers. Service is dependent on the PUD having or obtaining sufficient water available and that service can be provided under terms acceptable to the PUD. In general service will be provided upon request when service is feasible. Water provided may be potable water or it may be non-potable water for treatment by the purchasing purveyor.

List of Acronyms

ADD	Average Day Demand
AF	Acre-Feet
CF	Cubic Feet
CIP	Capital Improvement Plan
CWSP	Coordinated Water System Plan
DBPR	Disinfection By-Product Rule
DOH	Department of Health
DS	Dead Storage
DSL	Distribution System Leakage
DWSRF	Drinking Water State Revolving Fund
EDB	Ethylene Dibromide
EPA	United States Environmental Protection Agency
ERU	Equivalent Residential Unit
ES	Equalizing Storage
fps	Feet per Second
FSS	Fire Suppression Storage
GIS	Geographic Information System
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
gpm	Gallons per Minute
GWR	Groundwater Rule
HGL	Hydraulic Grade Line
IOC	Inorganic Chemical
L	Liter
LCR	Lead and Copper Rule
MCL	Maximum Contaminant Levels
MDD	Maximum Daily Demand
MG	Million Gallons
MGD	Million Gallons per Day
mg/l	Milligrams per Liter
MWS	Municipal Water Suppliers
OFM	State of Washington Office of Financial Management
OS	Operational Storage
PHD	Peak Hour Demand
PRV	Pressure-Reducing Valve
psi	Pounds per Square Inch
PWTF	Public Works Trust Fund
RC	Reliable Capacity
RCW	Revised Code of Washington
RR	Rural Residential
RWSA	Retail Water Service Area

SB	Standby Storage
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act
SOC	Synthetic Organic Chemical
TC	Total Capacity
TCR	Total Coliform Rule
TOC	Total Organic Carbon
TTHM	Total Trihalomethane
UGA	Urban Growth Area
UR	Urban Residential
USDA	United States Department of Agriculture
VFD	Variable Frequency Drives
VOC	Volatile Organic Chemical
WAC	Washington Administrative Code
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Program
WQMR	Water Quality Monitoring Report
WSP	Water System Plan
WUE	Water Use Efficiency

Introduction

The purpose of the Comprehensive Water System Plan (WSP) is to identify the Public Utility District No. 1 (PUD) of Whatcom County service areas, existing systems, service policies, future needs, and related issues, in a manner consistent with the Whatcom County Comprehensive Plan, WAC 246-290, and other applicable local, state and federal laws.

Water System Plans must be updated and submitted to the Washington State Department of Health (DOH) at least every ten years in accordance with the regulatory requirements contained in WAC 246-290-100. Prepared under the guidelines and criteria of DOH, this plan update will become, upon approval by DOH, a part of the Whatcom County Coordinated Water System Plan. DOH approved the PUD's existing Water System Plan in October 2004. Since then, several agency guidance documents, regulatory and case law changes affecting water system plans have occurred including updated drinking water regulations under WAC 246-290, updated Whatcom County Coordinated Water System Plan, the 2003 Municipal Water Law, implementation of the Water Use Efficiency Rule, updated DOH Water System Design Manual and DOH Water System Planning Guidebook.

The PUD owns and operates both potable and non-potable water systems. The PUD's potable water systems are the focus of this plan and include Group A Grandview-Northgate Industrial Park (Grandview-Northgate) and Group B Praxair water systems, although detailed analysis is limited to Grandview-Northgate and Praxair discussion is limited to providing basic system information in Appendix F. The WSP will provide planning information to guide the PUD in developing, operating, maintaining, and improving potable water service to its current and future customers. The PUD's non-potable Industrial Water Supply System treats surface water from the Nooksack River to industrial-grade standards for municipal purposes. PUD Industrial-grade water customers are located primarily in the Cherry Point industrial area but industrial-grade water is also used for irrigation and agricultural uses, and fire flow and non-potable demand in other areas including the Grandview-Northgate area.

Several PUD customers receiving industrial-grade water in the Cherry Point area have established their own potable water system with on-site facilities to further treat a portion of PUD supplied industrial-grade water for their own potable water needs. These potable water systems are not under the jurisdiction of the PUD nor are they considered by DOH to be consecutive water systems because they do not receive potable water from the PUD. The PUD is only responsible to supply industrial-grade water to these systems according to the terms of the respective water supply agreements. While these systems are not the subject of this plan, they are identified later in Chapter 1 as Neighboring/Adjacent potable water systems.

The PUD Board of Commissioners determined that the non-potable Industrial Water Supply System activities of the PUD are not included as an integral part of this WSP. This approach was selected to provide clarity as to which facilities and operations are under the public water system (DOH) regulatory framework. However, for context, Chapters 1 and 4 also provide information on the PUD's service of non-potable water for industrial, irrigation and agricultural uses.

Once adopted, this Water System Plan and its appendices will meet current DOH planning standards and supplant the 2004 Water System Plan. If the current Water System Plan is inadvertently silent on any issue of policy, the Board of Commissioners will separately consider such matters as appropriate.

1. Description of Water System

The Public Utility District No. 1 of Whatcom County (PUD) is located in Whatcom County in northwest Washington state. See Figure 1-1 Location Map. The PUD's overall water service area boundary includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham, Washington as shown on Figure 1-2 Overall Service Area Map.

Figure 1-1 Location Map

1.1 Authority and Management

Public Utility District No. 1 of Whatcom County (PUD) is a municipal corporation of the State of Washington created by a county-wide vote in 1937. The formation vote was taken when reliable, low-cost utility service was not generally available in rural areas, and the potential for public utility service was recognized as an important asset for economic development and raising the standard of living within Whatcom County.

Public utility districts were initially formed to combat high electric rates charged by private utilities, to provide electricity in rural areas where service had been denied, and to provide water service in otherwise unserved areas. Public utility districts are organized to provide utility service to their customers on a non-profit, cost of service basis. The PUD is authorized to provide water service on a county-wide basis pursuant to Chapter 54 RCW. The PUD potable water service areas are subject to existing service areas claimed under the Whatcom County Coordinated Water System Plan (CWSP). The PUD's authority to plan, maintain, and operate waterworks systems to meet the needs of both private and public users throughout Whatcom County is provided in RCW 54.16.030.

Public utility districts are expressly recognized under the Municipal Water Law (MWL) as a "municipal water supplier" that provides water for "municipal water supply purposes." Municipal supply purposes include potable water and non-potable water used for domestic, commercial, industrial, open space, and other governmental and non-governmental proprietary uses as defined in RCW 90.03.015(3)(4).

The legal responsibilities and powers of the PUD, including the establishment of rates and charges for services rendered, are exercised through a three-member Board of Commissioners elected from separate commissioner districts for staggered six-year terms. The PUD is administered according to RCW 54, municipal codes, applicable state codes, and the Policies and Procedures adopted by the Board of Commissioners. The PUD's management and organizational structure are summarized in Chapter 6, Section 6.1.

1.2 System Background

In reviewing and using this WSP, it is essential to remember that the PUD is in a unique position among public water utilities, in that it may provide both potable and non-potable industrial-grade water to its customers. The focus of this plan is on the potable water activities that fall under the Washington State Department of Health (DOH) public water system regulatory framework. The non-potable Industrial Water Supply System activities of the PUD are not included as an integral part of this WSP and only referenced as necessary for background or in support of this plan.

1.2.1 History of Water System Development and Growth

The PUD began operations in 1952 when General Petroleum (now Phillips 66) requested electric service from the PUD and obtained the power necessary to serve the refinery from the Bonneville Power Administration through an agreement with another PUD.

<u>Non-Potable Water Supply Background</u>

In the late 1950's the PUD initiated a study to consider the rural water supply needs for Whatcom County. At that time, it was determined that although water supply needs in the rural areas were growing, there was not sufficient demand to justify the PUD undertaking a program of general rural water supply.

During 1965 in response to a growing demand for water supply, the PUD obtained rights to surface water from the Nooksack River and constructed industrial-grade water (i.e. partially treated, non-potable, surface water) Treatment Plant No. 1, in Ferndale, and a 24-inch concrete cylinder pipeline from Treatment Plant No. 1 to the Intalco Aluminum Corporation (Intalco) located in the Cherry Point industrial area. Intalco established its own Group A water system and on-site treatment facility to further treat a portion of the PUD-supplied industrial-grade water for their potable water needs. With the pipeline completed, several farms also became PUD non-potable water customers, and in 1968 the PUD expanded Treatment Plant No. 1 in response to growing demand. In 1977 Phillips 66 became an industrial-grade water customer of the PUD and, like Intalco, established its own Group A water system and on-site treatment system to further treat a portion of PUD industrial-grade water for their potable water needs.

In the 1970s, the PUD obtained additional rights to surface water from the Nooksack River and constructed industrial-grade water Treatment Plant No. 2, located 3 miles northeast of Treatment Plant No. 1. A second 24-inch concrete cylinder pipeline was constructed from Treatment Plant No. 2 to Cherry Point following a more northerly route to serve additional customers, including Atlantic Richfield Company (ARCO, now BP Cherry Point Refinery) and others. Like Intalco and Phillips 66, BP established their own

Group A water system and on-site treatment facility to further treat a portion of the PUD-supplied industrial-grade water for their potable water needs.

In 1974, in response to water quality concerns with their existing groundwater supply, the City of Ferndale turned to the PUD for their water source. Ferndale purchased industrial-grade water from PUD Treatment Plant No. 1 and further treated it to drinking water standards for their customers. Later the City of Ferndale redeveloped its groundwater sources and added treatment to address the groundwater quality concerns. In 2012 Ferndale returned to using groundwater as their primary source of water, and shortly thereafter, the City and the PUD reached an agreement to discontinue PUD water supply to the City.

In 2000 the 24-inch pipelines from Treatment Plant No. 1 and Treatment Plant No. 2 were interconnected to provide increased reliability and greater flexibility. In 2014 a significant upgrade to Treatment Plant No. 2 was completed with the new plant capable of producing 12 MGD of industrial-grade water. An overview map of the PUD Industrial Grade Water Supply System is shown in Figure 1-3.

PUD industrial-grade customers that have established their own potable water systems with onsite facilities to further treat a portion of PUD supplied industrial-grade water for their respective potable water needs are shown in Figure 1-4 along with the service area of adjacent purveyors, all of which is discussed later in Section 1.2.3.

The PUD Industrial Water Supply System primarily serves the Cherry Point industrial area but it is also available to serve the surrounding area including irrigation and agricultural uses, and fire flow and non-potable water delivered to the PUD's Grandview-Northgate service area. More information about the PUD's industrial-grade water system can be found in the PUD's Industrial Water Supply System Capital Improvement Plan, which is incorporated herein by reference and available upon request.

Potable Water System Background

The PUD acquired the water system serving the Grandview Light Industrial Park and the Northgate Industrial Park in 1995. Initially, the system was developed as two independent water systems serving a portion of the light-impact industrial zoned area in the vicinity of Grandview Road and Portal Way. Developers of the water systems, and the industrial parks, found that owning and operating a water system was becoming more difficult and sought out the PUD as the appropriate entity to take over ownership and operation of the water systems. As a condition of assuming ownership and operation, the PUD required that the two systems be combined into one system and that specific improvements be completed prior to acquisition.

The combined Grandview-Northgate Industrial Park (Grandview-Northgate or GV-NG) potable water system includes a groundwater well, nominal 35,000-gallon storage reservoir, booster pumps, and distribution system. The Grandview-Northgate Industrial Park also maintains a separate non-potable fire protection system, including source and distribution. The fire protection system initially had a ground water well and storage pond with booster pumps as its primary source of supply. In 2019 the fire protection system was connected directly to the PUD's Industrial Water System, which became the fire protection system's sole source of supply with no direct connection to the Grandview-Northgate potable system.

The Grandview-Northgate potable water system service area is shown in Figure 1-5 along with the service area of overlapping and adjacent water purveyors, all of which is discussed later in Section 1.2.3. Appendix G includes general information related to the Grandview-Northgate fire system.

In 1996, in response to a request from the Praxair Company located in the Cherry Point industrial area, the PUD established a Group B water system with a permit-exempt groundwater well to meet the limited potable water needs of the Praxair facility. The Praxair water system includes a groundwater well, bladder tank, and distribution system. The Praxair service area is shown on Figure 1-4. This plan's focus on Praxair is limited to providing basic system information in Appendix F and does not provide detailed analysis. Additional information can be obtained from the PUD.

1.2.2 Geography

The Public Utility District No. 1 of Whatcom County (PUD) retail service areas are located in northwest Whatcom County, generally north of Bellingham and west of I-5, Washington as shown on Figure 1-6 Water Bodies and Terrain Map.

Topography

The PUD's retail service areas are in Whatcom County is located in general terms, on a gently rolling plain adjacent to the Straits of Georgia. Elevations within the PUD service area vary from sea level to 350 feet, with the majority of the service area at an elevation of about 200 feet +/-. The Nooksack River is the freshwater body that serves as the PUD's surface water source. The Nooksack River flows from Mount Baker, a 10,700-foot peak just west of the main crest of the Cascade Mountain Range. The Nooksack River drainage is more than 780 square miles, an area of predominately agricultural and forestry land uses.

Geology

The PUD retail service areas are located on a broad domed upland rising from the Straits of Georgia to the west. A significant lake, Lake Terrell, is located centrally within the area, with drainage to the north and west, eventually reaching the south end of Birch Bay. To the east, the Nooksack River flows south from Mt. Baker to Bellingham Bay. Historically, the area is reported to have been entirely covered by mature forests, however, only small stands of second-growth trees remain. Much of the area west of the existing State Forestry Land was cleared for agriculture use early in the 20th century.

The area was completely glaciated and is typical of the Puget Sound region. As a result, no significant outcrops of bedrock are present. Exploration of the area has indicated that it is difficult to determine bedrock because much of the marine deposits and glacial till in the area is highly consolidated. The thickness of the overlaid materials varies from 20 to 200 feet.

The predominant material within the study area has been classified as Bellingham Drift. This material is described as blue-gray, unsorted, unstratified pebbly sandy silt and sandy clay. It is reported that the source of this material is rock debris melted out of floating ice and deposited on the seafloor. Remnants of mollusks and wood have been dated to between 11,000 and 12,000 BP (Before Present).

The formation generally has low permeability. Much of the water found within the area is considered to be in a perched condition.

Climate

Located adjacent to Puget Sound, Whatcom County has a moderate marine climate. Temperatures during the summer seldom exceed 80 degrees and generally fall to near 50 degrees overnight. Wintertime highs average about 50 degrees, while low temperatures average near freezing. Periods of

extended low temperatures do occur with up to two-week periods when temperatures never rise above freezing.

The area receives about 36 inches of precipitation annually, with much of the precipitation occurring during the winter and spring months. Precipitation during November, December, and January average about 5 inches per each of these months. Annual snowfall averages about 8.5 inches, more than in other parts of western Washington. Much of the snowfall results from cold fronts that descend southwest along the Fraser River from the interior of British Columbia.

Within recent years, multiple entities, including Western Washington University, have engaged in study efforts to model and forecast the effects of climate change on streamflow in the Nooksack River Basin. In general terms, these studies have reached the following, basic conclusions:

- Winter streamflow will increase.
- Summer flows will decrease.
- Existing snowpack will decrease.
- There will be a shift in the timing of spring melt peak and maximum snow water equivalent (SWE).
- Peak flow events will increase in magnitude and frequency.

1.2.3 Neighboring/Adjacent Purveyors

In the vicinity of the PUD retail service areas there are many purveyors identified in the Whatcom County Coordinated Water System Plan (CWSP) as shown on Figure 1-4 and Figure 1-5. For the purposes of discussion here we have listed Group A Public Systems identified in the CWSP that are within approximately one mile and Group B water systems that are within approximately 1,000 feet of the PUD existing Grandview-Northgate and Cherry Point service areas.

For each of the following systems with overlapping retail service areas, the PUD acknowledges the existing purveyors first right of refusal to serve customers in their retail service area as depicted in Figure 1-4 (Cherry Point) and Figure 1-5 (Grandview-Northgate).

<u>Grandview-Northgate Service Area</u>

Purveyor Name	System ID #	Distance (ft)	Other Notes
OVERLAPPING			
City of Ferndale and UGA	24850M		See Ferndale/PUD Interlocal Agreement Chapter 10.2
Custer Water Association	17050R		
Infra Pacific Water System	070874		
Double L Mobile Home Park	19890Y		Included in Proposed Service Area
Fairfield Mobile Home Park	02601D		Included in Proposed Service Area
Henry Hall Water System	AC929K		Group B system

< 1,000-ft			
Brown Lane Water Association	62485F	Adjacent	Group B system
Orchard Water Association	64150V	700	
< One Mile (5,280-ft)			
Aldergrove Water Association	01200A	3,100	
Baker View Water Association	04050J	4,200	
Enterprise Estates Water Association	23480U	1,400	
Evergreen Mobile Park and Sales	241518	1,300	
Mountain View Kingdom Hall Water System	04048D	1,600	
Old Settlers Water Association	633502	4,600	
Tall Cedars Estates Water Association	87120B	4,300	

Cherry Point Service Area

Purveyor Name	System ID #	Distance (ft)	Other Notes
OVERLAPPING			
Praxair	05184K		Group B system, PUD Owned and Operated, Groundwater Well source.
Vonni	02152K		Group B system, Groundwater well source
BP-Cherry Point Refinery	03315D		PUD acknowledges BBWSD wholesale potable water service to BP Refinery. See BBWSD supply agreement Chapter 10.2.
Intalco Aluminum Corporation	35800E		PUD source water
Phillips 66 Company	554509		PUD source water
Rubicon Property 1 LLC	AD513K		PUD source water
Pleasant Valley Water System	67900T		
Old Settlers Water Association	633502		
Petrogas Ferndale Terminal	061222		Group B system, PUD source water
PSE Ferndale Generating Station	05121F		Group B system, PUD source water

< 1,000-ft			
Birch Bay Water & Sewer District	95904U	Adjacent	PUD acknowledges BBWSD wholesale potable water service to BP Refinery. See BBWSD supply agreement Chapter 10.2.
Grandview Beach Water Association	289501	Adjacent	
North Kickerville	038722	Adjacent	Group B system
South Kickerville	03871J	Adjacent	Group B system
Kinder Morgan Water System	AC1203	Adjacent	Group B system
Barleans Water System	064292	Adjacent	
Neptune Beach Water Association	589504	Adjacent	
Sandy Point Improvement Company	76105A	Adjacent	
Lake Terrell Mobile Ranch Water System	44593W	1,300 *	* Adjacent to PUD non-potable main running along Aldergrove Road. Group B system.
< One Mile (5,280-ft)			
Bell Bay Jackson Water Association	054504	3,000	
North Star Water Association	61350X	4,300	
Sandy Point Improvement Company	76105A	1,200	
Starvin-Sams No. 19/Slater Rd Water System	56821L	5,200	

1.2.3.1 Grandview-Northgate - Overlapping Service Areas

Several overlapping service areas with the PUD exist as listed above and shown in Figure 1-5. Each of the Group A overlapping service areas is discussed below. The PUD is not aware of any conflicts in water service being provided within these overlapping service areas. For each of the following systems with overlapping retail service areas, with the exception of Ferndale UGA, the PUD acknowledges first right of refusal to serve customers in their retail service area as depicted in Figure 1-5.

<u>City of Ferndale</u>

The City of Ferndale operates a water system (ID# 24850M) with a service area that serves Ferndale and the surrounding area. Ferndale's 2016 Water System Plan is incorporated herein by reference. Until 1974, Ferndale's water supply consisted solely of groundwater wells. Groundwater quality (primarily aesthetics) became a concern so Ferndale secured partially treated surface water from the PUD in 1974, and constructed a water filtration plant in 1975. Ferndale redeveloped its ground water sources and added treatment to address water quality concerns. The PUD stopped providing partially treated water to

Ferndale in 2011, at the City's request. The City now relies entirely on its own groundwater wells and treatment facilities to serve its customers.

Ferndale Partial Annexation of Grandview Retail Service Area

On March 4, 2009, the City of Ferndale annexed approximately 144 acres of property within the Ferndale Urban Growth Area. The annexed area includes less than half of the PUD's Grandview-Northgate water system existing service area and excludes the property where the Grandview-Northgate facilities (i.e. well, storage, pump house) are located. The annexed area does include some Grandview-Northgate water system distribution mains. The Ferndale City Limits including this annexed area are shown on Figure 1-5.

In the course of its annexation, Ferndale took no action to assume service to the affected portion of the PUD's Grandview-Northgate water system. The most recent Ferndale Comprehensive Water System Plan identified alternatives but does not indicate any current plans to extend their water supply to the annexed area that overlaps the PUD's retail service area. Should Ferndale seek to promote or approve development within the current annexed area or Urban Growth Areas (UGA) that exceeds the PUD's Grandview-Northgate water system capacity, the PUD may request that Ferndale meet such future demand with its municipal water supply. The PUD may also consider development of additional capacity if the PUD has reasonable long-term certainty to justify capacity development. Alternatively, the PUD could request that Ferndale contribute to the development of capacity necessary to serve demand in the overlapping service area and future UGA annexation.

Ferndale Urban Growth Area

The Ferndale 2016 Comprehensive Water System Plan identifies urban growth areas including most of the current and proposed PUD Grandview-Northgate service area. Figure 1-7 shows the Ferndale Annexation Phasing Plan in relation to the Grandview-Northgate existing and proposed service areas. Until such time as any portion of the Ferndale UGA overlapping the PUD retail service area is annexed, the PUD continues to plan for service consistent with established zoning (See Figure 1-8) and the interlocal agreement with Ferndale (Chapter 10.2).

<u>Custer Water Association</u>

Custer Water Association is a Group A community water system serving primarily single-family residences with an approximate residential population of 365. Custer's water source is groundwater from four active wells (approximately 215-ft deep) that are not treated. The Custer Water Association service area overlapping with the Grandview-Northgate service area seen in Figure 1-5 is approximately 74 acres. The west 28 acres is zoned Rural 1 Unit/5Acres (R5A) with two existing residences and about 27 acres undeveloped. The east 46 acres is zoned light-impact industrial (LII) with two residences, one small commercial building (Orchard Grange #346) and approximately 43 acres undeveloped. The PUD is willing and able to serve potable and fire water required for the current zoning in the overlapping service area.

<u>Infra Pacific Water System</u>

Infra Pacific is a Group A non-transient, non-community (NTNC) water system serving industrial/commercial users with 10 connections and an estimated nonresidential population of 106. Infra Pacific's water source is a groundwater well approximately 70-feet deep that is treated by filtration and chlorination. The Infra Pacific service area is approximately 40 acres overlapping with the existing Grandview-Northgate retail service area as seen in Figure 1-5. The Infra Pacific service area is zoned

light-impact industrial (LII) and appears to be about half developed along the Delta Ring Road looping through the area.

Double L Mobile Home Park (MHP) (Proposed Service Area)

Double L MHP is a Group A community water system serving 25 single family residences. Double L's water source is shallow groundwater well approximately 25-feet deep that is treated by filtration and chlorination. The Grandview-Northgate proposed retail service area overlaps the Double L service area. The Double L owner has inquired with the PUD regarding future potable water service due to concerns about source reliability and water quality. Double L service area zoning is Rural 1 Unit/5 Acres (R5A), outside the Ferndale UGA and it appears to be mostly developed.

Fairfield Mobile Home Park (MHP) (Proposed Service Area)

Fairfield MHP is a Group A community water system serving 25 single family residences. Fairfield's water source is groundwater well approximately 95-feet deep that is treated by filtration and chlorination. The Grandview-Northgate proposed service area overlaps the Fairfield service area. The Fairfield owner has inquired with the PUD regarding future potable water service due to concerns about source reliability and water quality. Fairfield service area zoning is Urban Residential 4 Units/Acre (URF)Rural 1 Unit/5 Acres (R5A), inside the Ferndale UGA and it appears to be mostly developed.

1.2.3.2 Grandview-Northgate – Adjacent Group A Public Water Systems of Significance

A number of other Group A water systems are in the vicinity of the Grandview-Northgate service area. However, those that are adjacent systems are also overlapping and as such have already been discussed above in Section 1.2.3.1

1.2.3.3 Cherry Point – Overlapping Service Areas

There are several overlapping service areas with the PUD Cherry Point retail service area as listed above and shown in Figure 1-4. Each of the overlapping service areas is discussed below. The PUD is not aware of any conflicts in water service being provided within these overlapping service areas. At this time the PUD does not operate any Group A Water Systems in the Cherry Point Service Area. For each of the following systems with overlapping retail service areas, the PUD acknowledges first right of refusal to serve customers in their retail service area as depicted in Figure 1-4.

Overlapping service areas are grouped as:

- Potable Water Systems with their own source of water;
- Potable Water systems sourcing non-potable industrial-grade water from the PUD

Potable Water Systems with Their Own Source of Water

Praxair (ID# 05184K) (Group B) (PUD owned and operated) Ground Water Well.

Vonni Short Plat (ID# 02152K) (Group B) (Ground Water Well)

Potable Water Systems Sourcing Non-Potable Water from the PUD

The PUD has been providing water to industrial customers in the Cherry Point industrial area for over 35. In most cases the industrial customers have established their own Group A water system and on-site treatment facility to further treat a portion of the PUD supplied industrial-grade water for their own potable water needs. Each of the following PUD industrial customers have their own potable water system service area that overlaps with the PUD Cherry Point retail service area.

BP-Cherry Point Refinery

The BP Cherry Point Refinery (ID# 03315D) operates a water system to distribute wholesale potable water supply received from Birch Bay Water and Sewer District (BBWSD). BBWSD provides direct potable water service by agreement (See Chapter 10.2) to the BP Cherry Point Refinery (BP Refinery) through a meter at the intersection of Grandview Road and Jackson Road, near the northwest corner of the refinery. Both the PUD and BBWSD acknowledge the BP Refinery service area. The following information regarding the BP Refinery water system is presented for historical significance and reference.

In 1977, when BP Refinery (formerly Arco purchased by BP in 2000) became a PUD industrial-grade water customer, BP established its own Group A water system and on-site treatment facility to further treat a portion of the PUD supplied industrial-grade water for their own potable water needs.

In 1990, ARCO was interested in discontinuing operation of their on-site potable water system. In response, the PUD made an arrangement to purchase potable water from BBWSD to meet the potable water needs of the ARCO refinery. Under the terms of the potable water service agreement with the PUD, the BP potable water treatment system was to be maintained in standby condition to provide potable water supply if BBWSD supply was interrupted as it could be under the agreements.

BP Refinery's desired to end standby operation of its water treatment system and secure a direct contractual relationship with BBWSD. Subsequent to detailed discussions with Washington State Department of Health (DOH), and consultations with the BP Refinery manager, the PUD secured assurance from BP Refinery that under its new direct water service contractual relationship with BBWSD, the PUD would remain the exclusive provider of industrial water supply to the BP Refinery.

In 2008 BBWSD signed a direct supply agreement with BP to deliver potable water to the BP Refinery through a meter at the intersection of Grandview Road and Jackson Road, near the northwest corner of the refinery. The refinery continues to operate its own water system to distribute supply received from BBWSD throughout the refinery property and the District provides no oversight, monitoring or support beyond the service meter. A copy of the supply agreement is included in Chapter 10.2.

In 2010, BBWSD submitted a Notice of Intent (NOI) to the Whatcom County Boundary Review Board (BRB) to provide direct potable water service to the BP Refinery. At the time of this proposed action, the BP Refinery fell within the PUD's designated retail service area claimed in its 2004 Water System Plan and the 2001 Whatcom County Coordinated Water System Plan (CWSP) Update.

The BBWSD 2019 Comprehensive Water System Plan identifies delivery of water supply to the BP Refinery water system. However, the BBWSD retail service area does not include any portion of BP Refinery service area that lies in the Cherry Point industrial area, also identified as the Cherry Point Urban Grown Area (UGA).

The PUD Cherry Point retail service includes all of the Cherry Point UGA. The PUD Cherry Point retail service area does not overlap with the BBWSD retail service area. The PUD Cherry Point

retail service area overlaps the BP Refinery service area. The PUD Acknowledges BP Cherry Point Refinery service area first right of refusal. The PUD further acknowledges BBWSD wholesale potable water supply agreement to serve the BP Refinery. See BBWSD supply Agreement included in Chapter 10.2.

Intalco Aluminum Corporation (Intalco)

Intalco owns and operates a Group A non-transient, non-community potable water system (ID#35800E) with capacity to serve more than 1,000 employees. Intalco was the PUD's first non-potable water customer (1965) and initially supplied by water from the Nooksack River through by the PUD's Water Treatment Plant No. 1 and distribution pipeline. Today Intalco is supplied by the PUD's Industrial Water System including water from the Nooksack River through both Water Treatment Plant No. 1 and No. 2. Intalco developed an on-site surface water treatment system to meet its potable water supply needs.

The Intalco treatment system is a conventional filtration system that includes coagulation before filtration. Two filter aid polymers and chlorine solution are added to the incoming water before a contact chamber and the filters. A sequestering agent (lead and copper corrosion inhibitor) is added to the treated water to provide corrosion control in the Intalco facility distribution system.

Two separate storage tanks provide potable water storage, a 10,000-gallon elevated steel tank with a fiberglass liner that provides the head for filter backwash and distribution system pressure, and a 40,000-gallon in-ground concrete reservoir.

Phillips 66

Phillips 66 owns and operates a Group A non-transient, non-community potable water system (ID# 554509). In 1977, Phillips 66 refinery became a non-potable water customer of the PUD initially sourcing water from Treatment Plant No. 1 for both its industrial and potable water supply needs. Today Phillips 66 is supplied by the PUD's Industrial Water System including water from the Nooksack River through both Water Treatment Plant No. 1 and No. 2. Phillips 66 developed its on-site surface water treatment system, including filtration and chlorination, to meet the potable water needs of employees when it was initially constructed. Water from PUD's Industrial Water System passes through the refinery's settling facilities before it is processed by their onsite potable water treatment facility.

Rubicon Property 1, LLC.

Rubicon owns and operates a Group A non-transient, non-community potable water system (ID# AD513K). Water sourced from the PUD Treatment Plant is further treated through a bag filter system followed by chlorination to meet potable water needs. Rubicon contracts with SMA #163 for monthly servicing and testing.

Pleasant Valley Water Association

The Pleasant Valley Water Association (ID# 67900T) service area overlaps with the PUD service area in the southwest corner and northwest corner of Grandview and Kickerville. The southwest overlapping area belongs to Chemco and is undeveloped. Pleasant Valley previously served a house in this area owned by Chemco but there is no longer a house in the area. The northwest overlapping area currently serves one single family residence. Pleasant Valley has a limited number of connections available and is unlikely to be able to serve development in the overlapping

area west of Kickerville beyond the existing single-family residence in the northwest and the single-family residential commitment to Chemco in the southwest.

Old Settlers Water Association

The Old Settlers Water Association service area overlaps with the PUD service area north west of Grandview and Kickerville. The Old Settlers distribution system runs south along Kickerville and stops just north of Terrell Creek, which is also the north boundary line of the Cherry Point UGA and the north boundary line of the PUD proposed Cherry Point retail service area. Old Settlers does not have any service connections, commitments, or plans to serve south of Terrell Creek in the area that overlaps with the PUD proposed service area. Old Settlers has limited water rights and source of supply and its distribution system does have the capacity to extend south of Terrel Creek.

Petrogas Ferndale Terminal

Petrogas Terminal (formerly Chevron Terminal and prior to that Texaco) owns and operates a Group B system (ID# 061222). Water sourced from PUD Industrial Water System is treated by simple cartridge filtration, chlorination, and Ultra Violet. Petrogas contracts with SMA #163 for monthly servicing and testing. Petrogas also purchases bottled water from Culligan for drinking. Petrogas is in the process of expanding to a Group A system to meet their growth needs, including construction of a new surface water treatment system to further treat PUD sourced industrial-grade water.

Puget Sound Energy (PSE) Ferndale Generating Station

Puget Sound Energy (PSE) owns and operates a Group B water system (ID# 05121F), which was originally owned and developed by Tenaska. Tenaska Cogeneration facility became a non-potable customer of the PUD in 1993. Water sourced from PUD Industrial Water System is further treated to drinking water standards through a skid-mount slow sand filter system.

Puget Sound Energy (PSE) – Whitehorn Generating Facility

Puget Sound Energy previously operated a Group B water system (ID# 18464N) southwest of the intersection of Jackson Road and Grandview Road. DOH reports it has been inactive since 2005. The primary source of water was PUD industrial-grade water and the emergency supply was listed as a ground water well. The PUD has not researched how this facility is presently served.

1.2.3.4 Cherry Point – Adjacent Group A Public Water Systems

A number of other public water systems are in the vicinity of the PUD's Cherry Point service area. A brief overview of the larger adjacent Group A water purveyors not already considered is described below.

<u>Birch Bay Water & Sewer District – Direct Service to BP Cherry Point Refinery</u>

Birch Bay Water and Sewer District (BBWSD) serves an unincorporated area of Whatcom County located area around Birch Bay, between the City of Blaine (Blaine) and the Cherry Point industrial area, and east towards Kickerville Road. Portions of the BBWSD service area are included in the City of Blaine Urban Growth Area and the Birch Bay Urban Growth Area. The service area is strongly influenced by the recreational nature of the community, and consequently, both the population served and water-use vary seasonally. The water supply for the BBWSD is purchased from Blaine. Blaine is located about 6 miles to the north and serves BBWSD through two system interties.

BBWSD provides direct wholesale potable water service to the BP Cherry Point Refinery water system by agreement (See Chapter 10.2). The BBWSD retail service area does not overlap the BP Cherry Point Refinery service area or the PUD Cherry Point retail service area. Service to BP is provided through a meter at the intersection of Grandview Road and Jackson Road, near the northwest corner of the refinery. The refinery operates a water system to distribute this supply throughout the refinery property. BBWSD does not provide any oversight, monitoring or support beyond the service meter.

City of Blaine Water System

The City of Blaine (Blaine) retail service area serves Blaine and the surrounding area, including wholesale water supply to the BBWSD and the Bell Bay Jackson Water Association.

Blaine's water supply is groundwater from the Dakota Creek watershed east of Blaine. The Dakota Creek aquifer system is reported to be quite large, 30 square miles, and can meet local water supply needs for 20 years. Blaine's water supply also includes deep ground water sources under development to supplement existing sources of supply.

Lummi Reservation/Private Water Associations

The potential for Wholesale Water Supply to areas south of Cherry Point is discussed here for future consideration. Options for wholesale supply include delivery of partially treated industrial-grade water or water treated to potable water standards. Such wholesale supply could occur through connection to an existing 16-inch water main located on Lake Terrell Road that falls outside of the reservation's external boundaries. Should the PUD develop a potable water treatment plant to serve the Cherry Point Area, it may be possible, subject to design, installed treatment capacity, and other considerations, for the PUD to provide wholesale potable water supply to address: (1) the Lummi Nation on-reservation needs; and (2) non-Indian (fee land) private water association needs such as Neptune Beach and Sandy Point Improvement Company.

The provision of any such wholesale supply would require: (1) the PUD's rescission of PUD Resolution 387 which precludes the PUD from providing water supply within the boundaries of the "Nooksack Indian Tribe Reservation and Trust Lands, and the Lummi Tribal Reservation…." absent resolution of existing jurisdictional/legal impediments and examination of technical/economic factors; (2) an amendment to the PUD's water system plan and associated service area mapping; and (3) project approval from the Washington Department of Health (DOH) for the design/operation of related potable facilities.

In addition to the above actions, the PUD would seek express, written consent from the Lummi Nation for the provision of industrial-grade or potable wholesale supply within their reservation boundaries, and a determination of related terms and conditions that might affect such service. The PUD has no current plans to undertake the steps necessary to design, engineer, permit and finance the (above-referenced) water supply considerations.

1.2.4 Ordinances

The Public Water Systems Coordination Act of 1977 codified as Chapter 70.116 RCW, and the standards presented in the Whatcom County Coordinated Water System Plan (CWSP) provide a set of minimum design and performance criteria for new water utilities and for all existing utilities planning to install capital facilities for expansion purposes.

The District, following Title 54 RCW, adopts resolutions to develop, manage and operate the water utility. Key water system standards and requirements are described throughout this report.

1.3 Overview of Existing Water Systems

While the PUD considers potential potable service throughout its service area boundaries, the focus of this plan is on the PUD owned and operated potable Group A Grandview-Northgate water. Group B Praxair system information can be found in Appendix F.

The PUD current potable water customer base is direct service to commercial and light industrial customers in the Cherry Point (Praxair) and Grandview-Northgate service areas. However, the PUD's long-term vision anticipates provision of service to a broad base of light industrial, commercial, residential, and wholesale customers throughout its service areas including service to other purveyors.

1.4 Inventory of Existing Facilities

1.4.1 Description of Facilities and Major Components

Cherry Point (non-potable)

The PUD Industrial Water Supply System major components, including Treatment Plants 1 and 2 and transmission and distribution mains are shown on Figure 1-3. While the PUD non potable industrial water supply system may be a source of supply for potable water systems within the PUD service area, the PUD industrial water supply system is not included in this planning document. More information about the PUD's industrial-grade water system facilities and components can be found in the PUD's Industrial Water Supply System Capital Improvement Plan which is incorporated herein by reference and available upon request.

Praxair (Group B)

In 1996, in response to a request from the Praxair Company, the PUD established a Group B water system with a permit-exempt groundwater well to meet the limited potable water needs of the Praxair facility in the Cherry Point area. The Praxair water system includes a groundwater well, bladder tank, and distribution system. The water system is adequate for existing demand and Praxair does not anticipate any new demand. Routine operations and maintenance are all performed as needed and no capital improvements are anticipated. The Praxair service area is shown on Figure 1-4. Additional information about the Praxair water system can be found in Appendix F.

Grandview-Northgate (Group A)

Figure 1-5 provides an overview of the PUD's Grandview-Northgate retail service area potable facilities and distribution systems. Figure 1-9 provides a Schematic of the Grandview-Northgate potable water system. The PUD's Grandview-Northgate potable facilities are described in the following sub-sections.

1.4.2 Number of Service Connections (Existing and Approved)

The Grandview-Northgate (Industrial Park) is currently approved for an unspecified number of connections. The WFI, last updated 2/14/2020, identifies 44 active service connections, which are comprised entirely of light-impact industrial and commercial type uses.

1.4.3 Source of Supply and Disinfection

The Grandview-Northgate (GV-NG) potable source of supply is a ground water well summarized in Table 1-1. The source water is disinfected using a sodium hypochlorite solution injected directly into the well

discharge pipe when the well runs. The well discharges to an above ground storage tank where contact time for disinfection is achieved prior to being pumped to the distribution system.

Table 1-1 Sources of Supply

Facility	Source Number	Location	Depth (feet)	Casing Size (in)	Capacity (gpm)
GV-NG	S01	Northgate Spur/Way	108	6	91

1.4.4 Water Rights

The PUD has a groundwater right for the source well for the Grandview-Northgate potable system. Table 1-2 provides a summary of this existing groundwater water right. A water right self-assessment is included in Section 10.4 and discussed further in Chapter 4. A detailed analysis of future and existing supply and demand is presented in Section 3.4.1, Table 3-5 and Table 3-6.

Table 1-2 Existing Groundwater Water Rights

Facility	Source Number	Water Right Certificate/ Permit Number	Priority Date	Maximum Instantaneous Water Right (gpm)	Maximum Annual Withdrawal (acre-ft./year)
GV-NG	S01	G1-25463P	10/24/1991	116	92.8

1.4.5 Storage

The Grandview-Northgate potable system storage tank is listed in Table 1-3.

Table 1-3 Storage

Facility	Estimated Year Built	Diameter (feet)	Height to Overflow (feet)	Overflow Elevation (feet)	Usable Volume (gallons)
GV-NG	1993	20	15	130	35,000

1.4.6 Booster Stations

The PUD Grandview-Northgate potable system booster pumps are listed in Table 1-4.

Table 1-4 Booster Stations

Facility	Year Built	Number of Pumps	Pump Capacity (gpm)	Motor HP	Discharge HGL	Emergency Generator?
GV-NG	1993	3	100	7.5	205’-250’	Yes

Grandview-Northgate pressure tanks are listed in Table 1-5.

Table 1-5 Pressure Tanks

Facility	Year Installed	Number of Tanks	Capacity (gallons)
GV-NG	1993	8	120 each

1.4.7 Pressure Zones

The Grandview-Northgate potable service area consists of one pressure zone, as shown on Figure 1-9 Facility Schematic. The distribution system is served by the booster station and operates in the range of 40 - 60 psi (approximate hydraulic grade line range = 205' – 250').

1.4.8 Distribution System

The distribution system piping is comprised of modern materials and are generally in good condition; polyvinyl chloride (PVC), ductile iron (DI), and high-density polyethylene (HDPE). Valves are located at road junctions and blow off stations are strategically located throughout the distribution system to accommodate normal operations and maintenance needs. Fire hydrants are installed in the service area; however, these are not part of the potable water system and are served by a separate and dedicated fire distribution system. Service meters are installed for all connections. A summary of distribution piping is shown in Table 1-6.

Table 1-6 Pipe Inventory

Pipe Size	Pipe Material (Lineal Feet)		
(System)	PVC	DI	HDPE
2-inch	2,304	--	--
3-inch	1,933	--	--
6-inch	6,389	11,438	631

1.4.9 Facilities Supervisory Control and Data Acquisition (SCADA)

The Grandview-Northgate potable system storage tank level control start and stop set points operate the well to main tank level. Pressure switches cycle the three booster pumps as needed to maintain pressure in the range of 40-60 psi.

Daily demand from the meter located after the booster pumps is recorded and available for analysis. Telemetry notifies the water system operator of any alarm conditions.

1.4.10 Existing Interties

The Grandview-Northgate potable water system has no interties with other nearby purveyors. The PUD supports emergency potable water system interties with adjacent water systems where this a benefit to one or both water systems. Emergency interties increase reliability of water systems during emergency and other unusual operation circumstances. The PUD continues to explore possible interties as part of its ongoing emergency preparedness and drought resiliency planning efforts.

1.5 Related Plans/Documents

1.5.1 Public Water System Coordination Act

The Public Water System Coordination Act (Coordination Act), enacted by the Washington State Legislature in 1977 and codified as Chapter 70.100 RCW and Chapter 246-293 WAC provides authority to the county for identifying a critical water supply service area (CWSSA) in a given area "where water supply problems related to uncoordinated planning, inadequate water quantity or unreliable water service appear to exist." Whatcom County established its CWSSA for the original Coordinated Water System Plan (CWSP) effort in 1993, which includes "all lands west of the Mt. Baker-Snoqualmie National Forest Boundary excluding certain portions of the Lummi and Nooksack Indian reservations". The CWSSA boundary is shown on Figure 1-2.

The primary goal of the Coordination Act is to provide for an adequate supply of potable water for consumptive use while recognizing that water supplies are finite and variable in the County and must be used efficiently. A second goal is to ensure that an adequate supply of water is readily available to serve projected growth and land uses. These goals represent a nexus between water supply and land use planning. Coordinating land use planning with water supply planning ensures predictability for both the water utility and the community. When land use and water supply planning are coordinated, water utilities may develop long-range financial, technical, and operational plans with regards to capacity in accordance with planned land use.

The Coordination Act requires that service area boundaries be established among the purveyors (WAC 246-293-250) based on a variety of factors, including topography, readiness, and ability to serve, local franchise areas, legal water system or municipal boundaries, future population projections, and sewer service areas. It also specifies that these service areas be developed in conformance with the land-use policies of the County. Designated service areas include those areas in which the utility expects adequate customer growth, within a reasonable period of time, to support an established plan for system development.

The Coordination Act provides the legal authority for municipal and private water utilities to establish an exclusive service area within the county's designated CWSSA. Service areas refer to a specific geographical area described in the written agreement required by WAC 246-293-250, known as the Declaration of Water Utility Service Areas. This process of service area designation, and any resulting agreements between utilities, assures that water system planning, capital improvement programs, and financial commitments are consistent with state and county requirements.

1.5.2 Whatcom County Coordinated Water System Plan

The Whatcom County Coordinated Water System Plan (CWSP) is a plan for public water systems within the Critical Water Supply Service Area (CWSSA) established by Whatcom County. The original CWSP was a cooperative effort led by the PUD in 1993 with subsequent updates, approved by both Whatcom County and DOH in 2000, 2016, and as amended in 2019, under the direction of the Water Utility Coordinating Committee (WUCC), which was established pursuant to the Coordination Act (Chapter 70.116 RCW),

The CWSP represents the collective views of the WUCC and integrates the documented views of other state and local governments. The document, officially known as the "Regional Supplement," and individual Water System Plans (WSPs) approved by the Washington State Department of Health (DOH),

comprise the CWSP. When integrated with the County's GMA Comprehensive Plan, the CWSP presents a significant piece of the larger resource and growth management strategy for the County's future.

1.5.3 Establishment of Service Areas

Water utilities are given exclusive rights to provide service in their designated service areas. Under the Coordination Act all public water systems are required to identify their service areas by submitting a Declaration of Water Utility Service Areas to the Whatcom Planning and Development Services (PDS). Utilities required to prepare or update a water system plan under WAC 246-290-100 must designate service areas in the plan. The 2003 Municipal Water Law allows municipal water suppliers, defined "an entity that supplies water for municipal water supply purposes" (RCW 90.030.015(3) & (4)), to expand their water right place-of-use to the service area identified in an approved Water System Plan (WSP).

The establishment of service area boundaries carries obligations with it. The **first obligation** is that county and state governments recognize an identified utility as the agency responsible for providing all public water service within a designated area. The **second obligation** is that the designated utility assumes responsibility, within its service area, for development of cost-effective and efficient service to accommodate the future growth that these areas will experience. For those systems that are required by the Washington State Department of Health (DOH) to prepare a water system plan, it should be consistent with the growth management objectives established for these areas by Whatcom County's Comprehensive Plan. **A third obligation** relates to the designated **retail service area** in which a municipal water supplier has a "duty to serve" when conditions defining this duty in RCW 43.20.260(1:4) are met.

It should be noted that a utility's water facilities, such as sources of supply and reservoirs, can be located outside the utility's designated service area. These facilities can also be located within another utility's retail service area, provided the facilities are not used for direct retail service without the written concurrence of the designated utility.

1.6 Service Area Characteristics

1.6.1 Existing and Proposed Service Areas

The PUD's existing and proposed retail service areas include Cherry Point and Grandview-Northgate, are shown in Figure 1-4 and Figure 1-5, respectively.

The PUD's Cherry Point retail service area is shown in Figure 1-4. The existing Cherry Point service area generally extends from Grandview Road at the north to Slater Road at the south, and from Lake Terrell Road and Kickerville Road at the east and extending west to the coast. The proposed Cherry Point service area has been expanded north to include the whole of the Cherry Point UGA including the area zoned light-impact industrial. This expanded area is adjacent to the PUD's existing Cherry Point retail service area and water service to this expanded area is not planned for by other water utilities. Existing service areas overlapped by the PUD Cherry Point expanded retail service area are acknowledged to have first right of refusal to serve their existing service area unless otherwise agreed.

The Grandview-Northgate retail service area is shown in Figure 1-5. The existing Grandview-Northgate service area generally follows the I-5 corridor from Fox Road at the north to Brown Road at the south, and North Enterprise Road at the east to Vista Drive at the west. The proposed Grandview-Northgate service area has been expanded to the north and southwest to include two mobile home parks, and their

respective water systems, because the owner of each property has expressed interest in direct retail service from the PUD. Any existing service areas overlapped by the PUD Grandview-Northgate proposed service area are acknowledged to have first right of refusal to serve their existing service area unless otherwise agreed.

The PUD's existing Wholesale Service Area is shown in Figure 1-2, and includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the following: Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and City of Bellingham.

Land Use

Whatcom County has jurisdiction over land use and zoning in unincorporated areas such as western county where much of the PUD service areas are located. The 1990 Washington State Growth Management Act (GMA) and subsequent revisions thereto have changed the way land use planning is completed in higher population counties of the State. The GMA requires Whatcom County to prepare and adopt a comprehensive plan that provides for and manages the growth projected for the next twenty years in a manner that is consistent with the goals of the Act.

Under the GMA, the County Comprehensive Plan must contain Urban Growth Area (UGA) designations, within which urban growth shall be encouraged and outside of which growth can occur only if it is not urban in nature. These areas include existing incorporated areas such as Ferndale along with their projected growth areas. A UGA may also be designated in an unincorporated area not contiguous to an existing city if the area is already characterized by urban growth or is adjacent to territory already characterized by urban growth. Fitting this description is the Cherry Point UGA, which the PUD's proposed Cherry Point retail service area encompasses.

Much of the PUD's Grandview-Northgate service area is within Ferndale City Limits and Urban Growth Area, see Chapter 2, Section 2.9 for further detailed discussion, including Ferndale's annexation plan for the overlapping UGA (See Figure 1-7).

The Public Facilities and Services goal under GMA is to "ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time development is available for occupancy and use without decreasing current service levels below locally established minimum standards" (RCW 36.70A.020 (12)).

Zoning

Whatcom County zoning within the existing Cherry Point retail service area is high-impact industrial (HII). The additional area included in the proposed Cherry Point retail service area to the north is light-impact industrial (LII).

Whatcom County zoning within the Grandview-Northgate existing service area is mostly LII and a relatively small area zoned Rural 1 Unit/5 Acres (R5A) at the western extents. The proposed service area includes two mobile home parks, one in R5A and the second in Urban Residential 4 Units/acre (UR4) zoning. There is also approximately 200 acres overlapping with Ferndale City Limits, which Ferndale identifies as Regional Retail (RR) zoning.

The zoning classifications in the PUD's Cherry Point and Grandview-Northgate service area regions is shown in Figure 1-8. The development and land use patterns generally match the zoning map, and is expected to continue with future development activity.

1.7 Retail Service Area

Refer to Section 1.5 above for a discussion of the regulatory history and associated Acts, Plans, and establishment of service areas. The existing and proposed PUD Cherry Point and Grandview-Northgate service areas are shown on Figure 1-4 and Figure 1-5, respectively.

The PUD is planning for the "retail service area" declared in this WSP as required under the 2003 MWL and supporting regulations. Therefore, all properties requiring new potable water supply within the retail service area designated concurrently with adoption of this plan will be served by the PUD.

1.7.1 Conditions of Service and Duty to Serve

PUD resolutions and policies define the conditions of water service including purveyor responsibilities, customer responsibilities, current connection fee schedules, maintenance and repair activities, and project-specific system design requirements in the case of developer extensions. Meter and material specifications are identified in PUD Design Standards and Construction Standards and Details, which are discussed in Chapter 7 and included in Appendix C.

Per RCW 43.20.260, "A municipal water supplier, as defined in RCW 90.3.015, has a duty to provide retail water service within its retail service area if:

1. Its service can be available in a timely and reasonable manner;
2. The municipal supplier has sufficient water rights to provide the service;
3. The municipal supplier 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 comprehensive plan, land use plan, or development regulations adopted by a city, town, or county for the service area.

The basis for meeting each threshold is summarized as follows, with specific determination to be made with each application of service. This summary has been prepared to be consistent with the Conditions of Service Criteria adopted in 2019 by the Whatcom County Water Utility Coordinating Committee and the CWSP Section 6.3.

<u>Timely and Reasonable:</u> The PUD provides water service to new connections following review of application for service. Applications are initiated by developers or property owners and must be complete and submitted with any required application fee. The application must provide a complete description of the service desired. Applications are reviewed by the PUD for consistency with this WSP, as may be amended, and the ability for existing infrastructure to provide the desired service. The review process includes confirming the area to be served is within the PUD service area and determining if specific conditions for service or completion of capital improvements identified in the WSP are required and or warranted, in addition to the standard service policies presented below or in PUD standards.

<u>Water Rights:</u> The PUD's water right portfolio is comprised of surface water rights located on the lower Nooksack River and groundwater rights located in the vicinity of the PUD's Grandview–Northgate industrial/commercial area. In general terms, the PUD's owned and operated potable water systems are served by groundwater sources and the PUD's non-potable industrial customers are served by surface water rights and associated facilities authorized to divert water from the lower Nooksack River. The PUD

has adequate water rights to serve existing and future demand in its service areas. A more complete discussion of these water rights and sources can be found in Chapter 4.

Capacity: Capacity of the Grandview-Northgate system is discussed in detail in Chapter 3. A key objective of water system planning is to anticipate and provide capacity for growth. Based on the needs identified in this Water System Plan, the PUD has prepared a Capital Improvement Plan (Chapter 8) to provide adequate physical capacity (source, storage, pumping, distribution) for anticipated growth and increasing water demand. In the broader service area where capacity may not currently exist, requests for service will be considered on a case-by-case basis. Options for service include but are not limited to extension and or expansion of existing facilities, PUD development of new facilities, applicant development of new facilities to be owned and operated by the PUD or the applicant, and other options as may be appropriate.

Land Use Consistency: The PUD has prepared this plan to support development of the PUD service areas at the land use currently adopted by Whatcom County. Confirmation of consistency with local planning documents is described at the end of this Chapter (Section 1.12). Applications for new water service are individually reviewed for consistency with the WSP. However, it is presumed that applications for service for new development are being reviewed by the local land use authority for conformance with appropriate development regulations, as enforcement of such is not under the PUD's jurisdiction.

1.8 Service Area Agreements

There are overlapping service areas within the Cherry Point and Grandview-Northgate service areas as described above in Section 1.2.3. The distribution systems in overlapping service areas do not conflict with each other and serve in different distinctly different areas. The PUD is not aware of any conflicts in water service being provided in these overlapping service areas.

An Agreement for the overlapping service areas with the City of Ferndale is found in Chapter 10.2. Where specific agreements are not in place to identify the primary service provider, the individual water purveyors have a mutual understanding that a property owner in the overlapping area will be served by the purveyor with first right of refusal as noted in Section 1.2.3. If the purveyor with first right of refusal is not willing or able to serve, the alternate purveyor may provide service and become the primary purveyor for the applicant property owner.

1.9 Service Area Policies

The following are the PUD's service area policies.

1.9.1 Wholesaling of Water

Utilities with water system plans may designate Wholesale Service Areas, where they provide raw, partially treated, or potable wholesale water service to a purveyor(s) who then provide direct service to the end user. The PUD's Wholesale Service Area is shown in Figure 1-2, and includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the following: Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, the City of Bellingham service area.

The PUD has a long history of delivering industrial-grade treated water to customers who have then established their own water system and on-site treatment facility to further treat a portion of the PUD supplied industrial-grade water for their respective potable water needs. The PUD negotiates agreements to deliver wholesale water on a case-by-case basis. It is envisioned that the PUD would provide water

service to existing and future purveyors within the PUD's Wholesale Service Area, upon request and when feasible, to meet current or anticipated future water supply needs. Water supplied may be potable, partially treated, or raw water with further treatment by the purchasing purveyor as needed to meet their needs.

1.9.2 Wheeling of Water

The PUD does not currently wheel water. However, the PUD may have an opportunity to wheel water in support of future Whatcom County water supply plan solutions.

1.9.3 Annexation/Service by Agreement

The PUD Commissioners review requests for expansion of its service areas, often referred to as annexation, or service outside the PUD service areas by agreement, on a case-by-case basis, considering a variety of factors, State and County land use requirements and all other applicable State and County regulations. Factors to be considered when reviewing annexation requests include:

- Location relative to service areas and existing infrastructure,
- Contiguity of area with the PUD service area,
- Reasonableness of size and shape,
- Present or future system capacity,
- Public health and environmental impacts,
- Financial impacts.

Future annexation by Ferndale of portions of the Grandview-Northgate service area lying within the Ferndale UGA is likely and will be addressed as appropriate at that time consistent with the Interlocal agreement between the PUD and City of Ferndale. See Chapter 10.2.

1.9.4 Direct Connection and Satellite (Remote) Systems

Consistent with the Whatcom County Coordinated Water System Plan Utility Service Review Procedures, a request for water from outside PUD declared retail service areas may be directed to the PUD for availability of service. The PUD will determine if supply is available and if so, identify the requirements for direct service which may include a construction of a water main extension or other facilities. There may be requests for service that cannot be met by the PUD because of system deficiencies, relative location or land use requirements. The PUD may conclude that it cannot provide service to the individual property owner or water system outside its service area at which point a notice of service declination will be available upon request.

At this time, the PUD is not aware of water systems in the vicinity of its existing service areas that are in need of or planning for Satellite or Remote management. However, as discussed elsewhere in this plan, the proposed service area includes possible direct connection of two mobile home parks that are adjacent to and would become contiguous with the Grandview-Northgate service area and therefore would not be satellite or remote systems.

1.9.5 Design and Performance Standards

The PUD has adopted minimum design and performance standards equivalent to or better than those in the Whatcom County Coordinated Water System Plan. PUD design and performance standards are described in Chapter 3, Chapter 7, and as otherwise defined in the PUD Design Standards and Construction Standards and Details, and adopted Standard Specifications and Standard Plans document incorporated by reference.

1.9.6 Formation of Utility Local Improvement Districts (ULIDs) Outside Legal Boundaries

The PUD does not form ULIDs outside its boundaries.

1.9.7 Urban Growth Area (UGA)

As discussed above in Section 1.6.1, the Whatcom County Comprehensive Plan must contain UGA designations. This Plan includes provision for potable water service in the Cherry Point UGA. This Plan also provides for potable water service in portions of the City of Ferndale UGA, which includes the remaining Grandview-Northgate service area not already in Ferndale City Limits, with the exception of the western most extents of the existing service area (that overlapping with Custer Water Association) and the proposed addition of the Double L MHP service are in the north, both of which are zoned R5A. Future annexation of portions of the Grandview-Northgate service area by the City of Ferndale is likely and will be addressed as appropriate at that time consistent with the Interlocal agreement between the PUD and City of Ferndale/PUD Interlocal Agreement found in. See Chapter 10.2.

1.9.8 Latecomer Agreements

The PUD will not generally pursue system extension unless a developer or group of landowners is willing to pay for the extension up front. If the extension will benefit additional future population (either infilling on individual lots or future raw land developments), the developer is generally required to size the facilities for those anticipated demands and may be allowed to recover a proportionate sum via a Developers Extension/Late Comers Agreements with the PUD. The PUD may consider participation in a developer extension on a case-by-case basis if there is a benefit to the greater respective service area.

1.9.9 Oversizing

The PUD will determine facility oversizing requirements on a case-by-case basis. Oversizing, beyond the capacities needed to serve a particular developer's interest, may be necessary to provide comprehensive service to an area without duplication of planning and construction, and to reduce inefficient operations and maintenance. In general, the PUD will not pay up front for the percentage of oversizing required to support future development of raw land even though the PUD may require such oversizing by developers. The PUD may elect to contribute towards oversizing necessary to accommodate infilling in areas of existing platted lots. The decision would be considered in anticipation of public benefit; and only if PUD contribution was financially feasible.

1.9.10 Cross-Connection Control Program

Where the known or potential contamination of the water system exists, water services shall be equipped with appropriate cross-connection control devices in accordance with Chapter 246-290 WAC. The PUD cross-connection program shall determine the need, size, type, and location of the device. The PUD

reserves the right to require backflow prevention assemblies prior to hook up for any service that may pose risk of known or potential contamination to the water system. All costs associated with the installation, maintenance, and testing of backflow prevention assemblies will be the responsibility of the customer. The PUD's Cross-Connection Control Program is discussed further in Chapter 6.

The PUD Resolution No. 800, which establishes its authority to implement a cross-connection control program, is included along with the Cross-Connection Control Program attached as Appendix H.

1.9.11 System Extension

The PUD has three methods for extending the water system. The first is the Developer Extension Agreement (DEA) – a contractual agreement between a developer and the PUD to allow the developer to build the extension. This method requires the developer to pay directly for all costs associated with the utility extension. The PUD then accepts the extension as part of the PUD system when it is installed to the specifications and satisfaction of the PUD water utility staff, Board, and consulting engineer if applicable.

A second method involves creating a Utility Local Improvement District (ULID). The District pays all the costs up front and the beneficiaries of the ULID pay the District back over a period of years.

The third method is a PUD-initiated project paid for with construction funds on hand or through other funding means such as a grant or loan from potential state or federal funding assistance programs. The PUD may make system upgrades and minor extensions as PUD-initiated projects, but will not typically extend new lines into previously unserved areas. The payback for borrowed funds is derived from rates for service, charges for connections to the system, and in some cases a capital assessment fee that may be localized or system wide.

Any extension must meet PUD minimum design and performance standards, plans must be approved by the PUD, and installation must be inspected by the PUD or its appointed representative during construction.

1.9.12 Other Service Area Policies

Emergency Interties: There are currently no interties with other nearby purveyors. The PUD supports emergency potable water system interties with adjacent water systems. Emergency interties increase reliability of water systems during emergency and other unusual operation circumstances. The PUD continues to explore possible interties as part of its ongoing emergency preparedness and drought resiliency planning efforts.

Service ownership/Responsibility: The PUD owns and maintains the service line to the meter, the meter, meter setter, and the meter box. The water service customer owns and maintains the service line and other facilities such as pressure-reducing valves, pumps, or cross-connection devices beyond the meter. Easements are to be required for waterlines and located on private property where they are to be owned and maintained by the PUD.

1.10 Satellite Management Agencies

The Whatcom County Coordinated Water System Plan (CWSP) outlines a Satellite System Management Program under which an established water purveyor can provide operation and management services to water systems servicing properties outside the purveyor's boundaries. In considering the Satellite System

Management Program, the PUD evaluated three primary options for supporting potable water supply to the broader community of Whatcom County outside: (1) direct service, in which the PUD owns the water system; (2) contract services, in which the District performs routine operation and maintenance for systems that are not owned by the PUD; and (3) support assistance, consisting of varied support to systems requiring assistance on a more limited scale.

The PUD is not, and does plan to become a DOH "approved" Satellite Management Agency (SMA) at this time. However, consistent with PUD history over the last 20 years, the PUD expects to continue providing technical support to water systems in Whatcom County on a limited scale and as budget constraints allow. The PUD is authorized to provide water service in Whatcom County and should the need arise, the PUD can operate a remote or satellite system if feasible without becoming a Satellite Management Agency.

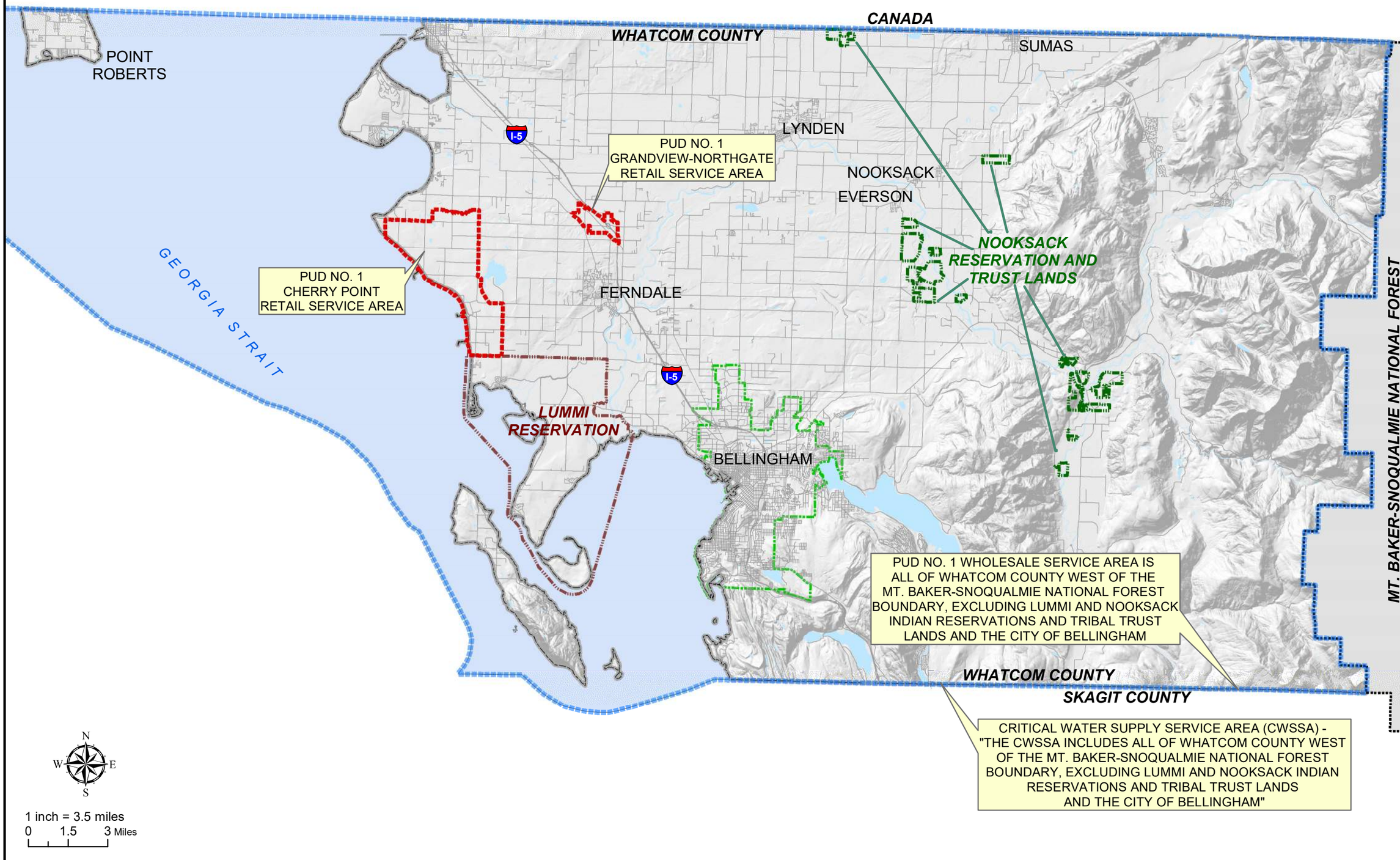
1.11 Complaints

The PUD rarely gets complaints regarding the water system. If there is a complaint and staff cannot resolve the issue over the phone, such as by explaining that the issue was due to flushing, a recent main break, or a localized issue within the commercial connection, water operators will be dispatched to investigate and document the situation. If the issue is related to the PUD's distribution system it will be resolved by following accepted water system practices and operational procedures. PUD personnel may contact the customer as necessary to obtain more information or otherwise ensure the problem was resolved or that the problem is a localized issue on the customer side of the water service and not a distribution issue. PUD personnel are not allowed to correct or fix any problems on the customer's side of the water service.

For the period 2010–2019, the PUD has not received any customer complaints other than periodic reports of a possible leak.

1.12 Consistency from Local Planning and WRIA

This plan was submitted to the Whatcom County Planning and Development Services (PDS), Whatcom County Health Department, and Whatcom County Engineering and found to be not inconsistent (PENDING) with local government planning. A copy of the consistency statement is included (PENDING) in Section 10.3.



CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD NO. 1

WHATCOM COUNTY WASHINGTON

FIGURE 1-2
OVERALL SERVICE AREA MAP

DATE 6/29/2020
SCALE AS SHOWN
PROJECT 2020-023

SHEET 1 OF 1

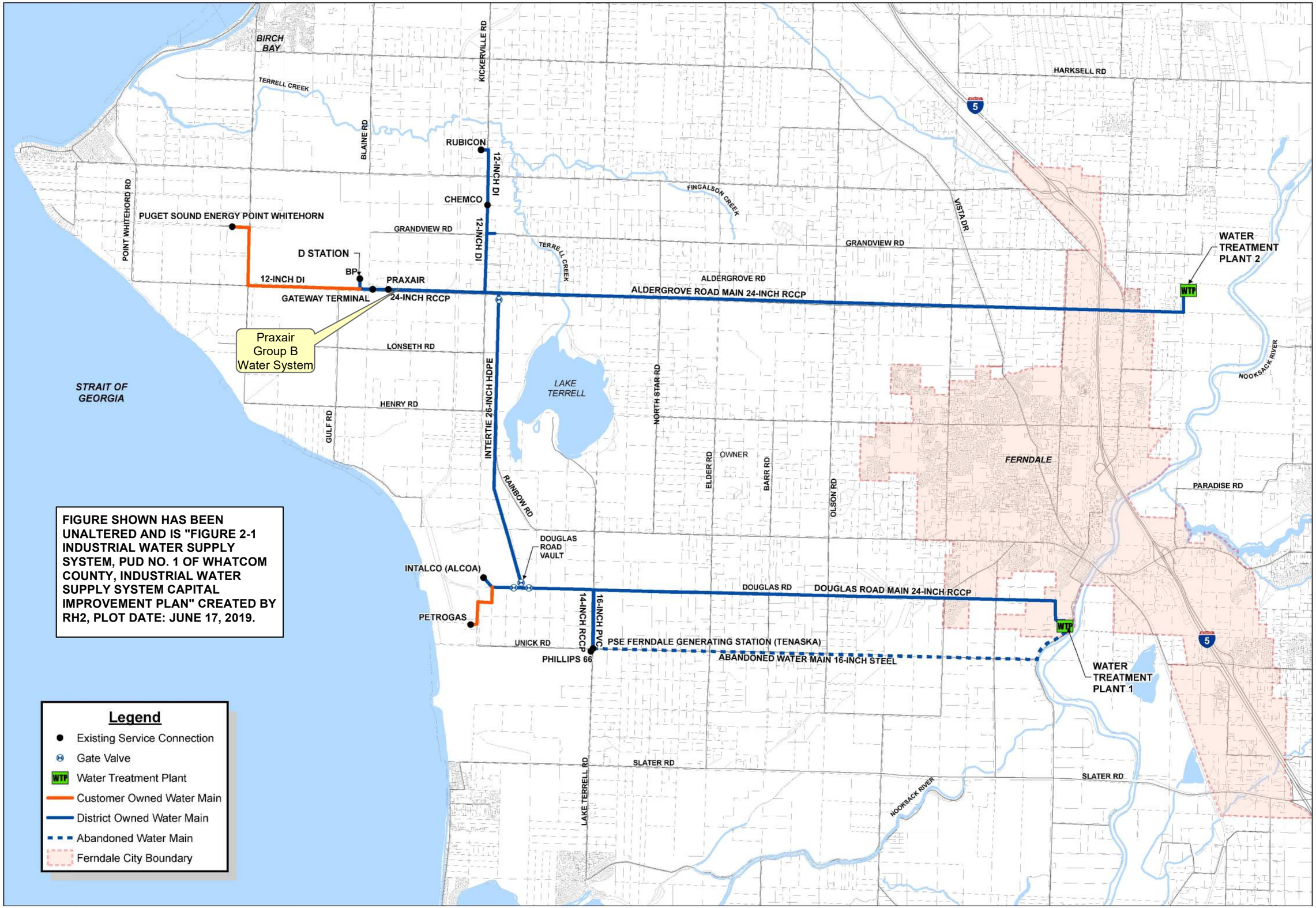


FIGURE SHOWN HAS BEEN UNALTERED AND IS "FIGURE 2-1 INDUSTRIAL WATER SUPPLY SYSTEM, PUD NO. 1 OF WHATCOM COUNTY, INDUSTRIAL WATER SUPPLY SYSTEM CAPITAL IMPROVEMENT PLAN" CREATED BY RH2, PLOT DATE: JUNE 17, 2019.

Legend

- Existing Service Connection
- Gate Valve
- WTP Water Treatment Plant
- Customer Owned Water Main
- District Owned Water Main
- Abandoned Water Main
- Ferndale City Boundary

CIVIL
STRUCTURAL
SURVEY

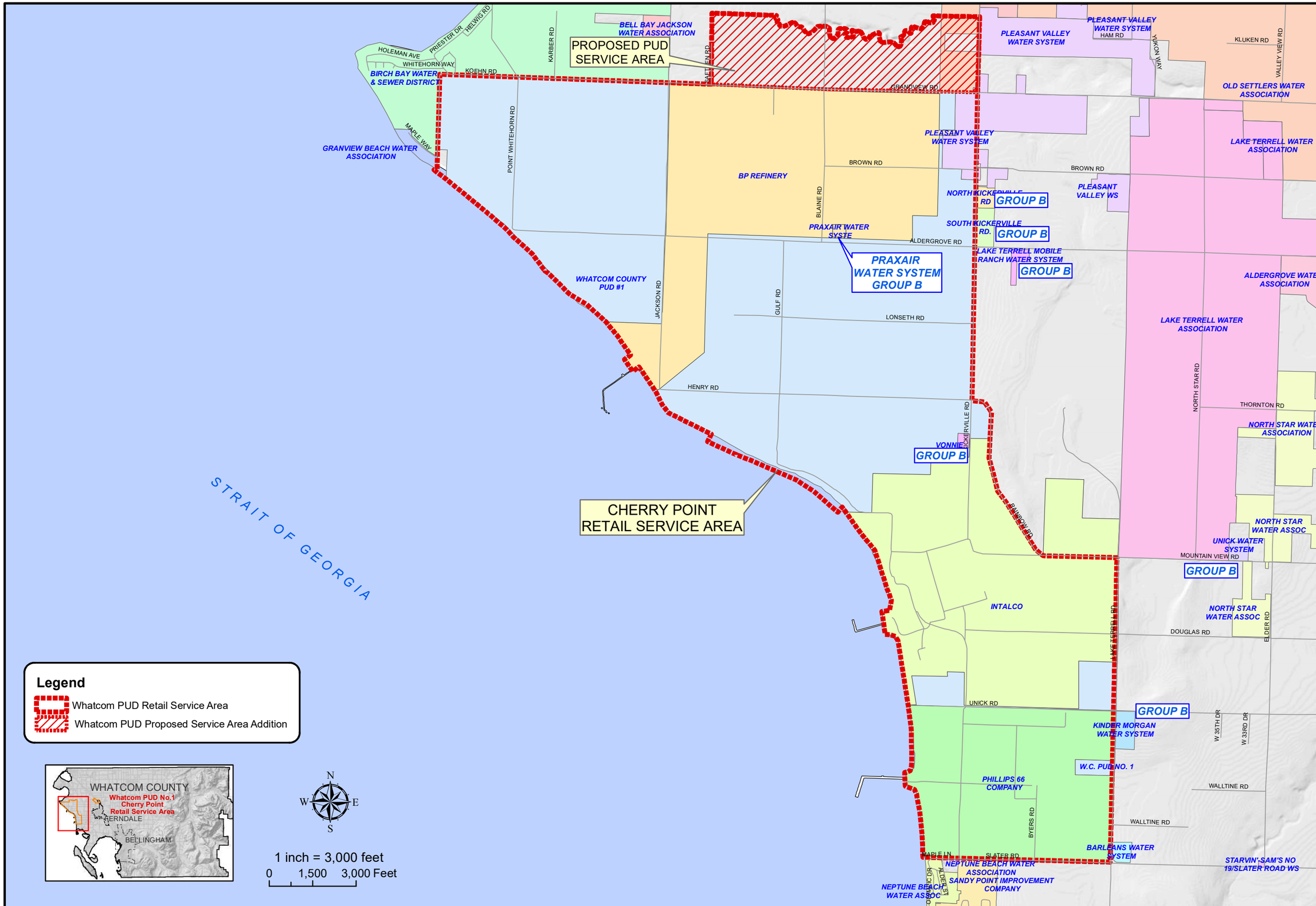
WILSON ENGINEERING
WILSONENGINEERING.COM

WHATCOM COUNTY PUD NO. 1

WHATCOM COUNTY WASHINGTON

FIGURE 1-3
INDUSTRIAL WATER SUPPLY SYSTEM MAP

DESIGNED BY -	DRAWN BY RDN	CHECKED BY -
DATE 6/29/2020	SCALE NOT TO SCALE	PROJECT 2020-023
SHEET 1	OF 1	



CIVIL STRUCTURAL SURVEY

WILSON ENGINEERING

WILSONENGINEERING.COM

DESIGNED BY	-
DRAWN BY	RDN
CHECKED BY	-

WHATCOM COUNTY PUD NO. 1

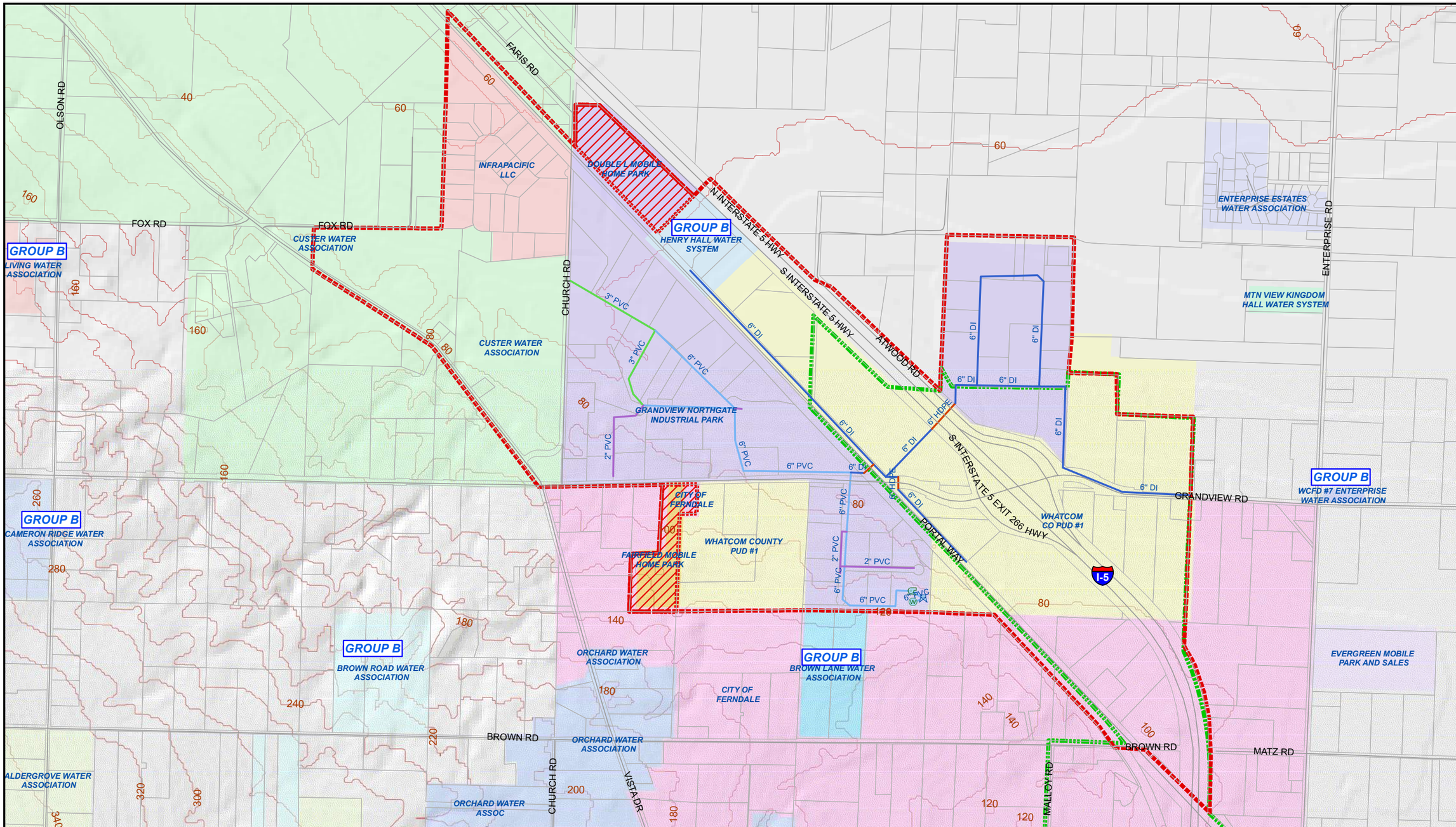
WHATCOM COUNTY WASHINGTON

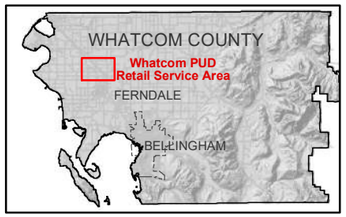
FIGURE 1-4

CHERRY POINT RETAIL SERVICE AREA

DATE	6/29/2020
SCALE	AS SHOWN
PROJECT	2020-023

SHEET 1 OF 1





ADJACENT PURVEYORS:

CUSTER WATER ASSOCIATION
INFRAPACIFIC LLC
DOUBLE L MOBILE HOME PARK
CUSTER WATER ASSOCIATION
CITY OF FERNDALE
FAIRFIELD MOBILE HOME PARK
HENRY HALL WATER SYSTEM
ENTERPRISE ESTATE WATER ASSOCIATION
MTN VIEW KINGDOM HALL WATER SYSTEM
WCFD#7 ENTERPRISE WATER ASSOCIATION
EVERGREEN MOBILE PARK AND SALES
BROWN LANE WATER ASSOCIATION
ORCHARD WATER ASSOCIATION
BROWN ROAD WATER ASSOCIATION
CAMERON RIDGE WATER ASSOCIATION
LIVING WATER ASSOCIATION

Legend

Pump Station
Reservoir
Groundwater Well

Water Mains
2" PVC
3" PVC
6" DI
6" HDPE
6" PVC

Whatcom PUD Retail Service Area
Whatcom PUD Proposed Service Area Addition
Ferndale City Limits

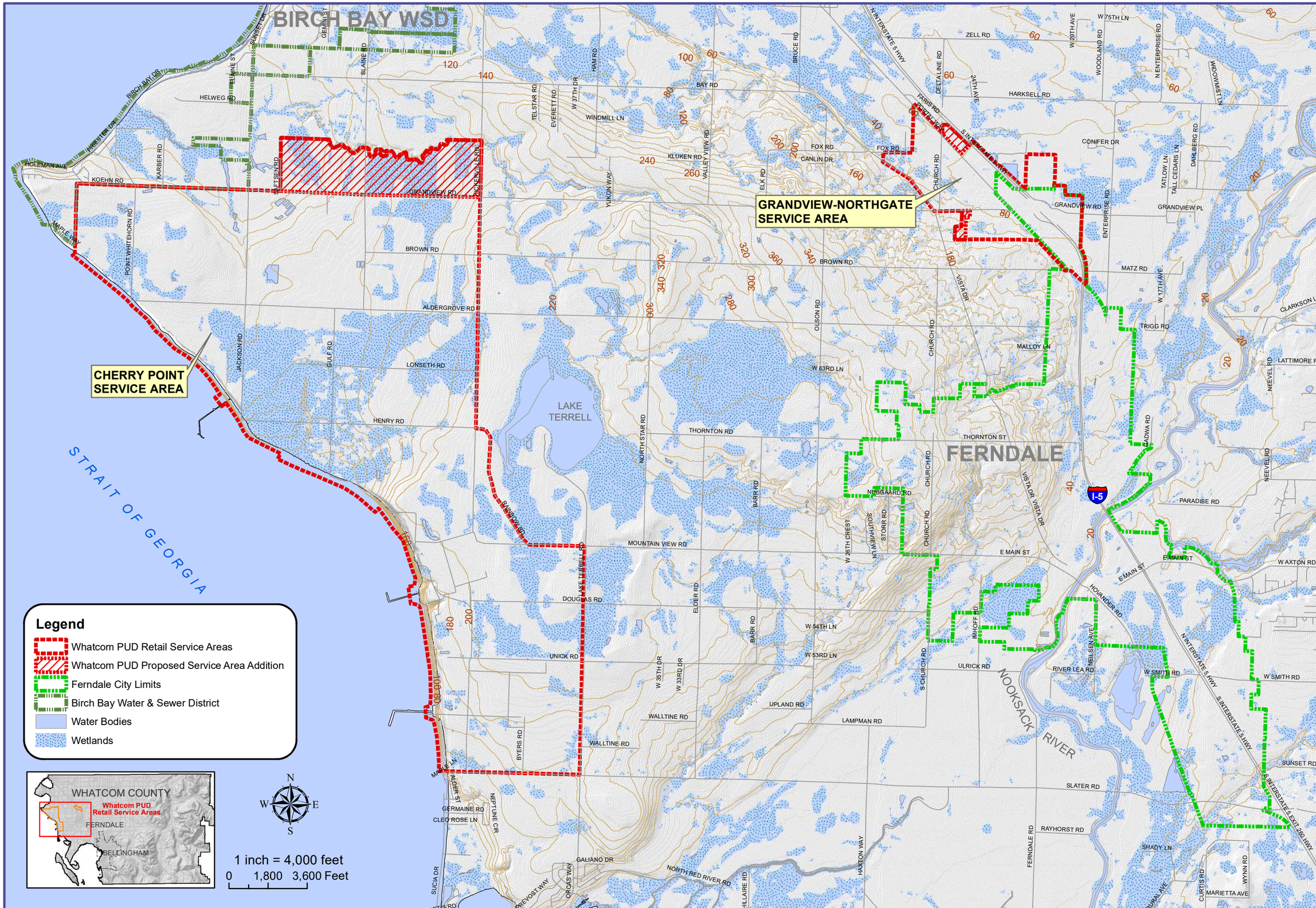
N W E S

1 inch = 1,003 feet
0 250 500 1,000 Feet

WILSON ENGINEERING
WILSONENGINEERING.COM
CIVIL
STRUCTURAL
SURVEY

WHATCOM COUNTY PUD NO. 1
WHATCOM COUNTY WASHINGTON
FIGURE 1-5
GRANDVIEW-NORTHGATE RETAIL SERVICE AREA

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -
DATE 6/29/2020
SCALE AS SHOWN
PROJECT 2020-023
SHEET 1 OF 1



CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY	-
DRAWN BY	RDN
CHECKED BY	-

WHATCOM COUNTY PUD NO. 1

WHATCOM COUNTY WASHINGTON

FIGURE 1-6
WATER BODIES AND TERRAIN

DATE	4-30-2021
SCALE	AS SHOWN
PROJECT	2020-023

SHEET 1 OF 1

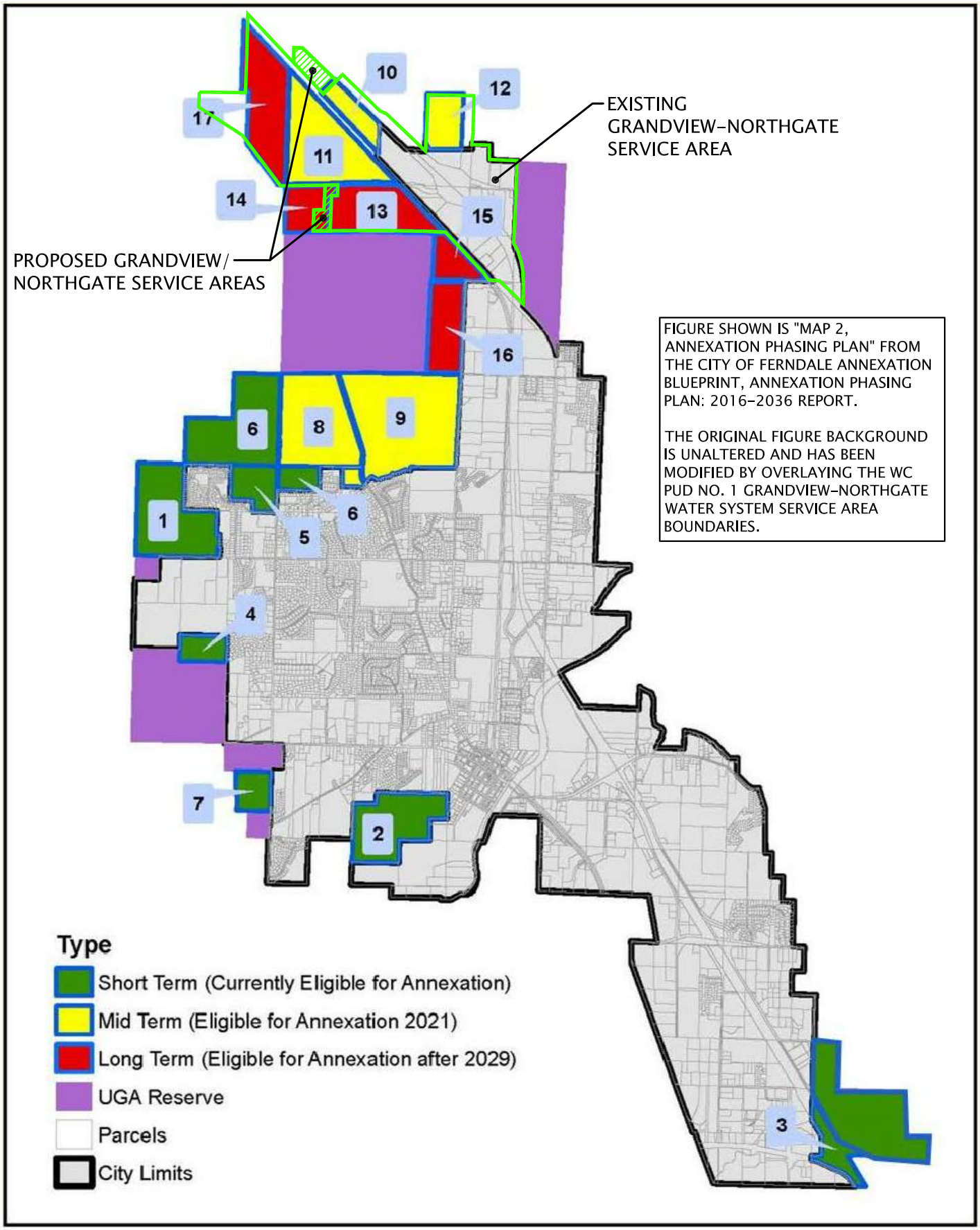


FIGURE SHOWN IS "MAP 2, ANNEXATION PHASING PLAN" FROM THE CITY OF FERNDALE ANNEXATION BLUEPRINT, ANNEXATION PHASING PLAN: 2016-2036 REPORT.

THE ORIGINAL FIGURE BACKGROUND IS UNALTERED AND HAS BEEN MODIFIED BY OVERLAYING THE WC PUD NO. 1 GRANDVIEW-NORTHGATE WATER SYSTEM SERVICE AREA BOUNDARIES.

PLOT SETTINGS: Adobe PDF NO-MERGE.pc3, Letter, Portrait, 1:1, WE APWA_UNSCREENED COLOR.ctb
W:\2020\2020-023 WC PUD NO. 1 WATER SYSTEM PLAN\DWG\2019\FIG1-7 FAPP AND GV SERVICE AREA.DWG - 6/30/2020 11:07 AM - Rio Nickerson

WILSON ENGINEERING

WILSONENGINEERING.COM

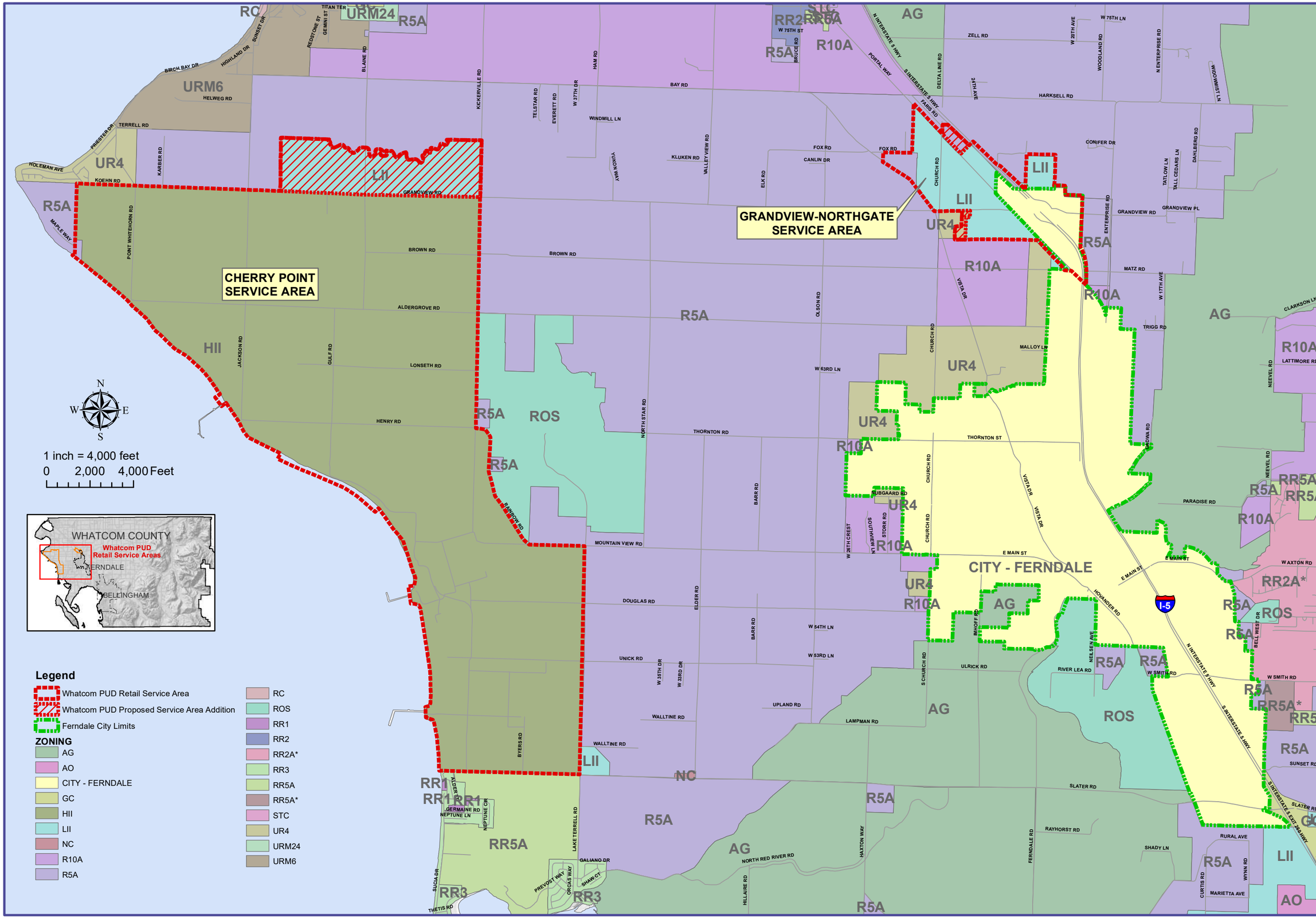
CIVIL
STRUCTURAL
SURVEY

WHATCOM COUNTY PUBLIC UTILITY DISTRICT NO. 1

WHATCOM COUNTY WASHINGTON

FIGURE 1-7
GRANDVIEW-NORTHGATE SERVICE AREA
AND FERNDALE ANNEXATION PHASING PLAN

DATE	SHEET
6/29/2020	1
SCALE NTS	OF
JOB NO. 2020-023	1



WILSON ENGINEERING
CIVIL STRUCTURAL SURVEY
WILSONENGINEERING.COM

WHATCOM COUNTY PUD NO. 1

WHATCOM COUNTY WASHINGTON

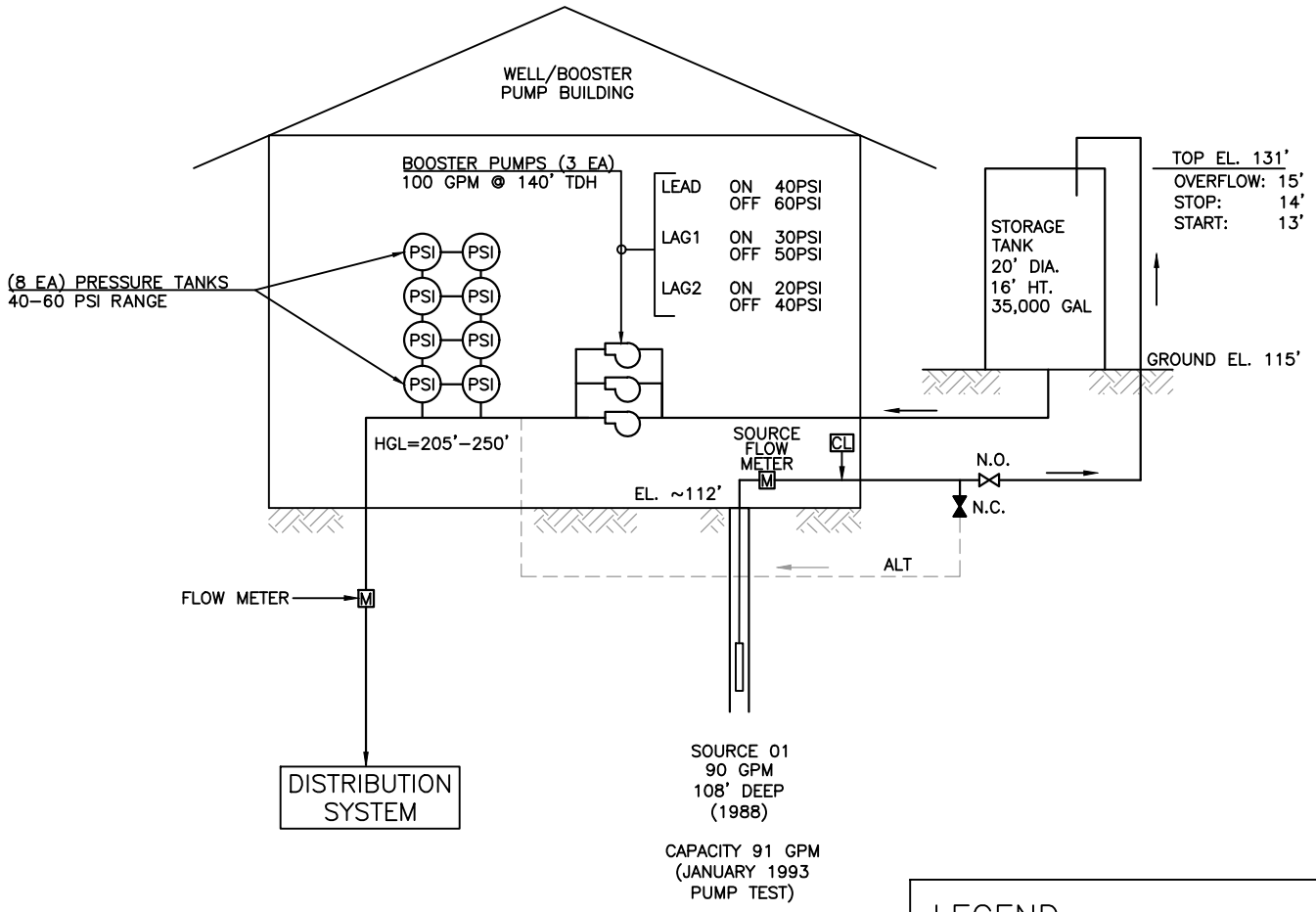
FIGURE 1-8

CHERRY POINT/GRANDVIEW-NORTHGATE AREA ZONING

DESIGNED BY	DRAWN BY	CHECKED BY
-	RDN	-

DATE	SCALE	PROJECT
4-30-2021	AS SHOWN	2020-023

SHEET 1 OF 1



LEGEND

———	WATER PIPE
- - - -	ALTERNATIVE PIPE CONNECTION
⋈	ISOLATION VALVE, NORMALLY OPEN
⋈	ISOLATION VALVE, NORMALLY CLOSED
TDH	TOTAL DYNAMIC HEAD
HGL	HYDRAULIC GRADE LINE
CL	CHLORINATION SYSTEM
M	FLOW METER

WILSON ENGINEERING
WILSONENGINEERING.COM

CIVIL
STRUCTURAL
SURVEY

WHATCOM COUNTY PUBLIC UTILITY
DISTRICT NO. 1

WHATCOM COUNTY WASHINGTON

FIGURE 1-9
GRANDVIEW-NORTHGATE WATER SYSTEM
FACILITY SCHEMATIC

DATE	SHEET
4-23-2020	1
SCALE	OF
NTS	1
JOB NO.	
2020-023	

PLOT SETTINGS: DWG To PDF.pc3, ANSI full bleed A (8.50 x 11.00 inches), Portrait, 1:1, WE APWA_UNSCREENED.ctb
W:\2020\2020-023 WC PUD NO. 1 WATER SYSTEM PLAN\DWG\2019\NORTHGATE-GRANDVIEW FACILITY SCHEMATIC.DWG - 6/30/2020 9:18 AM - Rig Nickerson

2. Basic Planning, Data and Water Demand

This chapter presents planning data and water demand forecasting for only the Grandview-Northgate Industrial Park (GV-NG) service area, as there is no potable water provided by the PUD in the Cherry Point service area. This information is used to evaluate the ability of the water system to provide service now and in the future. Existing historical service connection data is presented, along with historical water use data. Population in the traditional sense is not applicable to light-impact industrial use areas, but population as “non-residential users” is presented below for existing conditions only based on previous PUD estimates per the Department of Health (DOH) Water Facility Inventory (WFI) form. The data presented in this Chapter meets the DOH requirements for data collection under the Water Use Efficiency (WUE) program and helps to identify past water production and consumption trends. This chapter also includes projected land use and water demands for the 10-year and 20-year planning periods, as well as discussion regarding build-out projections for the proposed water service area. These projections are used for the system analysis in Chapter 3, which is the basis for development of the Capital Improvement Program in Chapter 8.

2.1 Current Population and Service Connections

The Grandview-Northgate (GV-NG) existing service area is approximately 655 acres and includes land zoned for light-impact industrial (LII) and rural – 1 unit per 5 acres (R5A). The majority of the existing service area lies within Ferndale City Limits and Urban Growth Area with the exception of 27 acres of R5A zoning to the west between Vista Drive and Fox Road. Zoning as defined by Ferndale within their City Limits overlapping the GV-NG existing service area is Regional Retail (RR), which is treated as LII for analysis purposes.

The proposed service area adds 12 acres of urban residential - 4 units per acre (UR4) located within the Ferndale Long Term UGA eligible for Annexation after 2029 and 21 acres of rural - 1 unit per 5 acres (R5A) located outside the Ferndale UGA, bringing the total proposed service are to 688 acres.

Almost all service connections within the GV-NG existing service area are LII zoned connections. There are two connections within the Ferndale City Limits. Table 2-1 shows the existing land uses and service connections, as well as the proposed area land uses. Active service connections have fluctuated from 39 – 43 over the last six years with no apparent growth trend.

Table 2-1 Existing Land Use and Service Connections, and Proposed Land Use

Zoning	Existing Area (acre)	Proposed Area (acre)	Existing Connections	Number of Users (1)
LII	416	416	39	-
UR4	0	12	0	-
R5A	39	60	0	-
Ferndale-City (2)	200	200	2	-
Total	**655**	**688**	**41**	**400**

Note: (1) Number of non-residential users (population) estimated for 2019 per the DOH WFI form.

(2) This includes City Limits only and does not include UGA or UGA Reserve. City zoning is Regional Retail.

2.2 Water Use Data Collection and Demand Forecast

The Washington State Legislature enacted the Municipal Water Law due to the increased demand on the State's water resources. Under the Municipal Water Law, DOH has adopted a WUE program, which became effective on January 22, 2007. As part of the WUE program, municipal water suppliers (MWS), including Whatcom County PUD No. 1 (PUD), are required to:

- Collect source and use data
- Forecast demand
- Evaluate WUE measures
- Calculate distribution leakage
- Implement a WUE program to meet their goals

The PUD's WUE program is discussed further in Chapter 4 of this Plan. Data collection, demand forecasts, and calculation of distribution leakage are discussed below.

2.3 Water Use Data

The PUD collects monthly and annual totals of water produced. The source of supply well is metered and recorded every month. The PUD periodically collects daily data at the meter located downstream of the booster pumps prior to distribution. Service meters are installed on all service connections. Water consumption data is collected every month.

2.3.1 Water Production

The GV-NG service area water production for the last six years is shown in Table 2-2. The table also shows the number of connections and active connections for each year.

Table 2-2 Historical Water Production (gallons)

Year	Total (2)	Percent Change (from previous year)	Number of Connections	Active Connections (1)
2014	5,121,418	16.6%	40	38
2015	5,027,108	-1.8%	39	38
2016	5,328,730	6.0%	42	39
2017	5,012,046	-5.9%	39	36
2018	6,179,785	23.3%	43	40
2019	6,110,824	-1.1%	41	37

Note: (1) Active connections are connections using water for the calendar year.
(2) Production adjusted to reflect Healthy Pet potable metered use at 8% of total use based on daily meter readings April-May, 2021.

As shown in Table 2-2, the GV-NG water production has generally increased since 2014 with an overall increase of about 19%. Since the number of connections have remained relatively consistent, the production data supports the traditional patterns of highly variable use for light-impact industrial land uses.

2.3.2 Historical Water Consumption

The GV-NG service area water consumption for the last six years is shown in Table 2-3.

Table 2-3 Historical Water Consumption (gallons)

Year	Total (2)	Percent Change (from previous year)	Number of Connections	Active Connections (1)
2014	4,758,726	13.5%	40	38
2015	4,811,885	1.1%	39	38
2016	4,859,305	1.0%	42	39
2017	4,669,359	-4.1%	39	36
2018	5,987,502	22.0%	43	40
2019	5,936,103	-0.9%	41	37

Note: (1) Active connections are connections using water for the calendar year.
(2) Consumption adjusted to reflect Healthy Pet potable metered use at 8% of total use based on daily meter readings April-May, 2021.

As shown in Table 2-3, GV-NG water use has generally increased since 2014 with an overall increase of approximately 24.5%. Light-Impact Industrial use customers currently make up the entirety of the water

use. Since the number of connections have remained relatively consistent, the use is driven by the type of connections and fits into the highly variable use patterns typical of light-impact industrial land uses.

2.4 Distribution System Leakage

Distribution system leakage is water lost from the distribution system and includes both apparent and real losses. Water is either considered "authorized consumption" or "distribution system leakage", according to the DOH *Water Use Efficiency Guidebook*. Examples of authorized consumption that are not metered include flushing of water mains, firefighting, reservoir cleaning, etc. All water that is not authorized consumption is considered distribution system leakage.

The PUD does not currently track water used for water main flushing, reservoir cleaning, etc. It is recommended to track these uses in the future. Firefighting related uses are not applicable since the GV-NG service area potable and fire protection systems are separate. Table 2-4 summarizes GV-NG system leakage for 2014 through 2019.

Table 2-4 Distribution System Leakage

Year	Total Production (gallons)	Total Metered Consumption (gallons)	Additional Other Authorized Consumption (gallons)	Distribution System Leakage (gallons)	Percent Distribution System Leakage
2014	5,121,418	4,758,726	0	362,692	7.1%
2015	5,027,108	4,811,885	0	215,223	4.3%
2016	5,328,730	4,859,305	0	469,425	8.8%
2017	5,012,046	4,669,359	0	342,687	6.8%
2018	6,179,785	5,987,502	0	192,283	3.1%
2019	6,110,824	5,936,103	0	174,721	2.9%
			2017-2019 3-year Average		**4.3%**

Compliance with the distribution system leakage standard, which is part of the WUE requirements, is based on a 3-year rolling average. As shown in Table 2-4, the PUD distribution leakage over the last three years has averaged 4.3 percent. This is less than the WUE standard of distribution system leakage of 10 percent. Distribution system leakage in the GV-NG service area has decreased in recent years as leaks have been found and repaired.

2.5 Customer Classes, Large Users, and Seasonal Variations

2.5.1 Customer Classes

The GV-NG existing service area is a non-residential system consisting of only light-impact industrial (LII) customer class. Thus, an equivalent residential unit (ERU) type approach for analysis of demands and capacity will not be utilized.

The proposed GV-NG service area is mixed use consisting of primarily non-residential LII customers, but also containing relatively small areas of residential type (UR4, R5A). As described later in this Chapter, a combination of non-ERU and ERU based demand projections will be utilized.

2.5.2 Large Users

The water use in the GV-NG service area varies significantly. There are seven service connections, representing 4 users, that consistently make up the majority of the systems water use; Grandview Business Center, Western Refinery Services (2 connections), Grandview Lot 2 (2 connections), and Imco Construction (2 connections). The large users were identified as generally having a nominal average day demand (ADD) of >1,000 gpd. These connections and their total water use and percentage of the overall system use (consumption), for the last six years are shown in Table 2-5.

Table 2-5 Large and Small Connections Water Use

Year	Total Use, Large Users (gallons)	Percentage of System Use	Total Use, Small Users (gallons)	Percentage of System Use
2014	2,833,172	59.5%	1,925,554	40.5%
2015	2,889,185	60.0%	1,922,700	40.0%
2016	3,028,381	62.3%	1,830,924	37.7%
2017	2,847,836	61.0%	1,821,523	39.0%
2018	3,646,041	60.9%	2,341,461	39.1%
2019	4,166,501	70.2%	1,769,602	29.8%

As shown in Table 2-5, increase in water use is primarily driven by the large users. The ‘small’ users water use has remained relatively consistent over the last six years, and has actually shown an overall decreasing trend.

Table 2-6 summarizes the last six years of consumption data for the four large users (representing 7 service connections).

Table 2-6 Large Users Water Use (gallons)

Year	Grandview Business Center	Western Refinery Services (2 conn)	Grandview Lot 2 (2 conn)	IMCO Construction
2014	1,296,657	717,931	452,347	366,237
2015	945,921	727,356	685,831	530,077
2016	1,306,980	561,001	706,208	454,192
2017	1,009,651	765,718	701,982	370,485
2018	1,217,669	1,079,813	788,770	559,789
2019	1,401,379	1,306,254	1,117,114	341,754

As shown in Table 2-6 large user water use increases over the last six years have been primarily driven by two connections; WRS, and GV Lot 2 with increases of 82% and 147%, respectively.

2.5.3 Seasonal Variations

As expected for light-impact industrial land uses the typical seasonal water use patterns are more uniform throughout the year as compared to residential. However, the system does exhibit higher water use during the drier summer months with the highest use months typically being June, July, or August. This might be attributed to a variety of general seasonal increases in market activity including influx of users, increase in demand of product, increase in production/manufacturing of goods, and construction season activities. Small amounts of general landscaping and vegetation watering could also add to the seasonal increase during the dry summer months.

The Figure below shows the seasonal variation for monthly water use from 2014-2019, including the average of the six years.

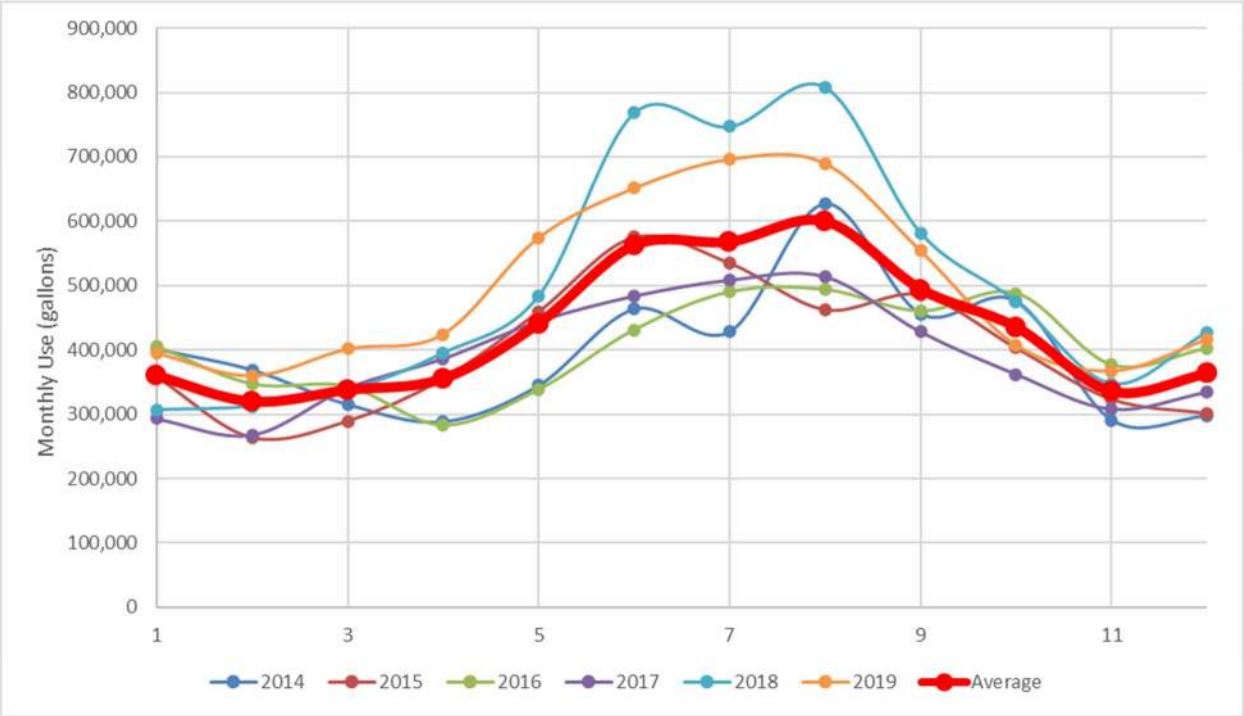


Figure 2-1 Monthly Water Use 2014-2019

2.6 Average Day Demand

The GV-NG service area Average Day Demand (ADD) for years 2014 through 2019 is shown in Table 2- 7. ADD presented is based on production as recorded at the well source meter and includes distribution system leakage.

Table 2-7 Average Day Demand

Year	ADD (gpd)
2014	14,031
2015	13,373
2016	14,599
2017	13,732
2018	16,391
2019	16,742

The ADD has generally increased since 2014 with an overall increase of about 3.2% per year. Since the number of connections have remained relatively consistent, the production data supports the traditional patterns of highly variable use for light-impact industrial land uses.

Future water use projections for this analysis will use an annual increase in ADD of 3.2%.

2.7 Maximum Day Demand

The GV-NG service area Maximum Day Demand (MDD) is evaluated using the maximum of three available methods and data sets. The first data set considered includes available daily records from the meter located downstream of the booster pump station to distribution, and thus includes distribution system leakage. Daily records were available for the entire year of 2017. Data for 2018 and 2019 were only partially available due to meter issues from May 10 – November 8, 2018 and June 13 – September 22, 2019. Available data for 2018 and 2019 were evaluated despite missing the likely peak usage seasons. Because of the variability in the daily meter recording time from day to day, a 3-day moving average was used to establish the maximum.

The maximum 3-day moving averages observed for the 3 years are shown in the Table 2-8. Also shown are the corresponding yearly ADD and resulting estimation MDD:ADD ratios.

Table 2-8 Method #1 Estimation of Maximum Day Demand

Year	Observed Maximum (gpd) (1) (4)	Dates	ADD (gpd)	MDD:ADD Ratio
2017	35,575	Sept 5-7	13,732	2.59
2018 (2)	22,859	Jan 27-29	16,391	1.39
2019 (3)	36,088	Oct 21-23	16,742	2.15

Notes:

(1) Maximum based on highest 3-day moving average for the year.

(2) Daily data not available from May 10 – November 8, 2018.
(3) Daily data not available from June 13 – September 22, 2019.
(4) Data adjusted to reflect Healthy Pet potable metered use at 8% of total use based on daily meter readings April-May, 2021.

Two other methods of estimating MDD were considered for this analysis. Method #2 considered an MDD to Maximum Month Average Day Demand (MMADD) ratio in accordance with the DOH Water System Design Manual (WSDM) Section 3.4.1. For water systems serving fewer than 1,000 people DOH recommends a ratio of 1.65. For 2019 the MMADD was 689,964 gallons produced during the month of August, or 22,257 gpd. Using the 1.65 ratio this yields an estimated MDD = 36,724 gpd. However, this method is based on data from residential systems and is recommended for residential systems, which does not apply to the GV-NG system.

Method #3 considered previous data analysis for the PUD by another consulting firm performed in 2014. The analysis determined peaking factors based on real, complete data for August 2014 by collecting daily and hourly data at the booster meter. It was concluded that the MDD:ADD peaking factor was 2.7 occurring on August 25, 2014. This agrees reasonably well with the data analysis presented above in Table 2-8, specifically year 2017 which resulted in a MDD:ADD ratio of 2.59.

This analysis will use the most conservative MDD:ADD ratio of the above methods considered, or MDD:ADD = 2.7. Future water use projections will follow the annual increase of 3.2% used for ADD.

2.8 Peak Hourly Demand (PHD)

Typically, a water system's Peak Hourly Demand (PHD) is calculated using the standard DOH equation (Equation 3-1) based on the number of equivalent residential units (ERUs) and Maximum Day Demand per ERU. However, this method does not apply to the non-residential GV-NG system. Methods used for determining PHD are presented here.

The GV-NG system does not have hourly meter collection data. For this analysis PHD is estimated based on previous data analysis for the PUD by another consulting firm performed in 2014 (same study used and presented in the MDD section above). The analysis determined peaking factors based on real, complete data for August 2014 by collecting daily and hourly data at the booster meter. It was concluded that the PHD:ADD peaking factor was 5.6 occurring on August 25, 2014.

This analysis will use a PHD:ADD ratio of 5.6. Future water use projections will follow the annual increase of 3.2% used for ADD.

2.9 Projected Land Use, Population, and Future Demands

<u>Projected Land Use</u>

The GV-NG water system proposed service area is almost entirely within the Ferndale City Limits and Urban Growth Area. Refer to Figure 1-5. See Ferndale Annexation Phasing Plan (FAPP) Figure 1-7. Currently, as shown in Table 2-1, there are approximately 200 acres within the Ferndale City Limits located in south-eastern part of the service area along the I-5 corridor. The City identifies the area zoning as Regional Retail (RR), which is treated as LII for analysis purposes. The City of Ferndale has plans to continue to annex much of the GV-NG service area in the future as follows:

- Mid-term phase, eligible for annexation in 2021:
    - Light-Impact Industrial zoning:

        - 128 acres between Delta Line Rd, Grandview Rd, and Portal Way, FAPP #11
        - 38 acres between Portal Way, I-5, Double L Mobile Home Park (not included in UGA), and Proctor Rd, FAPP #10
        - 45 acres along Buchanan Loop east of I-5. FAPP #12
- Long-term phase, eligible for annexation in 2029:
    - Light-Impact Industrial zoning:
        - 107 acres west of Delta Line Rd to the limits of R5A zone, FAPP #17
        - 79 acres south of Grandview Rd. FAPP #13
    - Urban Residential 4/acre (UR4) zoning:
        - 12 acres south of Grandview (consisting of Fairfield Mobile Home Park). FAPP #14

There is currently no Ferndale water supply infrastructure in the existing City Limits area within the GV- NG service area and there no known immediate plans to extend water to the area. As such, this analysis will project water use for the GV-NG system service area without consideration of potential future water service provided by the City of Ferndale.

It is expected that future land use in the GV-NG proposed water service area will remain the same as currently designated in the Whatcom County Comprehensive Plan and the Ferndale Comprehensive Plan. Each of these two areas includes important light-impact industrial lands, necessary to allow Whatcom County to achieve its economic development objectives.

Projected Population

While population projections are commonly used to project future water demands for most water systems consisting of primarily residential type customers, the unique nature of the PUD's GV-NG non-residential light-impact industrial customer base does not lend itself to these traditional methods. The unique activity and water use patterns applicable to the system will be the primary factors that determine future water demands for the system. Thus, population projections are not considered for this analysis unless specifically identified.

Projected Future Demands

Percent Growth Approach

The GV-NG projected average day, maximum day, and peak hour demand is shown in Table 2-9. The projected average day demand (ADD) is based on a 3.2% increase per year. The projected maximum day demand (MDD) is based on a factor of 2.7 from ADD to MDD. The project peak hour demand (PHD) is based on a factor of 5.6 from ADD to PHD.

For more details and year-to-year projections, refer to the Storage Table identified in Chapter 3 System Analysis.

Table 2-9 Projected Average Day, Maximum Day, and Peak Hour Demand

Year	Projected Average Day Demand (gpd) (1)	Projected Maximum Day Demand (gpd) (2)	Project Maximum Day Demand (gpm)	Projected Peak Hour Demand (gpm) (3)
2019	16,742	45,203	31	65
2020	17,278	46,650	32	67
2030	23,675	63,922	44	92
2040	32,440	87,588	61	126

Notes:
(1) Based on an annual increase of 3.2%.
(2) Based on a MDD to ADD peaking factor of 2.7.
(3) Based on a PHD to ADD peaking factor of 5.6.

Water use projections were also evaluated from a “use per acre” basis, a “use per parcel” basis, and a zoning basis. These are used to establish reasonable use estimates and time lines for build-out of the proposed service area. Note the following projections assume that a majority of existing connections will continue their current use and those few connections that have experienced significant increase in use will level off and maintain their most recent use. Historical data suggests that this assumption may not apply to a small number of large users who have been using an increasing amount of water over at least the last six years. If use among these large users continues to increase the PUD could consider implementing a different water rate structure that might encourage more conservation-based trends from large users.

Use per Acre Based Projections

The total area of the parcels currently served in the existing service area is approximately 160 acres, consisting of entirely Light-Impact Industrial (LII) zoned connections. Using the highest historical ADD from 2019, the ADD use per acre is calculated as follows:

16,742 gpd / 160 acre = 105 gpd/acre

The total area of the parcels not currently served in the proposed service area is approximately 404 acres, consisting primarily of LII zoning but also includes residential zoning UR4 and R5A. Residential zoning connection typical water use amounts and patterns are not considered here. Also note these areas do not include roadways, including the I-5 corridor, or the railroad and thus total 564 acres (not the 688-acre complete area within the defined proposed service area limits). There are approximately 14 acres that appear to be very likely undevelopable (ponds, wetlands) based on aerial imagery. Less the undevelopable portion, the total future demands for the unserved area is estimated to be:

404 acres – 14 undevelopable acres = 390 acres x 105 gpd/acre = 40,950 gpd

The total estimated build-out ADD for the proposed service area is the current ADD plus the projected ADD:

16,742 gpd + 40,950 gpd = 57,692 gpd

Note that the projected 57,692 gpd ADD using this method is more than the projected 2040 ADD based on a continuing trend of 3.2% increase per year as shown in Table 2-9.

Use per Parcel Based Projections

The total number of parcels currently served in the existing service area is 41, consisting of entirely Light-Impact Industrial (LII) zoned connections. Using the highest historical ADD from 2019, the ADD use per parcel is calculated as follows:

16,742 gpd / 41 parcels = 408 gpd/parcel

The total number of parcels not currently served in the proposed service area is approximately 80, consisting primarily of LII zoning but also includes residential zoning UR4 and R5A. Residential zoning connection typical water use amounts and patterns are not considered here. There are 3 parcels that appear to be very likely undevelopable (ponds, wetlands) based on aerial imagery. Less the undevelopable parcels, the total future demands for the unserved area is estimated to be:

80 parcels – 3 undevelopable parcels = 78 parcels x 408 gpd/parcel = 31,824 gpd

The total estimated build-out ADD for the proposed service area is the current ADD plus the projected ADD:

16,742 gpd + 31,824 gpd = 48,566 gpd

Note that the projected 48,566 gpd ADD using this method is more than the projected 2040 ADD based on a continuing trend of 3.2% increase per year as shown in Table 2-9.

Zoning Based Projections

This estimate considers the residential zoned portions of the proposed service area assuming traditional residential water use amounts. The LII zoned portions of the service area will use the more conservative alternative approach defined above based on *use per acre basis* equal to 105 gpd/acre. The 390 developable unserved acres in the proposed service area consists of 12 acres UR4, 60 acres R5A, and 318 acres LII.

The 12 acres of UR4 zoning is the Fairfield Mobile Home Park (FMHP). FMHP has 25 ERUs existing and the ADD for the last three years is 155 gpd/ERU. Based on the current developed density the estimated build out of FMHP is 37 ERU.

Of the 60 acres of R5A zoning, 21 acres is the Double L Mobile Home Park (DLMHP). DLMHP has 25 ERUs existing and the ADD for the last three years is 112 gpd/ERU. Based on the current developed density the estimated build out of DLMHP is 59 ERU. For estimating the water demands of the remaining 39 acres of R5A this analysis will use the average of two analogous north Whatcom County water systems ADD; Pole Road Water Association (ADD = 340 gpd/ERU) and Meadowbrook Water Association (ADD = 380 gpd/ERU), average ADD = 360 gpd/ERU.

Projected water demand calculations are as follows:

- Fairfield MHP: 37 ERU x 155 gpd/ERU = 5,735 gpd
- R5A: 1 unit/5acres x 39 acres = 8 units (ERUs) x 360 gpd/ERU = 2,880 gpd
- Double L MHP: 59 ERU x 112 gpd/ERU = 6,608 gpd
- LII: 318 acres x 105 gpd/acre = 33,390 gpd

- TOTAL projected ADD = 48,613 gpd

The total estimated build-out ADD for the proposed service area is the current ADD plus the projected ADD:

16,742 gpd + 48,613 gpd = 65,355 gpd

Note that the projected 65,355 gpd ADD using this method is more than the projected 2040 ADD based on a continuing trend of 3.2% increase per year as shown in Table 2-9.

For this analysis, build-out ADD is taken to be the maximum of the above calculation methods, zoning-based projection = 65,355 gpd.

3. System Analysis

This chapter presents an analysis of the water system components for only the PUD Grandview-Northgate Industrial Park (GV-NG) service area to determine if the water system is capable of providing sufficient quality and quantity of water. System design and water quality standards applicable to Whatcom County PUD No. 1 are presented in this chapter. Construction standards are presented in Chapter 7. Recommendations to improve compliance with the required standards are presented at the end of this Chapter.

3.1 System Design and Construction Standards

The PUD has adopted system design, water quality and construction standards. These standards are summarized below.

3.1.1 Design Standards

Performance and design criteria serve as a basis for evaluation of sizing and reliability of the PUD GV-NG water system including source, storage, distribution, and fire flow. However, fire flow is not discussed as part of this Water System Plan, except where referenced for information only, since it is a separate system not connected to the potable system. General criteria and standards that must be met are based on Washington State and Federal Regulations, including the Revised Code of Washington (RCW) and WAC 246-290. More specific design guidelines are provided in the DOH *Water System Design Manual*. Design standards are also outlined in the Whatcom County *Coordinated Water System Plan*.

Table 3-1 Design Standards

Standard	DOH *Water System Design Manual* (October 2019) (for non-residential systems)	PUD Standard
Average and Maximum Daily Demand	Average day demand (ADD) determined from metered water use records. Maximum day demand (MDD) could be determined by service meter data logging, customer contracted volumes, defined process needs, and/or analogous system data.	ADD is calculated from metered water use records. MDD is calculated by multiplying ADD by 2.7 based on previous analysis of collected data.
Peak Hour Demand	Peak hourly demand (PHD) could be determined by service meter data logging, customer contracted volumes, defined process needs, and/or analogous system data.	PHD is calculated by multiplying ADD by 5.6 based on previous analysis of collected data.

Standard	DOH *Water System Design Manual* (October 2019) (for non-residential systems)	PUD Standard
Source	Supply sources must be able to meet MDD (including distribution system leakage [DSL].	Same as DOH *Water System Design Manual*
Storage	Sum of: **Operational Storage** – Volume devoted to supplying water system while sources of supply are off. Does not apply to water systems operating under continuous pumping mode. **Equalizing Storage,** ES = (PHD – Q_s)(150 min) **Standby Storage,** SS based on customer expectations **Fire Suppression Storage,** FSS = (FF)(t_m) **Dead Storage**, DS = not available to customers where: PHD = Peak hourly demand (gpm) ADD = Average day demand for system (gpd) Q_s = Sum of all installed, continuously available source capacities, except emergency sources (gpm) FF = Required fire flow rate (gpm) t_m = Duration of FF rate (min) (for FSS)	**OS** = 1-ft controls range ~2,350 gallons **ES** same as DOH **SS** = 1 x ADD **FSS** separate system, not applicable **DS** = 6" sediment storage (below top of outlet pipe) ~1,175 gallons
Fire Flow Rate and Duration	Determined by the local fire authority or WAC 246-290-221(5). Coordinated Water System Plan.	Fire protection system separate, Not Applicable to potable system. Fire standards in accordance with Table 5-3 of Whatcom County Coordinated Water System Plan.
Minimum System Pressure	Water system must be able to provide PHD at no less than 30 psi at all service connections when all equalizing storage is depleted. Water system must be able to provide 20 psi at ground level at all service connections under fire flow conditions plus MDD, when all equalizing and fire flow storage is depleted.	Same as DOH *Water System Design Manual,* except Fire Flow conditions not applicable (separate system)
Minimum Pipe Size	A hydraulic analysis must be used to determine the minimum size of a transmission or distribution main to provide the minimum system pressures.	Same as DOH *Water System Design Manual*

Standard	DOH *Water System Design Manual* (October 2019)	PUD Standard
Valve and Hydrant Spacing	Valving should be sufficient to minimize customers out of service when water is turned off for maintenance, repair, replacement, or additions. On mains 12-inch or less, mains should be able to be isolated every 1,000 feet or less by closing valves. Fire hydrants should be provided with their own auxiliary gate valve.	Valve and hydrant standards: Valve spacing (LII zoning); 500 feet (CWSP 5.2.4, Table 5-1). Hydrant spacing; max. 900 feet (WAC 246-293-650 [1] & [2]).
Reliability Recommendations	• Source capacity adequate to provide MDD in a period of 20 hours or less of pumping. • Back-up power or two independent public power sources, connections for pump stations. • Booster stations have multiple pumps installed and capacity to provide PHD with largest pump out of service. • More than one gravity storage tank. • Standby storage of at least 2 times ADD. • Alarms on reservoirs to indicate high or low levels. • Looping of distribution mains when feasible. • Pipe velocities less than 8 feet per second (fps) under PHD. • Flushing velocities of at least 2.5 fps for all pipes.	Same as DOH *Water System Design Manual,* except Standby storage level of service and any considerations related to fire flow (separate, not applicable) or ERUs (not applicable)
Water Quality	Water quality standards are defined in WAC 246-290-300.	WAC 246-290-300

3.1.2 Construction Standards

The PUD's construction standards are included in Chapter 7 and Appendix C. These construction standards define the materials and construction standards that must be used when contractors, developers, and the PUD construct improvements to the water system.

3.2 Water Quality Standards

The federal Safe Drinking Water Act (SDWA), originally passed by the United States Congress in 1974 and amended in 1986 and 1996, is the primary federal law that ensures the quality of drinking water in the United States. The Environmental Protection Agency (EPA) sets drinking water quality standards and oversees local agencies who implement the standards. In Washington State, the DOH is responsible for implementing and enforcing drinking water regulations. State drinking water regulations are published in WAC 246-290-300. The regulations establish monitoring requirements, maximum contaminant levels (MCLs), and requirements for follow-up actions. Table 3-2 lists the existing water quality regulations that are currently applicable to the GV-NG potable water system.

Table 3-2 Existing Water Quality Regulations Applicable to the PUD GV-NG Potable System

Regulation	Description	Contaminants Affected
Bacteriological, Revised Total Coliform Rule (RTCR)	Systems must collect total coliform samples at sites throughout the distribution system according to their written coliform monitoring plan. The number of samples is based on the population served. Sets requirements for Level 1 and 2 assessments and corrective action, reporting, recordkeeping, public notification, and consumer confidence reporting requirements.	Coliform
Inorganic Chemical and Physical	Washington State has adopted the federal MCLs and monitoring regulations for inorganic chemicals and physical parameters. .	IOCs
Organic Chemicals	Washington State has adopted the federal MCLs and monitoring regulations for organic chemicals.	VOCs and SOCs
Lead and Copper Rule	Washington State has adopted the federal Lead and Copper Rule, which requires sampling for lead and copper at targeted sample tap locations. Lead and copper action levels are exceeded if more than 10 percent of the samples collected during the monitoring period exceed 0.015 mg/L and 1.3 mg/L, respectively.	Lead and Copper
Disinfectants and Disinfection Byproducts Rule (DBPR)	The DBPR requires that water systems (community and non-transient non-community) that use chlorine, chloramines, chlorine dioxide, or ozone in their treatment process monitor for disinfection byproducts. Systems that deliver water continuously treated with chlorine or chloramines shall monitor and record residual disinfectant levels in the distribution system. Stage 2 of the DBPR was adopted by Washington State in 2009 and became effective January 4, 2010.	TTHMs, HAA5, Chlorite, Bromate

Regulation	Description	Contaminants Affected
Radionuclides Rule	The Radionuclides Rule requires that all community water systems using groundwater or surface water or a combination must sample for radionuclides at every entry point that is representative of all sources being used under normal operating conditions.	Radionuclides
Consumer Confidence Report	Group A water systems are required to provide their customers with a report annually summarizing their water system's water quality. The report is required to be delivered to customers on or before July 1 of each year.	Reporting Only
Groundwater Rule (GWR)	The basic requirements of the GWR include: source water monitoring (triggered and assessment), compliance monitoring, sanitary surveys and corrective actions, and public notification.	Bacteriological

Table 3-3 Future Water Quality Regulations Applicable to the PUD

Regulation	Description	Contaminants Affected	Status of Rule
Radon Rule	The Radon Rule would apply to those water systems using groundwater as a source of supply. It is expected that systems serving less than 10,000 customers would need to meet an alternative MCL of 4,000 pCi/L where their state implements an EPA approved multi-media mitigation (MMM) plan to address radon in indoor air.	Radon	EPA proposed new regulations in 1999 to reduce the health risk of radon. It is not known at this time if/when the Radon Rule will be finalized.
PFASs (Per- and polyfluoroalkyl substances)	EPA action plan issued February 14, 2019. Action Plan Program Update issued February 26, 2020, which issues preliminary determinations to regulate PFOA and PFOS.	PFOA, PFOS	Not aware of any current required or planned regulations.

3.3 Water Quality Analysis

The PUD's GV-NG service area compliance with the required water quality regulations is discussed in detail in Chapter 6 *Operations and Maintenance Program*.

3.4 System Analysis

3.4.1 Source of Supply

Water Rights

Water rights are summarized and presented in Chapter 4.

The analysis of water rights presented below applies only to the Instantaneous Flow and Annual Volume of the groundwater source water right for the source well for the GV-NG potable system. The analysis is based on a projected water demand increase of 3.2% per year as described in Chapter 2.

The PUD Grandview-Northgate Industrial Park (GV-NG) system maximum day demand (MDD) and average day demand (ADD) must comply with the maximum instantaneous and maximum annual withdrawal limitations of the water rights associated with the groundwater source currently used in the GV-NG service area. Year 2019 ADD and MDD (production demands, including DSL) are compared to the existing groundwater water rights in Table 3-4.

Table 3-4 Existing Groundwater Right Analysis – Existing (2019) Status

	Existing Water Rights		Existing Water Demands (Production, includes DSL)		Current Water Right Status Excess/(Deficiency)	
	Max. Instant. Flow Rate (Q_i) (gpm)	Max. Annual Volume (Q_a) (acre-ft./year)	Max. Instant. Flow Rate (gpm)(1)	Max. Annual Volume (acre-ft./year)(2)	Max. Instant. Flow Rate (Q_i) (gpm)	Max. Annual Volume (Q_a) (acre-ft./year)
GV-NG	116	92.8	31	18.8	85	74

Notes:
(1) Water Demands maximum instantaneous flow rate is MDD for the system as discussed in Section 2.7.
(2) Water Demands maximum annual volume is based on ADD for the system as discussed in Section 2.6.

As shown in Table 3-4, the GV-NG existing maximum instantaneous flow rate and existing maximum annual volume are in compliance with available groundwater rights for the service area.

The projected MDD is compared to the existing total maximum instantaneous groundwater right in Table 3-5.

Table 3-5 Existing Instantaneous Groundwater Rights Analysis

Year	Projected MDD (gpd) (1)	Projected MDD (gpm)	Water Right - Maximum Instantaneous Flow Rate (Q_i) (gpm)	Forecasted Instantaneous Water Right Status Excess/(Deficiency) (gpm)
2019	45,203	31	116	85
2020	46,650	32	116	84
2030	63,922	44	116	72
2040	87,588	61	116	55
Build-Out (2)	176,459 (2)	123	116	(7)

Notes:.
(1) The projected MDD is based on a growth rate of 3.2% as described in Chapter 2.
(2) The projected build-out is based on zoning. See Section 2.9.

As shown in Table 3-5, the GV-NG service area is projected to have adequate instantaneous groundwater rights beyond year 2040.

The GV-NG projected average day demand (ADD) is compared to their maximum annual withdrawal groundwater right in Table 3-6.

Table 3-6 Maximum Annual Withdrawal Existing Groundwater Rights Analysis

Year	Projected ADD (gpd) (1)	Projected ADD (acre-ft./year)	Water Right - Maximum Annual Volume (Q_a) (acre-ft./year)	Forecasted Annual Water Right Status Excess/(Deficiency) (acre-ft./year) (gpm)
2019	16,742	18.8	92.8	74
2020	17,278	19.4	92.8	73.4
2030	23,675	26.5	92.8	66.3
2040	32,440	36.3	92.8	56.5
Build-Out (2)	65,355	73.2	92.8	19.6

Notes:
(1) The projected ADD is based on a growth rate of 3.2% as described in Chapter 2.
(2) The projected build-out is based on zoning. See Section 2.9.

As shown in Table 3-6, the GV-NG system is projected to have adequate annual groundwater rights beyond year 2040.

The GV-NG system water right self-assessment for the applicable groundwater right is located in Section 10.4.

Source of Supply Capacity and Reliability

The GV-NG water system has one well that supplies the entire potable distribution system. The well pumps to the storage tank and then the booster pumping station pumps from the storage tank to supply the distribution system. The system operates on one pressure zone. Auxiliary power is available at the well and booster pumping station site provided by a portable generator that is normally located at the site and on standby.

The total source of supply based on Grandview-Northgate existing groundwater rights is 116 gpm. The well was flow tested in 1993 to a production capacity of 91 gpm. The currently installed well pump is rated at 90 gpm.

Sources must be able to meet the water system's MDD. For reliability, sources normally should be able to replenish depleted fire suppression storage within 72 hours while concurrently supplying the MDD of the system. The PUD's fire suppression system is entirely separate from the potable water system and this reliability recommendation does not apply to the GV-NG potable water system.

The GV-NG total source capacity, based on the well pump capacity, is compared to the total projected MDD in Table 3-7.

Table 3-7 Source Capacity Analysis, Based on Well Pump

Year	Project MDD (gpd)	Projected MDD (gpm)	Total Source Capacity (gpm) (1)	Source Capacity Surplus/(Deficit) (gpm)
2019	45,203	31	90	59
2020	46,650	32	90	58
2030	63,922	44	90	46
2040	87,588	61	90	29
Build-Out (2)	176,459	123	90	(33)

Notes:
(1) Source capacity is based on the well pump capacity.
(2) The projected build-out is based on zoning. See Section 2.9.

As shown in Table 3-7, the GV-NG system is projected to have adequate source capacity based on well pump capacity beyond year 2040.

The GV-NG total source capacity, based on well production capacity, is compared to the total projected MDD in Table 3-8.

Table 3-8 Source Capacity Analysis, Based on Well Production Capacity

Year	Project MDD (gpd)	Projected MDD (gpm)	Total Source Capacity (gpm) (1)	Source Capacity Surplus/(Deficit) (gpm)
2019	45,203	31	91	60
2020	46,650	32	91	59
2030	63,922	44	91	47
2040	87,588	61	91	30
Build-Out (2)	176,459	123	91	(32)

Notes:
(1) Source capacity is based on the well production capacity per the 1993 well test.
(2) The projected build-out is based on zoning. See Section 2.9.

As shown in Table 3-8, GV-NG is projected to have adequate source capacity based on well production capacity beyond year 2040.

3.4.2 Booster Station Capacity and Reliability Analysis

The GV-NG system booster station is considered a closed system booster station since the distribution system is closed to the atmosphere (all supply and storage to the distribution system is provided by pumping). Booster station pumps in a closed system supply the entire flow and pressure required by the service area. Therefore, closed system pumps must be able to supply peak hour demand (PHD) at no less than 30 psi at all service connections throughout the distribution system. For reliability purposes, DOH recommends that the booster station provide peak hour demand at 30 psi throughout the distribution system, with the largest pump out of service. Typically, a closed system booster station must also be capable of meeting fire suppression requirements, while maintaining a minimum of 20 psi at ground level at all points in the distribution system. However, this requirement does not apply to the GV-NG potable system since the fire suppression system is separate.

The GV-NG system booster station has three 100 gpm pumps that each alternate as the lead pump each pump cycle. Auxiliary power is available at the site from a portable generator that is normally located at the site and on standby. Auxiliary power is supplied to the booster pumps and well pump. The GV-NG booster station capacity, with the one of the three equal pumps out of service, is compared to the projected PHD for the system in Table 3-9.

Table 3-9 Booster Station Analysis

Year	Projected PHD (gpm)	Total Booster Station Capacity (gpm) (1)	Booster Station Capacity Surplus/(Deficit) (gpm)
2019	65	200	135
2020	67	200	133
2030	92	200	108
2040	126	200	74
Build-Out (2)	254	200	(54)

Notes:

(1) For reliability purposes, the total booster station capacity assumes one of the three 100 gpm pumps is out of service.

(2) The projected build-out is based on zoning. See Section 2.9.

As shown in Table 3-9, the GV-NG booster station has adequate capacity to meet the projected peak hour demands beyond year 2040.

3.4.3 Pressure Tanks Analysis

The existing booster system includes eight (8) 120-gallon bladder pressure tanks. Based on a single pump nominal capacity of 100 gpm operating between 60 and 40 psi the required number of 120-gallon pressure tanks per DOH requirements is calculated as follows (DOH WSDM Equation 9-1):

$T \geq (R \times Qp) / (Nc \times Vb)$

where: $R = [15 \times (P1 + 14.7) \times (P2 + 14.7)] / [(P1 - P2) \times (P2 + 9.7)]$

$= [15 \times (50+14.7) \times (45+14.7)] / [(50-45) \times (45+9.7)] = 211.84$

Vb = the gross volume of an individual bladder tank in gallons = 120 gallons

T = the number of bladder tanks of gross volume Vb.

P1, P2 = pressures selected for water system operation in psig (gauge pressures). P1 corresponds to the pump-off pressure and P2 to the pump-on pressure. P1 = 60 psi, P2 = 40 psi.

Nc = number of pump operating cycles per hour, 6 cycles/hr max.

Qp = pump delivery capacity in gallons per minute at the selected pressure range, nominal 100 gpm.

$T = (61.66 \times 100) / (6 \times 120) = 8.56$

This calculation indicates that nine (9) 120-gallon pressure tanks are required for current conditions. Thus, one additional 120-gallon pressure tank is needed. Alternatively, installing variable frequency drives (VFDs) on the pump motors greatly decreases the number of bladder tanks required by increasing the allowable pump cycles per hour to 100-200 cycles/hr. VFDs would reduce the required number of bladder tanks to one (1), although two (2) tanks is recommended for redundancy purposes.

3.4.4 Storage Analysis

The GV-NG system has one active storage tank that provides storage to the water distribution system. The tank is a bolted metal storage tank with a Hypalon waterproof liner. Total available storage in the existing tank is 32,900 gallons (at the current pump OFF height of 14-ft), or 35,250 gallons at the tank overflow height of 15-ft

Storage analysis for the GV-NG system is included as Table 3-10. The Table shows storage requirements for each year of the 20-year forecast, or until 2040. It also shows storage requirements for projected build-out, which is expected to occur well beyond year 2040. A discussion of each storage component follows.

Operational Storage

Operational storage is the storage available to the system while the sources of supply are not operating. It is typically the amount of drawdown during normal operating conditions, and is in addition to the other storage components. The total operational storage requirement for the system is 2,350 gallons, based on a 1-ft drawdown level.

Equalizing Storage

Equalizing storage is used to meet the periodic peak demands placed on the water system. Equalizing storage must be provided as part of the total storage and it must be available at 30 psi to all service connections. Calculation of equalizing storage depends on the mode of source pump operation and hydraulic capabilities. The following equation (from the DOH Water System Design Manual) is used to calculate the equalizing storage for the GV-NG system.

$ES = (PHD - Q_s)(150 \text{ min})$

Where,

PHD = peak hourly demand (gpm)

Q_s = Sum of all continuously available source capacities, except emergency sources (gpm)

The total source of supply capacity available to the distribution system as it relates to equalizing storage is 90 gpm (well pump capacity) as shown in Section 3.4.1.

Standby Storage

Standby storage provides storage in emergency conditions where sources may have failed or circumstances dictate higher demands on the water system than would normally be anticipated. The volume of standby storage required for non-residential systems depends on customer expectations and the purveyor's defined level of service. The following equation is used to calculate standby storage for the GV-NG system.

SB = 1 days x ADD

Where,

ADD = Average day demand for design year, gpd

Fire Suppression Storage

Fire suppression storage is provided so that the water required to fight fires is available when necessary. The GV-NG water system has a separate fire protection system and fire suppression storage is not applicable to the potable system.

Dead Storage

Dead storage is the volume of stored water that is not available to all customers at the minimum pressure requirements without pumping. The GV-NG system has a dead storage volume of 1,175 gallons, which is an estimated allowance based on typical outlet pipe elevation (6-inches) and any potential siltation at the bottom of the tank. Other than these minor allowances, the GV-NG system does not have any dead storage, as water is pumped out of the tank to supply the distribution system.

Storage Analysis Summary

The PUD GV-NG potable water system's storage is currently adequate and is projected to be adequate nearly until year 2036. Based on the trends in water use increases over the last six years the system will need about 42,000 gallons of total storage in the next 20 years. However, approximately 94,000 gallons is needed for the projected build-out, which is expected to occur well beyond year 2040. It should be noted that this analysis is based on the PUDs current level of service, which includes one average day demand (ADD) of standby storage volume. When the PUD upgrades storage in the future, it is recommended to consider providing the DOH recommended standby storage volume of the maximum day demand (MDD). The recommended total storage is shown in Table 3-10 Storage Table.

Table 3-10 Storage Table
Whatcom County PUD No. 1 - Grandview-Northgate Industrial Park

Date: 5/25/2021

Year	Average Daily Demand (gpd) *	Maximum Daily Demand (gpd) Method #1 *	Maximum Daily Demand (gpd) Method #2 *	Maximum Daily Demand (gpd) Method #3 *	Maximum Daily Demand (gpm) (Higher of #1,#2/#3))	Peak Hourly Demand (gpm)	Operational Storage (gal) (1' controls range)	Equalizing Storage Required (gal)	Standby Storage-1xADD	Dead Storage (gal) (6" sediment storage)	Total Storage Required (gal)	Total Storage Recommended (1xMDD) (gal)	Storage Available
2019	16,742	35,575	36,724	45,203	31	65	2,350	0	16,742	1,175	20,267	48,728	35,000
2020	17,278	36,713	37,899	46,650	32	67	2,350	0	17,278	1,175	20,803	50,175	35,000
2021	17,831	37,888	39,112	48,143	33	69	2,350	0	17,831	1,175	21,356	51,668	35,000
2022	18,401	39,101	40,363	49,683	35	72	2,350	0	18,401	1,175	21,926	53,208	35,000
2023	18,990	40,352	41,655	51,273	36	74	2,350	0	18,990	1,175	22,515	54,798	35,000
2024	19,598	41,643	42,988	52,914	37	76	2,350	0	19,598	1,175	23,123	56,439	35,000
2025	20,225	42,976	44,364	54,607	38	79	2,350	0	20,225	1,175	23,750	58,132	35,000
2026	20,872	44,351	45,783	56,354	39	81	2,350	0	20,872	1,175	24,397	59,879	35,000
2027	21,540	45,770	47,248	58,158	40	84	2,350	0	21,540	1,175	25,065	61,683	35,000
2028	22,229	47,235	48,760	60,019	42	86	2,350	0	22,229	1,175	25,754	63,544	35,000
2029	22,941	48,746	50,321	61,939	43	89	2,350	0	22,941	1,175	26,466	65,464	35,000
2030	23,675	50,306	51,931	63,922	44	92	2,350	310	23,675	1,175	27,510	67,757	35,000
2031	24,432	51,916	53,593	65,967	46	95	2,350	752	24,432	1,175	28,709	70,244	35,000
2032	25,214	53,577	55,308	68,078	47	98	2,350	1,208	25,214	1,175	29,947	72,811	35,000
2033	26,021	55,292	57,077	70,256	49	101	2,350	1,679	26,021	1,175	31,225	75,460	35,000
2034	26,854	57,061	58,904	72,505	50	104	2,350	2,165	26,854	1,175	32,543	78,194	35,000
2035	27,713	58,887	60,789	74,825	52	108	2,350	2,666	27,713	1,175	33,904	81,016	35,000
2036	28,600	60,771	62,734	77,219	54	111	2,350	3,183	28,600	1,175	35,308	83,927	35,000
2037	29,515	62,716	64,742	79,690	55	115	2,350	3,717	29,515	1,175	36,757	86,932	35,000
2038	30,459	64,723	66,813	82,240	57	118	2,350	4,268	30,459	1,175	38,252	90,033	35,000
2039	31,434	66,794	68,951	84,872	59	122	2,350	4,837	31,434	1,175	39,796	93,234	35,000
2040	32,440	68,932	71,158	87,588	61	126	2,350	5,423	32,440	1,175	41,388	96,536	35,000
Projected Build-Out Based on Zoning:													
	65,355	138,879	143,324	176,459	123	254	2,350	24,624	65,355	1,175	93,504	204,607	35,000

Formulas & Definitions

Peak Hourly Day (PHD)

PHD to ADD ratio = 5.6 per on MSA Draft 2015 based on collected data.

Equalizing Storage (ES)

Well #	Status	Q, gpm (pump capacity)	Q (ac-ft)
1	Active	90	
TOTAL		90	

ES=(PHD-Q)(150 min)

where Q is the Total Flow rate of all active sources

Maximum Capacity Based on GV-NG Groundwater Rights

Instant.= 116 Capacity= 167,040 gpd = MDD
Annual= 92.8 Capacity= 82,841 gpd = ADD

*Reflects growth rate of 3.2% based on demand increase from 2014 to 2019.

Average Daily Demand (ADD) & Maximum Daily Demand (MDD) (refer to WSP Chapter 2)

2019 ADD = 6,110,824 gpy
ADD = 16,742 gpd

Method #1, 3-day Ave 2017 daily data, MDD = 35,575 gpd Sept. 5-7, 2017
2017 ADD = 13,732 gpd
MDD to ADD ratio = 2.59 use 2.7 (see Method #3)

Method #2, MDD to MMADD ratio = 1.65 per DOH WSDM Section 3.4.1
August 2019 MMADD = 689,964 gal/month
MMADD = 22,257 gpd
MDD = 36,724 gpd

Method #3, MDD to ADD ratio = 2.7 per MSA Draft 2015 based on collected data
MDD = 45,203 gpd

Standby Storage (SB)

Alt #1 1 days x Average Daily Demand

Fire Suppression Storage (FSS)

Not applicable, separate dedicated fire system not evaluated in this analysis.

3.4.5 Distribution System Analysis

3.4.5.1 General Description and Condition

The GV-NG potable water system distribution main characteristics (material, diameter, lengths) are identified in Chapter 1 Section 1.4.

The system was originally constructed in 1993 and is expected to be in generally good condition based on age (oldest ~ 27 years), and materials (C900 PVC, cement lined DI, HDPE). The system's low distribution system leakage rates support that the pipe is generally in good condition. Known water main leaks are rare and upon discovery they are immediately repaired. The PUD reviews service meter readings for unusually high-water use anomalies and notifies customers accordingly. Operators keep records of identified and fixed leaks and record the date and location of each leak, noting whether it was a main leak, meter leak or service line leak and which side of the meter it was on.

3.4.5.2 Hydraulic Analysis

The water distribution system was modeled in order to analyze the hydraulic performance of the system. Components included in the model were pipes, junctions, pumps, and storage tanks. The separate fire system was not analyzed. The model was designed as a steady state system, in which the PHD was analyzed for the following scenarios:

1. Existing ,
2. 20-yr Projected (2040),
3. Projected Build Out.

The results of these PHD scenarios were then used to identify any deficiencies or areas of future improvements.

Appendix A includes the model results and maps showing the node pressures for PHD models.

Descriptions of how the system was modeled, model assumptions, and model output are discussed below.

Hydraulic Modeling Software

The GV-NG potable water distribution system has been modeled using Innovyze InfoWater for ArcGIS software.

Peak Hourly Demand

Model Information

The basic assumptions of the model were created to mimic as close as possible existing distribution system conditions during PHD. Existing booster station settings and pump characteristics were provided by the system operators. Existing distribution system piping was created in GIS, based on available paper copy maps of the GV-NG system.

The GV-NG booster station has three identical pumps; two operating together are rated at approximately 200 gpm with a TDH of 140 ft. For existing booster station simulations, the booster station pumps were modelled with actual pump curves. A pressure reducing valve (PRV) set at 60 psi was used in the model to simulate the pressure tanks and pump operation settings in the booster station. The booster station draws water from the storage tank. The storage tank was modelled using actual size dimensions (20-ft

diameter x 16-ft height) and water level at the bottom of the equalizing storage as determined by the Storage Analysis table for each scenario.

All PHD distribution system models were created using projected PHD calculated using the equation shown in Table 3-1 and on Table 3-10 Storage Table, or PHD = 5.6 x ADD. The projected PHD is also shown in Table 3-9 Booster Station Analysis. The projected PHD for each scenario modelled are shown on their respective Figures in Appendix A. System demands were allocated based on locations of the corresponding service connections. Since the system is almost entirely light-impact industrial with highly variable demands amongst users, each service connection's use was evaluated and modelled with the demand at their real locations. Users were identified by name and account on maps allowing accurate allocation of significant demands. Demands were grouped and assigned to the most appropriate model node.

The hydraulic model nodes were assigned elevations from a digital terrain model (DTM) created from the North Puget 2017 LIDAR data set obtained from the Washington State Department of Natural Resources Washington LIDAR Portal.

An intensive field-testing calibration of the model was not performed for the following reasons:

- Basic system network and operations,
- High level of data collection effort and confidence in the accuracy of system infrastructure, facilities, boundary conditions, and operational practices,
- High level of accuracy and confidence in elevation data from LIDAR based DTM data set,
- High level of effort in model development and demand allocation,
- System is about half PVC pipe and half DI pipe, which both have a consistent pipe roughness parameter value that is well established,
- Conservative values for roughness were used.

Results

The following summarizes results for each of the PHD scenarios modelled, identified with corresponding Figure number in Appendix A:

1. Existing, Figure A-1:
    a. System pressures range from 59 – 80 psi. Note this is at the end of a pump cycle or high end of the pressure tanks (60 psi) with one pump running (PHD = 65 gpm).
    b. Pressures are 39 – 50 psi at the low end of the pressure tanks (40 psi) or the start of a pumping cycle.
2. 20-yr Projected (2040), Figure A-2:
    a. System pressures range from 57 – 78 psi. Note this is at the end of a pump cycle or high end of the pressure tank range (60 psi) with two pumps running (PHD = 126 gpm).
    b. Pressures are 37 – 58 psi at the low end of the pressure tanks (40 psi) or the start of a pumping cycle.
3. Projected Build Out, Figure A-3:
    a. Assumed improvements in model include:

- Storage Tank: 30-ft diameter x 20-ft height (105,700 gallons) meets build-out at current level of service (LOS) or beyond year 2040 for improved LOS (two of these tanks could be installed for build out capacity at improved LOS).

b. System pressures range from 53 – 73 psi. Note this is at the end of a pump cycle or high end of the pressure tanks (60 psi) with two pumps running (PHD = 254 gpm), or constantly maintained if VFDs are installed on the pumps and operated with a set point of 60 psi at the pump house.

c. Pressures are 33 – 53 psi at the low end of the pressure tanks (40 psi) or start of a pump cycle. This would not be applicable if VFDs were installed as noted in b) above.

3.4.6 Fire System

Drinking water regulations (WAC 246-290) do not apply to fire systems that are not delivering potable water. Consequently, review and approval of planning and design of these non-potable facilities by DOH is not required. However, if the non-potable fire system is constructed so that it may be converted to potable service in the future, the PUD will maintain design and construction records, including any calculations, specifications, drawings and consecution monitoring reports for review and documentation at the time of conversion. Should the PUD develop potable facilities in the future that also provide fire flow, those facilities will be designed and constructed consistent with PUD, State, and local regulations.

The GV-NG fire system is entirely separate from the potable water system and is not discussed in detail as part of this Plan. The GV-NG fire system meets or exceed the standards found in the Whatcom County Coordinated Water System Plan (CWSP). Table 5-3 from the CWSP identifies minimum and recommended fire flow requirements for Industrial zoning classifications as 1,000 gpm for 2 hours (minimum) and 2,000 gpm for 2 hours (recommended). Based on a hydraulic model analysis performed in InfoWater for ArcGIS software, using the EPANET model network built by other PUD consultants, the PUD GV-NG fire system is capable of providing flows above the CWSP recommended requirement. The fire flow analysis evaluates the fire flow available at each node in the model (representing approximate hydrant locations) individually while maintaining 20 psi at all other nodes in the system. The minimum fire flow available according to the model analysis is 2,370 gpm at the northern end of the Portal Way 8-inch fire main. With the exception of two other dead end 8-inch fire lines with 3,000 gpm and 3,400 gpm, available fire flows in the GV-NG fire system are generally in the 4,000 – 4,400 gpm range. The Fire Flow Analysis Map in Appendix G shows the modeled available fire flows throughout the system. Appendix G also includes the following:

- Fire Line Size Map
- Fire Hydrant Location Map
- EPANET Model Network Map (by others)
- Fire Flow Analysis Map (InfoWater)
- Fire Flow Analysis report (InfoWater)

3.5 Summary of System Deficiencies and Required Improvements

3.5.1 Water Quality

There are no water quality deficiencies.

3.5.2 Source of Supply

The GV-NG system is projected to have adequate instantaneous groundwater rights beyond year 2040.

The GV-NG system is projected to have adequate annual groundwater rights beyond year 2040.

The GV-NG system is projected to have adequate source capacity based on both well production capacity and well pump capacity beyond year 2040.

Required improvements:

- None

Recommended future actions to consider:

- Install a new second well to increase reliability.
- Install a surface water treatment plant sourcing water from the nearby PUD industrial supply system to supplement as needed for future growth and reliability/redundancy.

3.5.3 Storage

The GV-NG system currently has adequate storage volume capacity until about year 2036.

Required improvements:

- Replace the existing storage tank and increase capacity to accommodate projected build-out required volume of approximately 94,000 gallons. Recommend 1 each of 30-ft diameter x 20-ft height tank (105,700 gallons).

Improvements for DOH Recommended MDD Standby Storage (SS):

- Two of the above 105,700-gallon tanks would provide the recommended SS volume for the projected build-out and operational flexibility for tank maintenance. One tank would provide the recommended SS volume to just beyond year 2040.

3.5.4 Booster Stations

The GV-NG system is projected to have adequate booster station capacity beyond year 2040.

Required improvements:

- None.

Recommended actions to consider:

- Recommend upgrading pumps with variable frequency drives (VFD), which would reduce pressure fluctuations (20 psi) and would allow for greater operational flexibility (adjust more easily and potentially raise pressures throughout system). For example, VFDs could be set to maintain a 60-psi pressure set point at the pump house to maintain adequate pressures well above 30 psi throughout distribution at all times.

3.5.5 Pressure Tanks

The GV-NG system is currently inadequate by one 120-gallon pressure tank.

Required improvements:

- Add one 120-gallon pressure tank to the existing eight pressure tanks.
- ALTERNATIVELY, if booster station upgrades include installing VFDs the system could remove six (6) of the existing bladder pressure tanks. It is recommended to keep two tanks for minor pressure transient absorption and for routine maintenance of one required tank.

3.5.6 Distribution System

The GV-NG system has adequate capacity for projected demands through build-out within the current extents of the distribution system. However as future growth occurs piping installations will be required. Timing of these extensions are dependent on growth in these areas.

Required improvements:

- Various sections of pipe line extensions are required to extend service into undeveloped areas.

An additional pipeline improvement project is anticipated north along Portal Way to the proposed service area including Double L Mobile Home Park. Double L MHP has inquired with the PUD regarding water service and this project could move forward as soon as the proposed service area is approved. This project would consist of approximately 1,750 LF of 6-inch Ductile Iron piping (to match adjacent piping material).

4. Water Resources

This chapter has been prepared to discuss the PUD's surface and ground water rights, the condition and reliability of its water sources, and regional water resource and habitat protection planning processes. This discussion has been organized to recognize the quantities identified for irrigation use.

The primary purpose of the PUD is to provide a sufficient and reliable supply of water that can meet the existing and projected water supply needs of PUD customers within its retail and wholesale service areas. Pursuant to its broad statutory authority under chap. 54 RCW, and in accordance with RCW 90.03.015 (Municipal Water Law), the PUD is defined as a municipal water supplier and its water rights qualify for municipal water supply purposes due to their beneficial use for governmental and governmental proprietary purposes.

The PUD holds a combination of surface and groundwater sources for use in meeting the municipal water supply needs of its Cherry Point Retail Service Area, its Grandview-Northgate Retail Service Area, and broader wholesale service areas. The PUD's surface water rights were originally secured in the 1950's to serve the Cherry Point industries, the City of Ferndale, and local irrigators with an ample amount of water to support these entities and their respective beneficial uses of water. The PUD's groundwater rights were secured in the 1990's subsequent to its acquisition of the Grandview-Northgate water system.

The PUD's three surface water rights authorize the diversion of Lower Nooksack River surface water from PUD Plant 1 (RM 5.3), PUD Plant 2 (RM 9.2), and the GP Intake (RM 5.4) at a total instantaneous quantity rate of 83 cfs (Qi) (47.35 mgd), and an annual quantity (Qa) of 49,831 acre feet per year (afy). Of the total annual quantity (Qa) figure cited above, 6,264 afy (5.59 mgd) is designated by the PUD's Plant 1 and Plant 2 water rights for seasonal irrigation use within prescribed places of use. The PUD's groundwater sources withdraw water from wells located in the California Creek watershed. This water is treated to potable standards and used for (municipal) domestic and commercial purposes within the Grandview-Northgate area.

Further detail regarding the PUD's surface water rights, groundwater rights and related points of diversions (POD) are described in more detail later in this chapter

4.1 PUD Water Supply Source Characteristics

4.1.1 Surface Water – Nooksack River

The Nooksack River is located in WRIA 1 and comprised of three (3) forks: the North Fork, the Middle Fork, and the South Fork - all of which discharge to the mainstem channel. From the confluence of the Middle, South Fork and North Fork, the mainstem flows 36 miles through low lying agricultural and rural areas, as well as the communities of Deming, North Cedarville, Nooksack, Everson, Lynden, Ferndale, and the Lummi Nation before discharging into Bellingham Bay. The PUD 's surface water diversions are located in the Lower Nooksack River mainstem. Key tributaries to the Lower Nooksack River include Ten Mile Creek, Fish Trap Creek, and Bertrand Creek.

The Nooksack River, its forks, and tributaries are either closed to new appropriation or closed subject to minimum instream flows pursuant to administrative rule. Chapter 173-501 WAC - Instream Resource Protection Program –Nooksack Water Resource Inventory Area. As a consequence of this rule and subsequent court decisions (e.g., Postema, Swinomish, Foster, and Hirst), very little new source

development has occurred in the Nooksack River basin for many years. Because of their senior priority date, the PUD's surface water rights in the Lower Nooksack River are not subject to the Nooksack River Instream Flow Rule.

4.1.2 Nooksack River Fishery Habitat

The Nooksack River, as well as its forks and tributaries (WRIA 1) are home to seven species of salmon, including chinook, chum, coho, pink, sockeye, steelhead, and kokanee (land-locked sockeye). Populations of several of these species in the Nooksack River Basin have declined over the past decades. Three Puget Sound species found in WRIA 1: chinook, bull trout, and steelhead; are listed as "threatened" under the Federal Endangered Species Act (ESA).

According to the WRIA 1 Salmonid Recovery Plan, many factors have contributed to the decline of salmon populations in the Nooksack River Basin, including deterioration of stream and river habitat, poor water quality, the influence of hatcheries, and over-fishing. The habitat factors that limit salmon productivity, abundance, and diversity include channel stability, sediment load, obstructions, stream flows, withdrawals, temperature, and other factors. Efforts have been underway for several years to improve fish habitat conditions pursuant to the WRIA 1 Watershed Management Plan by the WRIA 1 Joint Board, the WRIA 1 Salmon Recovery Board, and other related processes.

4.1.3 Surface Water Source Reliability

As noted above, the PUD's Plant I and Plant 2 intake facilities are located within the lower reach of the Nooksack River estuary, at RM 5.3 and RM 9.2, respectively. The lower Nooksack River can be divided into two reaches, each with a distinctively different fluvial morphology. The estuary extends from the Marine Drive Bridge at RM 1.3, downstream to the mouth of the river where it empties into Bellingham Bay. The main channel reach extends from Marine Drive upstream to Lynden.

Stream flows in the Nooksack River originate from direct runoff from rainfall, melt-water stored in snow pack or glaciers, and groundwater. The proportion that each of these sources contributes to the total stream-flow varies depending on time of year and short-term weather patterns. Low stream-flows occur in mid fall if there are long periods of low precipitation and decreased glacial and snowmelt at higher elevations. Stream flow usually increases into mid-fall and early winter due to the onset of moisture laden Pacific storms.

Stream-flow decreases during winter and early spring, with the exception of major storm events, as most precipitation falls as snow and freezing temperatures prevent snowmelt. Stream-flow increases in mid to late spring as most precipitation falls as rain and warmer temperatures cause snowmelt at higher elevations. The large volume of water stored in snow-pack and glaciers maintains a relatively high base flow into early September. Over the course of its operational history, the PUD's diversion facilities have experienced reliable access to surface water flows, except during periods of hard river freeze when frazile ice conditions can affect the intake screens

4.1.4 Groundwater: Aquifer Systems

The northwest portion of Whatcom County (County) has both extensive unconfined shallow water table aquifers as well as deep confined aquifer. Aquifers in the County generally occur in permeable glacial deposits and stream valleys in the western part of the County, and in fractured bedrock and localized narrow stream valleys in the mountainous eastern part of the County. The aquifers in the western part of

the County are most productive and are part of the Puget Sound Aquifer System described by Vaccaro et al. (1998). A portion of this aquifer system extends northward into Canada, as described by the Abbotsford-Sumas Aquifer International Task Force in 1994 (Parametrix 2005).

The Abbotsford-Sumas aquifer is the principle aquifer of the region, covering an area approximately 100 square miles in size, with vertical depth ranging from 40 to 80 feet. Groundwater in the County typically flows from recharge areas in the uplands towards the Nooksack River and Sumas River, which are regional discharge areas. Groundwater contributes significantly to base flow (low flow inputs) to streams, as well as discharging to the Marine waters of the County (Parametrix 2005). (Source: USGS/2009).

The majority of the County's drinking water supply capacity is provided by surface water from Lake Whatcom or the Nooksack River. However, 95% of the 347 public water systems in the County rely on groundwater, and approximately 20,000 homes obtain water from domestic (exempt) wells (Whatcom County Water Team 1999, Parametrix 2005). The largest purveyors of groundwater in the County are the cities of Blaine, Sumas, Ferndale, and Everson. Agriculture and dairy uses in the County also rely heavily on groundwater for irrigation and process water.

Although the supply of shallow groundwater appears ample and its quality generally good, an increasing number of water quality problems have been identified in the area. Some groundwaters have been found to be contaminated with pesticides associated with agricultural practices. Large concentrations of nitrate and iron are commonly found in groundwater throughout the region, as well as areas of salt and corrosive waters.

4.1.5 California Creek Watershed

California Creek is one of two major streams in the Drayton Harbor watershed. The California Creek watershed is approximately 22.8 square miles in size and has a total length of approximately 9 miles. California Creek is inhabited by coho salmon and resident gamefish. Four stream systems and five major ditches drain into California Creek (Peterson 1995). The upper mainstem has been extensively channelized, impacted by agricultural activities, and lacks vegetative cover. According to Stanley (2003), process changes to the hydrology and to the delivery of nutrients in the California Creek watershed have resulted in significant impacts to the water quality and habitat within Drayton Harbor.

Two geologic settings exist in the vicinity of the Grandview area where the PUD operates its retail groundwater system: the Mountain View Upland and Custer Trough. The Custer Trough contains a thin unconfined aquifer consisting of sand that was deposited as distal glacial outwash by the glacier that advanced and retreated during the Sumas Stade (Cox and Kahle, 1999). The Sumas outwash overlies a very thick sequence of glaciomarine drift or marine silt and clay dominated deposits. Most wells in the Custer Trough tap groundwater in the Sumas outwash aquifer. The Mountain View Upland consists of glacial and non-glacially derived deposits. Most wells in this part of the upland, including the PUD wells, withdraw water from the unconfined sand and gravel aquifer (Vashon Advance Outwash/Deming Sand).

Because the California Creek watershed is closed to further consumptive uses (WAC 173-501-030), securing new groundwater appropriations is problematic absent a showing of full and effective mitigation for related impacts. The PUD is currently evaluating a project approved by Ecology under the 2018 Watershed Restoration Act whereby it would provide flow augmentation and habitat improvement measures to offset permit exempt wells and withdrawal from the PUD Grandview-Northgate ground water source in the California Creek watershed.

4.1.6 Groundwater Source Reliability

As noted earlier, the California Creek watershed is effectively closed by rule to new diversions and groundwater withdrawals and there is ongoing concern over surface water quality, loss of riparian habitat, and wetland cover. These conditions, however, have not affected source aquifer conditions in a manner that has compromised the quality or quantity of withdrawals authorized by the PUD's Grandview-Northgate well sources. In 2007, the Department of Ecology observed that based on the limited data available, groundwater levels have not declined or increased significantly since the Grandview area wells were drilled in the late 1980's.

4.2 Water Resource Management Plans

4.2.1 WRIA 1 Watershed management Plan

Subsequent to the passage of the Watershed Planning Act (ESHB 2514/RCW 90.82) in 1998 by the Washington State Legislature, Whatcom County (County), the City of Bellingham, and Public Utility District No. 1 of Whatcom County (PUD) decided to engage in the planning process with the County acting as the lead agency. Shortly thereafter, the Lummi Nation and Nooksack Indian Tribe were invited to join the process which occurred pursuant a Memorandum of Agreement (MOA) that was signed in October, 1998. Together, the five governments formed what became known as the "Joint Board", initiated public involvement, water quantity, and instream flow task forces. In 1999, caucuses were formed which led to the formation of the Planning Unit and related meetings.

Following the creation of the Joint Board and Planning Unit, work was undertaken on the development of the WRIA 1 Watershed Management Project Scope of Work. The scope of work included outreach and assessments, stream flow and habitat data collection, water quality improvement projects, and the establishment of the WRIA 1 Salmon Recovery Board.

In June of 2005, the WRIA 1 Watershed Management Plan Phase 1 was approved by Whatcom County, as well as the final draft of the WRIA 1 Instream Flow Selection and Adoption Plan. This action led in short order to the authorization of the Bertrand and Middle Fork Instream Flow Pilot Negotiation Projects by Memorandum of Agreements among the participating parties. The WRIA 1 Salmonid Recovery Plan was also approved in 2005 which focused on recovery of ESA listed Chinook.

Following the above actions, other related efforts and studies, the WRIA 1 Detailed Implementation Plan (DIP) was prepared for WRIA Watershed Participants as a tool intended to facilitate the implementation of actions and strategies contained in the June 2005 WRIA 1 Watershed Plan. The DIP was approved by the WRIA 1 Planning Unit on June 20, 2007.

In October 2010, the Lower Nooksack Strategy was approved by the Joint Board. Key tasks and objectives that were set for the Lower Nooksack Strategy (Strategy) include:

- Develop and implement a process for negotiating settlement of water rights for the Mainstem Nooksack River;
- Update and verify the Lower Nooksack River sub-basin water budget and provide technical support for decision-making.
- Update the Whatcom County Coordinated Water System Plan (CWSP).

In 2019, the WRIA1 Regional Water Supply Plan (RWSP) was crafted to establish a framework to address water supply needs for instream and out of stream uses. The RWSP is not replacing the Whatcom County Coordinated Water System Plan that is prepared under the Washington Department of Health regulatory framework, but is integrating it with other out-of-stream water uses and instream water needs, and in context with land use, water quality, habitat, and stream flows.

Tasks outlined in Strategy 3, (WRIA1-Wide) RWSP of the 2018-2022 WRIA 1 Watershed Management Board (WMB) Work Plan proposed three pilot areas, and implementation tasks. The proposed pilot areas are to be selected based on one or more of the following reasons:

- Data availability
- Leverages other ongoing or proposed activities and funding
- Supports and/or advances other strategies in the WRIA 1 Watershed Management Board 5-year Work Plan, in particular, future opportunities for Drainage Based Management.
- Salmon recovery opportunities

Outcome of the Phase 1 Scope of Work will be a water supply plan for the pilot areas that quantify current and future out-of-stream water supplies and identifies management solutions that address those needs that will be subject to senior federal and state water rights, some of which are yet to be determined, for both instream flow needs and out-of-stream water uses. The pilot area plans will be rolled up into the regional, WRIA 1 Wide water supply plan, which will be a separate, future scope of work. Implementation of the tasks outlined in this scope of work will be completed under the framework of the WRIA 1 WMB's multi-year work plan and structure.

The PUD is the administrative lead for advancing the WRIA 1 RWSP strategy. The (WRIA1-Wide) RWSP was submitted as a 2018 near term action (NTA) for inclusion in the 2018-2022 Action Agenda for Puget Sound. Funding for NTAs is EPA, National Estuary Program funding administered through Puget Sound Strategic Initiative Leads.

4.2.2 Watershed Restoration Act (ESSB 6091)

In January 2018, Washington passed a new law (ESSB 6091) that provides Ecology and local governments with tools to protect and enhance stream flows while ensuring that water is available for homes in rural parts of the state. ESSB 6091 was a direct response to the 2016 Hirst1 decision by the Washington Supreme Court. The law (now primarily codified in Chapter 90.94 RCW, Streamflow Restoration), clarifies how counties issue building permits for rural homes intending to use a groundwater permit-exempt well for their domestic water source.

The law allows new permit-exempt domestic wells to have an impact on closed water bodies and water bodies with minimum instream flows. It also requires planning efforts in 15 Water Resource Inventory Areas (WRIAs) to project consumptive use by new domestic permit-exempt wells over the next 20 years, and identify projects and actions to offset those impacts in order to achieve a net ecological benefit (NEB) for the WRIA. The new law established a February 1, 2019 deadline for Ecology to adopt a locally developed and approved watershed plan update for WRIA 1 (Nooksack).

Although a Watershed Management Plan Update was not locally approved by the deadline, tremendous work was accomplished by the WRIA 1 planning process. Ecology is building on that work to carry out the rulemaking process now required under RCW 90.94.020. On February 5, 2019, Ecology's Water

Resources Program announced the start of rulemaking to amend Chapter 173-501 WAC - Instream Resources Protection Program – Nooksack WRIA 1 to meet the requirements in RCW 90.94.020. Ecology is required by RCW 90.94.020 to adopt rules for WRIA 1 by August 1, 2020. The limited rule amendment will update and add to water management regulations in WRIA 1 by considering the following: 1) changing current regulations to increase flexibility for projects that retime high flows; 2) adding regulations to establish limits for domestic permit-exempt groundwater withdrawals for new users; and 3) making minor technical corrections.

The proposed rule amendment language establishes an indoor withdrawal limit of 500 gpd per new domestic permit-exempt well. To evaluate how an indoor water use rate of 500 gpd for all new homes impacts the consumptive use offset calculations, a scenario was run with an assumed 2,150 new homes, an indoor water use of 500 gpd, and an outdoor irrigation footprint of 1/12 of an acre for every new home.

The result was a total consumptive use offset of 390 acre-feet per year for the nine aggregated subbasins combined. The majority of consumptive use associated with each new home is associated with the outdoor water use. As noted above, indoor water use is typically only 10% consumptive, while outdoor use is 80% consumptive.

4.2.3 Whatcom County Coordinate Water System Plan Update

The 2016 Coordinated Water System Plan (CWSP) update was prepared for public water systems within the Critical Water Supply Service Area (CWSSA) that was established by the Whatcom County Council to include all of Whatcom County (County) west of the Mount Baker-Snoqualmie National Forest boundary, excluding certain portions of the Lummi and Nooksack Indian reservations.

The CWSP update was prepared under the direction of the Water Utility Coordinating Committee (WUCC), which was established pursuant to the Public Water System Coordination Act of 1977 (Coordination Act; Chapter 70.116 Revised Code of Washington (RCW)). The CWSP represents the collective views of the WUCC and integrates the documented views of other state and local governments. The document, officially known as the “Regional Supplement,” and the individual water system plans (WSPs) approved by the Washington State Department of Health (DOH), comprise the CWSP.

When integrated with the County’s GMA Comprehensive Plan, the CWSP presents a significant piece of the larger resource and growth management strategy for the County's future. The County’s 2016 GMA Comprehensive Plan Update anticipates that more than 80 percent of new growth over the next 20 years will be accommodated within cities and Urban Growth Areas (UGAs), with the remainder in rural areas. However, public water service and systems can either be urban or rural as defined in RCW 36.70A.030 (17:20).

Water supply and service policies in this CWSP are designed to support the Growth Management Act (GMA) and local land use policies by projecting population and employment growth capacities for the existing Municipal and non-government Group A water suppliers (comprising both UGAs and non-UGAs). These population growth capacities (i.e., maximum potential demand) are then compared with their respective water rights (supply) and DOH-approved system connection capacities.

Cumulatively, there are sufficient water rights available to meet all current and projected needs for the next 50 years. Most Group A utilities have sufficient individual water rights to meet their current demand and many their projected full build out demand. The WUCC recommends several measures, such as new water lines and interties that individual water utilities with inadequate water rights should implement, to

provide legal and secure supply of water to areas requiring additional water to support future growth and development.

4.2.4 Whatcom Salmon Recovery Plan

In 2003, Whatcom County received a grant from the Washington Department of Fish and Wildlife to develop the WRIA 1 Salmonid Recovery Plan (Plan). The core purpose(s) of the Plan are to: (1) identify the actions necessary to recover WRIA 1 salmonid populations, especially listed species; and (2) outline the framework for implementation of recommended actions that have been agreed to by local, state, tribal, and federal governments and stakeholders in WRIA 1.

The local vision of salmon recovery is to return self-sustaining salmonid runs to harvestable levels through the restoration of healthy rivers, marine shorelines, and natural processes, careful use of hatcheries, and responsible harvest. Achieving this vision will require active participation and support of local landowners, businesses, and the larger community.

The geographic scope of the WRIA 1 Salmonid Recovery Plan incorporates all upland, freshwater, estuarine and nearshore habitats in WRIA 1, including watersheds of the Nooksack and Lummi Rivers, independent coastal drainages (Dakota Creek, California Creek, Terrell Creek, Squalicum Creek, Whatcom Creek, Padden Creek, Chuckanut Creek, Oyster Creek, Colony Creek, and Whitehall Creek watersheds), and Fraser River tributaries south of the Canadian border (Sumas and Chilliwack Rivers). The Plan covers all WRIA 1 salmonid species with primary emphasis placed on ESA-listed species, and will include recommendations for all habitat, harvest, hatchery, hydropower and recreation actions that affect those salmonid populations.

Leadership for the WRIA 1 Salmon Recovery Program and WRIA 1 Watershed Management Programs is under a unified decision-making structure governed by the WRIA 1 Watershed Management Board. The WRIA 1 Watershed Management Program covers watershed planning issues including water quality, water quantity, instream flows, and fish habitat. The PUD has supported this Plan through its role on the WRIA 1 Joint Board. More information about the integrated governance structure and the watershed planning program is available at http://wria1project.whatcomcounty.org.

4.2.5 Cherry Point Reach Management Plan

The Cherry Point Reach Management Plan (plan) plan was created in 2010 to identify the natural resources (i.e., habitats and species) existing within the Cherry Point Aquatic Reserve, and the proposed uses, future threats, and management actions that will be employed by DNR to protect these resources. The aquatic reserve addresses the management of aquatic lands; it does not address the harvest of finfish or shellfish within the aquatic reserve.

The plan was developed with the help of independent scientists, federal, tribal and state resource agencies, site users, lessees, environmental and citizen groups who recognized the ecological importance of the site to both Puget Sound recovery and to commerce and industry. The PUD was represented in the planning process. The need for the plan was based upon an extensive review of the environmental health, natural resources, fish and wildlife species located at Cherry Point Reach.

The plan is intended to meet the following goals:

- fully define the current impacts through research and study
- reduce risks and identified impacts

- restore ecosystem functions
- provide for long-term ecosystem protection

4.2.6 Nooksack River Flood Management/Sediment Management Plans

In 2005, Whatcom County initiated a Sediment Management Plan (plan) for the lower Nooksack River that integrates geomorphic, biologic, and hydraulic analyses. The plan is a recommended component of the Lower Nooksack River Comprehensive Flood Hazard Management Plan (CFHMP) (Whatcom County Dept. of Public Works 1999). It is intended that the Sediment Management Plan will be a tool along with the CFHMP to provide flood protection.

4.3 Existing Water Rights

As noted above, the PUD has a combination of municipal, industrial, irrigation and agricultural purpose ground and surface water rights that serve its customers. The PUD's surface water rights were obtained to meet the water needs of PUD customers located within the Cherry Point Industrial Zone and to provide wholesale water supply to the City of Ferndale. The PUD's ground water rights were obtained to serve the water supply needs of PUD customers in the Grandview-Northgate and I-5 Properties industrial/commercial areas. The PUD's water rights are shown in Table 4-1.

Table 4-1
Whatcom PUD Water Rights

Number	Priority Date	Qi	Qa	Purpose of Use
Surface Water Rights				
S1-00707C	April 16, 1965	50 cfs/32.2 mgd	22,067 ac-ft	Municipal Purpose
			5,600 ac-ft	Irrigation
S1-00708C	Sept. 27, 1968	28 cfs/18.1 mgd	17,880 ac-ft	Municipal Purpose
			664 ac-ft	Irrigation
SW - 6000	Jan. 13, 1953	5 cfs/3.23 mgd	3,620 ac-ft	Municipal/Industrial Purposes
Chapter 2 Ground Water Rights				
G1-25463P	June 12,1989	116 gpm	92.8 ac-ft	Municipal Purpose (3 wells)
G1-*03041 (GWC 2505-A)	March 5, 1953	200 gpm	140 ac-ft	Municipal Purpose (1 well)
G1-26325	Sept. 11, 1991	1350 gpm	N/A	Municipal Purpose (Well - Fire Supply)
Exempt Well	N/A	5000 gpd	N/A	Praxair Supply/Domestic Use

4.3.1 Surface Water Rights: non-Potable Municipal/Industrial Water System

The PUD holds three (3) additive municipal purpose surface water right certificates (SWC) that are beneficially used within its Cherry Point Retail Service Area for the following purposes:

(1) to provide non-potable water to the PUD's Cherry Point industrial customers for industrial/commercial processes use; and

(2) to provide non-potable water to the PUD's Cherry Point industrial customers that is treated by said customers for on-site potable/domestic use.

The PUD surface water supply is withdrawn from two diversion/intake structures located on the lower Nooksack River and then subject to basic (solids removal) treatment before transmission. Plants 1 and Plant 2 are served by water rights that have amounts specifically dedicated to municipal/industrial purposes.

Under normal operations, PUD Plant 1 and Plant 2 respectively divert water from Nooksack River consistent with their authorized water rights described above. However, subsequent to the construction of an intertie between the two plants in 2003, the PUD gained substantial new flexibility in how it may operate its plants, serve customers, and manage treatment capacity limitations. This flexibility allows the municipal water rights authorized under Water Right 1 and Water Right 2 to be commingled for diversion from Plant 1 or Plant 2 – subject to their respective intake and treatment capacity limitations.

The PUD is evaluating the expansion of its existing surface water treatment and transmission systems to more efficiently accommodate the treatment and conveyance of its Plant 1 and Plant 2 water rights/water supply. The PUD's Plant 1 and Plant 2 diversion facilities have already been upgraded and modified to meet Washington State Department of Fish and Wildlife (WDFW) screening standards that are protective of ESA-listed salmonids.

The PUD meters the total amount of water withdrawn from the Nooksack River and pumped from its treatment facilities, and meters the amount of water sold. Water losses are negligible, except for wash-down and overflow losses at the treatment plants. Based on metering of intake and distribution it is estimated that less than 5% of the water diverted from the Nooksack River is lost.

4.3.2 Plant 1 – Water Right Certificate: S1-00707C

PUD Plant 1 Water Right (S1-00707C) is a certificated surface water right with a priority date of April 16, 1965. The Plant 1 Right 1 priority date is senior in time to the minimum in-stream flows established for the Nooksack River (WAC 173-501-030). Ecology issued the certificate for the Plant 1 Water Right 1 in 1982.

Water is withdrawn under this right from the Nooksack River at the intake facility for PUD Plant 1 which is located at River Mile 5.3. The water right authorizes a total instantaneous withdrawal rate (Qi) of 50 cfs (32.2 mgd) and a total annual quantity (Qa) of 27,667 af/yr. Of the total Qa figure, 22,067 af/yr is dedicated to municipal purposes, including potable, manufacturing and industrial uses. Approximately 5,600 af/yr is dedicated to seasonal, irrigation purposes. The PUD has the operational capacity to make full use of the instantaneous quantity (Qi) cited above.

Pursuant to the PUD's authority and status as a municipal purpose water supply system, the Plant 1 Water Right constitutes a municipal purpose water right that is in good standing, provides water for governmental and governmental proprietary purposes, and is being managed to meet present and future customer needs. Current beneficial use of this water right largely occurs within the PUD's Cherry Point

retail service area, although the PUD is investigating providing further wholesale use of the water right to water systems within Whatcom County.

In the course of PUD operations, the full instantaneous quantity (Qi) of 50 cfs has been pumped and applied to beneficial use on multiple occasions.

4.3.3 Plant 2: Water Right Certificate S1-00708C

PUD Plant 2 Water Right (S1-00708C) is a certificated surface water right with a priority date of September 27, 1968. The Plant 2 Water Right priority date is senior in time to the minimum in-stream flows established for the Nooksack River (WAC 173-501-030). Ecology issued the certificate for the Plant 2 Water Right 1 in 1982.

Water is withdrawn under this right from the Nooksack River at the intake facility for PUD Plant 2 which is located at River Mile 9.2. The water right authorizes a total instantaneous withdrawal rate (Qi) of 28 cfs (18.10 mgd) and a total annual quantity (Qa) of 18,544 af/yr. Of the total Qa figure, 17,880 af/yr is dedicated to municipal purposes, including manufacturing and industrial uses. Approximately 664 af/yr is dedicated to seasonal, irrigation purposes. The PUD has the operational capacity to make full use of the instantaneous quantity (Qi) cited above.

Pursuant to the PUD's authority and status as a municipal purpose water supply system, the Plant 1 Water Right constitutes a municipal purpose water right that is in good standing, provides water for governmental and governmental proprietary purposes, and is being managed to meet present and future customer needs. Current beneficial use of this water right largely occurs within the PUD's Cherry Point retail service area, although the PUD is investigating providing further wholesale use of the water right to water systems within Whatcom County.

In the course of PUD operations, the full instantaneous quantity (Qi) of 28 cfs has been pumped and applied to beneficial use on multiple occasions.

4.3.4 GP Intake/Plant 1: Water Right Certificate No. 6000 (General Petroleum)

Certificated Surface Water Right 6000 (General Petroleum/GP right) authorizes an instantaneous withdrawal rate (Qi) of 5 cfs, and an annual quantity (Qa) of 3,622 af/yr. The priority date is senior in time to the minimum in-stream flows established for the Nooksack River (WAC 173-501-030). The purpose of the water right is "manufacturing/industrial" and its priority date is January 13, 1953. This water right, along with its intake structure on the Nooksack River, was originally developed and perfected by General Petroleum Corporation (Mobil Oil) in 1954 to serve their Cherry Point refinery. When the BP Oil Company acquired the Mobil Oil refinery in 1989, the water right and intake facility were also transferred as part of the transaction.

The withdrawal facility originally associated with this right was interconnected with the PUD Plant 1 system at its Ferndale station in 1966, and later connected to the PUD distribution line near the refinery facility in 1976. Following the 1990 and 1991 floods of the Nooksack River that put the GP intake out of commission, the owner on January 2, 1992, assigned ownership of its intake facility, pump station and water right to the PUD. Shortly thereafter, the PUD returned the intake facility/pump station to fully operational status. PUD water system records reflect full beneficial use of the instantaneous and annual quantities authorized under this right.

In December 2003, the PUD received Ecology approval of its application to change the point of diversion (POD) of this right to the expanded Plant 1 intake, to change the place of use to "Area Served by PUD #1 of Whatcom County,", and the purpose of use to "municipal use." The water right change was largely driven by plans by the City of Ferndale (Ferndale) to rebuild a nearby bridge which would result in the condemnation and demolition of existing pump station. A superseding certificate was issued in August 2004 for this water right authorizing an instantaneous quantity (Qi) of 5 cfs and an annual quantity (Qa) of 3620 afy.

Subsequent to the change process, the PUD determined in 2013 that Ferndale had changed its plans and would not require demolition of the GP pump station. As a result of this information, the PUD requested and secured from Ecology on April 11 2014, an amended superseding certificate that restored the original BP Plant as an authorized point of diversion (POD), and retained Plant 1 as an alternate POD.

This certificated surface water right continues to be beneficially used through surface water diversions at PUD Plant 1, although the BP intake/equipment remains in place for operational flexibility.

4.3.5 PUD Municipal Water Rights: Beneficial use for Irrigation Purposes

The PUD's authority to use its municipal purpose rights (and related Qa/Qi) to serve irrigated agricultural purposes (e.g., drip/sprinkler irrigation of vineyards, potatoes, pasturage) within its service area is recognized in Ecology Pol-2030. Specifically, Pol-2030 states under the subsection relating to "Governmental Entities/Governmental Purposes", that "municipal water rights held by entities listed in RCW 90.03.015(4)(b) may include agricultural irrigation as a governmental purpose under an existing municipal water supply purpose water right, if such an entity has statutory authority to provide agricultural irrigation water and the entity has used the right, at least in part, for agricultural irrigation since the time the right was issued."

The above provision was crafted by Ecology with PUD's in mind and clearly applies to Whatcom PUD and its water rights. Whatcom PUD, similar to other PUDs, was formed with the statutory authority to provide water for agricultural irrigation as provided in RCW 54.16.030. To this end, but also prior to Ecology's development of Pol-2030, Whatcom PUD has beneficially used its municipal purpose water rights for over 40 years to serve irrigated agricultural uses located within its water service area as defined by the Whatcom County CWSP.

4.3.6 PUD Irrigation Purpose Surface Water Rights

As noted above, the certificates for the PUD's Plant 1 (S1-00707C) and Plant 2 (S1-00708C), water rights bifurcate their respective authorized annual quantities (Qa) between amounts that may be used for municipal water supply purposes (i.e., manufacturing, industrial, and municipal) and irrigation purposes. In this regard, the Plant 1 Water Right 1 authorizes an annual quantity (Qa) of 22,067 afy/yr for municipal purposes, and 5,600 afy for irrigation purposes. The Plant 2 water right authorizes an annual quantity (Qa) of 17,880 for municipal purposes, and 664 afy for irrigation purposes.

No specific instantaneous quantities (Qi) are identified for irrigation quantities, but such quantities are presumed to be derived from the Qi authorized by each right (Plant 1: 50 cfs/Plant 2: 28 cfs). The Plant 1 and 2 irrigation rights assume a water duty of approximately 2 feet per acre foot (e.g., pasturage, crop irrigation) for a seasonal (May –October) use.

The bifurcated quantities for irrigation purposes designated in the Plant 1 and Plant 2 water rights are distinct from the irrigation and dairy operation processing water the PUD provides to irrigators from its Plant 1 and Plant 2 municipal supply and related transmission lines. The bifurcation between the identified "municipal" purposes and irrigation quantities authorized under the Plant 1 and Plant 2 water rights, issued before enactment of the definition of "municipal water supply purposes" in RCW 90.03.015, is significant only with respect to the season of use. Although Ecology's administrative policy suggests that water quantities expressly authorized for agricultural irrigation might require approval of a water right change to be converted to municipal use, this policy should not apply to water rights issued to a public utility district for governmental or governmental proprietary purposes. However, any seasonal use restrictions on the irrigation quantities must continue to be observed unless the PUD obtains a change in the season of use.

Should such a change be requested, the PUD would need to demonstrate that the annual quantity (Qa) proposed for change has been perfected through beneficial use consistent with the terms/conditions of the applicable water right document.

4.3.7 Surface Water Rights Place of Use

In its 2004 Comprehensive Water System Plan (WSP), the PUD designated the Cherry Point Industrial Zone as a retail service area in accordance with the Municipal Water Law (MWL) and related Washington State Dept. of Health (DOH) regulations. Chapter 246-290 WAC. Pursuant to this action, the PUD made clear that it is prepared to meet all water needs of its Cherry Point customers from its Nooksack River source(s) should they request such service. The remainder of Whatcom County was designated as the PUD's future service area, less the Lummi Nation Reservation and those areas already claimed under the 2001 Whatcom County Coordinated Water System Plan (CWSP) Update. This service area was carried forward in the recent 2016 Whatcom County CWSP update.

Both prior and subsequent to the approval of its 2004 WSP, the PUD has been working with its customers and DOH to examine the feasibility of developing on-site potable surface water treatment options for its existing and future Cherry Point Retail Service Area customers. This work remains ongoing. If such treatment options are pursued, the PUD has advised DOH that it may be willing to act in either an owner/operator capacity.

In addition to the surface water treatment concept described above, the PUD has engaged in the following activities within recent years:

- Examined on a preliminary basis with DOH, Ecology, the Town of Sumas, and City of Blaine, the feasibility of using PUD, City of Blaine, and other water rights to address water supply issues affecting north Whatcom County irrigators and nitrate-affected water systems.
- Examined on a preliminary basis, the feasibility of providing PUD surface water as a wholesale water supply source that help to address tribal and non-tribal potable/commercial water needs on the Lummi Indian Nation reservation. Such service would require the consent of the Lummi Tribe and other related actions as preconditions to the provision of such wholesale service.
- Worked with the WRIA 1 Joint Board to advance implementation of the Lower Nooksack Strategy which has set goals relating to water rights settlement negotiations, water budget(s), water supply planning, water flow, and water quality monitoring

4.3.8 Groundwater Rights: Potable Water System

In 1993, the PUD obtained three groundwater water rights as part of an agreement executed with the Oxy Corporation and Jansen Inc., to serve the Northgate and Grandview industrial parks. One water right authorizes water for potable/fire flow water supply, one authorizes the provision of fire flow only, and one authorizes use of water for irrigation purposes. The Grandview and Northgate Industrial Parks along with a larger area of industrial and commercial land constitute the Grandview – Northgate Water Service Area as referenced in the Whatcom County CWSP, and this Water System Plan. As a condition of the PUD assuming ownership and operation of these two existing water systems, the PUD required that they be improved and interconnected. The developers were further required to convey the water rights associated with each system to the PUD. Based on demand projections for the Grandview-Northgate Retail Service Area, it does not currently appear that the PUD will be compelled to secure additional water supply for this area within the next twenty years. However, this assessment could change subject to land use, annexation, and new customer siting developments.

Pursuant to the PUD's authority and status as a municipal purpose water supply system, the Water Rights constitute a municipal purpose water right that is in good standing, provides water for governmental and governmental proprietary purposes, and is being managed to meet present and future customer needs.

<u>Grandview – Northgate Water System: GW Permit No. G1-25463 (P)</u>

The Grandview-Northgate Industrial Park ground water right (G1-25463P) is an additive water right that was originally issued to the Oxy Corporation in November 1990. The permit, which has a priority date of June 12, 1989, authorizes an instantaneous quantity (Qi) of 116 gpm and an annual quantity (Qa) of 92.8 ac-ft/yr for industrial/commercial purposes. The PUD obtained this water right (permit) with its assumption of service to the Grandview – Northgate Water System and service area in 1992/93.

The water right covers three wells located within the Grandview-Northgate Industrial Park. One of the wells is a 16-inch well that is used for fire protection. A 6-inch well located adjacent to the 16-inch well is used to charge the fire protection system. Another 6-inch well located in the southeast corner of the development is used for potable water supply. The quantities used in fire protection use are additive to the primary instantaneous and annual quantities cited above.

In 1993, the PUD submitted an application to change the place of use of this water right to enable it to serve the entire Grandview Light Industrial Zone (GLIZ) –which included property known as I-5 Properties, and to add an additional point of withdrawal (fire flow pond permitted under G1-23625) to the existing wells. The Department of Ecology approved the requested changes in 2007 and prescribed a development schedule that expires on August 18, 2031. An LID formed prior to the requested change provided the financing necessary to achieve the necessary system improvements and service consolidation.

<u>Grandview – Northgate Water System: Water Right: G1-26325C</u>

Groundwater Certificate (GWC) G1-26325C is an additive water right that authorizes an infiltration trench/pond to provide fire supply for the Grandview – Northgate Water System. This water right, which has a priority date of September 11, 1991, was issued in December 1993 and authorizes an instantaneous quantity (Qi) of 1,350 gpm for use on an as-needed, emergency basis. No annual quantity

was authorized. The right and related trench/pond remains in use for fire suppression purposes within the Grandview – Northgate Water System service area.

In 2019, the PUD commenced planning and engineering work to enable its Plant 2 transmission line to provide fire flow to the Grandview-Northgate Water System. This work was completed in 2020 but use of the trench pond well and related fire flow right will be discontinued. The PUD may place this water right in Trust on a voluntary, temporary basis.

Grandview – Northgate Water GW Cert. No. G1-*03041C (GWC 2505-A)

Groundwater Certificate (GWC) 2505-A is an additive water right that authorizes an instantaneous quantity (Qi) of 200 gpm and an annual quantity of 140 ac/ft year from a well for the irrigation of 70 acres. The water right's priority date is March 3, 1953, and a certificate was issued on February 26, 1956, indicating perfection of its authorized quantities. The priority date is senior in time to the minimum in-stream flows established for the Nooksack River (WAC 173-501-030). The water right was acquired by Grandview property developer, Jansen Inc., who used the water right for hay cutting and commercial nursery operations on property that is currently known as the Grandview Light Industrial Park. Subsequent to its acquisition by the PUD, the PUD allowed property owners to continue to make use of the right for landscape irrigation purposes. The PUD currently maintains the Well/water right as a standby water source and monitoring well.

4.3.9 Praxair Well

In addition to the ground water right described above, the PUD has the right to use water from another well that is exempt from permitting pursuant to RCW 90.44.050. The well, which serves the PUD's Praxair water system, was initially constructed as a test well under Groundwater Application G1-27758 (1996). The well is located at the PUD's D-station site on Aldergrove Road. Investigations found, however, that the aquifer at this location was not sufficient to develop a larger ground water supply. When the need for a potable water supply of less than 5000 gallons per day was determined necessary to allow the Praxair facility to expand, the PUD agreed to convert the well into an exempt, production well (per RCW 90.44.050) and construct the necessary system to serve Praxair. The PUD will continue to use this source of supply for industrial potable supply at that location limiting its consumptive use to 5000 gpd or less.

4.3.10 Groundwater Sources/Place of Use

As noted earlier, the PUD's Grandview - Northgate groundwater sources and related water rights were acquired in the early 1990's when the owners of the Grandview and Northgate Industrial Parks (Oxy Industries/Jansen Inc.) requested the PUD acquire and manage the existing private water system. The existing groundwater sources appear adequate to meet existing and future needs for this service area. This situation could change, however, as a result of zoning changes, the siting of new, high volume water customers, and the annexation of a portion of the Grandview / I-5 service area by the City of Ferndale.

4.4 Water Right/Service Area Adjustments/Issues

4.4.1 Cherry Point Industrial Zone: BP Refinery

In 2010, Birch Bay Water and Sewer District (BBWSD) submitted a Notice of Intent (NOI) to the Whatcom County Boundary Review Board (BRB) to provide potable retail water service "in and around the BP Cherry Point Refinery (formerly ARCO)". At the time of this proposed action, the BP Cherry Point Refinery (BP Refinery) fell within the PUD's designated retail service area claimed in its 2004 Water System Plan and the 2001 Whatcom County Coordinated Water System Plan (CWSP) Update. Prior to their proposed action, however, BBWSD had been providing potable water service to the Refinery pursuant to a wholesale agreement with the PUD.

BBWSD's proposal to include the BP Refinery property within its retail service area occurred as a result of the BP Refinery's desire to end operation of its potable supply system and secure potable water supply directly from BBWSD. Subsequent to detailed discussions with Washington State Department of Health (DOH), and consultations with the BP Refinery manager, the PUD secured assurance from BP/Refinery that under its new (direct retail water service) contractual relationship with BBWSD, the PUD would remain the exclusive provider of industrial water supply to the BP Refinery.

Pursuant to the above actions and assurances, in addition to correspondence from the BP Refinery to DOH stating that the "PUD would continue to supply the refinery with industrial water", the PUD verbally advised DOH in February 2011, that it would not challenge BBWSD's proposed action as a service area dispute. On February 18, 2011, DOH approved BBWSD's requested amendment (i.e., service area adjustment) to their Water System Plan.

As a consequence of DOH's approval, the PUD's retail service area claim to the Refinery Property has been adjusted. The PUD, however, retains its retail service area claim to the balance of the Cherry Point Industrial Zone and can be assumed in the future to oppose any further efforts to diminish its retail and/or wholesale service claim to this area.

4.4.2 City of Ferndale Wholesale Water Supply

On December 31, 2011, water service to the City of Ferndale (Ferndale) was formally terminated at Ferndale's request. This action occurred subsequent to Ferndale advising the PUD on September 14, 2011, that it would no longer purchase wholesale water from the PUD to meet its municipal water supply needs and would instead rely on the redevelopment of existing groundwater rights.

Prior to the PUD's termination of wholesale supply, Ferndale's water use was approximately 800,000 gpd (292,000,000 gallons per year/896 afy). Although Ferndale has halted its use of PUD water, it remains possible in future years that Ferndale will resume its wholesale supply relationship with the PUD in some form at which point the PUD would make necessary adjustments to its service area.

4.4.3 City of Ferndale partial Annexation of Grandview Retail Service Area

On March 4, 2009, The City of Ferndale annexed approximately 144 acres of property within Ferndale Urban Growth Area. The annexed area includes less than half of the PUD's Grandview-Northgate Water System retail service area, and excludes existing structures falling within the Grandview-Northgate Industrial Zone, including the PUD property where its Grandview-Northgate Water System facilities (i.e.,

wells, storage, water rights) are located. See Figure 1-5. The annexed area does, however, include property where a PUD Grandview-Northgate Water System transmission main is located.

In the course of its annexation, Ferndale took no action to transfer the annexed portion of the PUD's Grandview-Northgate Water System retail service area to its own retail service area. Further, Ferndale officials have indicated they have no clear future plan or interest to extend their retail service area and related water supply to the annexed area that remains within the PUD's service area. Should Ferndale seek to promote and/or approve development within the annexed area that exceeds the PUD's Grandview-Northgate Water System existing supply capacity, the PUD may request that Ferndale meet such future demand with its own municipal water supply and/or voluntarily relinquish the annexed part of its service area.

4.5 Regional Water Management: North Whatcom County

Since the early 1990's, the PUD has sought to develop and advance regional water supply initiatives that could assist irrigators, small water systems, tribes, and other parties meet their respective supply and environmental interests. The PUD remains willing to play this role to extent feasible, particularly in the area of north Whatcom County where water quality problems (e.g., nitrates) affect a number of small water systems and communities.

PUD-Washington State Dept. of Health Partnership Concept

In order to assist such systems, the PUD remains willing to consider the following partnership actions with the Washington State Dept. of Health (DOH):

Administration/Facilitation of State Funding: As a municipal water system with regional planning and water service authority, the PUD is well situated to receive and administer DOH/legislative funding to advance DOH priority (health related) regional projects. Private water systems are often not eligible under law to receive and expend such state/federal funding.

Small System Consolidation/Planning/Engineering Services: The PUD is prepared to contract/partner with DOH subject to acceptable conditions for the purpose of providing planning, engineering, and management services relating to the consolidation of small, water quality and quantity affected water systems.

Sub-regional Water Treatment Services: The PUD is prepared to contract with DOH regarding the design, construction, ownership, management, and operation of a sub-regional (Nooksack Basin) potable water treatment plants (WTP) that can provide safe drinking water to small, water quality-affected systems. If legally authorized by DOH, the PUD could also assign ownership of a WTP or other facilities developed by the PUD in partnership with DOH to the benefitting small water systems and provide contract management/operation services.

Sub-regional Water System Contract Services: The PUD is prepared to contract with small water systems, subject to acceptable conditions, to provide water system management, oversight, and operations support to small water quality-affected systems. (See discussion of Satellite Management Services in Chapter 1, Section 1.10 for more detail).

4.6 New Source Development: Grandview System

As noted above, the PUD has completed the work to enable its Plant 2 transmission line to provide fire flow to the Grandview-Northgate Water System in 2020. The PUD will continue to provide treated domestic supply to the system's existing and future retail customers from its existing well source, but use of the trench pond well and related fire flow right will be discontinued. The PUD may place this water right in Trust on a voluntary, temporary basis.

City of Ferndale

As discussed earlier, the City of Ferndale (Ferndale) has annexed approximately one half of the PUD's Grandview-Northgate Retail Service area. Ferndale has also terminated its water supply relationship with the PUD and now meets its water demands through the use of prior authorized groundwater wells. Should Ferndale's annexation result in zoning changes that alter current development trends and build-out assumptions, the PUD's existing supply may not prove adequate to meet service area needs. In that event, the PUD may request that Ferndale provide necessary water supply to address any related deficit from its existing sources.

PUD Surface Water Rights

The PUD holds substantial surface water right on the Nooksack River at its Plant 1 and Plant 2 intake/treatment locations with a place of use that includes "area served by Whatcom County PUD." Such surface water could be potentially available to the City of Ferndale's recently annexed area and/or the PUD's Grandview-Northgate service area subject to its potable treatment, the construction of a new transmission line (and pump stations), and an assessment of water quality mixing/feasibility issues. The PUD's surface water rights authorize use within the "area served by PUD #1 of Whatcom County", therefore, no water right change would be required. The cost of transmitting and treating such supply, however, could be prohibitive.

4.7 Water Resource Alternatives

Wastewater Reuse

The greatest potential for water reuse comes not from the PUD's existing potable water customers, but rather from its non-potable water customers because quantities delivered for non-potable are much greater than for potable. Additionally, any treatment for re-use would not need to be up to drinking water quality standards. Consequently, water saved by implementing additional water reuse in partnership with its non-potable customers could provide additional non-potable water or potable water. Such water would require treatment for use in the PUD's potable systems. The PUD has an on-going program working with its industrial customers to encourage conservation and reuse of existing supplies.

Desalination

Although desalination is a technique that can be used to develop additional potable water supply, the PUD has not evaluated the process in detail due to its existing supply position. Skagit County PUD has installed a reverse osmosis desalination plant to serve potable water customers on Guemes Island. The process was selected because of problems with salt water intrusion of the groundwater supply and

because of the high cost to bring any other supply to the remote location. Desalination remains a water supply option, albeit an expensive one.

4.8 Water Use Efficiency

Under the Water Use Efficiency Rule (WUE), and as applicable to the Grandview-Northgate (GV-NG) potable water system, the PUD must set water use efficiency goals and measure progress each year toward meeting those goals. Goals must include a measurable outcome, address water supply characteristics, and include an implementation schedule. The PUD must also evaluate or implement efficiency measures to help meet the goals.

This Water Use Efficiency Program promotes efficient water use and enhances the adequacy of the current sources to meet existing and future needs. While the PUD had not previously had a formal written Water Use Efficiency Program, it has been in compliance with the mandatory water use efficiency measures. In 2010 the PUD established conservation goals and measures. The most recent update to the WUE goals and performance measures were adopted by the PUD on August 24, 2021 as Resolution No. 798. All services are metered and have been for several years. The PUD is planning to work towards implementation of supplementary measures identified in this plan.

4.8.1 Water Use Efficiency Goals

The PUD conservation objective for the GV-NG system is to promote water conservation in order to maximize current sources. The goals for the planning period are:

- Maintain 10% or less distribution system leakage (DSL) rate.
- Reduce seasonal outdoor water use by 2 to 3 percent every 2 years, or a minimum of 1 percent per year.

4.8.2 Water Use Efficiency Program Measures

The WUE Rule requires that water efficiency measures must be implemented or evaluated. WAC 246-290-810 identifies the minimum number of water use efficiency measures that must be evaluated based on system size. The GV-NG system has less than 500 connections and therefore must evaluate or implement one supplementary water use efficiency measure in addition to the mandatory measures. The following describes the mandatory and supplemental measures the PUD continues to or will implement for the GV-NG system.

Mandatory Measures:

1) Source and Service Metering and Meter Calibration: The GV-NG system currently meters all customers and sources, and will work to implement a program and schedule calibration of the source meter and critical service meters (large users).
2) Leak Detection and Water Accounting:
    a. The GV-NG system has a low Distribution System Leakage (DSL). Most of the original distribution system is of modern materials and there have not been many significant problems with leakage. The three-year annual average is 4.3% with the most recent year (2019) at 2.9%.

b. The PUD will continue to follow System Leak Detection and Repair Protocol which includes notifying customers of high variance water consumption. The PUD will also keep records of found leaks and repairs.

3) Customer Education:

a. The PUD plans to include conservation tips with customer bills on a periodic basis.

b. The PUD plans to include water consumption history on customer billing.

c. The PUD continues to develop other education out-reach methods or incentives to lower seasonal outdoor water use.

Supplementary Measures the PUD will implement:

1) Replace Aging Customer Meters: New meters will provide more accurate readings and utilize new technology for collection of data. More accurate customer meter readings will contribute towards the goal of maintaining low levels of unaccounted for water. The PUD will work to implement a program and schedule for meter replacement where calibration critical service meters (large users) is not warranted.

2) Customer Leak Detection and Notification: It is anticipated that new meter technology will indicate if there is a potential leak on the customer's side of the meter. When a leak is indicated the customer will be notified of the possible leak. This contributes towards the goal of reducing customer usage, and supplements PUD current measure implementation of monitoring and notifying customers of high variance water consumption.

4.8.3 Budget for Water Use Efficiency Measures

The PUD will continue to use current budget allocations to fund the basic WUE Program for the GV-NG system. Additional funds will be sought, on an as needed basis, through grant and loan programs as well as rate increases to support the capital improvement projects that contribute to efficiency such as a meter replacement project. Alternatively, meter replacement may take place more frequently on a smaller scale to work with existing operations and maintenance budgets.

4.8.4 Water Demand Forecasting and Target Water Savings Projections

The WUE Rule has added new criteria to consider when preparing demand forecasts. The PUD is now required to project demands both with and without anticipated savings from the WUE program. It also provides a basis to measure conservation success versus actual water use data.

The projections below summarize the average day demand with and without water use reduction. Table 4-2 provides water demand forecasts with and without anticipated savings from the WUE Program.

Table 4-2 Water Demand Forecasts w/ and w/o WUE and Projected Water Savings

Year	Projected Annual Daily Usage without WUE (gal/day) (1)	Projected Annual Daily Usage with WUE (gal/day) (2)	Annual Daily Savings (gal)
2020	16,742	----	----
2022	18,401	18,033	368
2024	19,598	18,835	763
2026	20,872	19,673	1,199
2028	22,229	20,548	1,681
2030	23,675	21,462	2,213

Note: (1) Based on a 3.2% annual increase as described in Chapter 2.

(2) Based on a 2% every 2 years reduction, or 1% per year (i.e. annual increase of 2.2%).

4.8.5 Annual Performance Reporting

The Grandview-Northgate Group A water system is a Non-Transient Non-Community (NTNC) water system and submits a Water Use Efficiency Annual Performance Report. The annual report includes:

- Total source production and system wide consumption
- Distribution system leakage in percentage and volume
- Goal description, schedule, and progress towards meeting goals.

Washington Department of Health, Office of Drinking Water (DOH) has developed a report form that must be used. This report is submitted to DOH annually and available to the public on the DOH website.

4.8.6 Evaluation of Water Use Efficiency Program Measures

The PUD reviews the water rate structure of the GV-NG system periodically and evaluates rates that promote conservation. The PUD will continue to monitor the success of its conservation measures by documenting reduction in water use, tracking non-revenue for water, and continuing conservation communication to customers.

4.8.7 Water Loss Control Action Plan

The GV-NG system has a three-year annual average distribution system loss of 4.3%, well below 10% maximum limit set by the Water Use Efficiency Rule, and therefore a Water Loss Control Action Plan is not required at this time.

4.9 Water Resource Management Actions

The PUD remains prepared to employ its surface water rights to provide water supply management solutions within the Nooksack Basin, including for multi-purpose storage, flow augmentation, small system

assistance, off-setting/mitigating irrigation diversions, on-reservation tribal supply, and other constructive uses. To this end, the PUD supports collaborative water management solutions as opposed to adjudication, as the best means to improve fish habitat conditions, protect the Nooksack Basin economy, and foster creative solutions and partnerships that meet the collective interests of the water user community.

Maximizing the use of existing ground water rights continues to be the most feasible to the PUD relative to its Grandview-Northgate retail (potable) service area. The PUD intends to review its existing groundwater rights and seek changes where appropriate or necessary to ensure continued, reliable supply to Grandview – Northgate Water System service area.

As development occurs in the Ferndale area, extension of the Ferndale potable water distribution system continues to move closer to the Grandview – Northgate Water System service area. At some point it may become economical to intertie the systems. The PUD will continue to evaluate an intertie with the Ferndale system, either as a means to provide a higher level of reliability, or perhaps to supplement existing PUD facilities.

Currently additional potable water supply demand in the PUD's existing service areas is likely to be met by treating the PUD's surface water supply. Consequently, the PUD will continue to assure efficient use of the surface water supply through conservation and reuse to maximize the quantity of surface water available to meet potential future potable demand.

5. Source Water Protection

5.1 Wellhead Protection Program

The Safe Drinking Water Act (Section 1428) established a Wellhead Protection Program (WHP) to protect groundwater used by public water systems. The regulation requires each state to prepare a WHP program for EPA approval. DOH has developed regulations that require Group A water systems using groundwater sources to develop and implement the WHP plans (WAC 2460290-135).

The objective is to prevent releases of contaminants to groundwater in areas that contribute water to the public water supply systems. The PUD is implementing the provisions of the Wellhead Protection Program.

The four basic elements of a WHP are as follows:

- An initial groundwater susceptibility assessment for each water supply source.
- Delineation of the wellhead protection area (WHPA) that directly contributes groundwater to each water supply well.
- Inventory of land uses and identification of potential sources of contamination within each WHPA.
- Development of spill prevention plans and water contingency plans that minimize or eliminate the possibility of contaminants to the groundwater supply, and also develop options for maintaining water supply in the event the aquifer contributing to a source is contaminated.

A Susceptibility Assessment of the Grandview-Northgate Water System potable well was originally completed and submitted to DOH in April of 1998. A complete Wellhead Protection Program, including an updated Susceptibility Assessment, has been reviewed and updated as part of the planning process for this Water System Plan update. The Wellhead Protection Plan (WPP) is attached as Appendix E and addresses the requirements as specified in WAC 246-290-135. The Plan's 6-month, and 1, 5, and 10-year zones showing the time of travel required for a contaminant to reach the well field is shown in Figure 5-1 included in the WPP, and also shown at the end of this Chapter. An inventory prepared in the Wellhead Protection Plan indicated that the major categories of potential sources of contamination include (in no particular order):

- Storm Water
- Possible Improperly Abandoned Wells
- Household Hazardous Products
- Onsite Sewage Disposal Systems
- Hazardous Material Transportation
- Abandoned Residential/Farm Fuel Storage Tanks
- Agricultural Practices including possible Surface Watering and Manure Application
- Fueling Stations

Figure 5-2 in the WPP shows potential sources of contamination.

The PUD's GV-NG water system is in a good position to continue providing a safe and reliable supply of drinking water. The Wellhead Protection Plan serves to protect the drinking water supply at minimal costs to consumers, while maintaining compliance with drinking water regulations. With continued education and a

heightened awareness of the need for groundwater protection and conservation by the Commission, staff, and the consumers, the PUD is well positioned to have clean, reliable supply of quality water into the future.

Legend

- Pump Station
- Reservoir
- Groundwater Well

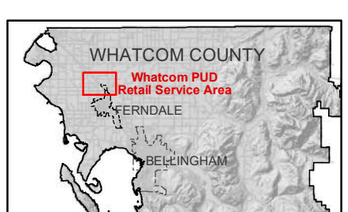
Water Mains

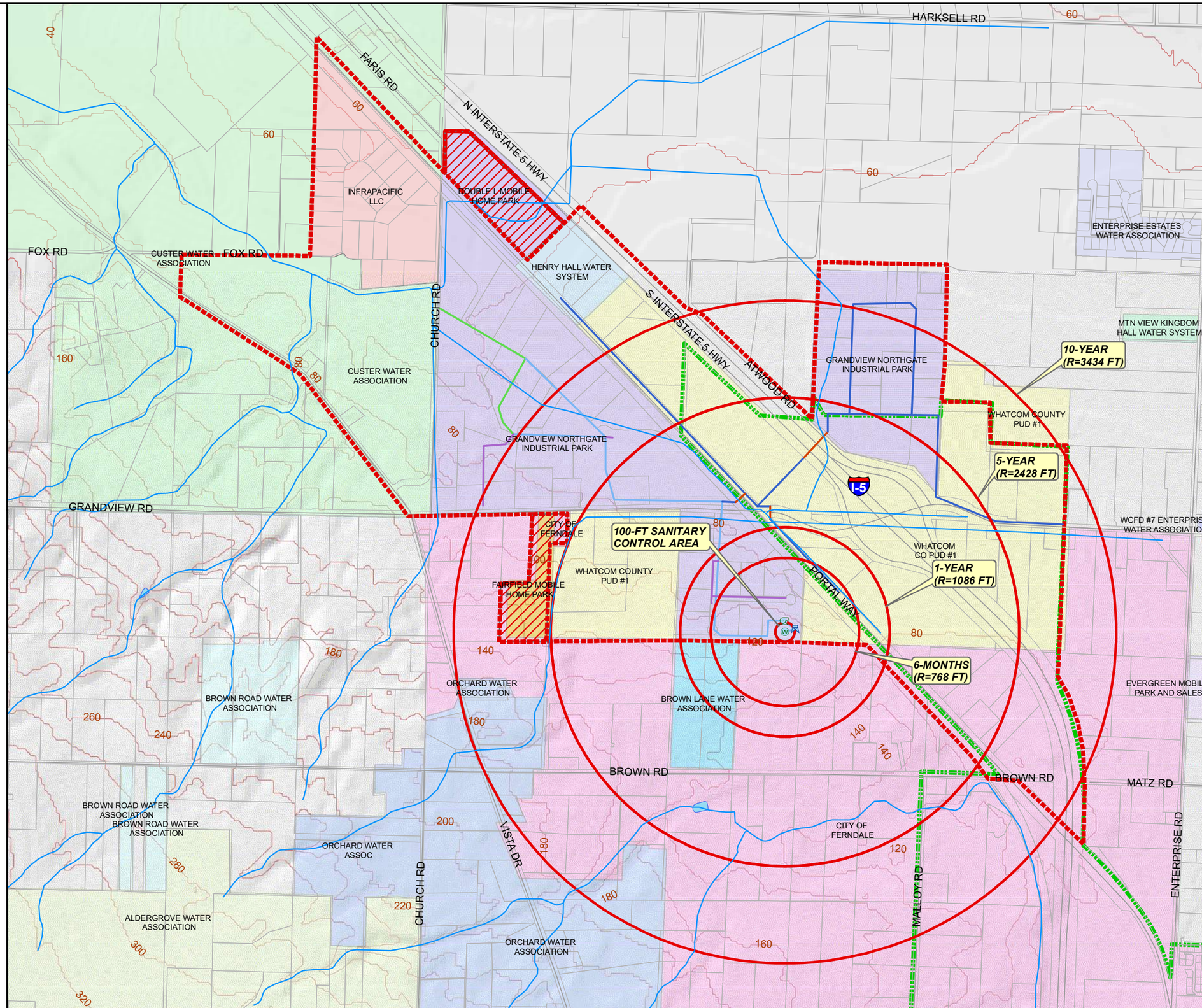
- 2" PVC
- 3" PVC
- 6" DI
- 6" HDPE
- 6" PVC
- Whatcom PUD Proposed Service Area
- Whatcom PUD Proposed Service Area Addition
- Ferndale City Limits
- Groundwater Travel Time Boundary (Based on Water Right Qi)

N
W E
S

1 inch = 1,000 feet

0 245 490 980 Feet





CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE 5-1
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
WELLHEAD PROTECTION AREA

DATE 4-30-2021
SCALE AS SHOWN
PROJECT 2020-023

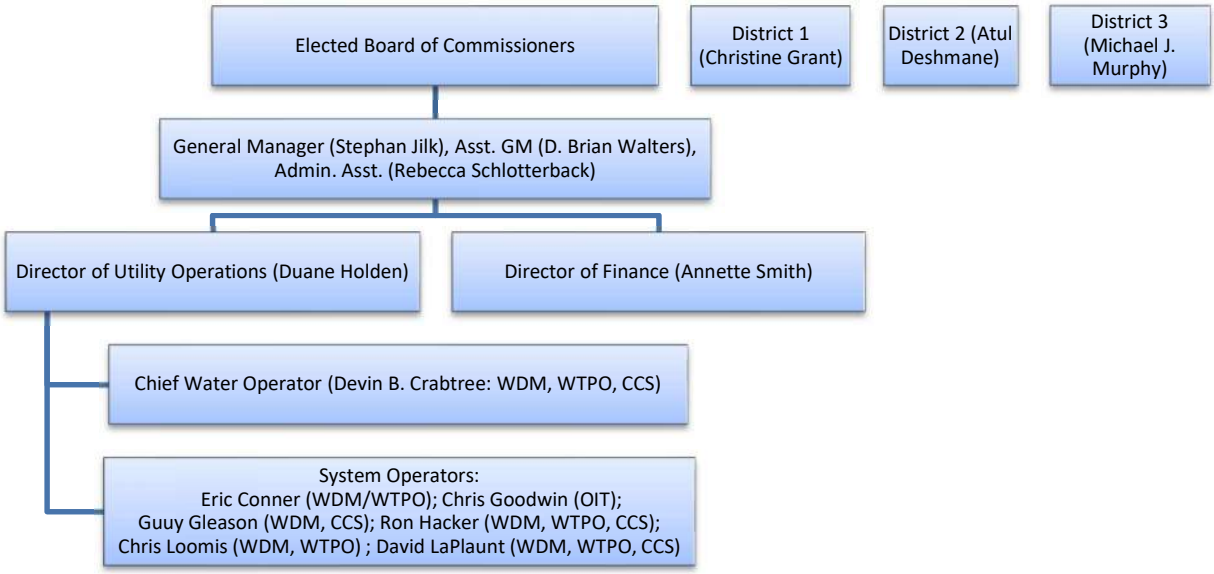
SHEET 1 OF 1

6. Operations and Maintenance Program

6.1 Water System Management and Personnel

Public Utility District No. 1 of Whatcom County (PUD) is a municipal corporation of the State of Washington and its legal responsibilities and powers are exercised through a three-member Board of Commissioners elected from separate commissioner districts for staggered six-year terms. The Board determines policy, sets rates and charges, and approves the budget. The PUD water utility is administered according to RCW 54, municipal codes, applicable state codes, and the Policies and Procedures adopted by the Board of Commissioners.

The General Manager oversees the day-to-day operations of the PUD and is supported by an Assistant General Manager and Administrative Assistant. The Director of Finance oversees the financial and administrative activities of the PUD, including potable water system functions including water meter reading and billing services and maintaining water sales records for individual customers and utility total sales. The Director of Utility Operations oversees the activities related to the PUD water and electrical utility systems, including the potable GV-NG system. The PUD has a Chief Water Operator oversees the day-to-day management and operations of the GV-NG system. The Chief Water Operator and supporting staff, including additional certified water operators, operate and maintain the potable system, including performing daily operation and inspection and water quality monitoring (as required by DOH). The Board of Commissioners, General Manager, Director of Finance, and Chief Water Operator carry out the policies set by the Board of Commissioners. The current management structure is shown in the following diagram:



The PUD attorney provides general advice and counsel to the Board of Commissioners and manager regarding the legal requirements of their operations, contact, permits, personnel, and legal challenges to PUD activities. Various consulting firms (including operators, engineering firms, etc.) selected on a project-by-project basis provide general assistance, surveying, analysis, design, plan review, project management and construction management services to the PUD.

6.2 Operator Certifications

The PUD Grandview-Northgate system is required to have a Certified Operator including a Distribution Manager 1 and Cross Connection Control Specialist. The certification and training requirements are included in Chapter 246-292 of the Washington Administrative Code. The certifications held by current PUD staff are summarized in Table 6-1.

Table 6-1 Grandview-Northgate Operator Certifications

Certification (Water Related)	Number of PUD GV-NG Staff
Water Distribution Manager 1	5
Water Treatment Plant Operator 1	5
Cross Connection Control Specialist	3

6.3 System Operation and Control

6.3.1 Reference Documents

Detailed information regarding the operation and maintenance of water production equipment is contained in the O&M Manuals at the water production facility (incorporated herein by reference). Presented below is an overview of how the water system operates.

6.3.2 Identification of Major System Components

Figure 1-9 Facility Schematic identifies all major GV-NG system components. During normal operation the well fills the storage tank upon demand (water tank level). The storage tank is filled from the top and emptied from the bottom. The water is chlorinated between the well and storage tank. The booster pumps are supplied by the storage tank and raise the pressure of the distribution system to meet demand. There is only one pressure zone. There are eight (8) bladder pressure tanks that supply the system between pressures of 60 psi (lead pump OFF) and 40 psi (lead pump ON).

6.3.3 Routine System Operation

System Operations and Control for the water system is managed by the Chief Water Operator. The Chief Water Operator is responsible for operation and preventative maintenance activities. Table 6-2 outlines scheduled O&M activities. Routine operations also include utility locates, service installations, investigation of customer complaints, shut-offs, and service changes on an as-required basis.

Table 6-2 Routine System Operations

Major System Component	*Daily*	*Weekly*	*Monthly*	*Annual*
Wells		Record meter reading, Observe operation	Record meter reading, Observe meter during low demand period (leak detection)	
Chlorination equipment		Observe to verify operation, Replenish chlorine supply		
Booster Pumps	SCADA System records meter reading	Record meter reading, Visual inspection, pump operation check	Record meter reading, Observe meter during low demand period (leak detection)	Preventative Maintenance, Adjust pressure switches as necessary
Generator				Preventative Maintenance
Reservoirs	Measure residual chlorine after reservoir	External visual inspection		Topside inspection
Distribution mains (all)	Measure residual chlorine		Collect water quality samples as required	Flush
Service Meters			Meter reading, review usage for anomalies (leaks)	
Misc./General	Observe for leaks or unusual noises			

Safety information and training is provided to staff personnel as appropriate. The information includes as appropriate Safety Responsibility, Confined Space Entry, Lock-out/Tag-out, Accident Prevention and Investigation, Hearing Safety and Back Injury Prevention. Material Safety Data Sheets are to be kept at the office and posted where the chemical is used. Attendance to safety training classes and conferences is encouraged.

6.3.4 Preventative Maintenance Program

Preventative maintenance details are in the individual equipment O&M Manuals. An outline of the Preventative Maintenance Program is presented in Table 6-3.

Table 6-3 Preventative Maintenance Program

Major System Component	*Activity*	*Frequency*
Fire Hydrants (all)	Hydrant exercise and flushing (also blow-off flushing)	Annual
Booster Stations	Inspection, O&M Manual preventive maintenance checklist (i.e. greasing, check voltage, amp draw)	Monthly/Annual
Generator	Inspection, O&M Manual preventive maintenance checklist (i.e. greasing, check voltage, amp draw)	Periodic
Reservoirs	External inspection of screens, Interior inspection and cleaning (as needed) Foundation inspection (as needed)	Annual 3-5 Years 7-10 years
Distribution mains (all)	Exercise all valves (concurrent with hydrant flushing) Blow-off flushing of problem dead end lines	Annual As required
Meters/services (all)	Rebuild/calibrate/replace aging services	As required

6.4 Summary of Operations and Maintenance Deficiencies

There are currently no operation or maintenance deficiencies.

6.5 Comprehensive Water Quality Monitoring (Regulatory Compliance) Plan

The Water Quality Monitoring Schedule, Coliform Monitoring Plan, and Disinfection Byproduct Monitoring Plan are in Appendix B – Water Quality Data & Monitoring Plans. The Schedule and Plans present:

- Monitoring locations for each analytical parameter
- Monitoring schedules
- Monitoring waivers
- Projections of future monitoring requirements.

The PUD uses certified laboratories for all analytical testing. There are no special monitoring requirements imposed on the GV-NG system based on public health concerns.

6.6 Emergency Response Program

6.6.1 Water System Personnel Emergency Call-up List

The order of the emergency call-up list is as follows:

Name	Position	Phone Number
Devin B. Crabtree	Chief Water Operator	360-384-4288
Duane Holden	Director of Utility Operations	360-384-4288

The PUD phone system will direct the caller to the emergency personnel on duty.

Expertise: Both have comprehensive knowledge of the water production facilities and distribution system and are capable of making decisions in all types of emergencies.

6.6.2 Notification Procedures

Emergency services offices have been established at all levels of government (PUD, State, and Federal). Under emergency operations, the PUD functions as its own core management, setting priorities and implementing procedures subject to the requirements generated by the emergency. Liaison personnel from the PUD will be assigned to the County Emergency Operations Centers, on an as needed basis, to advise and provide information to governmental officials on the availability of PUD water for emergency operations and the proper utilization of the water by the public.

Listed below are the County, State, and Federal emergency offices that may be contacted for assistance or information:

Whatcom County Emergency Services
Doug Allan, Director
Address: 311 Grand Ave
Bellingham, WA 98226
Business Hours Phone: (360) 738-6681

Whatcom County Health Department
509 Girard Street
Bellingham, WA 98226
Business Hours Phone: (360) 778-6000
After Hours Emergency: (360) 715-2588

Department of Ecology, Northwest Regional Office
3190 – 160th Ave. SE
Bellevue, WA 98008
Business Hours Phone: (425) 649-7000

Department of Ecology, Bellingham Field Office
913 Squalicum Way #101
Bellingham, WA 98225
Business Hours Phone: (360) 255-4400

State of Washington, Department of Health / N.W. Drinking Water Operations
Laura McLaughlin, P.E.
20425 72nd Avenue South, Suite 310
Kent, WA 98032-2358
Business Hours Phone (Direct): (253) 395-6761
Office of Drinking Water Main Office Phone: (253) 395-6750
Emergency After-Hours Hotline Phone: 1-877-481-4901

Federal Emergency Management Agency
Federal Disaster Assistance Administration, Region X
130 228th Street SW
Bothell, WA 98021-9796
Phone: (425) 487-4604 Fax: (425) 487-4622

6.6.3 Public Information Emergency Plan

Agency Spokesperson

The information officer of the PUD is the General Manager. All contact with the press or other media shall be through him. It is important that the PUD broadcasts reliable and official information as early as possible while operating under this plan. County Emergency Service Offices should be kept abreast of emergency information being dispensed under this plan.

News Media

News Media

The following is a list of news media including newspapers, television stations, and radio stations.

Daily Newspapers	Phone	Fax
Bellingham Herald	(360) 676-2620	(360) 756-2826
Ferndale Record	(360) 384-1411	(360) 384-1417
Television		
KCPQ - Seattle	(206) 625-1313	(206) 383-9551
KING - Seattle	(206) 448-5555	(206) 448-4525
KIRO - Seattle	(206) 728-8250	(206) 441-4840
KOMO - Seattle	(206) 443-4000	(206) 443-6176
Radio Stations		
KZAZ - Bellingham	(360) 738-9170	(360) 738-4605
KISM - Bellingham	(360) 734-9790	(360) 733-4551
KGMI - Bellingham	(360) 734-9790	(360) 733-4551

Suggested Citizen Emergency Instructions

The following instructions are general in nature and intended to be used by PUD personnel attending telephones and taking calls relative to water inquiries during the following emergency situations:

Earthquakes

1. Draw a moderate quantity of water (a few gallons for each person) in case service should be disrupted. Do not draw a large quantity as this could interfere with water potentially used for firefighting or other life-threatening situations.
2. If water is off, emergency water may be obtained from hot water heaters, toilet tanks, melted ice cubes, water packed in canned vegetables.
3. If water pipes are damaged, shut off water supply at the house valve or the meter valve.
4. Do not drink anything from open containers near shattered glass, as glass contamination may exist. Only if their use is essential should liquids be strained through many layers of a clean handkerchief or cloth.

Water Quality Alert

1. Boil all drinking water. Do not drink any water that is discolored or smells. The PUD is in the process of testing tap water to see if it is safe to drink.

2. Water may be disinfected with non-scented household chlorine bleach (6-8% sodium hypochlorite solution). Do not use bleach solutions in which there are active ingredients other than hypochlorite.

   Use the following proportions.

	Clear Water	Cloudy Water
One Quart	1 drop	3 drops
One Gallon	4 drops	10 drops
Five Gallons	1/4 teaspoon	1/2 teaspoon

   Mix well and let the disinfected water sit for at least 30 minutes before using.

6.6.4 Vulnerability Analysis

In this section, each of the PUD GV-NG major facilities will be analyzed to determine which are the most critical to operations and what disasters they are vulnerable to. This vulnerability analysis examines each major system facility, its probability of either partial or total failure due to a natural or man-made disaster, and the impact of this failure on the operations of the GV-NG system. Prior to performing this analysis, it is first necessary to examine the following for each component:

- The most common emergency conditions which could occur,
- Any alternate modes of operation,
- Identification of the degree to which that component would be affected by specific emergency conditions.

By performing a vulnerability analysis, it will be possible to identify critical facilities necessary to maintain operations. Based on this assessment, facility contingency plans can be developed to respond to specific emergency conditions. A description of the major components is presented, followed by a discussion of possible emergency conditions, alternative modes of operations, and a summary of the vulnerability analysis results.

6.6.5 Identification of Major Facilities

For the purposes of this report, a critical facility is considered to be any component that, if removed from service for any period longer than to perform normal maintenance, would impact the GV-NG system's ability to supply water to its customers.

To determine those facilities that are critical, it is necessary to examine all major facilities. The major facilities within the PUD's GV-NG system can be summarized into three component categories (See Chapter 3 System Analysis for a detailed description). These categories are:

- Water Supply Sources (including booster stations)
- Water Storage Facilities
- Water Transmission Pipelines

6.6.6 Determination of Emergency Conditions

An emergency condition can be described as any state of system operation that is in response to a disruption of normal operations. Either a natural or man-made disaster or any other action that disrupts normal operation of the water system can cause emergency conditions. By determining the potential causes of an emergency condition and their effects on GV-NG systems, it is possible to identify those components/facilities that are most critical to the operation of the system. Contingency plans can then be developed for these facilities to minimize the impact of any future emergencies.

In determining which disasters could occur in the GV-NG service area, it is important to identify the conditions and effects the disaster would have. Many times, the resulting emergency conditions will be similar or overlapping for different types of disasters. Determining the effect of a disaster will have on the system will simplify the vulnerability assessment and the development of a contingency plan because corrective action required may be similar for different situations.

In examining the location of the GV-NG service area and the surrounding areas, natural and man-made types of disasters were considered and are discussed in the following sub-sections.

6.6.6.1 Natural Disasters

- Earthquake
- Wind/Ice Storm
- Volcanic Eruption

Earthquake

The potential occurrence of an earthquake in the Puget Sound area is high because of its location along the geologically active Pacific Rim. The U.S. Geological Service has reported it is probable that seismic activity with a magnitude greater than “8” on the Richter Scale could occur in the Puget Sound area. An earthquake of this magnitude could cause damage to every major facility and pipeline in the GV-NG system. Possible effects to the water system would include:

- Structural failure of reservoirs and facility buildings
- Broken pipelines, valves and well casings
- Damage to pumping equipment

In addition, considerable damage to communication and power lines could result in prolonged outages to large areas, and mobility could be restricted due to collapsed bridges and debris in the roadways.

Wind/Ice Storm

Strong winds and ice storms do occur in the area. For the most part, GV-NG facilities are adequately protected against direct damage due to strong winds and ice. The major problems associated with severe wind and ice storms are communication and power outages. These would primarily affect the facilities that use electric power such as pumping facilities; however, the primary facility has emergency backup power generation capability.

Volcanic Eruption

A disaster resulting from a volcanic eruption is possible. The closest dormant volcano is Mount Baker, although GV-NG may also be affected by ash from other Puget Sound volcanic eruptions.

There are two major problems associated with volcanic eruptions – debris flows and volcanic ash. A debris flow from Mount Baker will not likely have a direct effect on GV-NG facilities. Figure 6.1 (from USGS) shows potential inundation zones for Mount Baker.

The impact of a volcanic ash cloud is multi-fold and will cause serious problems with machinery and electrical equipment. Volcanic ash is hard, does not dissolve in water, is extremely abrasive and mildly corrosive, and conducts electricity when wet. It can affect visibility, access, and the supply of power. The electrical conductivity of wet ash can cause short circuits and electrical component failure, including power failure. It can also disrupt telephone and radio communications through physical damage to equipment, frequent lightning, and/or scattering or absorption of radio signals by the ash particles. Volcanic ash can cause internal combustion engines, such as those which would power water system generators, to stall by clogging air filters and can damage the moving parts of vehicles and machinery. Ash also clogs air-ventilation system filters to the point that airflow stops completely, causing equipment to overheat. The weight of the ash, especially when wet, can be substantial and has the potential of causing roofs to collapse. A USGS Fact Sheet on volcanic ash is available through the USGS website (http://vulcan.wr.usgs.gov).

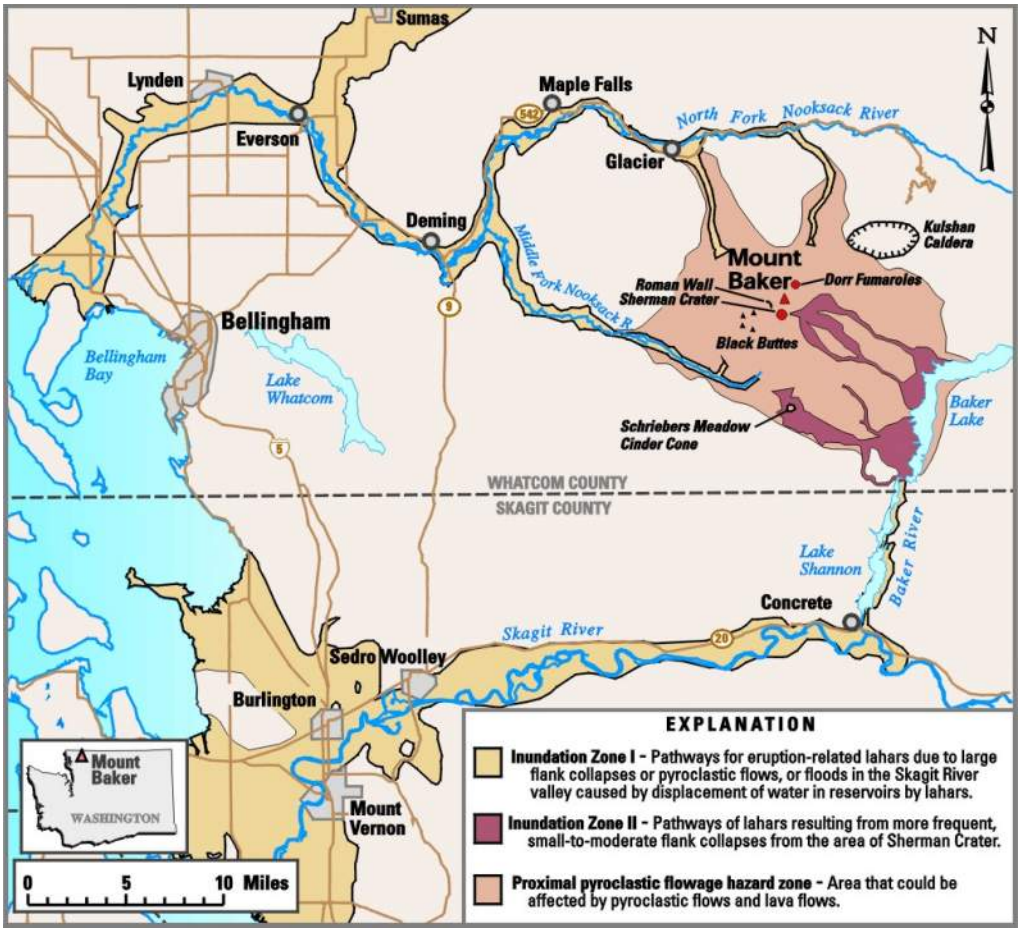


Figure 6-1 USGS Mt Baker Volcanic Eruption Inundation Zone Map

6.6.6.2 Man-made Disasters

- Chemical Spills/Leaks
- Fire/Explosions
- Vandalism/Sabotage
- Distribution Main Damage

Other types of disasters are considered to be too improbable or too minor to create an emergency situation. A description of each of the possible disasters and their effects on the water system are presented below.

Chemical Spills/Leaks

Contamination of GV-NG water supply sources could occur in one of two ways. The first is an acute spill source. The second is through groundwater movement of contaminated water into the water system well supply aquifer. Possible sources of this contaminated water could be seepage from underground tanks and pipelines, and waste storage areas.

The effects of the contamination of a well or the aquifer would severely impact PUD's ability to supply water to the service area of the well. Depending on the type and extent of the contamination, the PUD may need to either activate alternate sources of water supply and/or institute water conservation measures.

The PUD GV-NG source is vulnerable to chemical spills, but the risk is considered low because it is approximately 500-ft from the nearest major traveled road (Portal Way).

Fires/Explosions

Industrial explosions and/or fires can create excessive water demands for firefighting. These problems are not necessarily localized to industrial areas. Large fuel storage tanks and fuel pipelines are potential sources of explosions and fires. Natural gas pipelines, which are normally located in the same right-of-way's as water and sewer mains, are also potential sources of explosions and fires. All water system facilities are potentially susceptible to these types of accidents. The effects could last a few hours to several weeks. The impacts of an explosion or fire include the destruction and loss of adjacent water production facilities and structural damage to or loss of above-grade facilities such as pump buildings or storage tanks.

Vandalism/Sabotage

Incidents of vandalism and sabotage are impossible to predict. Although all facilities could be potential targets, above-grade structures would be the most likely targets. Incidents of vandalism/sabotage are usually limited to one specific facility, though the operation of facilities that depend on the targeted facility would also be affected.

Distribution Mainline Damage

In addition to normal wear and tear on distribution mainlines, it is not uncommon for water pipelines of all sizes to be broken or damaged during routine construction activities by both the water utility and other contractors. Such damage can cause a variety of problems such as loss of pressure, back siphonage, direct and indirect contamination.

6.6.7 Common Emergency Conditions

Examining the impacts on facilities caused by the previously identified disasters helped in identifying the most critical of these facilities. Damage to facilities by various types of disasters can be categorized as a series of common effects or impacts. While an earthquake and a windstorm are two completely different

types of disasters, the impacts are similar. Both of these disasters could cause power failures and transportation difficulties – the collapse of power transmission towers and bridges/overpasses due to an earthquake, or trees downed by a wind storm breaking power lines and blocking roads.

Components affected by the various types of disasters previously discussed are summarized in Table 6-4.

Table 6-4 Water Facilities Affected by Various Disasters

Type of Disaster	Supply Source	Reservoirs	Interties	Distribution Lines
Natural Disasters				
Earthquake	X	X	X	X
Windstorms	X			
Volcanic Eruption	X	X		
Ice Storms	X	X		
Manmade Disasters				
Chemical Spills/Leaks	X			
Fires/ Explosions	X	X	X	X
Vandalism/ Sabotage	X	X	X	X
Main Break				X

Based on Table 6-4, the types of common emergency conditions that could be encountered as a result of a disaster are listed in Table 6-5.

Table 6-5 Emergency Conditions Caused by Various Disasters

Type of Disaster	Loss of Power	Communication Failure	Access Difficulties	Personnel Problems	Damage to Facilities	Equipment Failure	Contaminated Supply	Abnormal Hydraulic Condition	Unauthorized Entry
Natural Disasters									
Earthquake	X	X	X	X	X	X	X	X	
Flooding			X	X	X	X			
Windstorms	X	X	X	X	X				
Volcanic Eruption	X	X	X	X	X	X			
Ice Storms	X	X	X	X	X				
Manmade Disasters									
Chemical Spills/Leaks			X		X		X		
Fires/ Explosions	X	X			X	X			
Vandalism/ Sabotage	X	X			X	X	X	X	X
Main Break					X			X	

The emergency conditions listed here are considered to be the most probable conditions that may be encountered during an emergency situation. A description of each of these conditions is listed below:

- **Loss of power:** Loss of power represents a loss of electrical power either locally to one facility or regionally to several facilities that causes a loss of operation for the affected facilities.
- **Communication failure:** A communication failure represents a loss of the telemetry link between a facility and the Control Center that causes a loss of system monitoring and alarm condition notification. Communication failure can also be the failure of system radio, internet, email, telephone, cell phones, and/or FAX machine that deprives PUD staff of the ability to communicate with each other, the PUD Office, or with outside entities.
- **Access difficulties:** Access difficulties represent problems associated with trying to travel to a specific facility, thereby reducing the PUD's ability to provide necessary maintenance for emergency operation.
- **Personnel problems:** Personnel problems, either due to the loss of human resources or expertise, represent a reduction in staff available for maintenance and emergency response.
- **Damage to structure:** Damage to structure represents a loss of integrity of a facility, which may cause or contribute to an operational failure of that facility.
- **Equipment failure:** Equipment failure represents failure or destruction of the facility equipment that results in the functional loss of the facility.
- **Contamination:** Contamination represents the contamination of the water supply causing a loss of capability to provide potable water.
- **Abnormal hydraulic condition:** An abnormal hydraulic condition represents any operational condition in the system not observed during normal operations, such as high discharge pressure for a water pump, low service water pressure, etc.
- **Unauthorized entry:** An unauthorized entry, as monitored by the telemetry system, represents possible illegal access into an Association facility.

6.6.8 Alternative Modes of Operation

This section presents a summary of the alternate modes of operation for each of the major components in PUD's GV-NG potable water system.

Water Supply Sources (Booster Stations/Interties/Emergency Sources)

The PUD operates GV-NG service area water production facilities including a well and a booster station. There are no emergency interties. The short-term alternate mode (e.g. 24 hours) in an emergency is to operate from standby storage in the reservoir utilizing the well, booster pump, and backup power. Longer-term solutions may include trucking water to the reservoir, setting up potable water distribution centers, or establishing an above-ground temporary emergency intertie with a neighboring water system/facility.

<u>Before activating any potential temporary emergency intertie the PUD will:</u>

- Consult with the DOH regional engineer about activation requirements including testing, flushing, and treatment if required.
- Exercise all valves and operational controls to ensure they function properly.
- Notify customers of water quality issues or changes in service that may occur while using the emergency source.

- Flush the source to waste before collecting initial coliform.
- Collect a chlorine residual and coliform sample before bringing the source on line.
- Once the source is online, consult with DOH regarding additional sample requirements.
- If the emergency source operates longer than initially discussed with the DOH regional engineer, additional samples for complete inorganic and organic chemicals may be required as prescribed by DOH.

Water Storage Facilities

Loss of any storage facility may reduce the water system's capability to meet peak demand periods, since well pump capacities are not sized to meet peak demands. Loss of any reservoir will require implementation of emergency water conservation during periods of high-water demand, which includes notifying all affected customers to reduce water consumption until the reservoir can be repaired or temporary storage can be established.

Water Distribution Pipelines

For areas where the water distribution system is looped, the broken water main will be isolated such that the minimum number of customers are without service. Portions of the water distribution system are not looped, so the PUD may not be able to isolate a broken water main to minimize the number of customers affected. Depending on the estimated repair schedule a temporary connection to the affected area may be needed.

6.6.9 Vulnerability Assessment of Critical Facilities

A vulnerability analysis is the determination of how susceptible GV-NG systems are to the emergency conditions and their effects on components listed above. A summary of the findings is presented below.

The most likely emergency to occur is a main break. The severity will vary depending on where the break occurs and how difficult it is to repair. In areas of the system that are not looped it is critical that an emergency bypass be established if repairs cannot be carried out immediately.

The second most likely emergency to occur would be power outages at varying levels of severity due to various causes. While this is a high probability occurrence, it does not typically adversely affect GV-NG operations since the PUD has a backup generator.

Another likely emergency to occur would be a chemical spill near the general vicinity of the GV-NG well. However, due to the isolated nature of the GV-NG well field it is unlikely that a chemical spill near the well field will occur. Any chemical spill would require immediate attention and remediation as outlined in the Wellhead Protection Plan.

Though less likely to occur, PUD operations are vulnerable to a severe earthquake or a volcanic eruption. Both will have system-wide impacts that are difficult to predict. Preparations should include making sure there is a stockpile of fittings and pipe necessary to repair all types of distribution lines in the GV-NG system, and stockpile of spare air filters for generators, buildings, etc.

6.7 Cross-Connection Control Program

Where known or potential for contamination of the water supply exists, customer water services shall be equipped with appropriate cross connection control devices in accordance with WAC 246-290-490. The PUD will determine the need, size, kind, and location, maintenance and testing requirements of the device as specified therein. Cross Connection Control devices shall be installed and maintained in accordance with the

PUD's Cross Connection Control Program. Cross Connection Control devices will be the property of the land owner/customer, who will be responsible for the maintenance and testing of the device.

Connections between the PUD's potable and non-potable water systems are not allowed as they would constitute a cross connection.

The PUD's GV-NG Cross-Connection Control (CCC) program is in accordance with WAC 246-290-490 and is included in Appendix H. The GV-NG CCC program is created from the Example Cross-Connection Control Program Legal Instrument for a Community System of the WA DOH Guidance Document for Cross-Connection Control for Small Water Systems (March 2004). The PUD Resolution No. 800 authorizing the Cross-Connection Control program also authorizes the system to terminate water service to consumers who do not comply with the resolution. However, the primary method for protection of the distribution system will be installation of a backflow preventer by the customer, at the customer's expense.

The PUD keeps a list of backflow assemblies in the GV-NG system and requires annual testing by a qualified backflow assembly tester of all backflow prevention equipment. Privately owned and maintained backflow prevention equipment are required to send their results to the PUD, where they will be reviewed and kept on file.

6.8 Sanitary Survey Findings

The sanitary survey is a periodic inspection of water system facilities, operations and records to identify conditions that may present a sanitary or public health risk. Washington state drinking water rules require all Group A public drinking water system to have a routine sanitary survey one every three to five years. The last survey was May 9, 2017 and the next survey will be in 2022.

During the most recent GV-NG sanitary survey on May 9, 2017 (see a copy in Chapter 10.1) there were no Significant Deficiencies, Significant Findings, or Observations reported in the 2017 Survey Report. The sanitary survey did recommend the PUD "maintain a photographic record of the reservoir hatch, gasket, lock and vent screen."

6.9 Customer Complaint Response Program

The PUD GV-NG service area Customer Inquiry/Complaint Response Program focuses on service to customers. The procedure starts with a customer contacting the PUD, usually by phone or email, and staff maintains a record of complaints. The complaints are passed on to either the General Manager, Director of Utility Operations, or the Chief Water Operator for response and resolution as appropriate. Once the item is resolved, the records are updated.

The PUD rarely gets complaints regarding the water system. If there is a complaint and staff cannot resolve the issue over the phone, such as by explaining that the issue was due to flushing, a recent main break, or a localized issue within the commercial connection, water operators will be dispatched to investigate and document the situation. If the issue is related to the PUD's distribution system it will be resolved by following accepted water system practices and operational procedures. PUD personnel may contact the customer as necessary to obtain more information or otherwise ensure the problem was resolved or that the problem is a localized issue on the customer side of the water service and not a distribution issue. PUD personnel are not allowed to correct or fix any problems on the customer's side of the water service.

For the period 2010–2019, the PUD has not received any customer complaints other than periodic reports of a possible leak.

6.10 Record Keeping and Reporting

The PUD maintains the following types of records for the GV-NG water system at the PUD Office:

- water quality test results
- water quality in distribution systems
- meter readings (customer and master meters)
- repair records
- equipment maintenance records
- customer service requests
- customer complaints and inquiries

The PUD follows a records retention schedule based on the type of records, the required statutory retention period, and the PUD retention period. The Chief Water Operator is responsible for scheduling and conforming to all DOH reporting requirements.

7. Distribution Facilities Design and Construction Standards

7.1 Project Review Procedures

For PUD initiated projects, the consultant engineer selected for the particular project prepares the project report(s) and construction documents and conducts an internal quality assurance review. A senior project engineer with substantial practical experience in water systems performs an independent review of the work performed by the project engineer. The PUD Management Team (General Manager, Director of Utility Operations, and Chief Water Operator) reviews distribution system plans to confirm that existing system information is correctly shown, and proposed connections are feasible with respect to valve arrangements and other considerations.

For projects covered by Developer Extension Agreements, the developer's engineer prepares the project reports, plans, construction documents, and the PUD Management Team reviews them. If the project includes more than water distribution mains, the project reports, plans and construction documents are sent by the developer's engineer to the State Department of Health for review and approval.

The PUD has requested approval by DOH of its design and construction standards in order to be eligible for project review exception for distribution main projects in the Grandview-Northgate (GV-NG) potable water system. This request is noted on the PUD GV-NG Water System Plan review application.

7.2 Policies and Requirements for Outside Parties

The PUD design and construction standards apply to outside parties and include requirements for utility easements and pipe looping. Developer projects are evaluated to assure conformance with the PUD Water System Plan and to determine specific requirements that may be imposed.

7.3 Design and Construction Standards

The PUD GV-NG design and construction standards are included in a stand-alone document titled *Water Design Standards and Construction Standards and Details.* The PUD requests concurrent DOH approval of these design and construction standards, included herein as Appendix C. Also incorporated by reference (see Section 10.5) is the PUD Standard Specifications & Standard Drawings document included in the 2004 WSP.

7.4 Construction Certification and Follow-up Procedures

The PUD requires a PUD approved inspector for both PUD-initiated and developer extension construction projects. The inspector checks all materials at the site against approved submittals, and monitors job progress, conditions and concerns. The inspector witnesses all pressure tests, water quality sampling, and startup. The PUD completes, or directly supervises, all new project connections to the existing system. Tests are conducted in accordance with PUD standards and Washington State Department of Transportation (WSDOT) Standard Specifications.

Upon completion of the project, the PUD's project specific consultant engineer signs and submits the Certificate of Completion form as required to the Department of Health for PUD initiated projects, and the Developer's engineer does the same for developer extension projects.

8. Capital Improvement Program

This chapter describes the methodology used in developing the PUD Grandview-Northgate (GV-NG) potable water system Capital Improvement Program (CIP); and presents the estimated costs and schedules for infrastructure projects planned for implementation as required through build-out. A series of capital projects have been identified to address the requirements of the PUD, Washington State DOH, the Whatcom County Coordinated Water System Plan, and other jurisdictions and agencies. The PUD is planning to focus on optimizing the operations of its existing infrastructure in the GV-NG system, installing new infrastructure as required to improve existing operations, consolidation of nearby systems, along with targeted renewal and replacement of water mains that may cause operational limitations. The PUD will also work to maintain its low rates of distribution system losses.

There have been no major capital projects in the GV-NG potable system in recent years. The following summarizes equipment replacements that have occurred within the last 10 years:

- Various minor equipment replacements including:
    - Replacement of bladder pressure tank #6 (2013).
    - Replacement of 2-inch well meter (2018).
    - Replacement of chlorine metering pump (2016, 2019).
- Replacement of well pump (2011).
- Replacement of booster pump #3 (2017).
- Replacement of booster pump #1 (2018).

8.1 Prioritizing Potential Improvements

In order to develop a prioritized list of capital projects, all potential projects were evaluated using the relevant criteria. The projects are prioritized based on the following criteria which are listed in order of decreasing importance:

- DOH Requirements
- System-wide Benefits
- Nearby system Benefits (consolidation)
- Hydraulic Capacity
- Looping

Identified projects are scheduled based upon priority and anticipated need. Annual budgetary limitations are not considered in this analysis. For more on the financial program, refer to Chapter 9. The GV-NG potable distribution system is on private easements, and both private and public roadways. Where facilities are in public right-of-way, the PUD will review upcoming County street improvements, if any, to schedule the water portion of the projects jointly as appropriate to minimize the cost to the ratepayers.

When necessary, the PUD endeavors to utilize all sources of outside funding which may be available in order to finance its capital improvement projects. The PUD will review developer extension requests on a case-by-case basis while complying with the "duty to serve" requirements. Depending on developer's interests, this may lead to an extension of the water system as well as a change in the GV-NG service area.

Any proposed changes in the GV-NG service area will follow required County CWSP and State requirements.

PUD policies for developer extensions dictate that the developer shall construct those facilities necessary to serve the proposed development. Normally the facilities required for a developer's extension are limited to the distribution extension but may also include distribution main upgrades and increased pump and storage capacity. Where proposed projects benefit those other than the developer, the PUD may provide for a late comer's agreement which allows the developer to recoup a portion of the construction cost when additional connections are made. The PUD may choose to participate in the cost or take responsibility to build the project.

8.1.1 Identification of Potential System Improvements

The required system improvements for the scenarios previously described are identified and discussed in Chapter 3 – System Analysis and summarized in Section 3.5.

8.2 Improvement Schedule and Estimated Project Costs

All identified capital improvements through year 2040 are summarized in the Capital Improvement Projects - Table 8-1. The year designation is an indication of the project's priority relative to other improvements, and is based on forecasted growth. If growth varies significantly from the projected the projects could be needed earlier or later than they are shown in this plan.

Table 8-1 includes potential extensions into the proposed service area for supply or consolidation of two Group A systems (Double L Mobile Home Park and Fairfield Mobile Home Park) by GV-NG potable water system. Main pipe sizes shown for these extension projects should be further evaluated before design and construction based on the project details, planned route for extension, and considering other potential future growth and development plans in the area of the extensions at that time. The PUD would apply for consolidation funding including grants and loans and look to the systems to be consolidated to pay for these projects.

Costs shown are based on the best available construction cost information today, without completing preliminary engineering on any of the projects. Planning level project costs were estimated in 2020 dollars for each of the planned improvements in Table 8-1 including estimated construction cost and indirect costs. The construction cost estimates include all construction related costs, sales tax and a contingency of 10 percent. The indirect costs are estimated as a percent of the construction cost and include engineering (preliminary design, final design, and construction management services), surveying, permitting, legal, and administrative services (15%). Piping project construction cost estimates are based on the following unit prices; $100/LF for 4-inch PVC, $125/LF for 6-inch PVC and $150/LF for 6-inch Ductile Iron. These unit prices are representative of entire project costs including all work typical for water main installations and assume installation in a mix of paved and non-paved surface restoration.

Table 8-1 Capital Improvement Plan, 20-yr

Event Trigger	Anticipated Year	Description	Financed By	Estimated Cost (2020$) (1)
Inadequate existing condition	2023	Upgrade existing 3~ booster pumps with VFDs.	Reserves	$41,000
System consolidation	2023	Extend Portal Way main north to Double L Mobile Home Park. Install 1,750 LF 6-inch Ductile Iron pipe.	Consolidation Grant/Loan, Cost Sharing	$360,000
Forecasted capacity limit	2036	Upgrade storage capacity. Install 105,000-gal concrete tank.	DWSRF	$220,000
System consolidation	Unknown	Replace 850 LF 2-inch PVC with min. 4-inch PVC, Salashan Loop north of Grandview Rd. Install 1,800 LF new min. 4-inch PVC main extension.	Consolidation Grant/Loan, Cost Sharing, Developer	$364,000

Notes: 1. Costs shown are 2020$ and do not include an annual escalation to the anticipated year of construction.

9. Financing and Implementation

The PUD manages the potable water system funds and resources in a professional manner in compliance with applicable laws, regulations, and PUD financial policies. Responsible fiscal stewardship requires on-going monitoring of revenues and expenses in order to make prudent business decisions and to report to the Board of Commissioners regarding the status of water system operations.

The PUD strives to maintain the potable water system as a self-supporting enterprise. Potable water system revenues come primarily from customer charges and are dependent upon established rates, fees and charges. The PUD's budgeting process includes a balanced and controlled annual potable water system budget. Preparation of expense and revenue projections are prepared and reviewed before approval of any rate increases.

Funding for the Capital Improvement Program (CIP) identified in the budget are maintained at a level sufficient to assure system integrity. To the extent that the annual level of capital investment can be managed by scheduling and scoping of projects, the funding should be provided at a fairly uniform level in order to avoid significant fluctuations and to reduce the impact on the operating budget and related rate increases.

Water rates, fees, and charges should be set at a level sufficient to cover expenses and maintain appropriate reserves. Water rates are set as low as possible and still provide for the on-going operations, maintenance, repair, replacement, capital improvements, and general business of the potable water system.

The PUD maintains overall potable water system cash balances to serve as a contingency reserve fund as established by Board Policy. In setting the contingency reserve fund the Board will consider the working capital needs and emergency contingencies and cash flow fluctuations.

9.1 Past and Present Financial Status

Summaries of PUD GV-NG system operating income and expenses for the past 5 years are included in Appendix D – Financial Data. This data was used to develop a projected operating budget for the years 2020-2030. The projected budget (Appendix D) indicates that the water system is and will remain in good financial condition.

9.2 Available Revenue Sources

Anticipated revenue sources for making system improvements include governmental grants/loans, connection fees, water rates, and Developer Extension Agreements.

The Drinking Water State Revolving Fund (DWSRF) is the most likely source of financing for major water system improvements. The DWSRF and other state funding sources and grants give priority to helping water systems come into compliance with state and federal drinking water regulations. State funding also encourages consolidation of water systems. The Drinking Water State Revolving Fund is an excellent source of low interest loans but the application process is very competitive and may limit the scope of work to health-related improvements such as corrosion control treatment, pipe replacement, and storage necessary to address substandard conditions.

A DWSRF loan is the most likely source of funding for any future consolidation of the nearby Double L and Fairfield Mobile Home Parks with the GV-NG potable water system. Other major water system improvements

that are not necessarily required to comply with drinking water regulations or consolidation will most likely come from capital reserves and new connection fees. The PUD does not expect to qualify for grants related to general capital improvements.

9.3 Water Rates

The PUD currently charges GV-NG potable customers for water service based on the rate structure shown in Table 9-1 (effective in 2019). Water rates are applied to service connections based on meter size. The meter size-rated maximum flows were used to calculate meter equivalents (ME) and the ME factors are used to calculate connection fees and monthly base rate fees for each connection. Resolution No. 569 (April 29, 2008) adopted by the PUD Commission details the system connection fee policy and methods. All service connections are required to be metered.

Table 9-1 Water Rate Structure (effective 2019)

Meter Size (1)	Meter Equivalents	Connection Fee (2)	Monthly Base Rate (3)	Use Charge ($/CCF) (4)
0.75	1.00	$4,404	$60.00	$10.81
1.00	1.67	$7,340	$100.20	$10.81
--	2.30	--	$138.00	$10.81
--	2.60	--	$156.00	$10.81
1.50	3.33	$14,680	--	$10.81
2.00	5.33	$23,488	$319.80	$10.81
3.00	10.67	$46,976	--	$10.81
4.00	16.67	$73,399	--	$10.81

Notes: 1. The largest meter currently installed in the GV-NG potable system is 2-inch. There are no larger connections anticipated.
2. Connection fee includes Base fee and Peak fee. Does not include the connection fee to the fire system.
3. Does not include a monthly fixed fire charge of $156.00.
4. CCF = 100 cubic feet.

The Board of Commissioners periodically review planned projects included in PUD GV-NG Capital Improvement Plan. When substantial changes to the capital improvement plan are anticipated, the Commissioners review the impacts on rates and charges and make adjustments accordingly.

The current rate structure charges for all water use but does not encourage conservation. A small number of large users represent about 62% (average over last six years) of the water demand. The current rates do not encourage conservation practices during the summer months when the system experiences an increase in water demand. It is important to note that the average demand increases by about 1.4 to 1.5 times during the warmest months, which is less than compared to typical residential system demands which almost doubles during the same summer months primarily to outdoor summer activities including lawn and garden watering.

It is recommended that the PUD consider a rate structure to encourage conservation by implementing the standard monthly use charge with a maximum use, and a higher rate for use above the established maximum, often called an inclining rate structure.

10. Miscellaneous Documents

10.1 Supportive Documents

Water Facility Inventory Form

Water Use Efficiency 2019 Annual Performance Report

Operating Permit

Operator Certifications

DOH Sanitary Survey Follow-up Letter

Declaration of Water Utility Service Area and Service Area Policy

State Environmental Policy Act (SEPA) and DNS Determination

Adoption of Water System Plan

10.2 Agreements

BBWSD Supply Agreement with BP Cherry Point Refinery

PUD Inter Local Agreement with City of Ferndale

10.3 Comments on Water System Plan

Washington State Department of Health (comments and responses letters)

Washington State Department of Ecology (comments and responses letters)

Whatcom County Planning and Development (comments and Local Government Consistency Review)

Whatcom County Health Department

Whatcom County Engineering

Consumer Meeting Documentation

WUE Goal Setting Forum Documentation

Adjacent Purveyors Notification Letter

Other

10.4 Water Rights

Groundwater Water Right Certificates and Well Logs

Water Right Self-Assessment

10.5 Documents Incorporated by Reference

Standard Specifications & Standard Plans (2004)

10.1 SUPPORTIVE DOCUMENTS

Water Facility Inventory Form

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 3
Updated: 02/14/2020

Printed: 5/27/2020
WFI Printed For: On-Demand
Submission Reason: Pop/Connect Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00638 N	GRANDVIEW-NORTHGATE INDUSTRIAL PARK	WHATCOM	A	NTNC

6. PRIMARY CONTACT NAME & MAILING ADDRESS

DEVIN B. CRABTREE [OPERATOR]
PUD # 1 OF WHATCOM COUNTY
1705 TRIGG RD
FERNDALE, WA 98248

7. OWNER NAME & MAILING ADDRESS

PUD #1 OF WHATCOM COUNTY
DEVIN B. CRABTREE
1705 TRIGG RD
FERNDALE, WA 98248

WATER SYSTEM

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 384-4288 x24	Owner Daytime Phone:	(360) 384-4288 x24
Primary Contact Mobile/Cell Phone:	(360) 739-0676	Owner Mobile/Cell Phone:	(360) 296-3260
Primary Contact Evening Phone:	(xxx)-xxx-xxxx	Owner Evening Phone:	(xxx)-xxx-xxxx
Fax: (360) 384-4849	E-mail: xxxxxxxxxxxxxxxxxxxx	Fax: (360) 384-4849	E-mail: xxxxxxxxxxxxxxxxxxxx

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- [ ] Agricultural
- [x] Commercial / Business
- [ ] Day Care
- [ ] Food Service/Food Permit
- [ ] 1,000 or more person event for 2 or more days per year
- [ ] Hospital/Clinic
- [x] 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
- [x] Special District
- [ ] State

14. STORAGE CAPACITY (gallons)

30,000

15	16 SOURCE NAME	17 INTERTIE	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22 DEPTH	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 TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	NORTHGATE IND. PK. ASSOC. AGK350		X										X			Y		X					98	116	NW NE	07	39N	02E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00638 N	GRANDVIEW-NORTHGATE INDUSTRIAL PARK	WHATCOM	A	NTNC

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		0	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	0		
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	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	44	44	
28. TOTAL SERVICE CONNECTIONS		44	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 0

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?	400	400	400	400	400	400	400	400	400	400	400	400
B. How many days per month are they present?	20	20	20	20	20	20	20	20	20	20	20	20

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

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

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: _____

WS ID	WS Name
00638	GRANDVIEW-NORTHGATE INDUSTRIAL PARK

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	5/27/2020		
Water System Id(s):	00638N		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	To	ALL
Water System Update Date	ALL	To	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	To:	ALL
Approved Connection Count	ALL	To:	ALL
Full-Time Population From:	ALL	To:	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

Water Use Efficiency 2019 Annual Performance Report

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Date Submitted: 6/23/2020

Water Use Efficiency
Annual Performance Report - 2019

WS Name: GRANDVIEW-NORTHGATE INDUSTRIAL Water System ID# : 00638 WS County: WHATCOM

Report submitted by: *Rebecca Schlotterback*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2019* To *12/31/2019*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*9,620,440* gallons
Authorized Consumption (AC) – Annual Volume	*9,445,719* gallons
Distribution System Leakage – Annual Volume TP – AC	*174,721* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*1.8 %*
3-year annual average	*2.9 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *06/22/2010* Has goal been changed since last performance report? *No*

Note: Customer goal must be re-established every 6 years through a public process

WUE Goals:

Customer Goal (Demand Side):

Reduce seasonal outdoor water use by 2 to 3 percent by December 31, 2012. Measures: Continue water consumption history on customer's monthly bill. Add conservation tips to customer bills beginning July1, 2010 and continue on quarterly basis. Add conservation tips to annual Consumer Confidence Report beginning July 1, 2010 and continue annually. Develop other educational out-reach methods or incentives to lower seasonal outdoor water use by December 31, 2012.

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

Reduce seasonal outdoor water use by 2 to 3 percent by December 31, 2012. Continue to reduce seasonal outdoor water use
Measures:
Continue water consumption history on customer's monthly bill.
Add conservation tips to customer bills beginning July 1, 2010 and continue on quarterly basis.
Add conservation tips to annual Consumer Confidence Report beginning July 1, 2010 and continue annually.
Develop other educational out-reach methods or incentives to lower seasonal outdoor water use by December 31, 2012.

Additional Information Regarding Supply and Demand Side WUE Efforts

Include any other information that describes how you and your customers use water efficiently:

Maintain 10% or less distribution leakage rate for the next six years beginning July 1, 2010.
Measure: Continue to follow System Leak Detection and Repair Protocol which includes notifying customers of high variance water consumption.

The WUE Goals are being evaluated and reestablished during the 2020 Water System Plan update.

Do not mail, fax, or email this report to DOH

Operating Permit

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

Individual System View - GRANDVIEW-NORTHGATE INDUSTRIAL PARK - Water System Id - 00638N

Compliance Actions	Operating Permits	Operators	Reports	Water Use Efficiency

General Information	Source Information	Samples	Exceedances	Water Quality Monitoring Schedule

Last Permit Color Issued: Green Last Permit Issued Date: 12/1/2020

Last Permit Issued Definition: Green: Systems in this category are considered adequate for existing uses and adding new service connections up to the number of approved service connections.

Current Color: Green Current Color is what the calculated permit color would be based on information as of 5/27/2021

Current Color Definition: Green: Systems in this category are considered adequate for existing uses and adding new service connections up to the number of approved service connections.

Override Comments:

Current Permit Conditions:

Links to external resources are provided as a public service and do not imply endorsement by the Washington State Department of Health

Department of Health, Office of Drinking Water

Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Send inquiries about DOH and its programs to the Health Consumer Assistance Office
Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 888-457-2467.
For technical issues with this website send email to DOH IT Service Desk or call 360-236-4357.

Operator Certifications

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

Individual System View - GRANDVIEW-NORTHGATE INDUSTRIAL PARK - Water System Id - 00638N

Compliance Actions	Operating Permits	Operators	Reports	Water Use Efficiency

General Information	Source Information	Samples	Exceedances	Water Quality Monitoring Schedule

Operator Name	Operator Number	Position Number	Certification Level Required	Certification Type
Fred Disch	006539	1	Water Distribution Manager 1	Regular
Ronald Hacker	011862			
Christopher Loomis	014419			
Eric Conner	014415			

Records 1 - 4 of 4

Export CSV

Links to external resources are provided as a public service and do not imply endorsement by the Washington State Department of Health

Department of Health, Office of Drinking Water

Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Send inquiries about DOH and its programs to the Health Consumer Assistance Office
Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 888-457-2467.
For technical issues with this website send email to DOH IT Service Desk or call 360-236-4357.

DOH Sanitary Survey Follow-up Letter

RECEIVED
JAN 30 2018
P.U.D. #1 OF
WHATCOM COUNTY

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

January 24, 2018

FRED DISCH
GRANDVIEW NORTHGATE INDUSTRIAL PARK
1705 TRIGG RD
FERNDALE WA 98248

Subject: Grandview Northgate Industrial Park ID 00638N
Whatcom County
2017 Survey Report

Dear Fred Disch:

Thank you for your time and attention during your recent sanitary survey. This report documents the information collected during the survey. Please note that defects in your water system facilities or operations that need your immediate attention are listed below as ***Significant Deficiencies*** or ***Significant Findings***. **None were identified during this survey, thank you**!

Read the observations and recommendations and follow up as appropriate to ensure safe and reliable drinking water and to comply with the drinking water regulations.

Significant Deficiencies – *Potential significant public health risks.*

- **None**

Significant Findings - *Defects in your facilities or operations that need immediate attention.*

- **None**

Referrals - *Deficiencies that will be addressed by program staff not the survey program.*

- **None**

Observations - *Notify you of other violations of drinking water rules.*

- None

Recommendations - *Improve your technical, managerial or financial capacity.*

- Maintain a photographic record of reservoir hatch, gasket, lock and vent screen.

By completing this sanitary survey, your water system met the requirements in WAC 246-290-416. Your next sanitary survey will be in 2022. Please note that you should not interpret satisfying the requirements of a sanitary survey as meeting other applicable local, state or federal statutes, ordinances or regulations. Regulations establishing a schedule of fees for review of planning, engineering and construction documents have been adopted (WAC 246-290-990). An invoice for $600.00 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 in the enclosed envelope or mail to: **WDOH, Revenue Section, PO Box 1099, Olympia WA 99507-1099.**

Thank you for your cooperation in the successful completion of the sanitary survey. If you have any questions or need additional information please call me at (253) 395-6778 or email to brian.boye@doh.wa.gov.

Sincerely,

Brian Boye, Office of Drinking Water
Washington State Dept. of Health

Enclosures

cc: Jolyn Leslie, P.E., DOH
Laurette Rasmussen, REHS, WCHD

Office of Drinking Water
Third Party Sanitary Survey Form (Checklist)

System Name:	**Grandview-Northgate Industrial Park**			Survey Date:	**5-9-17**
PWS ID#:	**00638**	County:	**Whatcom**	System Type:	**NTNC**
Persons Attending Inspection:	**David LaPlaunt, Certified Operator**				
Inspector's Name:	**Laurette Rasmussen**				

PART A: SUMMARY OF SIGNIFICANT DEFICIENCIES AND SIGNIFICANT FINDINGS

The following is a completed sanitary survey checklist and summary of inspection findings. This completed sanitary survey checklist is the basis for the cover letter you receive from your local health jurisdiction or from the WA Dept. of Health (DOH). The cover letter documents any significant deficiencies or significant findings that must be corrected. The cover letter may also summarize observations concerning compliance with certain rules, and offer recommendations you can use to make improvements to the operation and management of your water system. Contact your DOH regional office with any questions you have about this survey.

Bolded and highlighted checklist items represent significant deficiencies that, if left uncorrected, create a significant public health risk. Highlighted checklist items represent significant findings that, if left uncorrected, create a significant risk to the physical safety, security, or reliability of the public drinking water supply. You will be required to take some sort of corrective action for each checklist answer that is **bolded and highlighted**, or highlighted.

Significant deficiencies and significant findings identified during this sanitary survey:

none

Significant deficiencies or significant findings identified in the previous sanitary survey that remain unaddressed:

Observations and recommendations identified during this survey

keep photos of the reservoir hatch, gasket, lock, vent and screen.

PART B: GENERAL WATER SYSTEM DESCRIPTION

Provide a general description of the water system including changes, updates, connections, source(s), storage, number of pressure zones, treatment, and control system(s) and alarm(s). Make corrections and updates to the purveyor's water facilities inventory form (WFI).

The water system serves an industrial park approved for 48 connections. They are owned/operated by the PUD #1. They have a GREEN operating permit. There is a single drilled well, chlorination, 30,000 gallons storage and a single pressure system.

PART C: OPERATIONS and MANAGEMENT

1. Was the system operator, who is most knowledgeable about the system's day-to-day operations, present for the survey?		☒Yes ☐No ☐NA
2. Were water system records available for your review?		☒Yes ☐No ☐Partial
3. Has the purveyor developed and implemented either a Small Water System Management Program or a Water System Plan?		☒Yes ☐No
3a. If no, are the following planning documents complete and up to date:		
	Service Area and Facility Map	☒Yes ☐No ☐Partial
	Cross-Connection Control Program	☒Yes ☐No ☐Partial
	Source Water Protection Program	☒Yes ☐No ☐Partial
	Emergency Response Plan	☒Yes ☐No ☐Partial
	Operation and Maintenance Program	☒Yes ☐No ☐Partial
	Coliform Monitoring Plan	☒Yes ☐No ☐Partial
	Component Inventory and Assessment	☒Yes ☐No ☐Partial
	Asset Replacement and Other System Improvements	☒Yes ☐No ☐Partial
	Budget	☒Yes ☐No ☐Partial
4. Does the purveyor plan to make capital improvements in the next 1-3 years? If yes, describe below		☐Yes ☒No
5. Is there a backup operator available if the regular one is not available? If yes, provide contact info below		☒Yes ☐No
6. Were the water system's current and future water quality monitoring requirements reviewed?		☒Yes ☐No
7. Was water quality sample results and trends reviewed with the purveyor?		☒Yes ☐No
8. Does the system have emergency power?		☒Yes ☐No
9. Does the system experience frequent power outages (>2 per year)? If yes, explain below		☐Yes ☒No
10. Does the system experience frequent water outages (>2 per year)? If yes, explain below		☐Yes ☒No
11. Does there appear to be adequate reliability provided for this system? If no, explain below		☒Yes ☐No

Describe the general level of planning and management documents developed by this water system and any recommendations for additional development, including updates, system management practices and processes, water rates, etc.

This is a well operated water system with knowledgeable certified operators. Update the small water system management program as needed.

PART D: SOURCES (This page may be reproduced to add more sources)

12. Did you observe a source connected to the water system that is NOT listed on the WFI and in active use?					☐Yes ☒No
12a. If so, has the source received written DOH approval? (confirm with DOH post-survey)					☐Yes ☐**No**
13. DOH Source Number:				SO #**1**	SO #
14. Source Name from the WFI: (For example, North Well; Well #2; ABC334.)				Northgate Park	
15. Dept of Ecology Well Tag Number: (Use Well tag ID#, None or Not readable)				AGK 350	
16. Source Use:	P - Permanent	S - Seasonal	E - Emergency	p	

17. **If this is an emergency source, should it be disconnected?**	☐**Yes** ☐No ☒NA	☐**Yes** ☐No ☐NA
18. *Is the source a potential GWI source?*	☐*Yes* ☒*No*	☐*Yes* ☐*No*
WELL (if there is no well, skip to question 34)		
19. Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?	☒Yes ☐**No**	☐Yes ☐**No**
20. Is the wellhead located in a pit or vault?	☐Yes ☒No	☐Yes ☐No
21. Is the wellhead at risk of submergence?	☐**Yes** ☒No	☐**Yes** ☐No
22. Is the well cap sealed, watertight, and free of unprotected openings?	☒Yes ☐**No**	☐Yes ☐**No**
23. Is the well casing free of any unprotected openings?	☒Yes ☐**No**	☐Yes ☐**No**
24. Is there a vent on the well?	☒Yes ☐No	☐Yes ☐No
24a. If yes, is the vent protected? (24 non-corrodible mesh screen or slots)	☒Yes ☐**No**	☐Yes ☐**No**
25. Are conduits and junction boxes sealed to prevent contaminant entry?	☒Yes ☐**No**	☐Yes ☐**No**
26. Is the well unreasonably at risk to physical damage?	☐Yes ☒No	☐Yes ☐No
27. Is there a raw water source sample tap?	☒Yes ☐No	☐Yes ☐No
28. Is the source metered?	☒Yes ☐No	☐Yes ☐No
28a. If yes, is the source meter read at least monthly?	☒Yes ☐No	☐Yes ☐No
28b. If yes, are the water production records maintained?	☒Yes ☐No	☐Yes ☐No
29. Is the wellhouse properly constructed and maintained? If no, explain below	☒Yes ☐No	☐Yes ☐No
30. Is there any evidence of infestation by rodents or other pests?	☐Yes ☒No	☐Yes ☐No
31. Is the wellhouse and well adequately protected from unauthorized access and tampering?	☒Yes ☐No	☐Yes ☐No
32. **Is there a pump control valve or vacuum relief valve without an air gap on the valve discharge pipe?**	☐**Yes** ☐No ☒NA	☐**Yes** ☐No ☐NA
33. Are the source pump and pump controls operational and adequate to prevent chronic water outages or premature pump failure? If no explain below	☒Yes ☐**No**	☐Yes ☐**No**
SPRING (if there is no spring, skip to question 41)		
34. Is the springbox (structure, hatch, and overflow) constructed to prevent the entry of contaminants or direct surface drainage? If yes, describe below.	☐Yes ☐**No**	☐Yes ☐**No**
35. Is there a raw water source sample tap?	☐Yes ☐No	☐Yes ☐No
36. Is the source metered?	☐Yes ☐No	☐Yes ☐No
36a. If yes, is the source meter read at least monthly?	☐Yes ☐No	☐Yes ☐No
36b. If yes, are the water production records maintained?	☐Yes ☐No	☐Yes ☐No
37. Is the springhouse properly constructed and maintained? If no, explain below	☐Yes ☐No	☐Yes ☐No
38. Is there any evidence of infestation by rodents or other pests?	☐Yes ☐No	☐Yes ☐No
39. Is the springhouse and spring box adequately protected from unauthorized access?	☐Yes ☐No	☐Yes ☐No
40. **Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?**	☐Yes ☐**No**	☐Yes ☐**No**

Describe and evaluate the source facilities including maintenance, operations, sanitary and security observations and any major change made to the source such as pump replacement, deepening or reconstruction:

A single drilled well is located in the pumphouse. There is a screened vent and raw sample tap. There are no obvious sources of contamiantion within the 100 ft sanitary control area.

PART E: DISINFECTION

(If no disinfection, answer question 41 and skip rest of Part E)

41. *Does the operator batch chlorinate the source, the distribution system, or the reservoir just before collecting routine or repeat coliform samples? If yes, provide details below.*	☐*Yes* ☒*No*
42. Did you observe disinfection treatment connected to the water system in active use that is NOT listed on the WFI? If yes, explain below	☐Yes ☒No
43. Is ultraviolet light (UV) used for disinfecting a drinking water source? If no, skip to question 46.	☐Yes ☒No

44. Is the UV unit sized for the maximum flow rate, and is there a UV transmittance sensor controlling a solenoid valve or other device to shut off supply if the UV light fails?	☐Yes ☐No
45. Describe the UV equipment including: UV manufacturer and model number: Rated capacity (gpm): Cleaning frequency of quartz sleeve : Mo/Yr UV light last replaced:	
46. Is there continuous chlorination? If no, skip to Part F	☒Yes ☐No
46a. If yes, please measure the free chlorine residual from a representative location in the distribution system.	
Location description: Free chlorine residual:	
47. **Is there a water supply line plumbed directly into a chlorine solution tank without a reduced pressure backflow assembly on the supply line?**	☐**Yes** ☒No
48. Is there a post-treatment sample tap?	☒Yes ☐No
49. Does the chlorine compound meet NSF/ANSI Standard 60? - household bleach is exempted	☒Yes ☐No
50. Is a backup chemical feed pump or spare parts for the operating chemical feed pump available onsite?	☒Yes ☐No
51. According to the operator, is there a DOH requirement for Chlorine Contact Time? If no, skip to Part F	☒Yes ☐No
51a. *If yes, measure and record the free chlorine residual at the CT6 compliance location:* *Describe compliance sampling location below – location must be prior to the first service connection downstream of chlorine addition.*	
52. *Is the chlorine pump and pump controls constructed and maintained to provide uninterrupted, reliable CT6 treatment? If no, describe below.*	☒*Yes* ☐*No*
Describe the chlorination facilities including purpose for chlorination, concerns with maintenance or operations, purveyor's record keeping of monthly reports, and sanitary and security observations: **Chlorine disinfection only, injected prior to the storage tank to provide contact time. 12% sodium hypochlorite is mixed with water in the solution tank. Free chlorine residual is checked daily and records are sent monthly to DOH.**	

PART F: TREATMENT

53. Is there any treatment other than chlorination or UV in use? If no, skip Part F.	☐Yes ☒No
54. Did you observe a treatment process connected to the water system in active use that is NOT listed on the WFI? If yes, describe below.	☐Yes ☐No
55. **Is there a water supply line plumbed directly into a chemical solution tank (e.g., fluoride saturator) without a reduced pressure backflow assembly on the supply line?**	☐**Yes** ☐No ☐NA
56. Are primary contaminant treatment facilities (e.g., nitrate, corrosion control, arsenic) operating properly? If no, describe below	☐Yes ☐**No**
57. Do the water treatment chemicals meet NSF/ANSI Standard 60?	☐Yes ☐No ☐NA
58. Is there a post-treatment sample tap?	☐Yes ☐No
Describe the treatment facilities including purpose for treatment, concerns with maintenance or operations, purveyor's record keeping of monthly reports, and sanitary and security observations:	

PART G: BOOSTER PUMPING FACILITIES and CONTROLS

59. Are there any booster pumps in use? If no, skip Part G	☒Yes ☐No
60. Are the booster pumps in good working condition? If no, explain below	☒Yes ☐No
61. Are pump and pump controls operational and adequate to prevent chronic water outages or premature pump failure? If no explain below	☒Yes ☐**No**
62. If there is a booster pump house/pump station, is it secure against unauthorized entry? If no, explain below	☒Yes ☐**No** ☐NA
63. Is the booster pump house/pump station properly constructed and maintained? If no, explain below	☒Yes ☐No
Describe and evaluate the pump facilities and controls including maintenance, operations, sanitary and security observations: **There are 3 booster pumps that appear to be in good working condition. The pumps "leap frog" from one to the next each time they turn on and then operate as lead/lag when needed.**	

PART H: PRESSURE TANKS

64. Are there any pressure tanks in use? If no, skip Part H	☒Yes ☐No
65. For systems using an air compressor, is the compressor an oil-free type or does it use food-grade oil?	☐Yes ☐No ☒NA
66. Are valves present to isolate pressure tanks for maintenance or repair?	☒Yes ☐No
67. Is there an ASME pressure relief valve installed between each pressure tank and any shutoff valve? (see DOH publication #331-429)	☒Yes ☐No
68. Are the pressure tanks in good working condition? If no, explain below	☒Yes ☐No
Describe and evaluate the pressure tanks including maintenance, operational, sanitary and security observations: **there are 8 bladder syle pressure tanks that appear to be in good working condition.**	

PART I: FINISHED WATER STORAGE

69. Is there a finished water storage tank in use? If no, skip Part I	☒Yes ☐No	
70. If unable to physically inspect the storage tank hatch, vent, roof, or overflow outlet, select the method you discussed with the purveyor to document their condition:		
a ☒ Reviewed and discussed maintenance records and recent photos		
b ☐ Photos will be taken and mailed by purveyor; additional follow-up required by DOH		
c ☐ Purveyor unable or unwilling to document; additional follow-up required by DOH		
Insert Tank Names		
71. Is the storage tank protected from unauthorized entry or vandalism? If no, explain below	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
72. Is the reservoir roof free of any unprotected openings? If no, explain below	☒Yes ☐**No** ☐unk	☐Yes ☐**No** ☐unk
73. Is the access hatch constructed and sealed to prevent the entry of contaminants? If no, explain below	☒Yes ☐**No** ☐unk	☐Yes ☐**No** ☐unk
74. If able to open hatch, is the stored water free of visible contaminants? If no, explain below	☐Yes ☐No ☒unk	☐Yes ☐No ☐unk
75. Is there a dedicated air vent on the storage tank?	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
75a. If yes, is the air vent constructed to prevent the entry of contaminants? If no, explain below	☒Yes ☐**No** ☐unk	☐Yes ☐**No** ☐unk
76. Is the overflow line constructed to prevent contaminants from entering the tank? If no, explain below	☒Yes ☐**No** ☐unk	☐Yes ☐**No** ☐unk
77. Does the overflow line discharge near ground level?	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
78. Is the overflow line discharge area protected from potential erosion?	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
79. Does the overflow line discharge into a storm drain or surface water?	☐Yes ☒No ☐unk	☐Yes ☐No ☐unk
79a. If yes, is there an air gap at the discharge of the overflow OR does the overflow drop at least 34 vertical feet measured from the overflow connection to the reservoir down to the receiving water body?	☐Yes ☐**No** ☐unk	☐Yes ☐**No** ☐unk
80. Does the overflow line discharge directly into a sanitary sewer without an air gap?	☐**Yes** ☒No ☐unk	☐**Yes** ☐No ☐unk
81. Can the reservoir be isolated from the rest of the water system and be drained through a dedicated drain line?	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
82. When was the tank inspected last? Explain below if necessary	2016	
83. What is the tank cleaning frequency? Explain below if necessary	annual	
84. Does the tank size, operation, and internal piping configuration appear to provide adequate water turnover (i.e. separate inlet/outlet, baffling or mixing to reduce stagnant water)? If no, explain below	☒Yes ☐No ☐unk	☐Yes ☐No ☐unk
85. Does the tank show signs of excessive leakage, significant structural cracking, or an advanced concrete spalling?	☐Yes ☒No	☐Yes ☐No
Describe and evaluate the finished water storage facilities including volume, operational drawdown, configuration of the inlet/outlet piping, any concerns about operations and maintenance, and sanitary and security observations: **30,000 gallons corregated type silo with a liner and is located next to the pumphouse. There is a screened vent and a screened overflow. The tank is cleaned annually. Keep a photo record of the hatch, gasket, screened vent and interior of the reservoir**		

and make available at the next survey.	
PART J: DISTRIBUTION SYSTEM	
86. Is a complete, up to date and accurate map of the distribution system maintained?	☒Yes ☐No
87. *Does the system provide adequote pressure throughout the distribution system? If no, exploin below.*	☒Yes ☐No
88. Are proper procedures followed for disinfection of new construction or repairs?	☒Yes ☐No
89. *Are there ony air relief or vocuum relief volves subject to submersion?*	☐Yes ☒No
90. Does the purveyor seasonally or annually flush the distribution system? If yes, describe below	☒Yes ☐No
91. Does the purveyor exercise its distribution system valves? If yes, describe below	☒Yes ☐No
Describe and evaluate the distribution system including maintenance, operational, sanitary and security observations: **There are 48 metered industrial connections. Eash is fitted with backflow prevention and the assemblies are tested annually. The water lines are flushed annually and as needed.** **There is a separate fire flow water system.**	
PART K: CROSS CONNECTION CONTROL (CCC)	
92. Does the water system serve a single connection? If yes, refer the purveyor to the Uniform Plumbing Code and skip Part K	☐Yes ☒No
93. Is the water system known to serve one or more high health hazard premises, such as those listed in Table 9 in WAC 246-290-490? If yes, describe the premise(s) below.	☒Yes ☐No
94. Has the purveyor established the legal authority to implement a CCC program (i.e., formally adopted an ordinance, resolution, by-laws, or other document defining the purveyor's CCC program requirements, and empowering the purveyor to enforce them)?	☒Yes ☐No
95. Has the purveyor designated a CCC Specialist (CCS) to be in responsible charge of the CCC program?	☒Yes ☐No
95a. If yes, has the CCS conducted a hazard evaluation to identify high health hazard premises?	☒Yes ☐No
95b. If yes, has the purveyor completed installation of a backflow prevention assembly on the service line to each identified high health hazard premise?	☒Yes ☐No ☐NA
96. Has each testable backflow prevention assembly installed for premises isolation been tested by a DOH certified backflow assembly tester (BAT) within the past 12 months?	☒Yes ☐No ☐NA
97. Did you observe the end of a hose connected to the potable water system submerged in a pool, hot tub, watering trough, or other non-potable body of water observed during the survey?	☐**Yes** ☒No
98. <u>This question only applies to a facility operating a sewage dump station</u>: Is there a sewage dump station without a reduced pressure backflow assembly on the water supply at the dump station?	☐**Yes** ☐No ☒NA
Additional cross connection control program comments: **Each industrial connection is isolated with a backflow assembly and the assemblies are tested annually and records are kept.**	
PART L: OPERATOR	
99. Is the operator of the water system certified?	☒Yes ☐No
100. Describe the operator's certification level (if certified), duration of employment with this water system, relationship with the system (e.g., contract operator, SMA, direct hire employee, volunteer, temporary, or owner), and duties and responsibilities. **employee of PUD#1**	
101. Does the operator conduct self-inspections of the water system? If yes, describe frequency and scope of these self-inspections below.	☒Yes ☐No
102. *Is the operator performing meosurements ond colibrotion of woter treotment monitoring equipment consistent with monufacturer recommendotions? If no, describe below.*	☒Yes ☐No ☐NA
103. *Is the operotor using proper inputs to treotment plont operations reports, such os correct volume, peak flow rote, time, ond moking the proper colculotions? If no, describe below.*	☒Yes ☐No ☐NA
104. *Does the operotor toke complionce woter quality samples ot the proper locotion? If no, describe below.*	☒Yes ☐No ☐NA
Additional operator comments:	

David LaPlaunt is a certified operator with PUD#1, they have a number certified operators on staff. He has a CCS, WDM, and is a WTPO in training. Fred Disch is the manager and is also a certified operator.

PART M: FIELD NOTES AND OTHER

Descriptions of any water quality tests, physical measurements, or simple repairs completed during the inspection:

PART N: SUPPLEMENTAL NOTES AND SAFETY CONCERNS

Supplemental comments from other parts of the checklist, and documentation of field safety concerns:

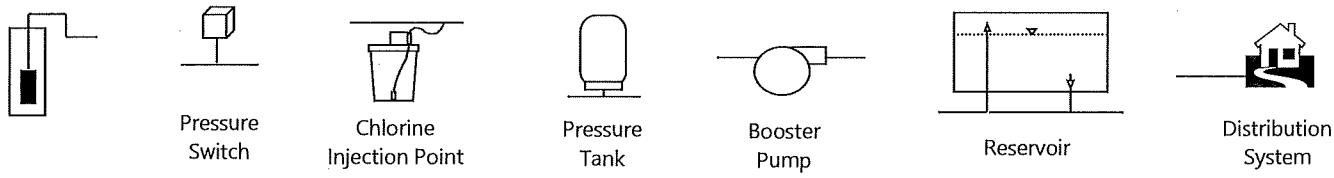
If you need this publication in an alternative format, call 800.525.0127 (TDD/TTY call 711). This and other publications are available at www.doh.wa.gov/drinkingwater.

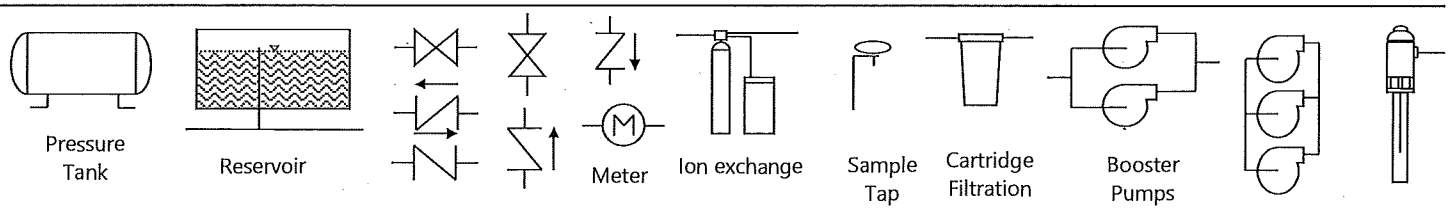
PART O: WATER SYSTEM FACILITIES FIELD SCHEMATIC

Use the space below to sketch a simple schematic of the water system facilities. You may use the templates shown below to help build your schematic. The sketch should show location of sources, treatment, pressure tanks, booster pumps, storage tanks, and a simple representation of the distribution system. Include direction of flow (directional arrows) and brief description of how the controls function.

Source Name:		Source Number:	

Example templates you can use to build your schematic:





PART P: INVENTORY OF POTENTIAL SOURCES OF CONTAMINANTS WITHIN THE SANITARY CONTROL AREA

Use the graph below to locate any potential biological and chemical contaminants found within the source's Sanitary Control Area (SCA). The SCA is the protective area within 100 feet of wells or 200 feet of springs.

Source Name:		Source Number:	

Radius (select one)	
☐	100 ft for Wells
☐	200 ft for Springs

Description of Features Shown on the SCA Schematic					
A.		C.		E.	
B.		D.		F.	

Sources of Contamination	Feet	Sources of Contamination	Feet	Sources of Contamination	Feet
Abandoned water wells		Dumpsters		Pesticide storage	
Animal burial		Fuel tanks (above or below ground)		Roads and parking lots	
Biological contaminants		Graveyards		Sewer lines, gravity or pressure	
Buildings		Hazardous waste disposal site		Storm water catch basins	
Chemical contaminants		Hazardous waste facility		Surface water	
Drainfields and septic tanks		Irrigation canal		Wastewater spray irrigation	
Drug lab		Landfill, dump, disposal area		Other:	
Dry wells		Pesticide application			

http://giswebp/maps/SWAP/index.html

File Edit View Favorites Tools Help

SWAP... WQMS... Ecol... Drud... Google ODW... SWAP

SWAP Map

Source Water Assessment Program (SWAP) Mapping Application

Help / Links

Data... Streets Aerial Topo

Search

Features Selected (Maximum of 1,000 records returned): 1

Zoom Clear

Water System ID: *00638*
Water System Name: *GRANDVIEW-NORTHGATE INDUSTRIAL PARK*
Source Number: *01*
Source Name: *NORTHGATE IND. PK. ASSOC. AGK350*
Source Type: *Ground Water - Well*
Source Use: *Permanent*
Total Connections: *48*
System Group: *A*
System Type: *Non-transient Non-community water system*
Township, Range, Section: *39N,02E, S07*
Quarter Quarter: *NWNE*
WRIA Number: *01*
County: *WHATCOM*
Source Susceptibility: *Moderate*
Primary Contact First Name: *FRED*
Primary Contact Last Name: *DISCH*
Primary Phone: *(360) 384-4288*
Primary Email: *troonnorth@hotmail.com*

50 m

100 ft

Search Results

Latitude: 48.888936 Longitude: -122.601559

https://www.google.com/maps/place/2257+Northgate+Spur,+Ferndale,+WA+98248/@48.888582,-122.60

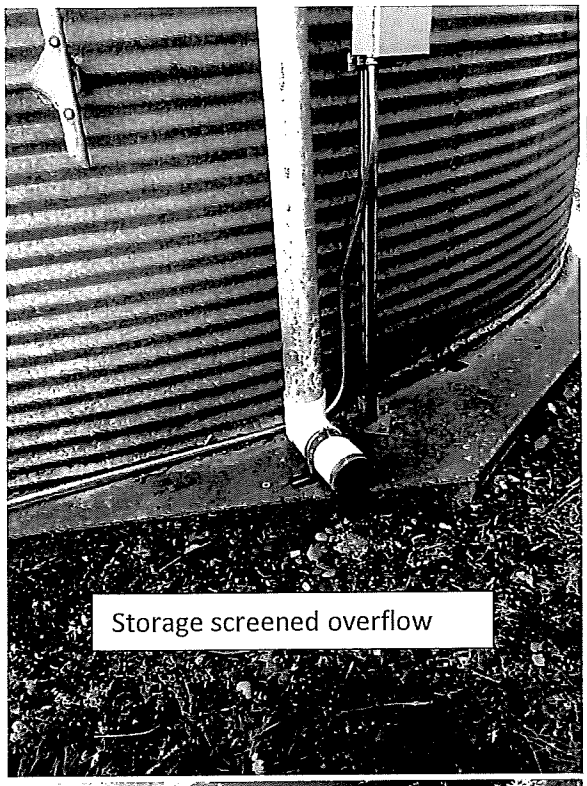
Google | Sanitary Surv... | 2257 Nort... | DOH - Wate...

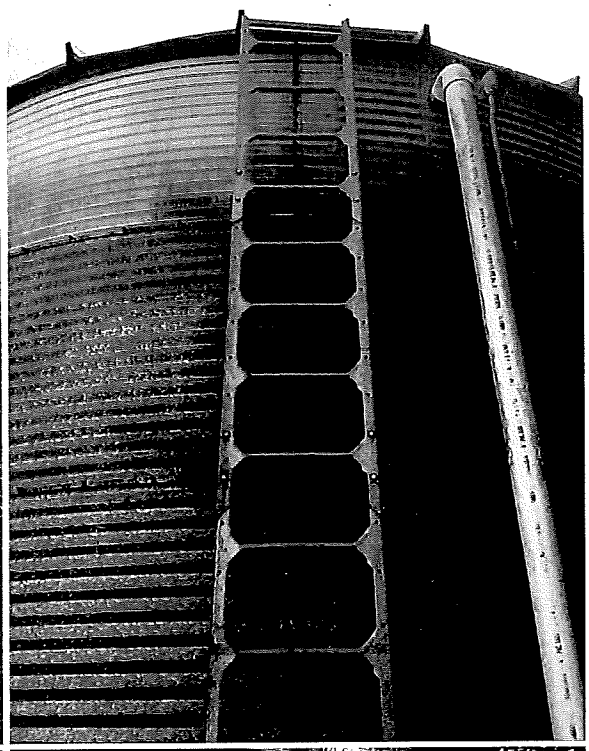
File Edit View Favorites Tools Help

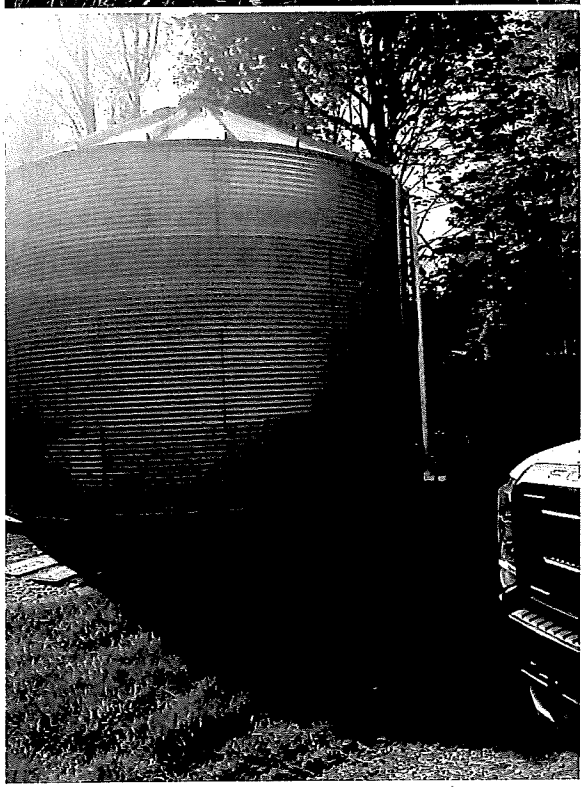
SWAP... WQMS... Ecol... Drud... Google ODW ... SWAP

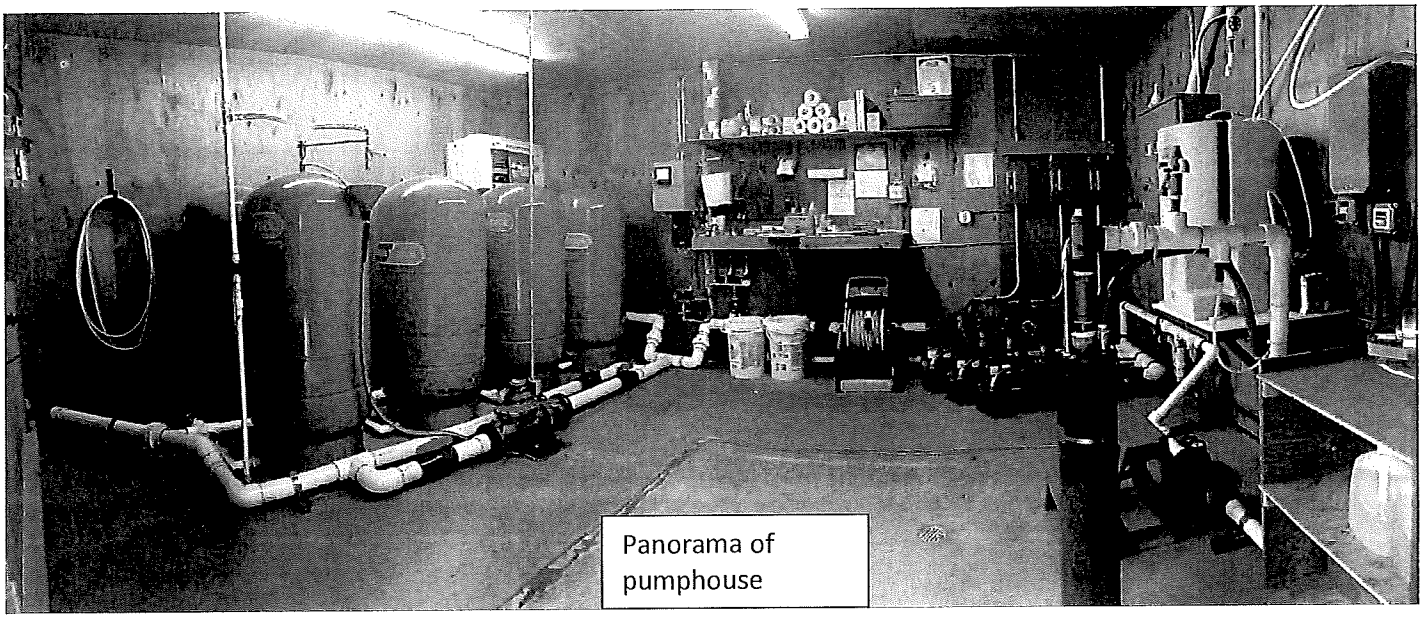
Google recommends using Chrome
Try a fast, secure browser with updates built in

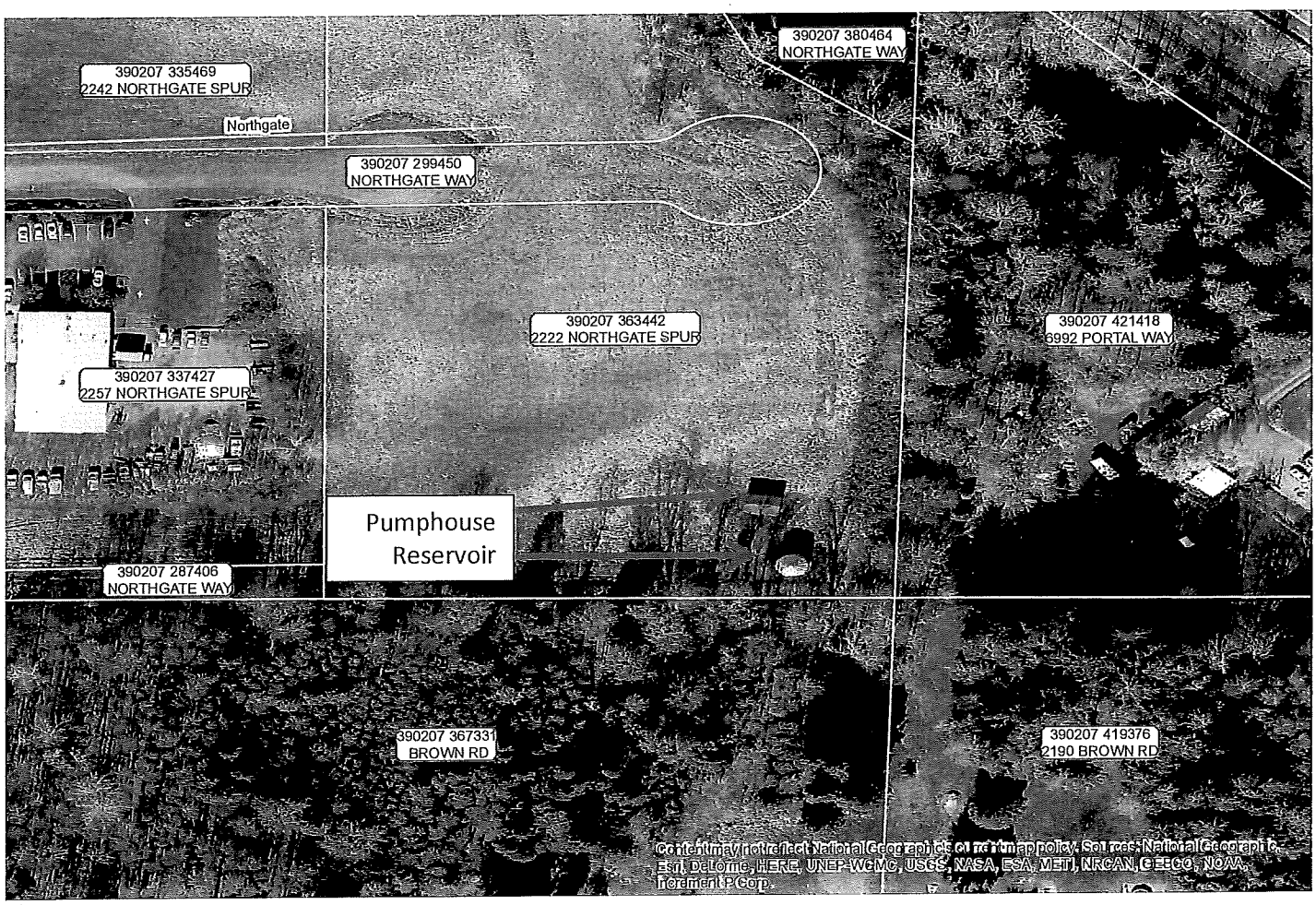
NO THANKS YES

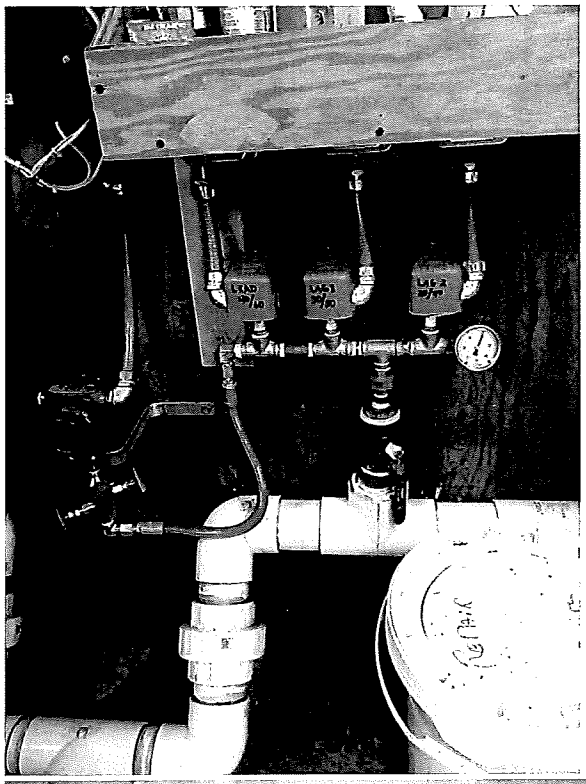

Storage screened overflow

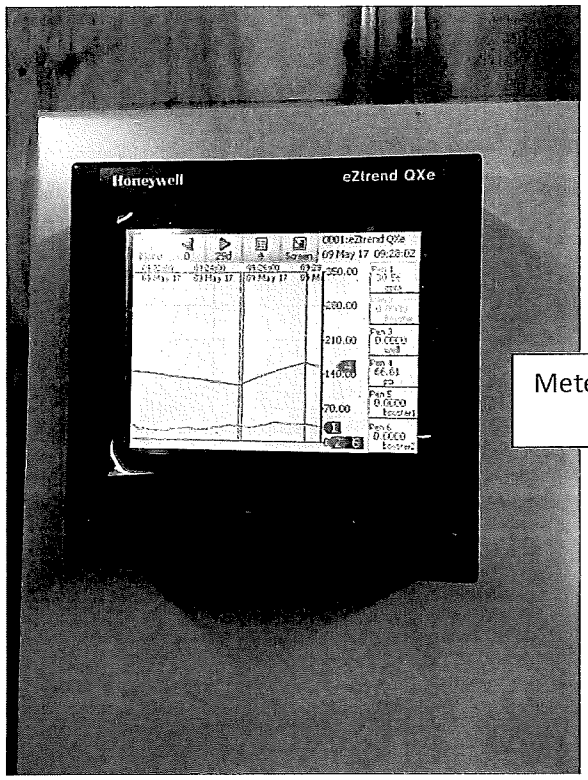





Panorama of pumphouse


390207 335469
2242 NORTHGATE SPUR
Northgate
390207 299450
NORTHGATE WAY
390207 380464
NORTHGATE WAY
390207 363442
2222 NORTHGATE SPUR
390207 421418
6992 PORTAL WAY
390207 337427
2257 NORTHGATE SPUR
Pumphouse
Reservoir
390207 287406
NORTHGATE WAY
390207 367331
BROWN RD
390207 419376
2190 BROWN RD
Contents may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



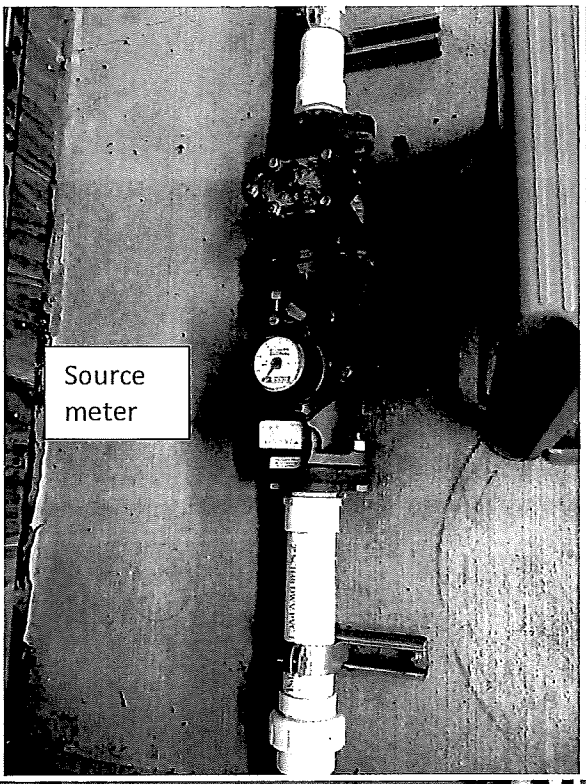


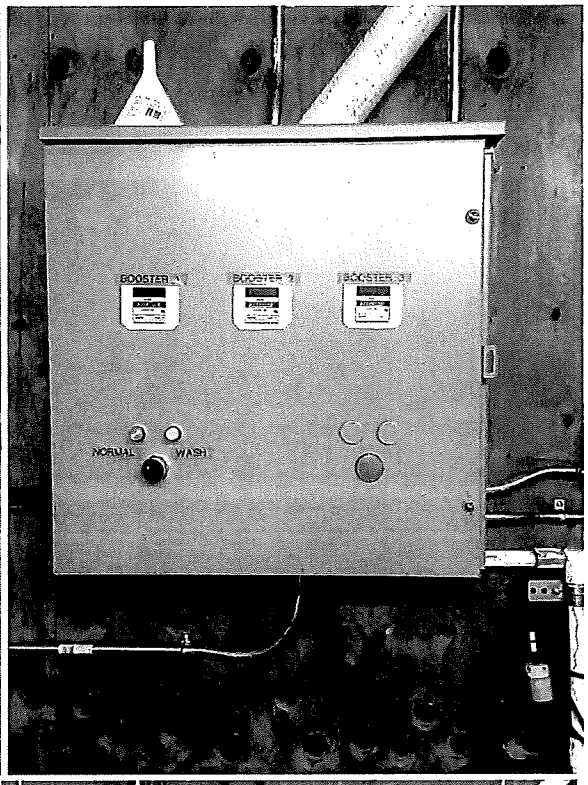
Meter readings

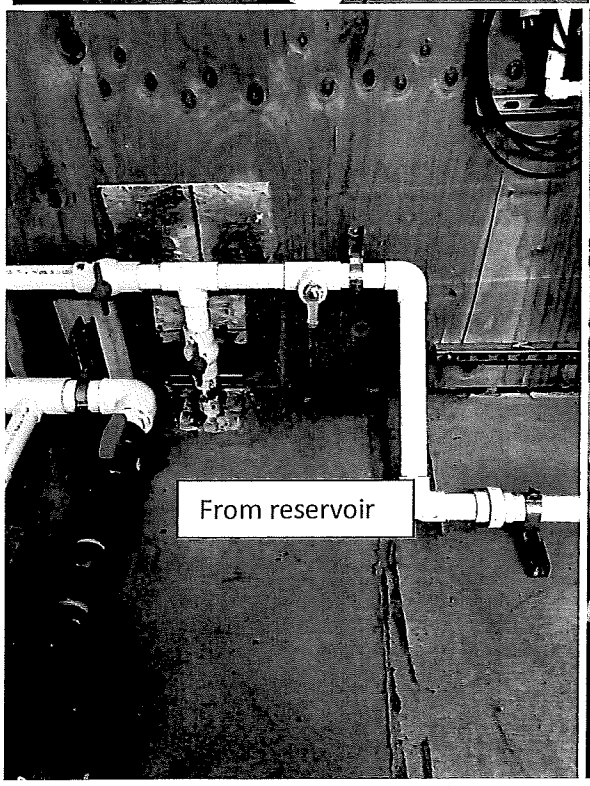
after storage sample tap

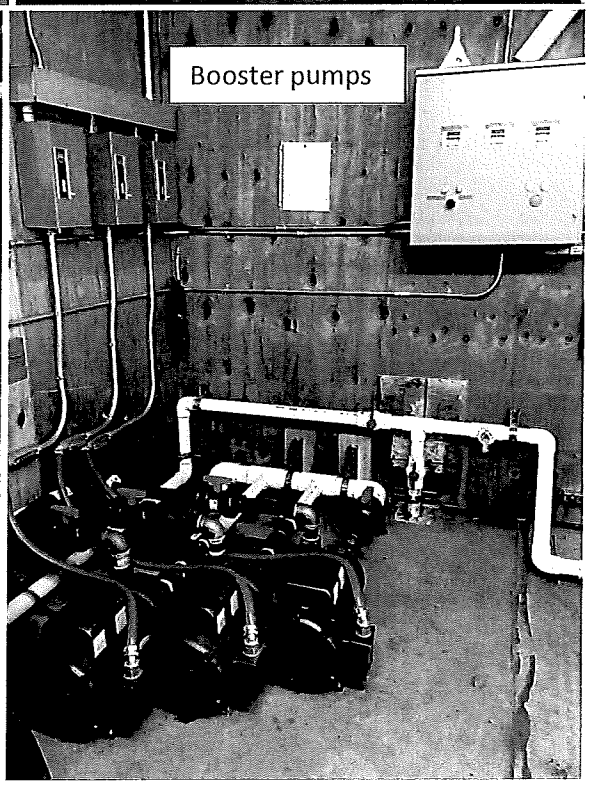
Meter after storage

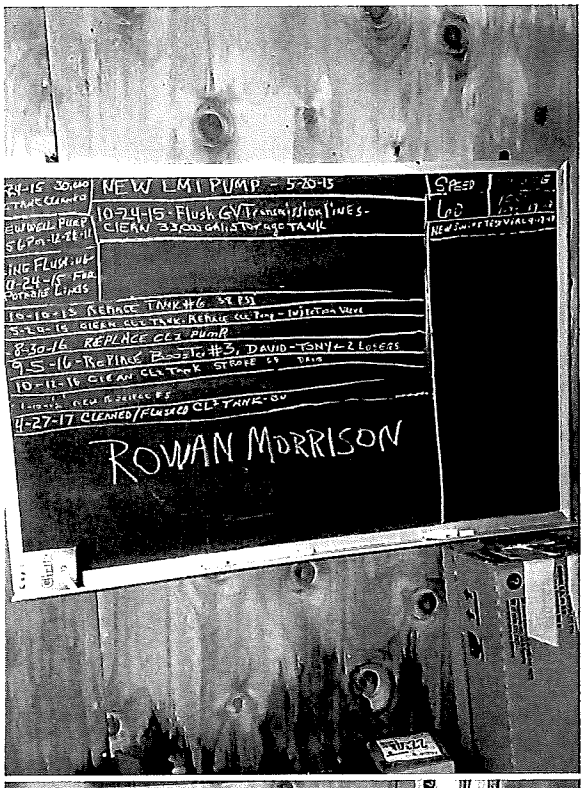
Pressure tanks

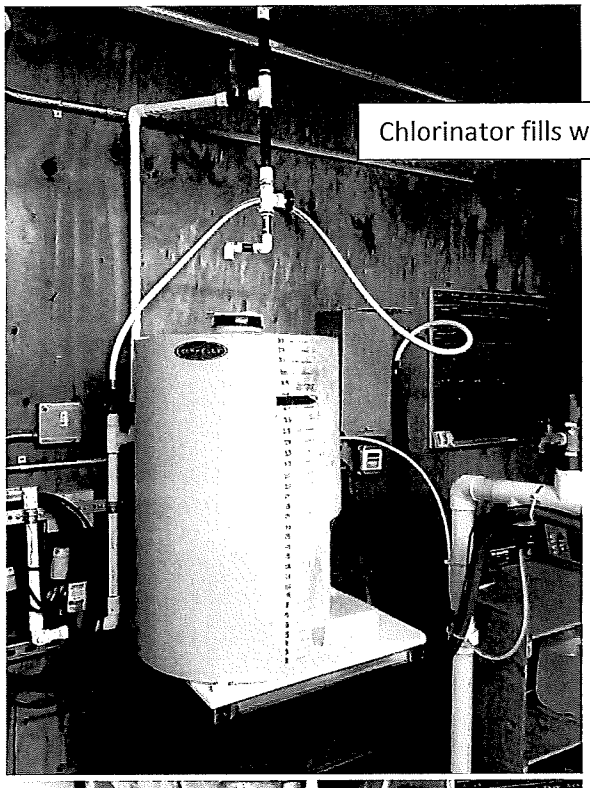

Source
meter


BOOSTER 1
BOOSTER 2
BOOSTER 3
NORMAL
WASH

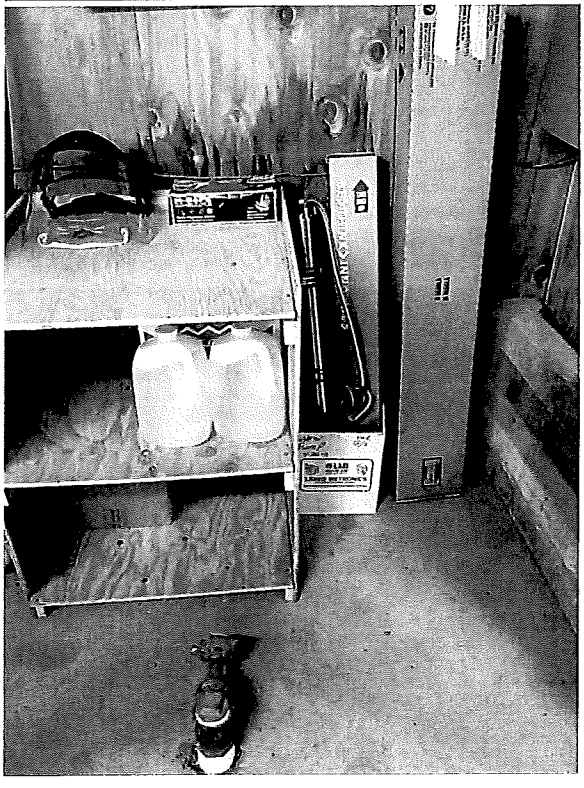

From reservoir

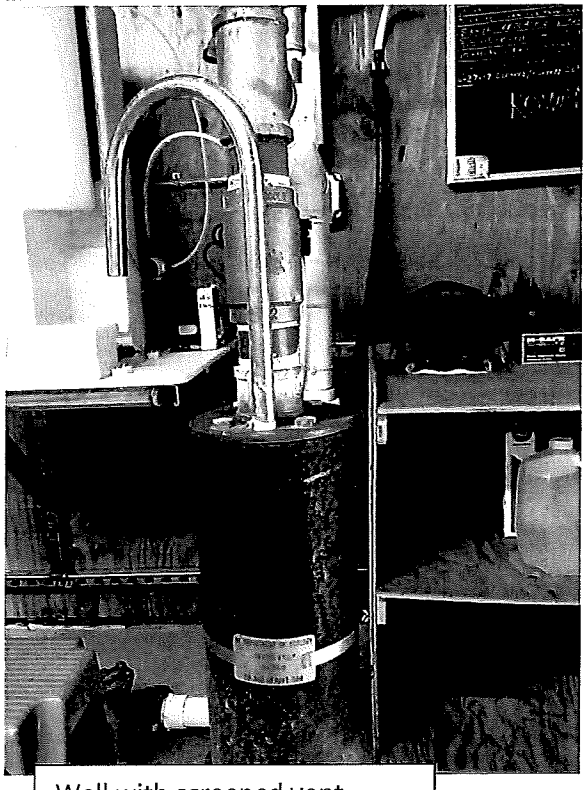

Booster pumps



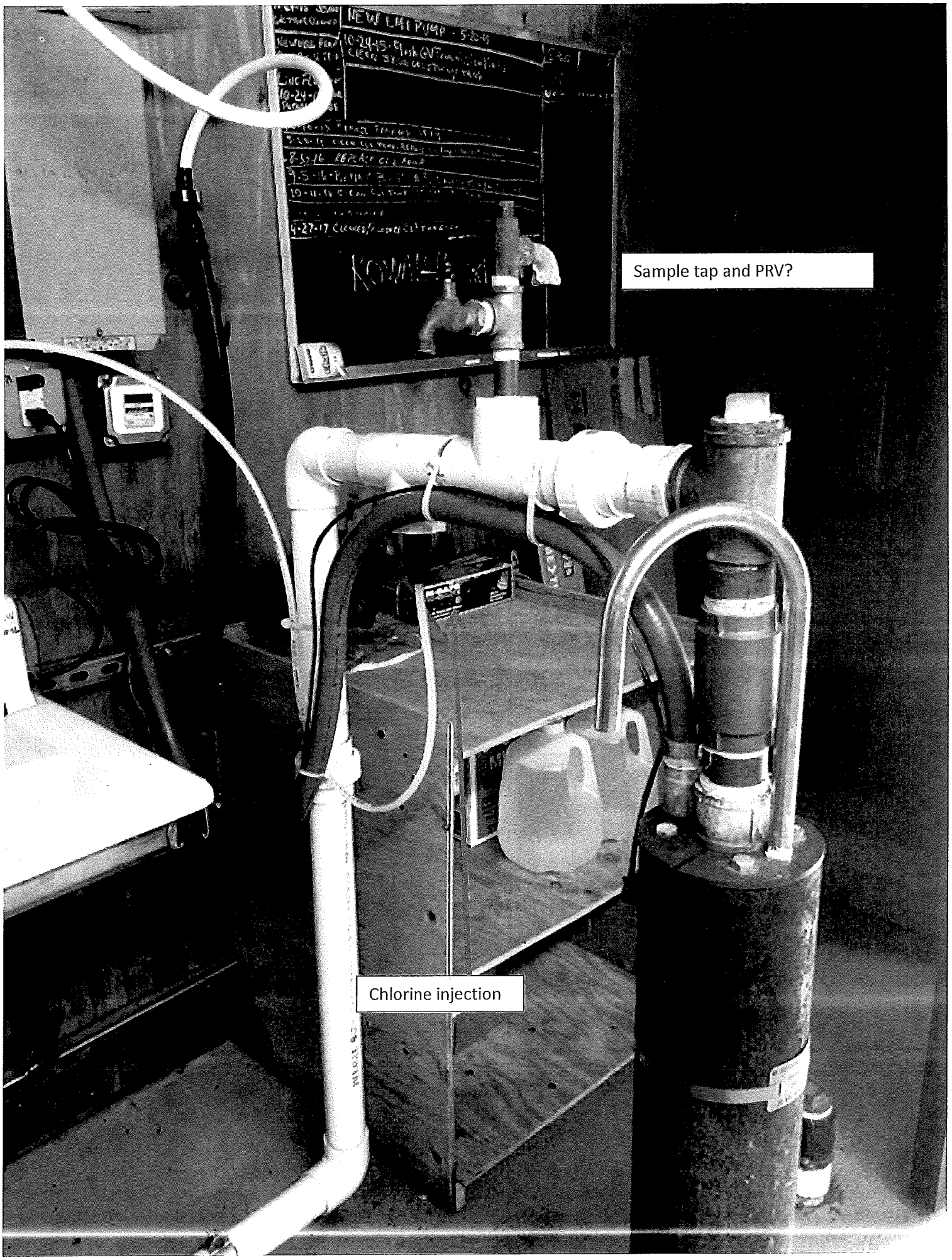


Chlorinator fills with air gap





Well with screened vent


Sample tap and PRV?
Chlorine injection

Declaration of Water Utility Service Area

Exhibit 4-1

DECLARATION OF WATER UTILITY SERVICE AREAS

for

WHATCOM COUNTY COORDINATED WATER SYSTEM PLAN

This Declaration, submitted by 'water utility', confirms that the attached map* accurately identifies the service areas (existing, retail, future, and wholesale) that the water utility either serves or plans to serve unless regulatory or other constraints do not enable the utility to do so.

The intent of this declaration is to define service areas in a manner which assures that time, effort, and money are best used by avoiding any unnecessary duplication of service. In the absence of overlapping boundaries, the Whatcom County Health and Human Services along with the Washington State Department of Health (DOH) will recognize the existing, retail, and future boundaries as the exclusive service area of the undersigned utility, giving the utility right of first refusal for serving future customers. The wholesale service area does not convey an exclusive service area, but is important for delineating the extent of a municipal water supplier's service area, which may represent its water right place of use.

Any proposed changes to a designated service area must include submittal of this declaration to Whatcom County Planning and Development Services, to allow the County to update the CWSP service area map. The utility will also need to provide service in a manner consistent with its own individual water system plan and service policies.

The person signing below assures that he or she has been authorized to sign the Declaration on behalf of the utility.

10-8-2021

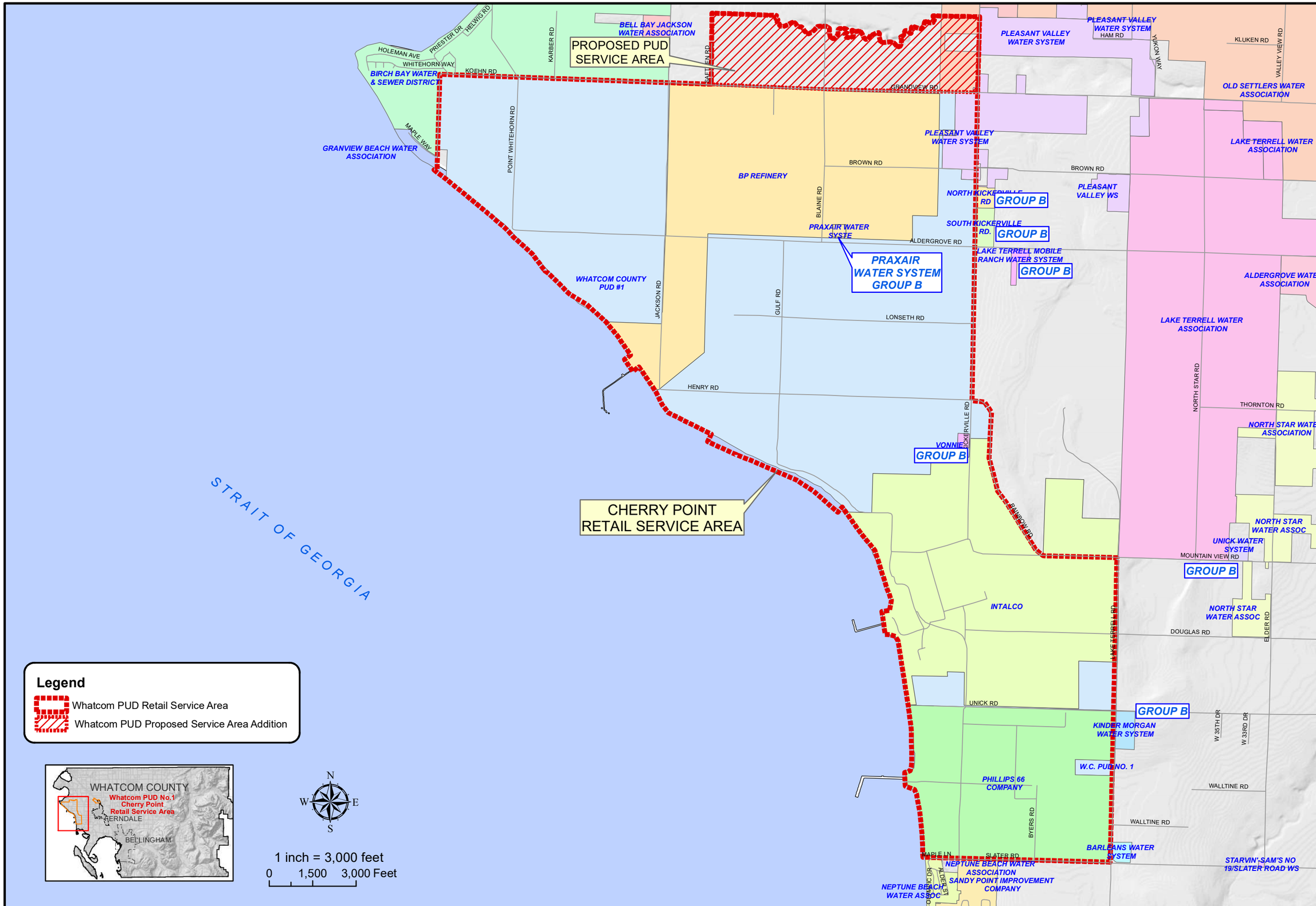
Date

PUD #1 OF WHATCOM COUNTY

Water Utility

Authorized Representative

*Note: This map needs to be clearly dated to ensure the most up-to-date version is being used and should accurately depict the existing, future, retail, and wholesale service areas.



CIVIL STRUCTURAL SURVEY

WILSON ENGINEERING

WILSONENGINEERING.COM

DESIGNED BY	-
DRAWN BY	RDN
CHECKED BY	-

WHATCOM COUNTY PUD NO. 1

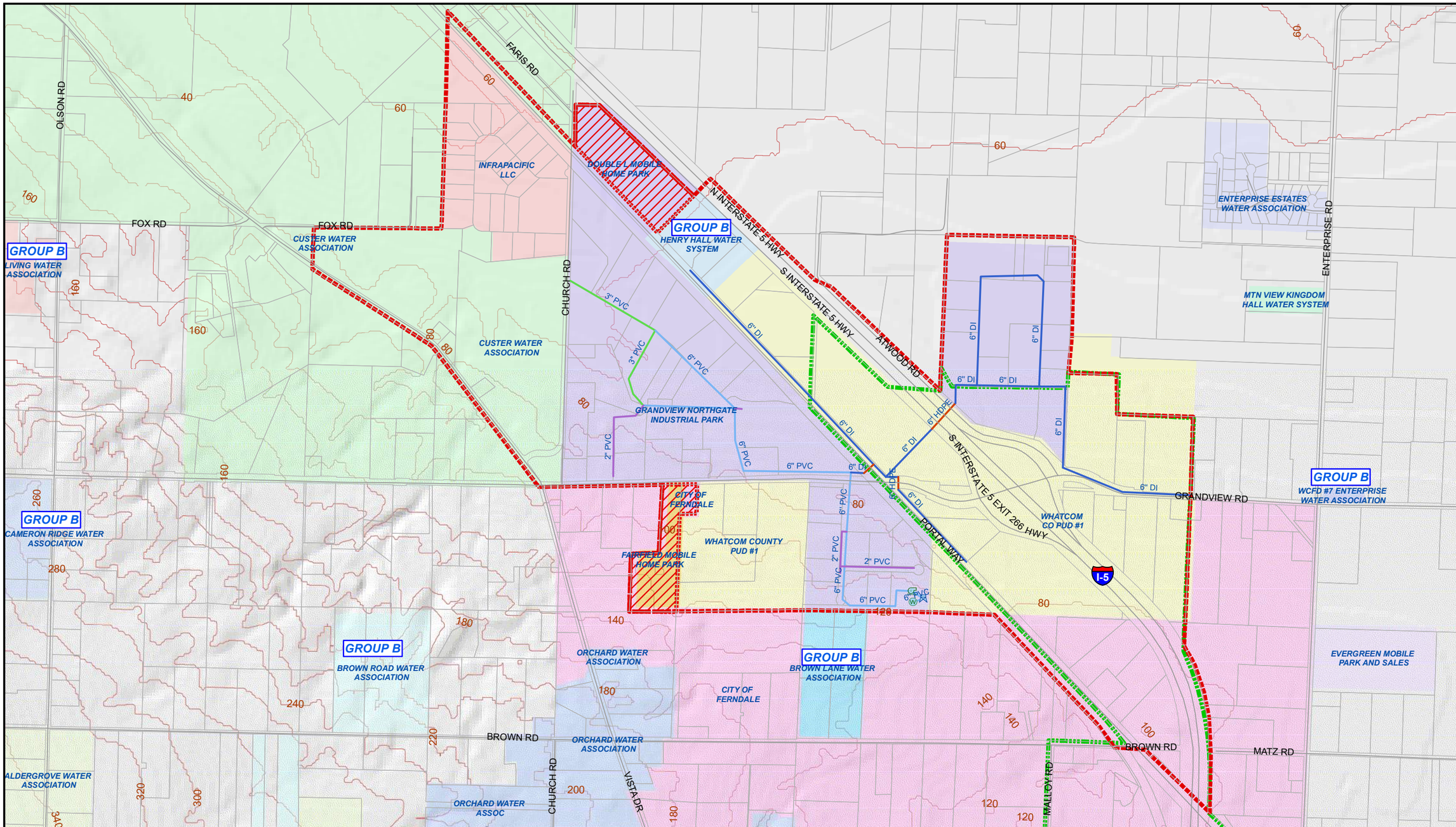
WHATCOM COUNTY WASHINGTON

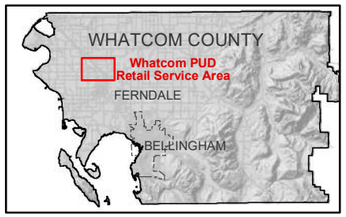
FIGURE 1-4

CHERRY POINT RETAIL SERVICE AREA

DATE	6/29/2020
SCALE	AS SHOWN
PROJECT	2020-023

SHEET 1 OF 1





ADJACENT PURVEYORS:

CUSTER WATER ASSOCIATION
INFRAPACIFIC LLC
DOUBLE L MOBILE HOME PARK
CUSTER WATER ASSOCIATION
CITY OF FERNDALE
FAIRFIELD MOBILE HOME PARK
HENRY HALL WATER SYSTEM
ENTERPRISE ESTATE WATER ASSOCIATION
MTN VIEW KINGDOM HALL WATER SYSTEM
WCFD#7 ENTERPRISE WATER ASSOCIATION
EVERGREEN MOBILE PARK AND SALES
BROWN LANE WATER ASSOCIATION
ORCHARD WATER ASSOCIATION
BROWN ROAD WATER ASSOCIATION
CAMERON RIDGE WATER ASSOCIATION
LIVING WATER ASSOCIATION

Legend

Pump Station
Reservoir
Groundwater Well

Water Mains
2" PVC
3" PVC
6" DI
6" HDPE
6" PVC

Whatcom PUD Retail Service Area
Whatcom PUD Proposed Service Area Addition
Ferndale City Limits

N W E S

1 inch = 1,003 feet
0 250 500 1,000 Feet

WILSON ENGINEERING
WILSONENGINEERING.COM
CIVIL
STRUCTURAL
SURVEY

WHATCOM COUNTY PUD NO. 1
WHATCOM COUNTY WASHINGTON
FIGURE 1-5
GRANDVIEW-NORTHGATE RETAIL SERVICE AREA

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -
DATE 6/29/2020
SCALE AS SHOWN
PROJECT 2020-023
SHEET 1 OF 1

State Environmental Policy Act (SEPA) and DNS Determination

State Environmental Policy Act (SEPA) Register

SEPA and NEPA documents posted by the Department of Ecology since 2000

202104367 - Whatcom County Public Utility District

Lead Agency
Whatcom County Public Utility District

File #
2021-SEPA-001

Website
www.pudwhatcom.org (http://www.pudwhatcom.org/)

Contact
Stephan Jilk
(360) 384-4288
Stevej@pudwhatcom.org (mailto:Stevej@pudwhatcom.org)

County
WHATCOM

Region
Northwest

SEPA #

202104367

Document Type

DNS

Date Issued

08/11/2021

Comments Due

08/24/2021

Proposal Name

PUD No. 1 of Whatcom County (“District”) Comprehensive Drinking Water System Plan (“WSP”) Update

Proposal Description

The purpose of the Comprehensive WSP is to identify the Public Utility District No. 1 of Whatcom County service areas, existing systems, service policies, future needs, and related issues, in a manner consistent with the Whatcom County Comprehensive Plan, WAC 246-290, and other applicable local, state and federal laws. WSP must be updated and submitted to the WA DOH at least every ten years in accordance wit the regulatory requirements contained in WAC 246-290-100.

Related Record

Location

Address: 1705 Trigg Rd, Ferndale, WA 98248
Longitude: -122.567350 Latitude: 48.878960
Parcel: n/a
Other identifying information: The P.U.D.'s overall water service area boundary, includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham, Washington.

Applicant

Dave Olson

Applicant Contact

Cornerstone Management
6912 Hannegan Rd, #105
Lynden WA 98264

Documents

- SEPA Checklist.pdf (Document/DocumentOpenHandler.ashx?DocumentId=118587) (2 MB)
- WhatcomPUDSEPA.pdf (Document/DocumentOpenHandler.ashx?DocumentId=118588) (3 MB)

Please email SEPA Help (mailto:sepahelp@ecy.wa.gov) with any updates, problems, or questions about SEPA Register.

© 2021 Washington State Department of Ecology - Shorelands Environmental Assistance Program

PUBLIC UTILITY DISTRICT NO. 1
of Whatcom County

P.O. Box 2308 • 1705 Trigg Road
Ferndale, WA 98248
P: (360) 384-4288 F: (360) 384-4849
email: info@pudwhatcom.org
www.pudwhatcom.org

DESCRIPTION OF PROPOSAL:	PUD No. 1 of Whatcom County ("District") Adoption of Comprehensive Drinking Water System Plan ("WSP") A copy of the WSP can be found at https://www.pudwhatcom.org/wp-content/uploads/2021/08/2021-08-06-WSP-Draft-reduced-file-size.pdf
PROPONENT:	P.U.D. No. 1 of Whatcom County PO Box 2308, Ferndale, WA 98248 Attention: Dave Olson, Cornerstone Management, Inc., (Consultant to the District)
LOCATION OF PROPOSAL:	The P.U.D.'s overall water service area boundary, includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham, Washington.
LEGAL DESCRIPTION:	Not Applicable
LEAD AGENCY:	P.U.D. No. 1 of Whatcom County

The Lead Agency for this proposal has determined that an environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file at the administrative offices of P.U.D. No. 1 of Whatcom County. This information is available to the public upon request.

This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below, when the determination is final. Comments must be submitted to the PUD's SEPA Responsible Office at the address below by 4:30 p.m. on August 24, 2021. Copies of the application are available for review at the P.U.D. No. 1 of Whatcom County, Administrative Offices,1705 Trigg Road, Ferndale, WA, 98248. If you have any questions or seek additional information, please contact Stephan Jilk, SEPA Responsible Official by phone at (360) 384-4288, or by email at stevej@pudwhatcom.org.

RESPONSIBLE OFFICIAL: Stephan Jilk
POSITION/TITLE: General Manager/SEPA Responsible Official, P.U.D. No. 1 of Whatcom County
ADDRESS: 1705 Trigg Road/PO Box 2308, Ferndale, WA, 98248
PHONE: (360) 384-4288

DATE: August 10, 2021

SIGNATURE _____

Commissioners: Atul Deshmane, Christine Grant, Mike Murphy • Stephan (Steve) Jilk, General Manager

PUBLIC UTILITY DISTRICT NO. 1
of Whatcom County

P.O. Box 2308 • 1705 Trigg Road
Ferndale, WA 98248
P: (360) 384-4288 F: (360) 384-4849
email: info@pudwhatcom.org
www.pudwhatcom.org

CC: **WA State Department of Ecology**
SEPA Unit, via email separegister@ecy.wa.gov

WA State Department of Fish and Wildlife
SEPA Unit, via email SEPAdesk@dfw.wa.gov

Whatcom County Department of Public Works
Director Jon Hutchings, via email JHutchin@co.whatcom.wa.us

Whatcom County Department of Planning and Development Services
Director Mark Personius, via email MPersoni@whatcomcounty.wa.us

City of Ferndale Community Development
Jesse Ashbaugh, Assistant Planner via email jesseashbaugh@cityofferndale.org

Lummi Nation, Natural Resources Department
Tamela Smart, Lena Tso and Merle Jefferson, via email
TamelaS@lummi-nsn.gov, Lenat@lummi-nsn.gov and merlej@lummi-nsn.gov

Nooksack Indian Tribe
George Swanaset, Jr., Director via email george.swanasetjr@nooksack-nsn.gov

Birch Bay Water and Sewer District
Dan Eisses, General Manager via email Dan@bbwsd.com

Commissioners: Atul Deshmane, Christine Grant, Mike Murphy • Stephan (Steve) Jilk, General Manager

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

PUD No. 1 of Whatcom County ("District") Adoption of Comprehensive Drinking Water System Plan ("WSP").

2. Name of applicant:

Dave Olson,
Cornerstone Management, Inc.
(Consultant to the District)
Certified Water Operator
6912 Hannegan Rd. Suite 105
Lynden, WA 98264
Phone: (360) 354-7909
Cell: (360) 739-5661
Fax: (360) 354-8935
dave@watersystemservices.net

3. Address and phone number of applicant and contact person:

See above

4. Date checklist prepared:

August 3, 2021

5. Agency requesting checklist:

PUD No. 1 of Whatcom County

6. Proposed timing or schedule (including phasing, if applicable):

Fall 2021

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No. Independent potential District capital construction projects in the future that are identified in the proposed WSP will undergo a separate project action SEPA review, unless exempt from SEPA review. Private development proposals or water service for are anticipated to undergo separate SEPA review by the applicable regulatory agency.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

The draft WSP available at https://www.pudwhatcom.org/wp-content/uploads/2021/08/WSP_July21_Website.pdf.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Whatcom County will be asked to provide a Local Government Consistency Statement and incorporate this WSP into its Coordinated Water System Plan.

Washington State Department of Health will be asked to approve this WSP.

No other applications for governmental approval are pending that directly affect this proposal.

10. List any government approvals or permits that will be needed for your proposal, if known.

Whatcom County will be asked to provide a Local Government Consistency Statement and incorporate this WSP into its Coordinated Water System Plan.

Washington State Department of Health will be asked to approve this WSP.

No other applications for governmental approval are pending that directly affect this proposal.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The purpose of the Comprehensive Water System Plan (WSP) is to identify the Public Utility District No. 1 (PUD) of Whatcom County service areas, existing systems, service policies, future needs, and related issues, in a manner consistent with the Whatcom County Comprehensive Plan, WAC 246-290, and other applicable local, state and federal laws. Water System Plans must be updated and submitted to the Washington State Department of Health (DOH) at least every ten years in accordance with the regulatory requirements contained in WAC 246-290-100. Prepared under the guidelines and criteria of DOH, this plan update will become, upon approval by DOH, a part of the Whatcom County Coordinated Water System Plan. DOH approved the PUD's existing Water System Plan in October 2004. Since then, several agency guidance documents, regulatory and case law changes affecting water system plans have occurred including updated drinking water regulations under WAC 246-290, updated Whatcom County Coordinated Water System Plan, the 2003 Municipal Water Law, implementation of the Water Use Efficiency Rule, updated DOH Water System Design Manual and DOH Water System Planning Guidebook. The PUD owns and operates both potable and non-potable water systems. The PUD's potable water systems are the focus of this plan and include Group A Grandview-Northgate Industrial Park (Grandview Northgate) and

Group B Praxair water systems. The WSP will provide planning information to guide the PUD in developing, operating, maintaining, and improving potable water service to its current and future customers. The PUD's non-potable Industrial Water Supply System treats surface water from the Nooksack River to industrial-grade standards for municipal purposes. PUD Industrial-grade water customers are located primarily in the Cherry Point industrial area, but industrial-grade water is also used for fire flow and non-potable demand in other areas including the Grandview-Northgate area. Several PUD customers receiving industrial-grade water in the Cherry Point area have established their own potable water system with on-site facilities to further treat a portion of PUD supplied industrial-grade water for their own potable water needs. These potable water systems are not under the jurisdiction of the PUD nor are they considered by DOH to be consecutive water systems because they do not receive potable water from the PUD. The PUD is only responsible to supply industrial-grade water to these systems according to the terms of the respective water supply agreements. While these systems are not the subject of this plan, they are identified later in Chapter 1 as Neighboring/Adjacent potable water systems. The PUD Board of Commissioners determined that the non-potable Industrial Water Supply System activities of the PUD are not included as an integral part of this WSP. This approach was selected to provide clarity as to which facilities and operations are under the public water system (DOH) regulatory framework. Once adopted, this Water System Plan and its appendices will meet current DOH planning standards and supplant the 2004 Water System Plan. If the current Water System Plan is inadvertently silent on any issue of policy, the Board of Commissioners will separately consider such matters as appropriate.

The draft WSP available at https://www.pudwhatcom.org/wp-content/uploads/2021/08/WSP_July21_Website.pdf.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The PUD's overall water service area boundary
includes all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest boundary, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham, Washington.

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site: ***Not Applicable***

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)? ***Not Applicable***

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. ***Not Applicable***

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. ***Not Applicable***

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. ***Not Applicable***

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
Not Applicable

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? ***Not Applicable***

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: ***Not Applicable***

2. *Air* [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.
Not Applicable

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.
Not Applicable

c. Proposed measures to reduce or control emissions or other impacts to air, if any:
Not Applicable

3. *Water* [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Not Applicable

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Not Applicable

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Not Applicable

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

Not Applicable

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Not Applicable

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

Not Applicable

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Not Applicable

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not Applicable

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Not Applicable

2) Could waste materials enter ground or surface waters? If so, generally describe.

Not Applicable

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Not Applicable

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Not Applicable

4. Plants [help]

Check the types of vegetation found on the site: ***Not Applicable***

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered? ***Not Applicable***

c. List threatened and endangered species known to be on or near the site. ***Not Applicable***

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Not Applicable

e. List all noxious weeds and invasive species known to be on or near the site.

Not Applicable

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. ***Not Applicable***

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site. ***Not Applicable***

c. Is the site part of a migration route? If so, explain. ***Not Applicable***

d. Proposed measures to preserve or enhance wildlife, if any: ***Not Applicable***

e. List any invasive animal species known to be on or near the site. ***Not Applicable***

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. ***Not Applicable***

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Not Applicable

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
Not Applicable

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. ***Not Applicable***

1) Describe any known or possible contamination at the site from present or past uses.

Not Applicable

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Not Applicable

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Not Applicable

4) Describe special emergency services that might be required.

Not Applicable

5) Proposed measures to reduce or control environmental health hazards, if any:

Not Applicable

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Not Applicable

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Not Applicable

3) Proposed measures to reduce or control noise impacts, if any:

Not Applicable

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Not Applicable

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Not Applicable

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

Not Applicable

c. Describe any structures on the site.

Not Applicable

d. Will any structures be demolished? If so, what?

Not Applicable

e. What is the current zoning classification of the site?

Not Applicable

f. What is the current comprehensive plan designation of the site?

Not Applicable

g. If applicable, what is the current shoreline master program designation of the site?

Not Applicable

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Not Applicable

i. Approximately how many people would reside or work in the completed project?

Not Applicable

j. Approximately how many people would the completed project displace?

Not Applicable

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Not Applicable

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Not Applicable

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not Applicable

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not Applicable

c. Proposed measures to reduce or control housing impacts, if any:

Not Applicable

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Not Applicable

b. What views in the immediate vicinity would be altered or obstructed?

Not Applicable

c. Proposed measures to reduce or control aesthetic impacts, if any:

Not Applicable

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Not Applicable

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not Applicable

c. What existing off-site sources of light or glare may affect your proposal?

Not Applicable

d. Proposed measures to reduce or control light and glare impacts, if any:

Not Applicable

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Not Applicable

b. Would the proposed project displace any existing recreational uses? If so, describe.

Not Applicable

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Not Applicable

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

Not Applicable

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Not Applicable

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Not Applicable

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Not Applicable

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Not Applicable

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Not Applicable

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Not Applicable

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Not Applicable

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Not Applicable

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Not Applicable

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

h. Proposed measures to reduce or control transportation impacts, if any:

Not Applicable

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed WSP is a plan that will guide the District in developing, operating, maintaining and improving potable water service and industrial grade water service to current and future District customers, although the District's non-potable Industrial Water Supply System is not an integral part of this WSP.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Not Applicable

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

Not Applicable

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Not Applicable

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Dave Olson

Name of signee Dave Olson

Position and Agency/Organization Cornerstone Management, Inc. President

Date Submitted: 8/3/2021

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

District adoption of the WSP would be unlikely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise.

Proposed measures to avoid or reduce such increases are:

None Necessary

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Adoption of the WSP will not affect plants, animals, fish or marine life.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

None Necessary

3. How would the proposal be likely to deplete energy or natural resources?

The WSP projects an increase in beneficial use of water due to projected customer demand.

Proposed measures to protect or conserve energy and natural resources are:

Continuation of PUD conservation policies, adherence to state conservation standards, and compliance with other appropriate state/federal standards.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Adoption of the WSP is not anticipated to use or directly affect environmentally sensitive areas, or areas designated for governmental protection.

Proposed measures to protect such resources or to avoid or reduce impacts are:

None necessary

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Adoption of the WSP by the District will not directly affect land or shoreline use in a manner incompatible with existing Whatcom County land use plans. Approval of the WSP by the WSDOH and incorporation of the WSP into Whatcom County's Coordinated Water System Plan will enable future County land use plans to be consistent with the GMA by providing a GMA-compliant plan for water system plan for potable water service within the applicable areas of the District. Implementation of the WSP will make development possible in a number of areas in Whatcom County consistent with applicable Whatcom County zoning regulations. All of these projects will need to be consistent with Whatcom County's land use policies and regulations and will require appropriate permits prior to construction. The WSP could affect County and/or City Urban Growth Area Planning and/or development review.

Proposed measures to avoid or reduce shoreline and land use impacts are:

None necessary by the District.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The WSP, if adopted by the District, would not directly affect demands on public services (i.e., potable and non-potable water service by the District), but could affect Whatcom County urban growth area, LAMIRD and rural area planning, and affect the land use planning of local Cities.

Proposed measures to reduce or respond to such demand(s) are:

None necessary by the District.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Adoption of the WSP will not conflict with local, state or federal laws or requirements for the protection of the environment. The WSP is not in conflict with requirements for protection of the environment.

Adoption of Water System Plan

RESOLUTION NO. 799

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY ("DISTRICT") ADOPTING THE COMPREHENSIVE DRINKING WATER SYSTEM PLAN UPDATE 2021

WHEREAS, the Public Utility District No. 1 of Whatcom County ("District") owns and operates both potable and non-potable water systems. The District's potable water systems are the focus of the Drinking Water System Plan 2021 Update which includes Group A Grandview-Northgate Industrial Park and Group B Praxair Water System; and,

WHEREAS, it is a requirement of the Washington State Department of Health (DOH) for the District to establish a comprehensive drinking water system plan satisfactory to DOH and consistent with the regulations provided in Chapter 246-290-100 WAC; and,

WHEREAS, the Washington State Department of Health (DOH) approved the District's existing Water System Plan in October, 2004, since then several agency guidance documents, regulatory and case law changes affecting water system plans have occurred including updated drinking water regulations under 246-290 WAC, updated Whatcom County Coordinated Water System Plan, the 2003 Municipal Water Law, implementation of the Water Use Efficiency Rule, updated DOH Water System Design Manual and DOH Water System Planning Guidebook; and,

WHEREAS, the Comprehensive Drinking Water System Plan Update 2021 ("Plan") provides guidance for planning and managing the Public Utility District No. 1 of Whatcom County's ("District") drinking water system and capital facilities, and it is the responsibility of the District to provide water that meets Washington State drinking water quality standards, to the customer at the meter; and,

WHEREAS, on August 10 2021, the District SEPA Responsible Official issued the District has prepared a Determination of Non Significance for the Drinking Water System Plan 2021 Update, which has been submitted to the Washington State Department of Ecology, Washington State Department of Fish and Wildlife, Whatcom County Public Works, Whatcom County Planning and Development Services, City of Ferndale Community Development, Lummi Nation Natural Resources Department, the Nooksack Indian Tribe, and Birch Bay Water and Sewer District; and,

WHEREAS, on August 24, 2021, the Board of Commissioners adopted Resolution No. 798, Water Use Efficiency Goals and Performance Measures, and in order to continue to provide for the public health and safety of its customers, the Board of Commissioners of the District shall authorize the 2021 update to the Plan.

NOW, THEREFORE, BE IT RESOLVED that Public Utility District No. 1 of Whatcom County, adopts the Drinking Water Comprehensive System Plan 2021 Update, a copy of which is attached to this resolution as "Exhibit A".

ADOPTED by the Commission of the Public Utility District No. 1 of Whatcom County at its regular meeting held on the 14th day of September 2021.

Public Utility District No. 1
of Whatcom County

_____
Atul Deshmane, President/Commissioner

_____
Christine Grant, Secretary/Commissioner

_____
Mike Murphy, Commissioner

APPROVED: SEPTEMBER 14, 2021

10.2 AGREEMENTS

BBWSD Supply Agreement with BP Cherry Point Refinery

COPY

AGREEMENT TO SUPPLY POTABLE WATER BETWEEN BIRCH BAY WATER & SEWER DISTRICT AND BP WEST COAST PRODUCTS, LLC

This potable water supply agreement ("Agreement") is entered the 27th day of May, 2008, by and between the Birch Bay Water & Sewer District ("Birch Bay") and BP West Coast Products, LLC ("BP").

ARTICLE 1. RECITALS

WHEREAS, this Agreement authorizes the sale of potable water from Birch Bay to BP for use at BP's real property described at Exhibit A (the "Property"), as further defined under Section 3.31 below; and

WHEREAS, Birch Bay first entered into an agreement with Whatcom County P.U.D. No. 1 ("P.U.D.") to provide an interruptible supply of potable water for use at the Property 1990, when the refinery at Cherry Point was owned and operated by Atlantic Richfield Company, the predecessor in interest to BP; and

WHEREAS, Birch Bay entered into a Wholesale Water Supply Agreement with the City of Blaine in 2002, thereby securing a more reliable supply of potable water; and

WHEREAS, Birch Bay and the City of Blaine intend to enter into a new potable water supply contract for additional potable water and are currently working together to obtain new groundwater rights; and

WHEREAS, Birch Bay expects that through these joint efforts with the City of Blaine an additional one million gallons per day in groundwater rights will become available for its use; and

WHEREAS, based on the expectation of obtaining these additional groundwater rights, Birch Bay is prepared to sign a new long term agreement to provide a non-interruptible supply of potable water to BP; and

WHEREAS, the parties intend that this Agreement will become effective and binding only upon certain conditions precedent, including the availability to Birch Bay of the aforementioned additional one million gallons per day in ground water rights; and

WHEREAS, the original 1990 agreement between Birch Bay and the P.U.D. to supply water to the Property was amended five times (August 22, 2006, August 14, 2007, January 28, 2008, March 4, 2008, and April 29, 2008) pending entry of a superseding, more permanent agreement; and

WHEREAS, Birch Bay and the P.U.D. will execute a sixth amendment to the original 1990 agreement ("Amendment No. 6") contemporaneously with execution of this

Agreement to provide for the terms of potable water service pending the Vesting Date of this Agreement; and

WHEREAS, BP is within the P.U.D.'s water service area but is not within the water service area of Birch Bay; and

WHEREAS, with the consent of the P.U.D., the parties desire that Birch Bay shall continue to provide potable water service to BP by contracting directly with BP; and

WHEREAS, Birch Bay and BP have now agreed upon a new contractual approach for delivery of water to the Property to reflect changed circumstances since entry of the 1990 water agreement; and

WHEREAS, the parties intend that upon its Vesting Date this Agreement will supersede all prior agreements and amendments pertaining to delivery of potable water from Birch Bay to the P.U.D. for use at the Property; and

WHEREAS, Birch Bay understands that upon the Vesting Date of this Agreement, its Agreement with the P.U.D. to provide potable water service to BP will terminate; and

WHEREAS, the foregoing terms are a material part of this Agreement;

NOW THEREFORE IT IS HEREBY AGREED:

ARTICLE 2. AGREEMENT

In consideration of the mutual promises and covenants herein, Birch Bay agrees to sell and BP agrees to purchase a supply of potable water for use at the Property under the following terms and conditions. All exhibits attached hereto are hereby fully incorporated as terms of this Agreement.

ARTICLE 3. DEFINITIONS

3.01 "Annual Quantity Limit" means the quantity of potable water specified in the Water Demand Forecast each Calendar Year for each of the following three components: (a) Maximum Annual Forecast Demand; (b) Peak Period Maximum Day Forecast Demand; and (c) Off-Peak Maximum Day Forecast Demand. The Annual Quantity Limit for each component shall not exceed Contract Demand for that component.

3.02 "Birch Bay" means the Birch Bay Water & Sewer District.

3.03 "Birch Bay Administrative Costs" means direct or indirect costs incurred by Birch Bay as a result of special requests or special circumstances attributable to providing potable water service to BP or to the provision of unique services for BP related to this Agreement.

3.04 "Birch Bay Comprehensive Water System Plan" means the most recently adopted Birch Bay Comprehensive Water System Plan, including amendments thereto, now or in the future. The Birch Bay Comprehensive Water System Plan and amendments thereto shall be considered "adopted" and effective immediately upon approval by the Board of Commissioners, prior to final approval by state agencies or Whatcom County.

3.05 "BP" means BP West Coast Products, LLC.

3.06 "CPI" means Consumer Price Index (CPI) for All Urban Consumers for the Seattle-Tacoma-Bremerton area.

3.07 "Calendar Year" means the entire twelve (12) month period beginning January 1 and ending December 31.

3.08 "Condition Precedent" means a condition which must be satisfied before this Agreement may become effective.

3.09 "Contract Demand" means the maximum quantity of potable water Birch Bay shall make available to BP in the following three components: (a) Maximum Annual Contract Demand; (b) Peak Period Maximum Day Contract Demand; and (c) Off-Peak Maximum Day Contract Demand. The Contract Demand will not change from year to year, shall not be exceeded, and shall remain fixed for the duration of this Agreement.

3.10 "Curtailment" means a temporary reduction or elimination of water service on grounds identified in Section 8.04.

3.11 "Directly Attributable Excess Costs" means costs to Birch Bay which are unique to providing water service to BP and are incurred in providing services beyond those identified herein. These costs include without limitation the cost of installing additional meters and piping applied solely for the benefit of BP, water quality monitoring required for BP water service, more frequent meter reading than is provided herein, and identifiable Birch Bay Administrative Costs. Directly Attributable Excess Costs may be a component of the Regular Periodic Invoice or may be billed by separate special invoice.

3.12 "District Code" means the code and all resolutions adopted by the Birch Bay Water & Sewer District.

3.13 "Equivalent Living Unit" or "ELU" means a unit estimated to have approximately the same water use as one single-family residence, to be determined pursuant to the Birch Bay Comprehensive Water System Plan and District Code.

3.14 "Fixed Charge" means that portion of the System Capacity Charge as is billed in each Regular Periodic Invoice. The Fixed Charge shall be derived by dividing

the System Capacity Charge by the number of Regular Periodic Invoices issued in one Calendar Year. For example, if the Regular Periodic Invoice is sent to BP on a bimonthly basis, the Fixed Charge shall equal the System Capacity Charge divided by six (6); if the Regular Periodic Invoice is sent to BP monthly, the Fixed Charge shall equal the System Capacity Charge divided by twelve (12). The System Capacity Charge shall be determined as provided in Section 11.01.03.

3.15 "General Facilities Charge(s)" means an identified portion of the charge for one ELU, established by resolution of Birch Bay, for connection to the Birch Bay water system. The General Facilities Charge is based on the applicant's equitable share of the cost of the Birch Bay water system and potentially portions of the City of Blaine water system. The General Facilities Charge is calculated based upon the pro rata share of the cost of existing facilities and facilities planned for construction within ten (10) years as shown in a Comprehensive Water System Plan or Plans, in conformance with RCW 57.08.005(10).

3.16 "gpd" means gallons per day.

3.17 "gpm" means gallons per minute.

3.18 "In District" means water service to customers within Birch Bay's jurisdictional boundary.

3.19 "In District Meter Revenues" means the gross amount of revenue received for maintenance and operation of water service meters through which water is provided to customers within Birch Bay's jurisdictional boundaries.

3.20 "In District Quantity of Water" means the total amount of water provided to customers within Birch Bay's jurisdictional boundaries.

3.21 "In District Water Revenues" means the gross amount of revenue received for providing water service to customers within Birch Bay's jurisdictional boundaries.

3.22 "Maximum Annual Contract Demand" means the maximum quantity of potable water Birch Bay shall make available to BP under this Agreement in any single Calendar Year. The Maximum Annual Contract Demand is 85.93 acre feet (28 million gallons) per Calendar Year.

3.23 "Maximum Annual Forecast Demand" means the maximum quantity of potable water Birch Bay shall make available to BP during the course of a Calendar Year, as established for each Calendar Year of this Agreement by the Water Demand Forecast (Article 7). Maximum Annual Forecast Demand is a metric used for Annual Quantity Limits established from the Water Demand Forecast (Article 7). The Maximum Annual Demand shall be expressed in acre feet per year.

3.24 "Maximum Day Demand" means the maximum quantity of potable water Birch Bay shall make available to supply BP on any single day (midnight to midnight), subject to the terms of this Agreement. The Maximum Day Demand shall be expressed in gallons per day ("gpd").

3.25 "Meter Reading Charge" means a regular charge for reading the meter at each point of connection, to be billed as part of the Regular Periodic Invoice.

3.26 "Notice of Satisfaction" means written notification from Birch Bay to BP that one of the conditions precedent to effectiveness of this Agreement established in Article 4 has been satisfied.

3.27 "Off-Peak Period Maximum Day Contract Demand" is 180,000 gpd, which is the Maximum Day Demand for each day from September 11 through June 14, inclusive

3.28 "Off-Peak Period Maximum Day Forecast Demand" means the Maximum Day Demand from September 11 through June 14, inclusive, established for each such time period during the term of this Agreement by the Water Demand Forecast (Article 7). Off-Peak Maximum Day Forecast Demand is a metric used to determine Annual Quantity Limits established from the Water Demand Forecast.

3.29 "Peak Period Maximum Day Contract Demand" is 75,000 gpd, which is the Maximum Day Demand for each day from June 15 through September 10, inclusive.

3.30 "Peak Period Maximum Day Forecast Demand" means the Maximum Day Demand from June 15 through September 10, inclusive, established for each such time period during the term of this Agreement by the Water Demand Forecast (Article 7). Peak Period Maximum Day Forecast Demand is a metric used to determine Annual Quantity Limits established from the Water Demand Forecast.

3.31 "Property" means the real property to which the potable water supply under this Agreement shall be delivered and used, which real property is described in Exhibit A and which may be amended from time to time by mutual agreement of Birch Bay and BP.

3.32 "psi" means pounds per square inch.

3.33 "P.U.D." means Whatcom County Public Utility District No. 1.

3.34 "Regular Periodic Invoice" means the invoice from Birch Bay to BP for provision of water services under this Agreement to be regularly issued on a monthly, bimonthly, or such other billing time period, but not more frequently than monthly and not less frequently than quarterly, as is determined in the discretion of Birch Bay. The Regular Periodic Invoice will include meter charges, the sum due based on the Volume-Based Water Rate, the Fixed Charge, and any other applicable costs, surcharges, penalties

and interest. In addition, the Regular Periodic Invoice may include Directly Attributable Excess Costs.

3.35 "Seasonal Demand Surcharge" means an additional rate charged for supplying potable water during a particular calendar period, less than a full Calendar Year. Any Seasonal Demand Surcharge shall be included on the Regular Periodic Invoice.

3.36 "System Capacity" means the total capacity or maximum capability of the Birch Bay water system to deliver potable water service to its present and future customers.

3.37 "System Capacity Charge" means an annual charge for the reservation by BP of a portion of Birch Bay's System Capacity. The System Capacity Charge shall be computed as provided in Section 11.01.03. The System Capacity Charge shall be billed to BP in the form of the Fixed Charge on the Regular Periodic Invoice.

3.38 "Total Periodic Water Charges" means the total sum due from BP as stated on the Regular Periodic Invoice.

3.39 "Vesting Date of this Agreement" means thirty (30) days following the issuance of the Notice of Satisfaction indicating that the last of the remaining conditions precedent identified in Article 4 is satisfied.

3.40 "Volume-Based Water Rate" means the rate charged by Birch Bay to BP for providing water to the Property based on the actual quantity of water delivered. The Volume-Based Water Rate shall be calculated and charged as provided in Section 11.01.01. The sum derived from the Volume-Based Water Rate shall be a component of the Regular Periodic Invoice.

3.41 "Water Demand Forecast" means a written five-year forecast specifying, separately for each Calendar Year, the following components: Maximum Annual Forecast Demand, Peak Period Maximum Day Forecast Demand, and Off-Peak Period Maximum Day Forecast Demand.

ARTICLE 4. CONDITIONS PRECEDENT

4.01 Description of Conditions Precedent. The conditions precedent in this Article 4 must be satisfied before the full rights and obligations of this Agreement will vest and be in effect. As defined in Section 4.03 below, only certain rights and obligations will be in effect between the date on which this Agreement is fully signed and the Vesting Date.

4.01.01 Condition Precedent No. 1 – Additional Water Rights. Additional water right permits shall be issued by the Washington Department of Ecology and modifications shall be made to Birch Bay's Agreement For Wholesale Supply of

Water with the City of Blaine, which permits and modifications provide for an additional one million gallons per day or more in ground water rights to Birch Bay beyond what is held by Birch Bay in water right permit or certificate or by contract with the City of Blaine on the date this Agreement is signed.

4.01.02 Condition Precedent No. 2 – Approval of District Water Service Beyond District Boundary. Approval by the Boundary Review Board ("BRB") either by actual decision or by operation of law due to a failure to assume jurisdiction over the matter of Birch Bay's provision of potable water service to BP. All costs incurred by Birch Bay in connection with making application to the BRB and the approval process, and all costs in connection with any appeals from the BRB decision, shall be borne by BP. Birch Bay will request a deposit from BP intended to cover all Birch Bay's expenses associated with the BRB approval process and will provide BP with a detailed accounting of said expected expenses. Birch Bay will follow this same process in the event of any appeal. In the event that, in the sole judgment of Birch Bay, additional funds are necessary for the approval process or any appeal, Birch Bay will request an additional deposit from BP. Birch Bay shall have no obligation to pursue BRB approval or pursue or defend any appeal until its deposit requests are fully funded by BP. Within ninety (90) days of Birch Bay's receipt of an initial project deposit from BP in the amount requested by Birch Bay, Birch Bay shall submit a Notice of Intention to the BRB to serve potable water to BP, which lies beyond its service area boundaries. Following final BRB approval and expiration of any applicable appeal periods, Birch Bay will remit any remaining balance from monies deposited by BP back to BP.

4.02 Notice of Satisfaction. Upon determining that each of these conditions precedent has been met, Birch Bay shall provide a Notice of Satisfaction to BP. A separate Notice of Satisfaction shall be issued for each condition precedent satisfied. The Notice of Satisfaction for each condition precedent shall be issued only when in the sole judgment and discretion of Birch Bay, the subject condition precedent has been satisfied.

4.03 Vesting Date of Agreement. Prior to the Vesting Date of this Agreement, the only rights and obligations in effect will be those related to this Article 4, BP's obligation to prepare and deliver annually a Water Demand Forecast pursuant to Section 7.01, the provisions of Article 15, and Amendment No. 6. The Vesting Date of this Agreement shall be thirty (30) days following the date a Notice of Satisfaction is issued for the last remaining condition precedent identified in Section 4.01 to be satisfied. Following the Vesting Date, all rights and obligations set forth in this Agreement will be in effect and enforceable.

4.04 Failure to Timely Satisfy Conditions Precedent – Agreement Automatically Terminates. In the event Birch Bay has not issued a Notice of Satisfaction for both conditions precedent within one (1) year from the date this Agreement is fully executed, BP shall have the option to terminate this Agreement, in which case all rights and obligations of the Parties shall be extinguished. BP shall exercise this first option, if at all, by written notice to Birch Bay no earlier than the one-year anniversary of the date on which this Agreement is fully executed, and no later than

thirty (30) days thereafter. If BP does not exercise this option during that period, then in the event Birch Bay has not issued a Notice of Satisfaction for both conditions precedent within the second year following the date this Agreement is fully executed, then BP shall again have the option to terminate this Agreement, which second option BP shall execute, if at all, by written notice to Birch Bay no earlier than the two-year anniversary of the date on which this Agreement is fully executed, and no later than thirty (30) days thereafter. If BP does not exercise this second option during that period, then Birch Bay shall have one (1) additional year to issue a Notice of Satisfaction for both conditions precedent. If Birch Bay thereafter does not issue a Notice of Satisfaction for both conditions precedent prior to the three-year anniversary of the date on which this Agreement is fully executed, then the Agreement shall automatically terminate, and all rights and obligations of the Parties hereunder shall be extinguished.

ARTICLE 5. SUPPLY AND PURCHASE OF WATER

5.01 Birch Bay Obligation. Following the Vesting Date of this Agreement, Birch Bay shall supply to BP the Annual Quantity Limit of potable water for that Calendar Year as established in BP's Water Demand Forecast, or such portion thereof as is utilized by BP, according to the terms and conditions herein.

5.02 BP Obligation. BP shall annually purchase from Birch Bay potable water in an amount up to the Annual Quantity Limit for that year as established in BP's Water Demand Forecast, subject to the terms and conditions of this Agreement.

5.03 Restriction on Sale and Use. BP shall not put any water supplied pursuant to this Agreement to beneficial use at a location other than the Property. BP shall use the water supplied pursuant to this Agreement only at the Property; provided, however, that BP is permitted to supply water to any third party operating at the Property ("Third Party Consumer") under the following conditions:

(a) BP will be fully responsible for the delivery of such water and for any resulting liabilities that arise;

(b) BP shall appear, defend and fully indemnify Birch Bay from and against any and all claims or causes of action of any kind or nature arising from BP's provision of water to any Third Party Consumer as authorized herein;

(c) any charges from BP to the Third Party Consumer shall be based on metered water usage by said Third Party Consumer;

(d) BP shall remain fully responsible for timely payment to Birch Bay as provided in this Agreement for any and all water provided to or used by any Third Party Consumer regardless of whether BP itself receives payment from said Third Party Consumer; and

(e) a Third Party Consumer is not a third party beneficiary and shall not have any third party beneficiary rights under this Agreement.

ARTICLE 6. CONTRACT DEMAND

Contract Demand is established as follows. The Contract Demand limit on Maximum Annual Contract Demand shall be 85.93 acre feet per year (28 million gallons). The Contract Demand limit on Peak Period Maximum Day Contract Demand shall be 75,000 gpd. The Contract Demand limit on Off-Peak Maximum Day Contract Demand shall be 180,000 gpd. Contract Demand for any of the aforementioned components shall not be exceeded by BP at any time during the term of this Agreement.

ARTICLE 7. WATER DEMAND FORECAST

7.01 Annual Forecasts and Revisions. On or before August 1 of each Calendar Year following signature of this Agreement, BP shall provide Birch Bay with a Water Demand Forecast. Following the first Water Demand Forecast provided under this Agreement, each subsequent Water Demand Forecast shall be revised from the prior year. The first four (4) years of each revised Water Demand Forecast shall remain unchanged from that year's forecast in the prior Water Demand Forecast, except to the extent modifications are permitted pursuant to Section 7.02. Only for the fifth year of a revised Water Demand Forecast (which will always be the only new year appearing on the annual Water Demand Forecast) may a new water estimate for that year appear. In the event BP fails to provide a revised Water Demand Forecast on or before August 1 of any year following signature of this Agreement, the Water Demand Forecast for the fifth year shall be the same as that of the previous year in the Water Demand Forecast. If BP elects to provide a Water Demand Forecast in any year that provides more than five years' worth of future estimates, BP is permitted to revise in any future Water Demand Forecast any year's estimate beyond the first five appearing in the previous year's Water Demand Forecast.

7.02 Changes in Water Demand Forecast. The Water Demand Forecast shall be subject to the limitations cited in Articles 6 and 9 and may be modified pursuant to the terms of this Section.

7.02.01 At any time, BP may request a change to the Water Demand Forecast in addition to the annual revisions described in Section 7.01. Granting such changes outside the annual revision process set forth in Section 7.01 shall be in the sole discretion of Birch Bay.

7.02.02 In the event that Birch Bay approves a requested change to the Water Demand Forecast that includes a quantity of water higher or lower than that used as the basis for the current System Capacity Charge, the revised quantity shall form the basis for a new Fixed Charge and form the basis for quantity limitations cited in Section 9.02. The new Fixed Charge will take effect in the year in which the quantity change becomes effective.

7.03 Changes in Water Consumption Due to Conservation. In the event that potable water consumption is permanently reduced due to conservation activities at BP, BP may request changes in the Water Demand Forecast and the Fixed Charge. Such requests by BP shall be supported by documentation and information or professional opinions provided by BP to Birch Bay. The requested changes are subject to approval or modification by Birch Bay and shall be made or not made in the sole discretion of Birch Bay.

ARTICLE 8. WATER SERVICE PROVISIONS

8.01 Measurement of Service.

8.01.01 All water service under this Agreement shall be measured by metering equipment owned by Birch Bay. Birch Bay shall furnish, install, maintain, repair, calibrate and read any meters or metering equipment used to measure water delivery under this Agreement. In the event that more than a single meter is installed at the service location, the readings thereof may be billed by adding them together, if appropriate.

8.01.02 Any meter which has registered not more than 3% slow or fast shall be deemed correct and there shall be no adjustment made to the Regular Periodic Invoice. In the event any meter fails to register or registers in error by more than 3%, the Parties shall agree upon the length of time deemed affected by meter malfunction and the quantity of water delivered during such period of time. An appropriate adjustment shall be made to the next Regular Periodic Invoice for the purpose of correcting such errors. Birch Bay shall read all meters at regular intervals consistent with and sufficient to determine volume usage for inclusion on each Regular Periodic Invoice. All billings based on meter readings for less than the time period billed on the Regular Periodic Invoice shall be prorated accordingly.

8.01.03 Birch Bay shall maintain, operate and install a meter that can be remotely read on a daily basis. The cost of the meter shall be paid by BP according to the terms of Amendment No. 6.

8.02 Meter Test. Birch Bay shall periodically inspect and test the installed meters at intervals consistent with its practices for other customers. At the written request of BP, the District shall make additional tests of any or all such meters in the presence of BP's representatives. The cost of such additional tests shall be considered Directly Attributable Excess Costs. No meter shall be placed in service or allowed to remain in service which has an error in registration in excess of 3% under normal operating conditions.

8.03 Change in Volume or Character. Reasonable notice shall be given reciprocally by Birch Bay or BP regarding any material changes anticipated in the volume or characteristics of the water service provided or required. Nothing in this section is intended to modify the rights or obligations of the parties with respect to Water Demand Forecasts or other changes in water consumption described in Article 7. When

Birch Bay deems scheduled interruptions of service in excess of ten (10) hours necessary to install, repair, replace, inspect, or perform any routine maintenance work on Birch Bay's water supply facilities, Birch Bay shall provide BP with ten (10) days' prior written notice of said interruption. All work shall be done, whenever reasonable, without service interruption, reduction, or termination of delivery of water to BP and shall be scheduled at a time convenient to BP whenever reasonable. The written notice shall specify the estimated duration and extent of the scheduled interruption, reduction or termination of water supply and the reasons therefor. Birch Bay shall give BP oral notice of the anticipated interruption prior to sending said written notice thereof.

8.04 Continuity of Service and Force Majeure

8.04.01 Birch Bay shall use reasonable diligence to provide a regular and uninterrupted supply of service at each service location but shall not be liable for damages, breach of contract, or otherwise, to BP for the failure, suspension, diminution or other variations of service occasioned by or in consequence of any scheduled or unscheduled monitoring, maintenance, repair, or replacement activity. The Parties understand and acknowledge that Birch Bay will not provide BP with potable water supply of reliability equivalent to that provided to other Birch Bay customers because Birch Bay is waiving its normal build through and looping requirements pursuant to Article 12 with the consent of BP, which has chosen to provide, operate and maintain potable water storage at the Property sufficient to provide an adequate level of additional reliability as determined by BP.

8.04.02 Birch Bay shall not be liable for damages, breach of contract, or otherwise, to BP for failure to perform any part of this Agreement due to circumstances beyond the reasonable control of Birch Bay, including but not limited to acts of God, fires, floods, drought, earthquakes, wind, lightening, or other catastrophes, or due to quarantine, acts of a public enemy, foreign or domestic, strikes, civil disturbance, changes in law, orders by a court or regulatory agency of competent jurisdiction, or failure, breakdown, or significant unanticipated limitation of sources of supply, transmission or other variation of service. Under any of the foregoing conditions, Birch Bay's obligations under this Agreement shall be suspended or limited to such a degree and for such a period as is reasonable under the circumstances; provided that Birch Bay shall work in good faith to remedy the condition(s) with all reasonable dispatch, to the extent it is within its control.

8.05 Waiver of Liability for Consequential Damages or "Lost Profits." BP hereby knowingly waives any and all rights to, and forever discharges Birch Bay from, any and all claims or potential claims for consequential damages or "lost profits" arising as a result of: (i) the acts or omissions of Birch Bay; (ii), any breach of a term of this Agreement by Birch Bay; or (iii) any other potential cause associated with provision of the water service agreed upon herein.

8.06 Point of Service Connection

8.06.01 The point of delivery for water service provided under this Agreement shall be at the existing connection to BP's potable water distribution system located at the intersection of Grandview Road and Jackson Road. Other points of connection may be requested by BP and shall require prior approval by Birch Bay; provided that, such approval shall not be unreasonably withheld. All costs associated with review, approval and implementation of any request for a different or additional point of connection, including Birch Bay Administrative Costs, shall be borne entirely by BP.

8.06.02 Any additional meters requested by BP shall be paid by BP in accordance with Section 11.01.04.

8.07 Description of Water Service. Subject to all other terms in this Agreement, Birch Bay will deliver potable water to BP at a pressure of not less than the state standard of 30 psi. Birch Bay shall make reasonable efforts to provide 125 gpm of water at 65 psi at the point of delivery. In the event that Birch Bay determines that delivery of water to BP at pressures greater than 30 psi will cause Birch Bay to incur additional costs, the District will provide notice of such additional costs to BP. In the event BP desires assurance of delivery of potable water at above 30 psi, it shall make such a request to Birch Bay in writing. Following receipt of such a request from BP, any costs incurred by Birch Bay in delivering water supply to BP at above 30 psi shall be paid by BP as additional costs. Birch Bay shall not be obliged to incur additional costs for improving water delivery to BP to a pressure above 30 psi without a written request from BP.

8.08 Water Quality. The quality of water supplied pursuant to this Agreement shall be potable and safe for human consumption in accordance with applicable standards governing water quality for Group A water systems, as defined by Washington Administrative Code § 246-290-020, as amended, adopted by and from time to time revised by Federal and State agencies.

8.09 Cross Connection Control. BP shall be subject to Birch Bay's cross connection control program and related code provisions now in place or as amended in the future by Birch Bay.

8.10 Water Rights. Notwithstanding any other provision of this Agreement, Birch Bay's supply of water to BP shall not confer any water rights belonging to Birch Bay or the City of Blaine to BP or to any third parties.

ARTICLE 9. WATER USE LIMITATIONS

9.01 Maximum Contract Limits. Water delivery to BP under this Agreement shall be limited by Contract Demand as established by Maximum Annual Contract Demand, Peak Period Maximum Day Contract Demand, and Off-Peak Period Maximum Day Contract Demand, pursuant to Article 6.

9.02 Annual Quantity Limits. BP shall provide Birch Bay with a Water Demand Forecast specifying its water quantity needs pursuant to Section 7.01. The

Water Demand Forecast for each Calendar Year shall be the Annual Quantity Limit for that Calendar Year. BP's actual usage shall conform to the Annual Quantity Limit established. The Peak Period Maximum Day Forecast Demand shall provide the basis for the System Capacity Charge and Fixed Charge in Section 11.01.03.

9.03 Exceeding Annual Quantity Limit. In the event BP's actual water usage exceeds its Annual Quantity Limit for any component thereof in the first year of this Agreement or in any Calendar Year thereafter, it shall be subject to the surcharge described in Section 11.01.06.

9.04 Excess Deliveries. Notwithstanding the limitations set forth in Section 9.02, Birch Bay may, in its sole discretion, deliver water to BP at a volume or flow rate in excess of the Annual Quantity Limit for one or more components thereof to the extent that the other customers of Birch Bay are not adversely affected; provided that, if the Annual Quantity Limit is exceeded for one or more component thereof, the surcharge described in Section 11.01.06 shall apply. The determination of whether other Birch Bay customers are adversely affected shall be left entirely to the judgment of Birch Bay. Under no circumstances shall BP exceed any component of its Contract Demand.

9.05 Limit on Excess Deliveries. In the event that in the sole determination of Birch Bay, water deliveries in excess of any or all components of the Annual Quantity Limit create or may create adverse effects on Birch Bay's other customers, Birch Bay may require that BP reduce its demand to conform to the water use limitations set forth in Section 9.02. BP shall promptly comply with all such requests from Birch Bay to provide water demand reductions.

9.06 Water Use Efficiency Requirements. BP shall employ all reasonable and cost-effective means to ensure that the potable water supplied pursuant to this Agreement is used efficiently. In response to written notice from Birch Bay, BP shall hire a qualified consultant to perform a water use efficiency audit. This shall occur as deemed necessary by Birch Bay at least once every six (6) years but no more frequently than every five (5) years to assist Birch Bay in complying with the Water Use Efficiency Rule under WAC 246-290-800 *et seq.*, unless more frequently required by future changes to the Water Use Efficiency Rule or other State regulations. Any water use efficiency audit performed as required pursuant to Amendment No. 6 shall also be considered as accomplished pursuant to this Section 9.06 for purposes of complying with frequency requirements. BP shall provide the auditors report and a summary of those efficiency measures recommended for implementation by BP to Birch Bay for review and comment. BP, at its sole discretion, shall choose the efficiency measures to implement. Factors that go into consideration shall include, water efficiency gained, water cost savings, project cost and employee health & safety. BP shall consider the Birch Bay's comments in preparing the final list of efficiency measures to be implemented.

9.07 Water Leakage. BP shall make reasonable efforts to minimize water leakage from its water system. In the event that leakage in any billing period exceeds five (5) percent of BP's water consumption, BP may request an equitable adjustment of its Regular Periodic Invoice, consistent with then-existing Birch Bay policies on leak

adjustments for commercial accounts or excess demand surcharges described in Section 11.01.06. BP's request shall be assessed subject to the following conditions:

(1) BP notified Birch Bay of the leak within twenty-four (24) hours of discovery of the leak; and
(2) BP repairs the leak promptly.

Nothing herein is intended to limit the discretion of the Board of Commissioners in determining whether to grant or deny a request for invoice adjustment based on a water leak.

ARTICLE 10. CURTAILMENT OF WATER DELIVERY

Birch Bay may curtail water service to BP in the event of force majeure or service interruptions described in Section 8.04. In the event Birch Bay determines in its sole judgment and discretion that it is necessary to curtail water deliveries to BP for any reason identified in Section 8.04, Birch Bay, to the extent reasonable and feasible given the nature of the force majeure and/or service interruptions, will provide written notice to BP stating the reason, magnitude of required curtailment and expected duration of such curtailment. BP's period of curtailment shall run concurrent with curtailment on water usage of other similarly situated Birch Bay customers. For curtailment purposes, Birch Bay intends to treat BP in a manner reasonably similar to other customers. During any period of curtailment, Birch Bay, to the extent reasonable and feasible given the nature of the force majeure and/or service interruptions, shall consult with and inform BP and its other customers on a regular basis as to the status, issues and potential operational conditions that exist and/or are projected to exist. Birch Bay may be required by state regulation, now or in the future, to prepare a water shortage response plan. Birch Bay will provide BP with an opportunity to comment during its development of any such plan.

ARTICLE 11. COSTS, FEES AND CHARGES

11.01 Cost Components. Unless otherwise agreed herein, all costs of any kind incurred by the District to provide water service to the Property shall be borne by BP. Such costs shall include the components set forth in this section. Each of these components are intended to be mutually-exclusive and shall be added together to reflect the total cost subject to billing in the Regular Periodic Invoice. The following rates and charges are intended to reflect the aforementioned costs and shall be timely paid by BP.

11.01.01 Volume-Based Water Rate. The Volume-Based Water Rate shall be determined by subtracting the District's total billed In District Meter Revenues from the District's total billed In District Water Revenues, and then dividing the resulting difference by the total In District Quantity of Water sold for the given twelve (12) month period. The twelve (12) month period upon which the Volume-Based Water Rate is calculated shall be selected at the discretion of the Birch Bay; provided that said twelve (12) month period shall end within six (6) months of the Vesting Date of this Agreement for the first year this Agreement is in effect and thereafter within six (6)

months of the date of rate change implementation; and provided further that, Birch Bay shall provide BP with at least one (1) month prior written notice of the vesting date of the rate change. There is no limitation on the frequency of adjustment of the Volume-Based Water Rate.

11.01.02 Meter Reading Charge. BP shall pay a meter reading charge of $2,100.00 per Calendar Year for the first point of connection and $1,050.00 per Calendar Year for each subsequent connection. The meter reading charge shall be computed and billed to BP by dividing the meter reading charge into equal parts for billing purposes; e.g. 6 equal parts for bimonthly billing and 12 equal parts for monthly billing. This charge may be adjusted annually, at the sole discretion of Birch Bay, for changes in the CPI from the date of signing of this Agreement.

11.01.03 System Capacity and Fixed Charge

11.01.03.01 Following the Vesting Date of this Agreement, prior to January 1 of each Calendar Year of the Water Demand Forecast or as soon as possible thereafter, Birch Bay shall determine an annual System Capacity Charge for said Calendar Year for Birch Bay's water service to BP. The System Capacity Charge is a charge for BP's reservation of Birch Bay's System Capacity resulting from BP's rights under this Agreement. The System Capacity Charge shall be the interest-only amortized cost of Birch Bay's General Facilities Charge (at the time of computation) for the Equivalent Living Units required by the water usage reserved for BP in said Calendar Year of the Water Demand Forecast. The Fixed Charge shall be computed and billed to BP by dividing the System Capacity charge into equal parts for billing purposes; e.g. 6 equal parts for bimonthly billing and 12 equal parts for monthly billing. The frequency of billing and the billing period for which Regular Periodic Invoices are sent may be subject to change and shall be in the sole discretion of Birch Bay but shall not be more frequent than monthly or less frequently than quarterly. The System Capacity Charge shall be calculated as follows:

$$\textit{System Capacity Charge} = \textit{General Facilities Charge} \times \frac{\textit{Peak Period Maximum Day Forecast Demand}}{\textit{Vol/ELU} \times \textit{Residential Peaking Factor}} \times i$$

Where:

Vol/ELU = the average volume for one (1) Equivalent Living Unit as determined in the Birch Bay Comprehensive Water System Plan.

i = Monthly General Obligation 20-year Municipal Bond Index published by the Federal Reserve using any twelve (12) month period ending less than three (3) months prior to the date of implementation plus a margin of 200 basis points (2%). Total Interest Rate (GO 20-yr municipal bond index plus 200 basis points) shall not exceed 9%.

Residential Peaking Factor = the residential peaking factor as determined in the Birch Bay Comprehensive Water System Plan

11.01.03.02 In the event that the Fixed Charge for any Calendar Year is not established by Birch Bay, the Fixed Charge for the prior Calendar Year shall be utilized until the new charge is determined.

11.01.04 Costs directly attributable to water service to the Property. Birch Bay will deliver the services and perform the duties imposed by this Agreement for the charges and fees identified herein. In addition to the Volume-Based Water Rate, Fixed Charge, and any applicable costs or surcharges, BP shall pay to the District all Directly Attributable Excess Costs for providing water service to BP.

11.01.05 Birch Bay reserves the right to impose a Seasonal Demand Surcharge consistent with any surcharge imposed on Birch Bay's other customers.

11.01.06 In the event that BP exceeds any component of its Annual Quantity Limit, a surcharge of thirty (30) percent of the Total Periodic Water Charges shall be charged to and paid by BP. The thirty (30) percent surcharge shall be added to the total of BP's Regular Periodic Invoice for each billing period during which BP has exceeded any component of the Annual Quantity Limit.

11.02 Billing and Invoices

11.02.01 Based on the meter readings required in Article 8, and the charges identified in Section 11.01, Birch Bay shall provide a Regular Periodic Invoice of the Total Periodic Water Charges to BP. Billing and collecting shall be performed according to District Code.

11.02.02 BP shall pay Birch Bay's Regular Periodic Invoice for Total Periodic Water Charges and any other invoice authorized by this Agreement in full within three (3) weeks following the date of mailing by Birch Bay. Any Regular Periodic Invoice or portion thereof, or any other invoice or portion thereof, remaining unpaid three (3) weeks after the date of mailing by Birch Bay shall be deemed delinquent. In the event of delinquency, BP shall become subject to Birch Bay billing and collecting fees and charges, and unless BP cures the deficiency no later than 30 days after receipt of written notice of the deficiency from Birch Bay, BP shall be subject to termination of water service for non-payment.

ARTICLE 12 NO BUILD-THROUGH OR LOOPING

Waiver of Build-Through and Looping Requirements. Birch Bay shall not apply any build-through or looping requirements to BP. This waiver is in consideration of BP's provision for on-site storage as referenced in Section 8.04.01.

ARTICLE 13 TERMINATION

13.01 Termination Notice Required. Either Birch Bay or BP may terminate this Agreement upon providing three (3) years prior written notice to the other party. For a termination notice initiated by Birch Bay, Birch Bay may by action of its Board of Commissioners extend its three (3) year termination notice for up to two (2) additional

years at its sole discretion, so long as such Board action is taken within three (3) years following the termination notice. In considering said extension, the Board will take into account B.P.'s progress toward acquiring additional potable water supply, the estimated demand of Birch Bay's other customers during such extension, and any other factors the Board deems appropriate.

13.02 Limitation on Birch Bay Termination. Notwithstanding Section 13.01, under no circumstances will a termination initiated by Birch Bay be effective until at least ten (10) years after the date this Agreement is executed.

ARTICLE 14 DURATION

Unless earlier terminated pursuant to Article 13, the duration of this Agreement shall be thirty (30) years from the Vesting Date of this Agreement. By mutual agreement of BP and Birch Bay, the term of the Agreement may be extended by up to ten (10) years. Said mutual agreement to extend the Agreement shall be reached not later than six (6) months prior to the end of the original term.

ARTICLE 15 ADMINISTRATIVE AND GENERAL PROVISIONS

15.01 Consultation and Communication. Upon BP's request, Birch Bay will make available at the Birch Bay Water and Sewer District Office, all public records that would be subject to disclosure under the Public Records Act, Chapter 42.56 RCW. Birch Bay and BP will meet annually to informally review Birch Bay's multi-year supply and demand forecast and discuss continued potable water supply to the Property during the multi-year forecast period. Birch Bay will include BP's Water Demand Forecast in its analysis of supply and demand.

15.02 Validity of Existing Wholesale Water Supply Agreement. The Parties hereby expressly acknowledge that this Agreement is dependent upon the existence and continuing validity of the Wholesale Water Supply Agreement between Birch Bay and the City of Blaine in its present form or as amended to the satisfaction of Birch Bay.

15.03 Dispute Resolution. Any dispute arising out of the terms and conditions of this Agreement shall first be subject to the following mediation process. If a dispute shall arise, a meeting shall be held promptly between the Parties to attempt in good faith to negotiate a resolution to the dispute. For purposes of this section, "promptly" shall mean within fourteen (14) calendar days of a Party requesting a meeting to resolve a dispute. If within ten (10) days after such meeting the Parties have not succeeded in resolving the dispute, then the dispute shall be mediated. Either Party may provide written notice to the other that the dispute shall be submitted to mediation and a mediator shall be selected. In the event that within seven (7) days of receipt of said written notice the Parties are unable to agree on a mediator, either party may request appointment of a mediator by the Whatcom County Superior Court. Both Parties shall cooperate to assure that mediation occurs in a timely manner and both Parties shall supply all materials provided to the mediator to the other Party at least two (2) days before mediation. Mediation shall not extend beyond one (1) day except by mutual agreement of the

Parties. The cost of the mediator shall be borne equally by the Parties; otherwise each Party shall bear its own costs associated with the mediation including their respective attorney's fees. Engaging in mediation shall not affect any claim, right, remedy, or defense of either Party. Should mediation prove unsuccessful, all claims, rights, remedies and defenses of each Party shall be preserved and litigation may be commenced without further delay.

15.04 Parties Are Separate Entities. The Parties are each separate and independent public entities operating pursuant to the terms and conditions of this Agreement. No agent, employee, or representative of a Party to this Agreement shall be deemed to be an agent, employee, or representative of any other Party for any purpose.

15.05 BP Indemnification of Birch Bay. BP shall indemnify, defend and hold Birch Bay, its officers, agents and employees harmless from all suits, claims or liabilities of any nature, including attorney fees, costs and expenses, for or on account of injuries or damages sustained by any person or property resulting from the negligent acts or omissions of BP or its agents or employees in connection with BP's performance under this Agreement. If suit in respect to the above is filed and judgment is rendered or settlement made requiring payment of damages by Birch Bay or its officers, agents or employees, BP shall pay the same.

15.06 Birch Bay Indemnification of BP. Birch Bay shall indemnify, defend and hold BP, its officers, agents and employees harmless from all suits, claims or liabilities of any nature, including attorney fees, costs and expenses, for or on account of injuries or damages sustained by any person or property resulting from the negligent acts or omissions of Birch Bay or its agents or employees in connection with Birch Bay's performance under this Agreement. If suit in respect to the above is filed and judgment is rendered or settlement made requiring payment of damages by BP or its officers, agents or employees, Birch Bay shall pay the same.

15.07 Notices. All notices and other communications required or permitted to be given by this Agreement must be in writing and must be given and will be deemed received if and when either hand delivered, faxed or mailed to:

DISTRICT	**BP**
General Manager Birch Bay Water & Sewer District 7096 Point Whitehorn Road Birch Bay, WA 98230	Utilities Superintendent BP Cherry Point Refinery 4519 Grandview Road Blaine, WA 98230

or to such other address as the Parties hereto may from time-to-time designate in writing and deliver in a like manner. Facsimile transmission of any signed original document and retransmission of any signed facsimile transmission shall be the same as delivery of an original document.

15.08 Nonwaiver of Breach. Failure of either Party at any time to require performance of any provision of this Agreement shall not limit such Party's right to

enforce such provision, nor shall any waiver of any breach of any provision of this Agreement constitute a waiver of any succeeding breach of such provision or a waiver of such provision itself.

15.09 Severability. If any term or provision of this Agreement or the application thereof to any person, entity or circumstance shall to any extent be invalid or unenforceable, the remainder of this Agreement and the application of such term or provision to persons, entities or circumstances other than those as to which it is held invalid or unenforceable shall not be affected thereby, and each term or provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

15.10 Binding on Successors and Assigns. This Agreement may be recorded by either Party and shall be binding upon the successors and assigns of each Party; subject to the rights and restrictions on resale and use set forth Section 5.03.

15.11 "Days" Means Calendar Days. Unless otherwise specified, all deadlines in this Agreement expressed by a certain number of days shall mean "calendar" days.

15.12 Governing Law. The laws of the State of Washington shall govern any disputes arising under this Agreement.

15.13 Venue. Subject to the mediation requirements herein, any disputes shall be adjudicated in the Superior Court for Whatcom County, Washington, unless otherwise agreed.

15.14 Section Headings. Section headings or captions are for reference only and shall not affect the construction or interpretation of this Agreement.

15.15 Applicability. This Agreement shall supersede any existing agreements between the Parties on the subject of potable water supply as of the date on which this Agreement is signed, subject to the provisions herein delaying termination or superseding of existing agreements until the Vesting Date of this Agreement.

15.16 Entire Agreement – Modifications Must Be in Writing. This Agreement constitutes the entire agreement between the City and the District as to the matters contained herein. No oral or written statements made by either Party prior to or following entry of this Agreement shall be considered a part of this Agreement unless expressly incorporated herein in writing. This Agreement may be modified in writing only, upon mutual agreement of the Parties.

[Signature Page Follows]

Dated this 8th day of May, 2008.

BP

Stephen McCormack
Chief Financial Officer
Cherry Point Refinery

BIRCH BAY WATER & SEWER DISTRICT

Patrick Alesse, President

APPROVED as to form:

Attorney for Birch Bay Water & Sewer District

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

On this 27 day of May, 2008, before me personally appeared Patrick Alesse, to me known to be the President, of the Board of Commissioners of BIRCH BAY WATER & SEWER DISTRICT, and acknowledged that he signed the same as his free and voluntary act and deed, and stated upon oath that he is authorized to execute the foregoing instrument of the said BIRCH BAY WATER & SEWER DISTRICT for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year first above written.

GLENN E. GOLAY
COMMISSION EXPIRES
NOTARY
PUBLIC
JULY 18, 2009
STATE OF WASHINGTON

Print
Name: Glenn E Golay
NOTARY PUBLIC in and for the
State of Washington.
My commission expires:
7/18/09

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

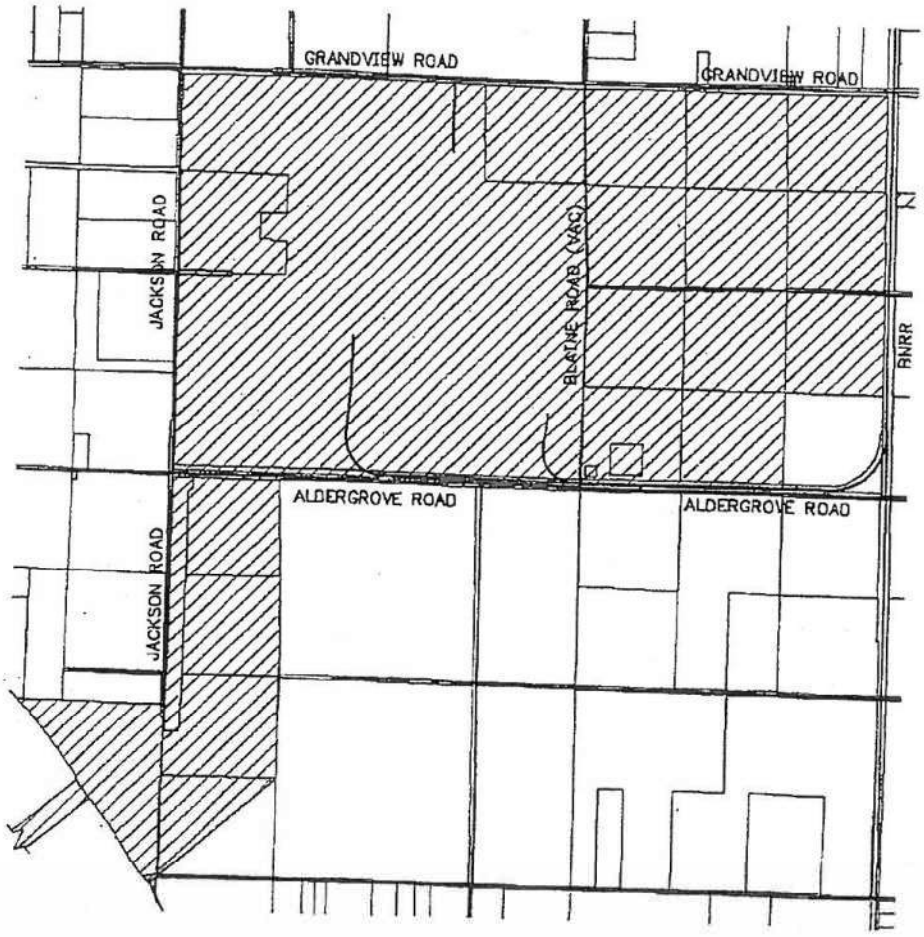
On this 9th day of May, 2008, before me personally appeared Stephen McCormack, to me known to be the Chief Financial Officer of the BP Cherry Point Refinery, and acknowledged that he signed the same as his free and voluntary act and deed, and stated upon oath that he is authorized to execute the foregoing instrument of the BP for the uses and purposes mentioned in the instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year first written above.

DONNA L. ROSE
COMMISSION EXPIRES
NOTARY
PUBLIC
1-17-10
STATE OF WASHINGTON

Print
Name: Donna L Rose
NOTARY PUBLIC in and for the
State of Washington.
My commission expires:
1-17-10

EXHIBIT A - PROPERTY

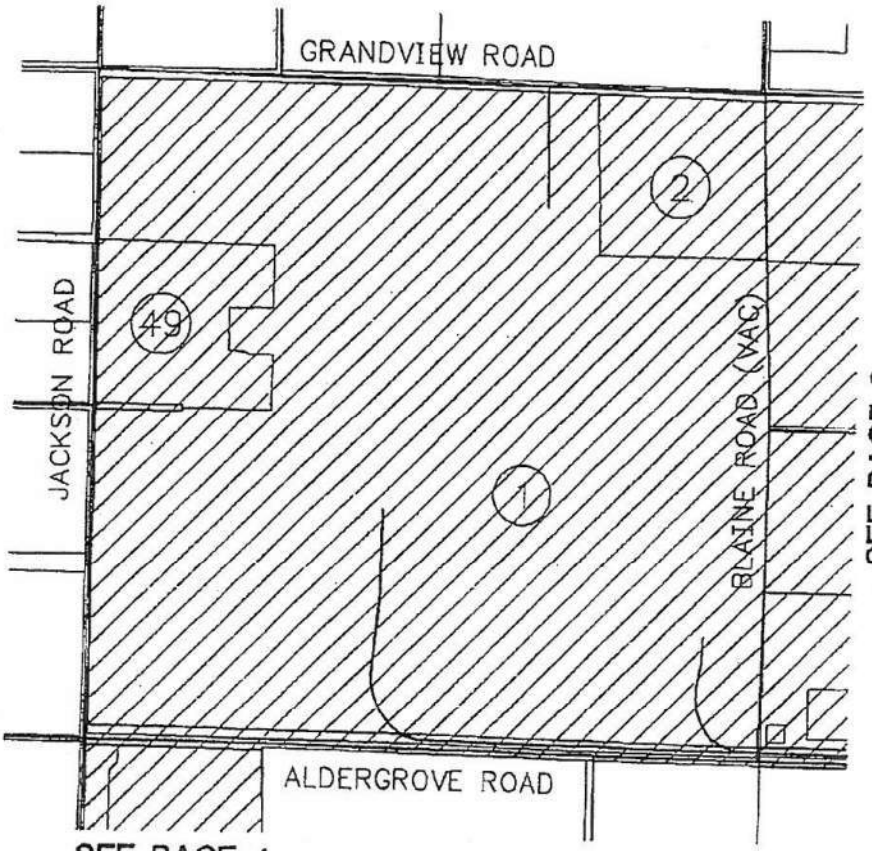


FOR MORE DETAILS, SEE PAGES 2, 3 AND 4

N

SCALE: 1"=2000'

EXHIBIT A - PROPERTY



SEE PAGE 3

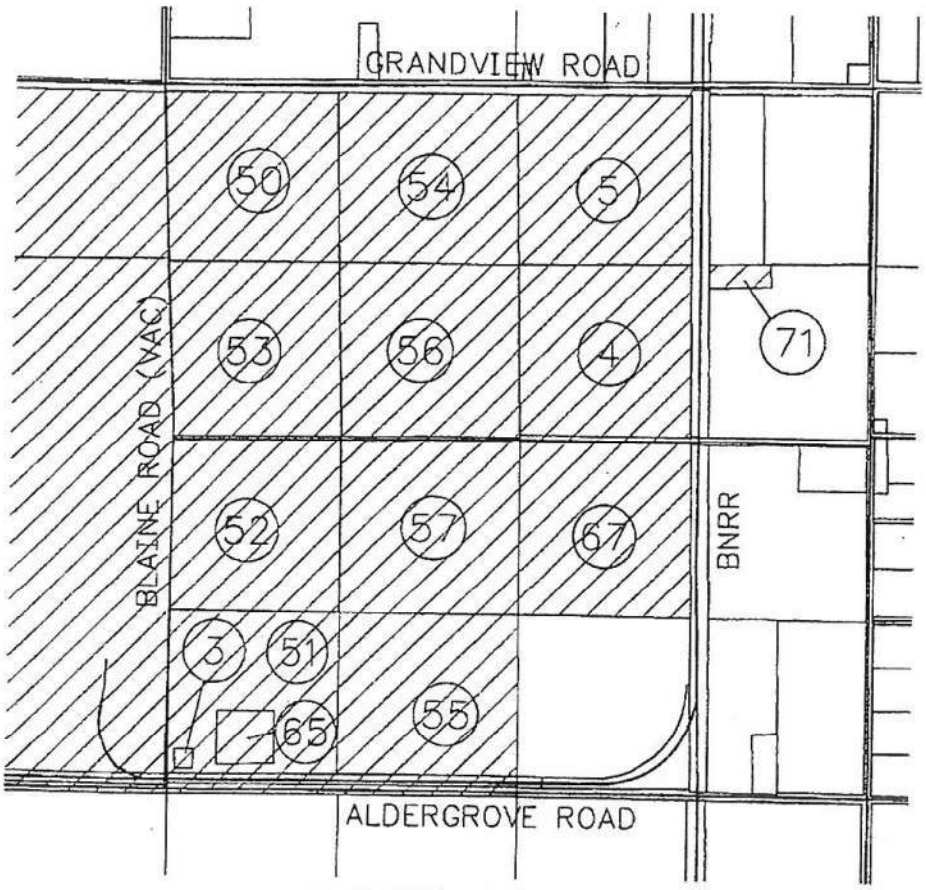
SEE PAGE 4

NO.	PARCEL NUMBER
1	390107-317235
2	390107-480470
49	390107-086341

N

SCALE: 1"=1200'

EXHIBIT A - PROPERTY



SEE PAGE 2

NO.	PARCEL NUMBER
3	390108-018023
65	390108-059042
50	390108-067476
51	390108-071094
52	390108-074214
53	390108-074352
54	390108-191484
55	390108-204081
56	390108-204346
57	390108-208209
4	390108-331342
5	390108-336471
67	390108-334207
71	390108-437396

N

SCALE: 1"=1200'

EXHIBIT A - PROPERTY

SEE PAGE 2

NO.	PARCEL NUMBER
58	390118-052092
6	390118-008350
59	390118-084466
60	390118-086345
61	390118-088200
8	395113-488166

N

SCALE: 1"=1200'

PUD Inter Local Agreement with City of Ferndale

PUBLIC UTILITY DISTRICT No. 1
of Whatcom County

1705 Trigg Road • Ferndale, WA 98248
P: (360) 384-4288 • F: (360) 384-4849
email: info@pudwhatcom.org
www.pudwhatcom.org

August 24, 2010

Greg Young
City Administrator
City of Ferndale
PO Box 936
Ferndale, WA 98248

RE: Grandview Annexation Interlocal Agreement

Dear Mr. Young,

The Board of Commissioners of Public Utility District No. 1 approved the Interlocal Agreement for the Grandview Annexation at their regular meeting this morning. Please find enclosed one fully signed copy. The City will need to record this document with the County. If you have any questions please contact Stephan Jilk at 384-4288 extension 12.

Sincerely,

Ann Grimm

Ann Grimm
Administrative Assistant

Enc.

INTERLOCAL AGREEMENT
BETWEEN THE CITY OF FERNDALE AND
PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY
RELATED TO THE CITY'S 2010 GRANDVIEW ANNEXATION

FINAL

This Interlocal Agreement ("Interlocal") dated August 10, 2010 is between the City of Ferndale ("City"), and the Public Utility District No 1of Whatcom County ("PUD") is made by and between the parties pursuant to the Interlocal Cooperation Act, RCW 39.34 and is based upon the following:

Whereas, the PUD owns and operates a potable and non-potable water system with water for those systems supplied by PUD owned and operated wells ("Grandview Water System") in an area north of the current City limits; and

Whereas, this system provides water services to the Northgate, Grandview, and Interstate 5 Industrial Zones as well as additional properties along I-5, Portal Way, and Grandview Road ("Grandview Service Area" - see Exhibit A); and

Whereas, the PUD holds water rights for the groundwater wells that serve the Grandview Water System; and

Whereas, these water rights have been determined by the PUD to be sufficient to serve those properties included in the Grandview Service Area; and

Whereas, certain Grandview Water System improvements were completed by the PUD through the formation of a Local Utility District ("LUD") in 2004, for which outstanding debt remains; and

Whereas, the overall service area of the PUD Grandview Water System includes properties currently being served by the PUD as a result of the LUD as well as properties not currently being served but within the Grandview Service Area; and

Whereas, the PUD Grandview Service Area is on both the east and west side of Portal Way; and

Whereas, the overall service area of the Grandview Water System is greater than the current Ferndale Urban Growth Area ("UGA") in this portion of the City; and

Whereas, the City is currently considering an annexation of some but not all of the UGA in this area ("2010 Grandview Annexation") and;

Whereas, the 2010 Grandview Annexation will bring certain properties into the City, all of which are located on the east side of Portal Way; and

Whereas, the 2010 Grandview Annexation will bring certain active service areas of the PUD's Grandview Water System into the city limits; and

Whereas, both Parties are interested in establishing an understanding as to the current and future ownership, operation, and expansion of the Grandview Water System following completion of the 2010 Grandview Annexation; and

Whereas, the City's 2010 Grandview Annexation of a portion of the PUD Grandview Service Area necessitates that the parties establish through an Interlocal certain understandings, commitments, undertakings, and obligations to facilitate and to enable the 2010 Grandview Annexation to occur without challenge from the PUD, to establish cooperative relations that may allow the City to acquire all or a portion of the Grandview Water System, and to establish a binding agreement to ensure the protection of the Grandview Water System, the Grandview LUD, and to establish mechanisms that facilitate connection to the City's Water and Wastewater systems.

NOW THEREFORE, THE FOLLOWING IS HEREBY AGREED AND THE PARTIES AGREE TO BE BOUND AS FOLLOWS:

Section 1. Intention of the Parties

It is the intention of the Parties to set out a framework whereby the City could assume ownership and operation of all or some of the Grandview Water System. It is also the intention of the Parties to outline operational control responsibilities between the PUD and the City following the 2010 Grandview Annexation but prior to the assumption of ownership by the City of any portion of the Grandview Water System including but not limited to the provision of new and/or additional water service to customers within the Grandview Water System Service Area, and limitations thereto.

Section 2. Capital and Operational Review

The City is currently undertaking a study of the Grandview Water System infrastructure together with a review of the Grandview Water System operations and financial management. It is anticipated that this study and review will be completed by June 30, 2011. The purpose of this study is to identify the current and future infrastructure needs of the Grandview Water System so the City can determine if the system is viable and in the best interest of the City to acquire, in whole or in part, as well as a review of the operational issues that would become salient following acquisition of the system by the City.

The Study will also address the technical issues that would allow the City to acquire some but not all of the Grandview Water System. This review shall determine the technical aspects of the City initially acquiring the portion of the Grandview Water System located on the east side of Portal Way following the extension of City water lines into the 2010 Grandview Annexation area together with the ability for the PUD to continue providing water service to the remainder of their Service Area located on the west side of Portal Way from their existing wells.

The PUD agrees to cooperate with the City in the completion of the study and will supply all publically available information to aid in the completion of this review. The cost of this review shall be solely the City's responsibility.

Section 3. Assumption of Grandview Water System Ownership and Operation

Following the completion of the studies outlined in Section 2 of this Interlocal and following a determination by the City that it is viable and in the best interests of the City to acquire all or a portion of the Grandview Water

System, the City will enter into negotiations with the PUD leading to the possible transfer of ownership and operation of the Grandview Water System as well as eventual transfer of water rights to the City.

Assuming that the results of the reviews detailed in Section 2 do not identify current deficiencies unacceptable to the City, the transfer of ownership of the eastern portion of the Grandview Water System could occur when a new 100,000 square foot or greater retail customer applies for and is granted a building permit from the City and it is determined by the City that the extension of City water lines into the annexed area can be accomplished and then only pursuant to a City and PUD mutually acceptable agreement for the City's acquisition of all or a portion of the Grandview Water System.

Under this scenario, the City may take over operation of the Grandview Water System Service Area on the eastern side of Portal Way with the supply of water being a developer-paid extension of City water lines into the annexed area. The current PUD water line(s) supplying the eastern portion of the Service Area (from PUD wells located on the western side of Portal Way) would be valved shut or otherwise disconnected, allowing the PUD to supply the Service Area on the western side of Portal Way independently.

It is the intention of the Parties that, in the event that the City does acquire the eastern portion of the Grandview Water System, the PUD will no longer have any operational responsibilities related to the eastern portion Grandview Water System following the transfer to the City as contemplated above. It is the intention of the parties to ensure the ability of the other Party to adequately supply water to the portions of the original Service Area for which either the City or the PUD retain. This may take the form of a transfer of easements, right-of-way or other provisions, possibly including the development of new facilities to replace needed functions for the remaining portion of the PUD Grandview Water System and/or to ensure either ownership or operational control over the water system infrastructure within the bifurcated Service Areas. The parties shall contemporaneously with any such action amend their water system plans and their retail service areas to reflect their respective revised service areas.

While this Interlocal addresses the issues related to the 2010 Grandview Annexation of properties on the eastern side of Portal Way, should the City move to annex the properties within their UGA on the western side of Portal Way, the Parties do hereby pledge to develop a follow-on Interlocal Agreement leading to the acquisition of the entire Grandview Water System by the City as well as the transfer of the PUD water rights to the City.

Should the review contemplated in Section 2 reflect significant current deficiencies in the Grandview Water System, the City and the PUD do hereby pledge to discuss the deficiencies and to develop a strategy to cure such deficiencies that do not result in an undue financial burden on either party. Should the City and the PUD be unable to craft an acceptable strategy for curing identified deficiencies, the City reserves the right to not acquire the Grandview Water System. Additionally, nothing in this Interlocal obligates the PUD to transfer all or a portion of the Grandview Water System to the City.

Section 4. Retention of the LUD Administration

The PUD will continue to manage the LUD, the collection of payments and the payment of debt service for all properties included in the 2004 LUD. Following the acquisition of the Grandview Water System by the City, the PUD will continue to fully administer the 2004 LUD until the outstanding debt is fully retired.

Section 5. PUD Provision of Water Service Following the 2010 Grandview Annexation

Following the completion of the 2010 Grandview Annexation but prior to the possible assumption of the eastern portion of the water system outlined in Section 3 by the City, the PUD will remain the designated water service provider in their Service Area. The City shall not extend any water service to any properties within the

Grandview Service Area, unless approved by the PUD. The City and the PUD will work cooperatively to design, permit, and approve any new connections, expansions or improvements to the Grandview Water System as well as any improvements or expansions to the system by existing customers with the understanding that such improvements shall be to current City standards and paid for by the customer(s) requesting or needing such improvements.

Prior to the issuance of any building permit within the annexed area, the City shall first contact the PUD to ascertain whether there is adequate PUD-supplied potable and non-potable service (which includes without limitation water supply, water pressure and duration of the supply and pressure) for the proposed use. If the PUD determines that there is inadequate water service for the proposed use or structure, the City shall not issue a building permit or zoning approval of any kind, provided however, that in the event that the PUD determines that there is inadequate water supply, the City may, in its discretion, extend water service to the proposed development.

Section 6. Annexation and the Boundary Review Board (BRB)

The purpose and intent of this Interlocal is to address issues relating to the continued supply of water in the PUD Grandview Service Area following the 2010 Grandview Annexation and the circumstances under which the City could potentially acquire and operate some or all of the Grandview Water System. It is agreed between the parties that this Interlocal does address these concerns and therefore the PUD will not invoke BRB jurisdiction for the 2010 Grandview Annexation.

Section 7. Wastewater

Once the 2010 Grandview Annexation is complete, the City will be the permitting agency for all development within the annexed area and may require the connection to the City wastewater system as a precursor for any development and/or expansion of existing uses in this area. It is agreed that the PUD will not provide any new water service in the annexed area without City approval, provided however that the foregoing does not prevent the PUD from expanding its water service to an existing customer within the annexed area provided that the City determines that existing on-site wastewater treatment facilities are able to adequately operate given the potential expansion of use.

Section 8. Recording

This Interlocal is intended to be recorded with the Whatcom County Auditor.

Section 9. Integration, Modification, Waiver

This Interlocal constitutes the complete and final expression of the agreement of the parties relating to the premises, and supersedes all previous contracts, agreements, and understandings of the parties, either oral or written, relating to the premises. This Interlocal cannot be modified, or any of the terms hereof waived, except by an instrument in writing executed by the City and the PUD.

Section 10. Governing Law, Jurisdiction and Venue

This Interlocal shall be governed by the laws of the State of Washington as to all matters, including but not limited to matters of validity, construction, effect, and performance and any action thereon shall be brought in Whatcom County Superior Court.

Section 11. **Neutral Authorship**
Each provision of this Interlocal has been reviewed and negotiated and represents the combined work product of all parties hereto. No presumption or other rules of construction which would interpret the provisions of this Interlocal in favor of or against the party preparing the same shall be applicable in connection with the construction or interpretation of any provisions of this Agreement.

Section 12. **Notice**
All notices and demands shall be in writing and sent to the addresses as follows:

TO CITY: Greg Young, City Administrator
City of Ferndale
PO Box 936
Ferndale WA 98248

TO PUD: Stephan Jilk, General Manager
Public Utility District No. 1 of Whatcom County
1705 Trigg Road
Ferndale WA 98248

Section 13. **Severability**
If a court of competent jurisdiction holds that any part, term, or provision of this Agreement to be illegal or invalid in whole or in part, the validity of the remaining provisions shall not be affected, and the parties' rights and obligations shall be construed and enforced as if the Agreement did not contain the particular provision held to be invalid. If any provision of this Agreement is in direct conflict with any statutory provision of the State of Washington, that provision shall be deemed inoperative and null and void insofar as it may conflict, and shall be deemed modified to conform to such statutory provision.

Section 14. **No Third Party Beneficiaries**
This Interlocal is entered into solely for the benefit of the parties hereto. This Agreement shall confer no benefits, direct or indirect, on any third persons or parties. No person or entity other than the parties of this Agreement themselves may rely upon or enforce any provisions of this Agreement.

IN WITNESS WHEREOF, THE PARTIES HERETO HAVE EXECUTED THIS Interlocal Agreement the date and year first written above.

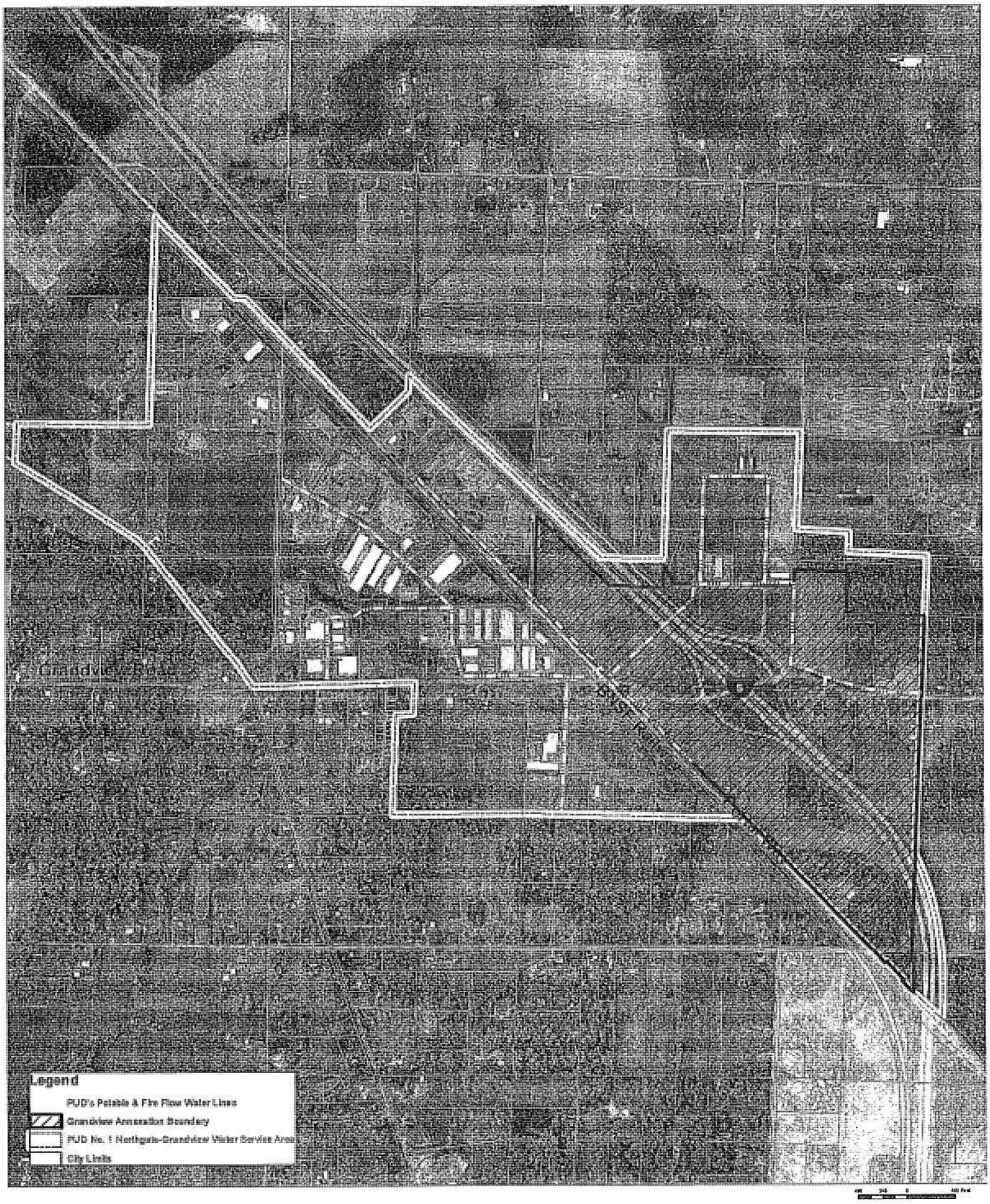
City of Ferndale

By: _____
Gary Jensen, Mayor

Whatcom County PUD No. 1

By: _____
Stephan Jilk, General Manager

Grandview Annexation Area



10.3 COMMENTS ON WATER SYSTEM PLAN

Comments on Water System Plan

Washington State Department of Health (comments and responses letters)

Washington State Department of Ecology (comments and responses letters)

Whatcom County Planning and Development (Comments and Local Government Consistency Review Checklist)

Whatcom County Health Department

Whatcom County Engineering

Consumer Meeting Documentation

WUE Goal Setting Forum Documentation

Adjacent Purveyors Notification Letter

Other

WILSON ENGINEERING

Curt Schoenfelder <cschoenfelder@wilsonengineering.com>

Whatcom PUD #1 Water System Plan Review

McLaughlin, Laura A (DOH) <laura.mclaughlin@doh.wa.gov> Tue, Nov 23, 2021 at 7:50 PM
To: Steve Jilk <stevej@pudwhatcom.org>
Cc: Dave Olson <dave@watersystemservices.net>, Curt Schoenfelder <cschoenfelder@wilsonengineering.com>, "Rodriguez, Richard (DOH)" <Richard.Rodriguez@doh.wa.gov>, Laurette Rasmussen <lrasmuss@co.whatcom.wa.us>

Dear Steve Jilk,

Thank you for submitting the Water System Plan (WSP) for the Whatcom County Public Utility District #1 (the PUD), received in this office on October 7, 2021. We have reviewed the plan and offer the following comments. These comments must be adequately addressed prior to approval of the WSP.

Since Grandview-Northgate Industrial Park (GV-NG) has mostly non-residential connections, DOH cannot monitor growth in terms of equivalent residential units (ERUs), as we typically monitor systems of GV-NG's size. For this reason, we will continue to observe GV-NG's growth, connections, and current demand with an unspecified designation and a requirement for the PUD to submit a project report for each new pipeline extension. At a minimum, the project reports for each new pipeline need to include the estimated demand (that the new pipeline will serve) and a hydraulic analysis.

Capacity and Demand Analysis:

1. Since this planning document presents significant demand uncertainty for future GV-NG connections (typical of industrial systems), please answer the following questions. These questions are intended to help GV-NG demonstrate its managerial capacity to manage water availability in alignment with growth:
    a. In the process of issuing water shares, how will GV-NG know how close it is to its capacity? How will GV-NG make this assessment prior to signing water availability forms? Describe the processes in place.
    b. Has the PUD considered putting the responsibility of determining future water demand of undeveloped parcels on the future property owner or the developer? If so, please describe this process.
    c. For the potential scenario in which future users all have very low demand, does the fee structure allow for GV-NG to maintain financial viability? For example, if very little water were needed to serve buildout, would the PUD make enough money to maintain operations?

2. On page 40, this plan notes that the ADD has increased by an average of approximately 3.2% per year in the existing connections (relatively constant number of connections), based on 2014-2019 data. Does GV-NG expect these existing connections to continue to increase their use by 3.2% per year, which would be added to expected growth (new connections)? This seems high but is possible. Please clarify. Describe your rationale either way. I couldn't understand if this 3.2% was being used to describe increased demand from existing uses or somehow translated to describe increased demand from future connections.

3. There appears to be significant variability in the MDD:ADD ratio from year to year that wasn't captured in the demand analysis. Consequently, the MDD doesn't appear to be conservative. Why wasn't the system able to use daily demand readings from the meter located after the booster pump on the SCADA system to provide a more accurate MDD? Is the PUD going to be able to use this valuable daily data for future planning?

Our records show Grandview Northgate's S01 to have a capacity of 116 GPM. This planning document references a January 1993 pump test indicating a capacity of 91 GPM and a current well pump capacity of 90 GPM. The source capacity will be updated to 90 GPM in Sentry. **No response needed.**

Emergency Response Plan

4. Thank you for including an emergency response plan and reviewing potential effects and response to various disasters that may affect GV-NG. Please address the following:

    a. In the Natural Disasters section on page 95, would it be helpful to consider planning to respond to flood events? Did GV-NG have any learnings during the recent flood event (week of 11/15/21) in Whatcom County? Why is the Flood category left blank in Table 6-5 on page 98?
    b. Laura McLaughlin's phone number should be 253-395-6761.
    c. Consider adding DOH ODW's main office number 253-395-6750, in case I'm not at my desk. Alternatively, just use the main office line to reach me.
    d. Consider adding the DOH Office of Drinking Water's Emergency After-Hours Hotline, 1-877-481-4901.
    e. Is the PUD or GV-NG a member of WAWARN?

O&M Manual:

5. I could not find a Disinfection Byproduct (DBP) Monitoring Plan in your planning document. Please provide a DPB Monitoring Plan. You can find a template on DOH's website, if you don't already have one.

Standard Specifications (Appendix C):

6. Standard Detail Exhibit 1, combination air/vacuum release valve vault/box should drain to daylight when possible and the air discharge should be screened with 24-mesh non-corrodible screen.
7. All vaults (meters, valve, etc.) should be located to prevent flooding, and if possible, with appropriate drainage installed. Flooded vaults pose risks to distribution. Consider adding a note to vault details about minimizing risk of flooding.
8. Specify that coliform is the bacteriological organism being used to test water after pipe disinfection on page 3 of 7 (in addition or instead of fecal coliform) and page 6 of 7 (#13 and #14).
9. I did not see a material specification for all materials in substantial contact with potable water to be ANSI/NSF Standard 61 certified. Either point me toward this specification or include it.
10. Note that a licensed professional engineer must certify that construction conformed to the approved construction documents and submit a Construction Completion Form for Distribution Main Projects to be filed at the PUD or GV-NG. I did not see a note to submit the Construction Completion Report, pressure leakage, and bacteriological report to the PUD.

We hope that you have found these comments to be clear, constructive and helpful in the development of your final draft WSP. In order to expedite the review of your revised submittal, please include a cover letter summarizing how each of the above comments was addressed in the revised WSP and where each response is located (i.e., page numbers, Appendices, etc.).

Regulations establishing a schedule of fees for review of planning, engineering, and construction documents have been adopted (WAC 246-290-990). The total cost is **$491**. An itemized invoice for the review of this project is attached to this email. Please remit complete payment in the form of a check or money order within thirty days of the date of this letter or mail payment to: WSDOH, Revenue Section, PO Box 1099, Olympia WA 99507-1099.

Thank you again for submitting your draft Water System Plan for our review. If you have any comments or questions concerning our review, please contact either Richard Rodriguez or myself.

Sincerely,

Laura McLaughlin, PE
Regional Engineer

Northwest Regional Office

Laura McLaughlin, PE

Gender Pronouns: she/her

Regional Engineer

Office of Drinking Water

Washington State Department of Health

Laura.McLaughlin@doh.wa.gov

253-395-6761 (direct) | www.doh.wa.gov

253-395-6750 (office) | 253-395-6760 (fax)

20211123160814413.pdf
116K

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Office of Drinking Water
INVOICE
Engineering, Planning, and Sanitary Survey Review Form

TO: STEVE JILK
WHATCOM CO PUD #1
1705 TRIGG RD
FERNDALE WA 98248

Invoice Number	N03879
Invoice Date	November 23, 2021
Billing Period	30 days NW

DATE	DESCRIPTION	QTY	COST	AMOUNT
11/23/21	REVIEW AND/OR APPROVAL OF PROJECT REPORT WHATCOM CO PUD NO 1- GRANDVIEW-NORTHGATE WHATCOM COUNTY WATER SYSTEM PLAN SUBMITTAL #: 21-1003	1	1	$491.00
	Total			**$491.00**
	Payment due within 30 days. Interest shall accrue at 1% per month after 30 days.			

Make Checks Payable to Department of Health
Return Lower Portion to:
Department of Health
PO Box 1099
Olympia, WA 98507-1099

Office of Drinking Water
Engineering, Planning, and Sanitary Survey Review Form

NAME	WHATCOM CO PUD #1-GRANDVIEW NORTHGATE
INVOICE NUMBER	N03879
INVOICE DATE	11/23/2021 21-1003 NW
AMOUNT	**$491.00**

DOH Form #331-332

Return to:
Department of Health
Revenue Section
PO Box 1099
Olympia, WA 98507-1099

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).

2 044129 00878

N03879

DOH Staff Name: McLaughin, Laura
Sublog Number: 21-1003
Water System ID: 95680 (PUD), 00638 (GV-NG)

System Name: Whatcom County PUD #1, Grandview Northgate
County: Whatcom

Fixed Fee for Service

WATER SYSTEM PLANS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
(a)(1) Water system plan (new and updated plans) <100 Services	$491		6.0	
Total Water system plans	$491	$0	6	0

SATELLITE MANAGEMENT AGENCY (SMA) PLANS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total SMA	$0	$0	0	0

PROJECT REPORTS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total Project Reports	$0	$0	0	0

CONSTRUCTION DOCUMENTS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total Construction documents	$0	$0	0	0

EXISTING SYSTEM APPROVAL

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total of Existing System approval	$0	$0	0	0

GROUP B AND OTHER EVALUATIONS AND APPROVALS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	No Number Hr 2nd Review
Total of Other evaluations and approvals	$0	$0	0	0
Total Fixed Fee for Service	**$491**	**$0**	**6**	**0**

Hourly fee for service	Fee	# Hr	System Size
Pay This Invoice Amount For This Review	**$491**	**0.0**	**6**	**0**

	Total for All Project Invoices	Total for All Project Hours
Summary	$491	6

December 1, 2021

Laura McLaughlin, PE, Regional Engineer
Richard Rodriguez, Regional Planner
Northwest Regional Office of Drinking Water
Department of Health
20425 72nd Ave. S, Ste 310
Kent, WA 98032-2388
Laura.McLaughlin@doh.wa.gov
Richard.Rodriguez@doh.wa.gov

Re: PUD No. 1 of Whatcom County, Grandview-Northgate Industrial Park, ID #00638
Whatcom County
Water System Plan, Submittal #21-1003

Dear Laura:

In response to your review comments/questions for the above-mentioned project in the email from you dated November 23, 2021 we provide the following responses and information. Your comments/questions are repeated below (in *italics*) and followed by our responses.

Capacity and Demand Analysis:

1. *Since this planning document presents significant demand uncertainty for future GV-NG connections (typical of industrial systems), please answer the following questions. These questions are intended to help GV-NG demonstrate its managerial capacity to manage water availability in alignment with growth:*

    a. *In the process of issuing water shares, how will GV-NG know how close it is to its capacity? How will GV-NG make this assessment prior to signing water availability forms? Describe the processes in place.*
    b. *Has the PUD considered putting the responsibility of determining future water demand of undeveloped parcels on the future property owner or the developer? If so, please describe this process.*
    c. *For the potential scenario in which future users all have very low demand, does the fee structure allow for GV-NG to maintain financial viability? For example, if very little water were needed to serve buildout, would the PUD make enough money to maintain operations?*

a. New applications requesting water service must provide a water system demand estimate based on the intended use of water for the service connection. For commercial or industrial type connections, which all existing and most future potential connections in the GV-NG service area consist of, the application requires an architect/engineer to provide the estimated daily consumption. This estimated water use information is provided in order calculate meter equivalents and size the water meter accordingly, which determines the connection fee, base rate, and use rates (see pg 108). The estimated water use can be compared with the latest year water use and this water system plan to ensure that capacity is available to serve the proposed connection.

b. Yes, as described in the response to a. above, the water service applicant must provide system demand estimates and a complete description of the service desired (see pg 20), which the PUD uses to ensure capacity exists to serve the demand.

c. The PUD reviews financial viability annually, and can adjust the rates, or even the rate structure, accordingly if needed. If financial viability appears to be trending in such a way warranting concern, for any reason including your potential scenario, then adjustments would be made as required ahead of any issues.

2. *On page 40, this plan notes that the ADD has increased by an average of approximately 3.2% per year in the existing connections (relatively constant number of connections), based on 2014-2019 data. Does GV-NG expect these existing connections to continue to increase their use by 3.2% per year, which would be added to expected growth (new connections)? This seems high but is possible. Please clarify. Describe your rationale either way. I couldn't understand if this 3.2% was being used to describe increased demand from existing users or somehow translated to describe increased demand from future connections.*

The assumption is that the existing connections use will level off. Most of the existing connections have had steady water use for the past years and the increases in water use has been driven by a few large users. Most of this large use is industrial/commercial process water and not domestic use requiring potable water. The largest water user historically (Healthy Pet) recently switched their large process water demands to the PUD's nearby industrial water system and thereby significantly reduced the demand on the GV-NG potable system. We expect this trend of transitioning to the non-potable system for process type water demands to continue with both existing and new water users. Therefore, the assumed 3.2% water demand growth projection for the system is likely conservative.

3. *There appears to be significant variability in the MDD:ADD ratio from year to year that wasn't captured in the demand analysis. Consequently, the MDD doesn't appear to be conservative. Why wasn't the system able to use daily demand readings from the meter located after the booster pump on the SCADA system to provide a more accurate MDD? Is the PUD going to be able to use this valuable daily data for future planning?*

The daily demand readings from the meter located after the booster pump were used (Method #1 pg 40) as part of the overall analysis to estimate MDD. Unfortunately, there were data gaps as a result of SCADA failures. The SCADA for the water system does have some issues but is improving and is becoming a higher priority. The PUD is currently evaluating a GV-NG water system-wide meter (source and customer) reading system upgrade. This system upgrade is expected to be purchased and implemented in 2022. Once implemented, more reliable and frequent collection of data will be available for future planning.

Emergency Response Plan:

4. *Thank you for including an emergency response plan and reviewing potential effects and response to various disasters that may affect GV-NG. Please address the following:*

    a. *In the Natural Disasters section on page 95, would it be helpful to consider planning to respond to flood events? Did GV-NG have any learnings during the recent flood event (week of 11/15/21) in Whatcom County? Why is the Flood category left blank in Table 6-5 on page 98?*
    b. *Laura McLaughlin's phone number should be 253-395-6761.*
    c. *Consider adding DOH ODW's main office number 253-395-6750, in case I'm not at my desk. Alternately, just use the main office line to reach me.*
    d. *Consider adding the DOH Office of Drinking Water's Emergency After-Hours Hotline, 1-877-481-4901.*
    e. *Is the PUD or GV-NG a member of WAWARN?*

a. There are no significant flood threats in the GV-NG area, only localized urban flooding from plugged drains etc., and no major flooding issues experienced during the recent flood event. The Flood category in Table 6-5 (pg 98) is filled out in the final Plan with X's in conditions: Access Difficulties, Personnel Problems, Damage to Facilities, Equipment Failure.

b. The phone number is corrected in the final Plan (pg 92).

c. The main office phone number is added under the DOH ODW listing (pg 92).

d. The Emergency After-Hours Hotline phone number is added under the DOH ODW listing (pg 92).

e. PUD/GV-NG is not a member of WAWARN at this time.

O&M Manual:

5. *I could not find a Disinfection Byproduct (DBP) Monitoring Plan in your planning document. Please provide a DPB Monitoring Plan. You can find a template on DOH's website, if you don't already have one.*

The DBP Monitoring Plan is now referenced in Section 6.5 (pg 91) and included in Appendix B.

Standard Specifications (Appendix C):

6. *Standard Detail Exhibit 1, combination air/vacuum release valve vault/box should drain to daylight when possible and the air discharge should be screened with 24-mesh non-corrodible screen.*

Appendix C Standard Detail Exhibit 1 Combination Air Release / Air Vacuum Valve Assembly Detail is revised in the final Plan.

7. *All vaults (meters, valve, etc.) should be located to prevent flooding, and if possible, with appropriate drainage installed. Flooded vaults pose risks to distribution. Consider adding a note to vault details about minimizing risk of flooding.*

The following notes have been added to Standard Detail Exhibits 4b, 7, and 11:

- "Positive drainage away from rim (Typ.)", and

- "Locate meter box in a location to minimize the risk of flooding. Where possible, install 2-in perf pipe wrapped in drainage fabric under meter box and 2-in Sch80 PVC drained to daylight w/ 24-mesh stainless steel screen and SS hose clamp at pipe end".

8. *Specify that coliform is the bacteriological organism being used to test water after pipe disinfection on page 3 of 7 (in addition or instead of fecal coliform) and page 6 of 7 (#13 and #14).*

Coliform has been clarified and/or added in the final Plan.

9. *I did not see a material specification for all materials in substantial contact with potable water to be ANSI/NSF Standard 61 certified. Either point me toward this specification or include it.*

This note has been added to the top of the list in Section 3 (pg 3 of 7).

10. *Note that a licensed professional engineer must certify that construction conformed to the approved construction documents and submit a Construction Completion Form for Distribution Main Projects to be filed at the PUD or GV-NG. I did not see a note to submit the Construction Completion Report, pressure leakage, and bacteriological report to the PUD.*

Chapter 7.4 (pg 103) identifies that the engineer must submit the CCR upon completion of the project. Additional language has been added to Appendix C Water Design Standards, Section 4, Note 16 on pg 6 of 7.

Regards,

Curt Schoenfelder, P.E.
Wilson Engineering, LLC
360-733-6100 ext. 1233
cschoenfelder@wilsonengineering.com

cc: Steve Jilk, General Manager, PUD No.1 of Whatcom County
Dave Olson, Water System Services

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • PO Box 330316 • Shoreline, Washington 98133-9716 • (206) 594-0000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

Sent Via Email

December 7, 2021

Whatcom County PUD #1
c/o Devin B. Crabtree
1705 Trigg Rd
Ferndale, WA 98248
devincrabtree@pudwhatcom.org

RE: Whatcom County PUD #1 (Water System ID 00638N)
2021 Water System Plan Comment Letter

Dear Devin B. Crabtree:

Thank you for the opportunity to review the Whatcom County PUD #1 Water System Plan (WSP), dated September 2021, and received on October 12, 2021. Consistent with the Memorandum of Understanding between the Department of Health (DOH) and Department of Ecology (Ecology), regarding joint review and approval of WSPs, this letter is being sent to your office with Ecology's comments. Specific elements of the WSP review included the Water Rights Self-Assessment as well as additional water rights documentation, including Ecology's water right files and previous Whatcom County PUD #1 WSPs and project reports, as applicable.

Ecology identified the following errors and suggestions.

On page 64, under Section 4, Water Resources, in the fourth paragraph, the quantities described are slightly off. The total instantaneous quantity rate should be 83 cfs (Qi), not 88 cfs, and the annual quantity (Qa) should be 49,831 acre feet per year not 49,231 afy.

In addition, within Table 6-3 on page 71, SW – 6000 Qa should be 3,620 afy, not 3,622 afy. Also within this table, G1-03041, should be G1-*03041 or Groundwater Certificate (GWC) 2505, and should be described as for Irrigation purposes, not Municipal Purpose.

It would be helpful to include all water rights the Whatcom County PUD #1 holds within the water rights self-assessment, not just the water rights associated with Grandview – Northgate Water Association.

On page 74, Section 4.3.5, it sounds like the PUD believes their irrigation water rights can be served anywhere within its service area. However, it is Ecology's understanding that the irrigation portion of their water rights can only be used within the Place of Use described in the

water rights. Please clarify this. It would also be helpful to include a map of the place of use of the irrigation portion of the water rights.

General Information

Water Right Summary

In preparing this comment letter, Ecology reviewed specific elements of Whatcom County PUD #1 WSP, including the Water Right Self-Assessment, as well as additional water rights documentation.

Please see Table 1 below for a comprehensive list of Whatcom County PUD #1 water rights and their respective relationships and limitations as understood by Ecology. Please note that the water rights summarized here include all water rights held by Whatcom County PUD #1, not just the water rights associated with Grandview – Northgate Water Association. This summarized list is not in agreement with the Water Right Self-Assessment in Section 10.4 of the WSP, dated September 2021.

Table 1. Existing Water Rights

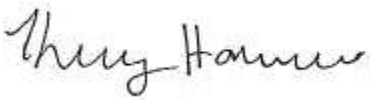
Water Right	Priority Date	Purpose of Use	Instantaneous Rate (cfs/gpm)		Annual Quantity (ac-ft/yr)	
			Additive	Non-Additive	Additive	Non-Additive
S1-00707C	4/16/1965	Manufacturing, Industrial, community & Municipal Supply		50 cfs		22,067
		Irrigation				5,600
S1-00708C	9/27/1968	Manufacturing and Industrial		28 cfs		17880
		Irrigation				664
S1-*11970C	1/13/1953	Manufacturing		5 cfs		N/A
G1-25463	7/8/1993	Industrial and Fire Protection		116 gpm		92.8
G1-*03041	3/5/1953	Irrigation		200 gpm		140
G1-26325	9/11/1991	Fire Protection		1350 gpm		N/A

Service Area

RCW 90.03.386(2) requires that water systems be in compliance with the terms of their WSP and that any alteration of the place of use not be inconsistent with any comprehensive plans or development regulations. An evaluation of any such change should be undertaken if a future expansion of the Whatcom County PUD #1 service area is planned.

Please contact me with any questions you may have at (360) 255-4385 or kelly.hamilton@ecy.wa.gov.

Sincerely,



Kelly Hamilton
Water Master
Water Resources Program

ecc: Richard Rodriguez, Department of Health
Curt Schoenfelder, Wilson Engineering, LLC

PUBLIC UTILITY DISTRICT NO. 1
of Whatcom County

P.O. Box 2308 • 1705 Trigg Road
Ferndale, WA 98248
P: (360) 384-4288 F: (360) 384-4849
email: info@pudwhatcom.org
www.pudwhatcom.org

January 13, 2022

Richard Rodriguez
Washington State Department of Health
NW Drinking Water Operations
20435 72nd Ave.S. Ste. 200
MS-K17-12
Kent, WA 98032-2358

Re: Whatcom County PUD No. 1 (Water System ID 00638N) Water System Plan
Response to Department of Ecology comments

Dear Mr. Rodriguez:

This letter provides Whatcom PUD's response to comments by the Department of Ecology on Whatcom PUD's Comprehensive Drinking Water System Plan Update 2021.

Ecology's comments, set out in a letter from Kelly Hamilton dated December 7, 2021, fall into two categories: errors and suggestions. Whatcom PUD has revised the Comprehensive Drinking Water System Plan Update to correct minor typographical errors, as summarized below.

Ecology's suggestions do not require revisions to this Plan, but Whatcom PUD will take them into consideration in future planning activities relating to non-potable water supplies.

Responses to Ecology's identified errors:

Chapter 4, p. 64, total Qi and Qa: We have corrected typographical errors in Section 4 to reflect the total instantaneous quantity of 83 cubic feet per second (cfs) and the total annual quantity of 49,831 acre-feet per year (afy).

Chapter 4, Table 6-3, SWC 6000: We have relabeled Table 6-3 on page 71 as Table 4-1. We have corrected the typographical error in the table to show the annual quantity for Amended Superseding Certificate 6000 (Record S1-*11970C) as 3,620 afy.

Chapter 4, Table 6-3, G1-*03041C (aka Groundwater Certificate 2505-A): We have corrected the water right record number in (relabeled) Table 4-1 and in the text in Section 4.3.8. As explained in Section 4.3.8, this seasonal irrigation right was acquired by Whatcom PUD in 1993, long before enactment of the 2003 Municipal Water Law, and is used for governmental or governmental proprietary purposes. Under RCW 90.03.015(4), Certificate G1-*03041C is a water right for municipal water supply purposes. To the extent necessary, Whatcom PUD will

Commissioners: Atul Deshmane, Christine Grant, Mike Murphy • Stephan (Steve) Jilk, General Manager

utilize the process in RCW 90.03.560 to request that Ecology amend its records to correctly identify this right as being for municipal water supply purposes.

Responses to Ecology's suggestions:

Include all PUD rights in the Plan's Water Right Self-Assessment: Whatcom PUD will take this suggestion under advisement for future planning. For purposes of this Comprehensive Drinking Water System Plan Update, the self-assessment includes only water rights used for potable water supply. If, in the future, Whatcom PUD submits a planning document relying on other water rights for potable supply, we would update the water right self-assessment accordingly. Please note that (relabeled) Table 4-1 does provide a listing of all water rights held by Whatcom PUD.

Clarify Section 4.3.5 re beneficial use of municipal water rights for irrigation: Ecology appears to question the statement in Section 4.3.5 that the PUD's authority to use its municipal water rights for agricultural irrigation within its service area is recognized by Ecology's Policy 2030. Section 4.3.5 accurately describes Ecology's recognition in Policy 2030 that beneficial use for agricultural irrigation is a legitimate use under a municipal water supply purpose right. Ecology erroneously suggests that there is a described place of use for irrigation under Whatcom PUD's municipal water right certificates that is different from the PUD's service area. The authorized place of use identified in both Certificate S1-00707C and Certificate S1-00708C is "Area served by PUD#1 of Whatcom County." These water right certificates do not identify a separate place of use for irrigation. Additional clarification of Section 4.3.5 is therefore unnecessary.

General Information -- water right summary: Whatcom PUD disputes Ecology's Table 1, which purports to list Whatcom PUD's existing water rights. In particular, we reject Ecology's erroneous characterization of all the PUD's water rights as "non-additive" and Ecology's failure to recognize the Qa for S1-*11970C (3,620 afy). We have corrected minor typographical errors in the Plan's references to some water rights, as outlined above. As corrected, Sections 4.3.1, 4.3.2, 4.3.3, 4.3.4, and 4.3.8, Table 4-1, and the Water Right Self-Assessment Form in Section 10 accurately describe Whatcom PUD's water rights.

Of particular relevance to this Plan Update, we note that the specific *quantities* that Ecology identifies for Superseding Permit G1-25463 are consistent with the additive quantities identified in Section 4.3.8 and the Water Right Self-Assessment.

General Information – service area: Ecology refers to RCW 90.03.386(2), which provides that the effect of WDOH approval of a planning document that describes a municipal water supplier's service area is that the place of use of a surface water right or groundwater right used by the supplier includes any portion of the approved service area if the supplier is in compliance with the terms of the water system plan, and any addition to the place of use is not inconsistent with local comprehensive plans or development regulations. Service area expansions in this Plan are consistent with the requirements of RCW 90.03.386(2). Section 10 of the Plan includes the Local Government Consistency Determination as well as the Declaration of Water Utility Service Area consistent with the Coordinated Water System Plan.

Whatcom PUD appreciates this opportunity to respond to Ecology's comments. We have corrected the minor errors Ecology identified in the Plan. We believe that Ecology's suggestions do not require further action to enable the Department of Health to timely approve this Comprehensive Drinking Water System Plan Update. Please contact me or Dave Olson if you have any questions about this response.

Sincerely,

Stephan Jilk
General Manager

4887-0850-7401 v.1

WHATCOM COUNTY
Health Department

Erika Lautenbach, MPH, Director
Amy Harley, MD, MPH, Co-Health Officer
Greg Thompson, MD, MPH, Co-Health Officer

October 4, 2021

Curt Schoenfelder, P.E.
Wilson Engineering, L.L.C.
805 Dupont Street Suite 7
Bellingham, WA 98225

Dear Curt,

The Whatcom County Health Department has received and reviewed the PUD No. 1 of Whatcom County Grandview-Northgate Industrial Park Water System Plan update. We have completed our review in accordance with the provisions of WAC 246-290 and based on addressing any Washington State Department of Health list of items, hereby approve your plan.

Sincerely,

Sue Sullivan, MBA
Whatcom County Environmental Health Manager

Cc: Clerk of the Whatcom County Council
Whatcom County Engineer
Whatcom County Planning
Washington State Department of Health. Northwest Regional Office

509 Girard Street
Bellingham, WA 98225-4005
360.778.6000 | FAX 360.778.6001
WhatcomCountyHealth

Whatcom County HEALTH Department

1500 North State Street
Bellingham, WA 98225-4551
360.778.6100 | FAX 360.778.6101
www.whatcomcounty.us/health

WHATCOM COUNTY
PUBLIC WORKS DEPARTMENT

Jon Hutchings
Director

James P. Karcher, P. E.
County Engineer
322 N. Commercial Street, Ste 301
Bellingham, WA 98225-4042
Phone: (360) 778-6210
Fax: (360) 778-6211

October 5, 2021

Mr. Curt Schoenfelder, P.E.
Wilson Engineering, LLC
805 Dupont Street, Suite 7
Bellingham, WA 98225

Subject: PUD No. 1, Grandview-Northgate Industrial Park – Water System Plan Update 2021
Whatcom County Public Works Review of 2021 Water System Plan Update

Dear Mr. Schoenfelder:

In reply to your email dated September 29, 2021, I do hereby approve the subject *"Whatcom County PUD No. 1, Grandview-Northgate Industrial Park – Water System Plan Update 2021"* contingent on compliance with the following:

- All work performed in County right-of-way requires a Revocable Encroachment Permit as a prerequisite. See Whatcom County Code (WCC) 12.16 for additional information. Feel free to call 360-778-6220, if you have any questions about this process.
- Depending on the scope of work of any given Wh Co PUD No 1 planned water system facilities project, the County might require:
  - Other permits (e.g., building, conditional use, land disturbance, shoreline) as a prerequisite to project execution, and;
  - Stormwater management documentation, with possible required engineered stormwater management system design.
- To accommodate our desire to minimize disturbance to County roadway surfaces, we encourage PUD No. 1 to locate, where feasible, new or reworked water system facilities outside the existing pavement of any improved County roadway.
- We encourage PUD No. 1 to accomplish, to the maximum extent feasible, its planned water system projects that involve work in County rights-of-way, in advance of our planned road projects. This will minimize roadway patching that would otherwise occur without coordination. We are happy to provide you with our current 6-Yr Transportation Improvement Plan upon request.

In closing, we appreciate your efforts to keep your Franchise Agreement with Whatcom County current, and remain available if you have any concerns or questions about our comments.

Sincerely,

James P. Karcher

James P. Karcher, P.E.
County Engineer

cc: County Council
County Executive
Public Works Director
Engineering Services Development Division Manager
Engineering Services Traffic Division Senior Engineering Technician

2021 BOARD OF COMMISSIONERS
Atul Deshmane, President
Mike Murphy, Vice President
Christine Grant, Secretary

PUBLIC UTILITY DISTRICT NO. 1
of Whatcom County

Agenda for the
Regular Commission Meeting
August 10, 2021
8:00 a.m.
via Zoom/Teleconference

1. Call to Order | Pledge of Allegiance
2. Approval of Agenda
3. Consent Agenda
   a) Approval of the Meeting Minutes of the Regular Meeting of July 27, 2021
   b) Approval of Claims for August 10, 2021
4. Public Comment
5. Old Business
   a) Strategic Planning Update on Initiatives
   b) General Manager Appointment Process Update
   Revised c) Approval of Resolution No. 797 – Amendment to Res. No. 768/Section 7: Commissioner Per Diem Compensation Policy
6. New Business
   a) Drinking Water System Plan Informational Meeting and Announcement of Water Use Efficiency (WUE) Goal Setting
   b) First Half 2021 Financial Report
   c) Amend Exhibit A to Resolution No. 767 – Delegation of Authority – Purchasing Limits
   d) Approve Update to District's Purchasing Policy – Purchasing Limits
   e) Approve Resolution No. 796 – Special Markets Condition
   f) Approve Interlocal Agreement with City of Blaine and Transfer of BPA EEI Budget
   g) Approve District's Medical/Dental Plan Renewal (Sept. 2021 – Aug. 2022) for Non-Bargaining Unit Employees and Commissioners
7. General Manager Report
8. Commissioner Reports
9. Public Comment
10. Adjourn

Until further notice: In-person attendance is not available at this time. All Commissioners will participate by teleconference or via the Zoom platform.

The public meeting can be accessed by internet: https://us02web.zoom.us/j/87835044888
Or by telephone: Dial 1 (253) 215 8782 or 1 (346) 248 7799
Webinar ID: 878 3504 4888

Next Commission Meetings: August 24 & Sept. 14, 2021 Regular Meetings |8:00 a.m.

Access information will be announced - the public may join the meeting by teleconference or Zoom platform.

Contact: Ann Grimm, Commission Clerk at (360) 384-4288 x 27 • www.pudwhatcom.org

procedures for other meetings to be approved. In this context, and pursuant to RCW 54.12.080, it is the Commission which determines what meetings are "for the benefit of the District" and thus what meetings/activities are for the performance of the Commission duties or are for the benefit of the District.

The goal of the revisions to the Policy is to allow the Commission to approve those meetings/activities that are eligible for per diem in advance and prior to such meetings/activities occurring. Resolution No. 797 outlines a cap of the annual per diem allowances, the meetings and events listed in Exhibit A sections 7.1.1-7.17 are for the benefit of the District and attendance by a Commissioner at these meetings or events are for a District purpose and/or are necessary for the performance of the Commissioner's official duties, and it establishes policy and procedures for per diem review and approval.

ACTION: Commissioner Grant motioned approve Resolution No. 797 – Approval of Amendment to Resolution No. 768 Section 7, until the August 10, 2021 meeting. Commissioner Murphy second the motion. Motion passed unanimously.

6. New Business

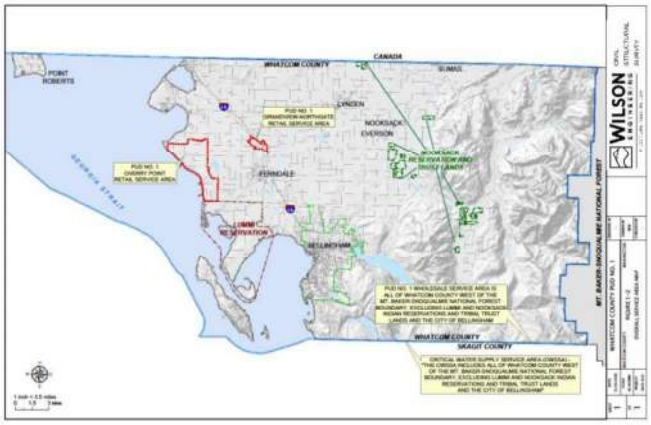
6a) PUD Water System Plan Update

Dave Olson and Curt Schoenfelder of Wilson Engineering provided the next step in the update for approval of the District's *potable water* supply plan. This plan represents the potable/drinking water system for the Grandview/I-5/Northgate Business Center area, which is approved by the State Department of Health and Whatcom County. Highlights included:

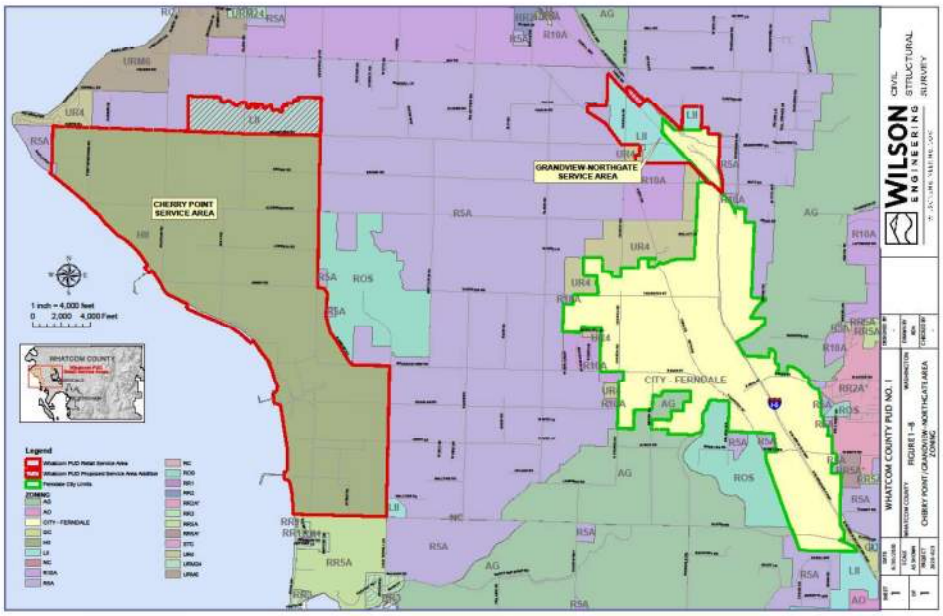
Requirements

- The PUD is authorized to provide water service on a county-wide basis pursuant to RCW Chapter 54. The PUD's authority to plan, maintain, and operate waterworks systems to meet the needs of both private and public users throughout the County is provide in RCW 54.16.030
- The PUD's designated "overall service area boundary" as all of Whatcom County west of the Mt. Baker-Snoqualmie National Forest, excluding the Nooksack Tribal Reservation and Trust Lands, the Lummi Tribal Reservation and Trust Lands, and the City of Bellingham.
- The Coordinated Water System Plan (CWSP), updated in 2016, is a plan for public water systems within the Critical Water Supply Service Area (CWSSA) established by the Whatcom County Council in 1993 under the Coordination Act of 1977.
- Public Water Systems within a CWSSA are required to prepare a Water System Plan (WSP)
- Municipal water suppliers (as defined in RCW 90.03.015) are required by DOH to prepare water system plans in accordance with WAC 246-290-100.
- Water System Plans must be updated and submitted to the Washington State Department of Health (DOH) at least every ten years in accordance with WAC 246-290-100.
- The WSP must designate a retail service area where the utility currently provides or plans to provide direct retail service connections to customers.
- The designation of a retail service area carries with it certain rights and duties:
- A municipal water supplier has the first right of refusal to provide water service within its retail service areas.
- A municipal water supplier has a duty to provide retail water service (duty to serve) to new service connections within its retail service under certain conditions.

Critical Water Supply Service Area (CWSSA)

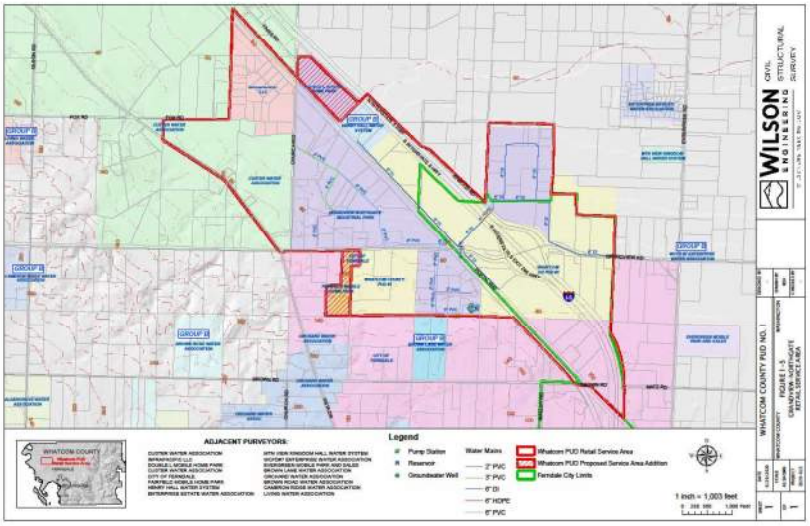


PUD Drinking Water Retail Service Area



Cherry Point Retail Service Area:

Grandview/Northgate Retail Service Area:



Plan Components: Part 1 / 2 (WAC 246.290.100)

- Chapter 1 Description of System
- Chapter 2 Basic Planning Data
  - Review water production & use – update parameters
  - Growth, forecasted
- Chapter 3 System Analysis
  - Review system capacity
  - Identify improvements needed (Ch 8)
- Chapter 4 Water Use Efficiency Program and Water Resource Analysis
  - WUE Goals
  - Monitoring Supply
- Chapter 5 Source Water Protection
  - Wellhead Protection Program (WHP areas and susceptibility Assessment)

Plan Components Part 2 / 2 (WAC 246.290.100)

- Chapter 6 Operations and Maintenance Program
  - Water Quality Monitoring Plan
  - Cross Connection Control Program
- Chapter 7 Development Standards
  - Develop Extension Agreements, Specifications and Details
- Chapter 8 Capital Improvement Program
  - Chapter 3 capacity deficiencies, aging infrastructure
- Chapter 9 Financial Program
- Chapter 10 Supporting Documents

What's Ahead

- Capital Improvements Program: Grandview – Northgate Service Area
  - No major capital improvements were identified for current 10 year planning period
  - Capital Improvements will be required for 10 – 30 year planning period depending on growth
- Potable Water Supply Strategic Planning: Chery Point Service Area

Next Steps:

August 10 — Water Supply Plan (WSP) Informational Meeting
Announcement of Water Use Efficiency (WUE) Public Forum
Public Comment Deadline August 20, 2021

August 24 — Public Forum on Water Use Efficiency Goals and Performance Measures
Adopt WUE Goals and Performance Measures
Adopt Cross-Connection Control Policy

September 24 — Adopt Comprehensive Drinking Water System Plan

Fall 2021 — Submit WSP to WA Dept. of Health for Approval
Submit WSP to WA Dept. of Ecology for Review and Comment
Submit WSP to Whatcom County for Consistency Review
Address Comments from Agencies
Adopt final WSP
Submit WSP to Whatcom County for inclusion in the Coordinated Water System Plan

The Commissioners thanked Olson and Schoenfelder for the presentation and update.

ACTION: No action taken. Information only.

6b) First Half 2021 Financial Report

Finance Director Annette Smith presented an update on the 2021 Capital and Operating Budget to Actual figures for January – June 2021.

2021 Operating Revenue: January – June

Revenue	Current YTD	Prior	Variance	%	½ Budget	Variance	%
Industrial Water Sales	4,439,038	4,596,965	(157,927)	-3.4	4,510,196	(71,158)	-1.6
Grandview Water Sales	124,490	123,204	1,786	1.4	128,785	(3,795)	-2.9
Electric-Pass Thru	4,770,819	4,786,827	(16,007)	-0.3	4,844,408	(73,589)	-1.5
Electric Gen. Serv.	1,101,978	1,070,550	31,428	2.9	1,101,978	-	0.0
Assessment Income	139,067	118,133	20,933	17.7	62,087	76,989	124.0
Interest Income	81,084	133,680	(52,596)	-39.3	131,465	(50,381)	-38.3
Misc. Income	76,345	19,627	56,718	289	213,520	(137,175)	-64.2
TOTAL REVENUE	**$10,733,321**	**10,848,985**	**(115,665)**	**-1.1%**	**10,992,429**	**(259,108)**	**-2.4%**

2021 BOARD OF COMMISSIONERS
Atul Deshmane, President
Mike Murphy, Vice President
Christine Grant, Secretary

PUBLIC UTILITY DISTRICT NO. 1
of Whatcom County

Agenda for the
Regular Commission Meeting
August 24, 2021
8:00 a.m.
via Zoom/Teleconference

1. Call to Order | Pledge of Allegiance
2. Approval of Agenda
3. Consent Agenda
   a) Approval of the Meeting Minutes of the Regular Meeting of August 10, 2021
   b) Approval of Claims for August 24, 2021
4. Public Comment
5. Old Business
   a) General Manager Appointment Process Update
6. New Business
   a) Drinking Water System Plan: Water Use Efficiency (WUE) Goal Setting Public Forum
   b) Approval of Resolution No. 798 – Water Use Efficiency (WUE) Goals
   c) Approval of Work Order No. 2 – Murraysmith – Engineering Services
   d) Approval of Purchase: Metal Clad Switchgear
7. General Manager Report
8. Commissioner Reports
9. Public Comment
10. Adjourn

Until further notice: In-person attendance is not available at this time. All Commissioners will participate by teleconference or via the Zoom platform.

The public meeting can be accessed by internet: https://us02web.zoom.us/j/82902993098
Or by telephone: Dial 1 (253) 215 8782 or 1 (346) 248 7799
Webinar ID: 829 0299 3098

Next Commission Meetings: Sept. 14 and 28, 2021 Regular Meetings |8:00 a.m.
Access information will be announced - the public may join the meeting by teleconference or Zoom platform.
Contact: Ann Grimm, Commission Clerk at (360) 384-4288 x 27 • www.pudwhatcom.org

PLATT ELECTRIC SUPPLY CO	544.23
PORTAL WAY FARM & GARDEN	114.68
PROTHMAN	6,500.00
PUBLIC UTILITY RISK MANAGEMENT SERVICES	7,857.30
PUD #1 OF WHATCOM COUNTY	3,476.00
PUGET SOUND ENERGY, INC	511.31
WA FEDERAL VISA CARD MEMBER SERVICES	3,777.65
WA ST DEPT OF REVENUE	76,933.28
WASHINGTON ALARM, INC.	126.58
WEG TRANSFORMERS USA, LLC	491,797.20
WESTERN CONFERENCE OF TEAMSTERS	9,119.50
WILSON ENGINEERING, LLC	205.00
GRAND TOTAL	**$2,166,291.91**

4. **Public Comment No. 1**
   No comments made.

5. **Old Business**
   5b) Broadband Program Update (due to technical connection issues, agenda item moved up)
   Jilk introduced and welcomed Chris Walker from NoaNet. Walker will be assisting the District as a member of the Port/PUD's Broadband Steering Committee Staff to support the PUD as a consultant and project manager for the broadband program effort.

   5a) General Manager Appointment Process Update
   Sitkin reported that the General Manager Job Description/Profile as begun its advertisement run with Prothman and on several other recruitment platforms including the District's website. The ad run just started last week and it is too early in the timeframe to tell what the response has been. The first round of selections for interviews is September 27.

6. **New Business**
   6a) PUD Drinking Water System Plan Update: Water Use Efficiency Goals and Performance Measures and Public Forum
   Dave Olson (Water Systems, Inc.) and Curt Schoenfelder (Wilson Engineering) provided the next step in the update for approval of the District's *potable water* supply plan. This plan represents the potable/drinking water system for the **Grandview/I-5/Northgate Business Center area**, which is approved by the State Department of Health and Whatcom County. Highlights included:

   Municipal Water Law/Water Use Efficiency
   Washington State Legislature passed the 2003 Municipal Water Law (MWL) to reform the state's water laws, accomplished two things:
   - Added flexibility in the use of municipal water rights to serve growing communities by eliminating some of the risk of losing those municipal rights to the state.
   - In exchange for this water right flexibility, the law requires municipalities to use water efficiently.
     - The Municipal Water Law (RCW 90.03.015(3)) states that Water Use Efficiency (WUE) requirements apply to all water systems defined as municipal water suppliers (MWS).
     - A Municipal Water Supplier is "an entity that supplies water for municipal water supply purposes." (RCW 90.03.015) The PUD is authorized to provide water service on a countywide basis pursuant to RCW Chapter 54. The PUD's authority to plan, maintain, and operate waterworks systems to meet the needs of both private and public users throughout the County is provide in RCW 54.16.030

   Municipal water suppliers are required by State Department of Health to prepare water system plans in accordance with WAC 246-290-100 and updated at least every ten years.
   - *As part of your planning document you* ***must develop and implement a WUE program*** *(WAC 246-290-800(2) and 246-290-810(2)).*
   - *WUE Goals and Performance Measures* ***must be established by the elected governing board*** *or the governing body of the water system (WAC 246-290-830(1)) through a public process (WAC 246-290-830(4)(a) at least every 6 years.*
   - Two Key Components:
     - Supply Side – Between Source and Customer Meters
     - Demand Side – Consumed by the Customers

   Supply Side – Between Source and Customer Meters – Non Revenue
   - Unauthorized Use (fire hydrants or service connections - none)
   - Distribution System Flushing (accounted for with flushing meter)

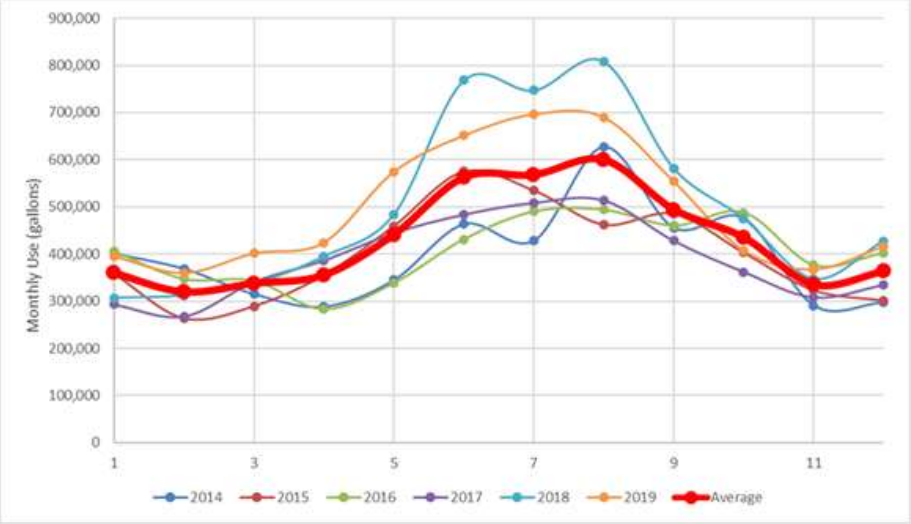
- *Distribution Leakage*: Trending downwards as Table 2-4 illustrates:

Table 2-4 Distribution System Leakage

Year	Total Production (gallons)	Total Metered Consumption (gallons)	Additional Other Authorized Consumption (gallons)	Distribution System Leakage (gallons)	Percent Distribution System Leakage
2014	5,121,418	4,758,726	0	362,692	7.1%
2015	5,027,108	4,811,885	0	215,223	4.3%
2016	5,328,730	4,859,305	0	469,425	8.8%
2017	5,012,046	4,669,359	0	342,687	6.8%
2018	6,179,785	5,987,502	0	192,283	3.1%
2019	6,110,824	5,936,103	0	174,721	2.9%
			2017-2019 3-year Average		**4.3%**

Demand Side – Consumed by the customers through meters

- Plumbing fixture efficiency • Leaks on customer side of meter
- *Seasonal demand* (process/commercial/outdoor use) [see table below]
  Schlotterback added that in the annual report submitted for 2020, Distribution system leakage three-year average (2018/2019 and 2020) was at an all-time low of **1.4%.** Jilk commented that in some of the earlier years noted above, he could report on specific leaks with individual customers who have asked for assistance to repair them.



Chapter 4.8.1 Water Use Efficiency Goals (Recommended)

The PUD conservation objective for the Grandview/Northgate system is to **promote water conservation** in order to maximize current sources. The goals for the planning period are:

- *Maintain 10% or less distribution system leakage (DSL) rate. (2.9% in 2019)*
- *Reduce seasonal outdoor water use by 2 to 3 percent every 2 years, or a minimum of 1 percent per year.*

* Note: this is somewhat subjective due to unique nonresidential customer base

The following describes the **mandatory and supplemental measures** the PUD continues to or will implement for the Grandview/Northgate system.

Program Measures:

1) Source and Service Metering and Meter Calibration:
   a. **Continue** metering of all customers and sources;
   b. **Develop** program for meter calibration or replacement where calibration is not warranted.
2) Leak Detection and Water Accounting:
   a. **Continue** to follow System Leak Detection and Repair Protocol which includes notifying customers of high variance water consumption.
3) Customer Education:
   a. **Continue** conservation tips periodically with customer bills.
   b. **Develop** educational out-reach methods or incentives to lower outdoor seasonal use.

Public Process: Grandview/Northgate Customers were notified and could provide comment on the Water Use Efficiency Goals and Measures (WUE) to be submitted by close of business on August 20, 2021. Jilk reported that no comments on the WUE were received.

Next Steps:

September 14	Adopt Cross-Connection Control Policy Adopt Comprehensive Drinking Water System Plan
Fall 2021	Submit WSP to WA Dept. of Health for Approval Submit WSP to WA Dept. of Ecology for Review and Comment Submit WSP to Whatcom County for Consistency Review Address Comments from Agencies Adopt final WSP Submit WSP to Whatcom County for inclusion in the Coordinated Water System Plan

The Commissioners thanked Olson and Schoenfelder for the presentation and update.

ACTION: No action taken. Information only.

6b) Approve Resolution No. 798 – Water Use Efficiency (WUE) Goals
Resolution No. 798 formally adopts the Water Use Efficiency Goals Program as discussed above, and is required for the update to the District's *Drinking Water* Water System Plan:

Goals:

1. Maintain 10% or less distribution leakage rate for the next six years beginning January 1, 2022; and,
2. Reduce seasonal outdoor water use by two to three percent every two years or a minimum of one percent per year.

Performance Measures:

- Continue to meter all customers and sources.
- Develop and implement a program and schedule for meter replacement where calibration of meter is not warranted.
- Continue to follow System Leak Detection and Repair Protocol, which includes notifying customers of high variance water consumption.
- Continue water consumption history on customer's monthly bill.
- Add conservation tips periodically to customer bills.
- Develop educational outreach methods or incentives to lower seasonal use.

Approval of Resolution No. 798 has no fiscal impact to the District.

ACTION: Commissioner Murphy motioned to APPROVE RESOLUTION NO. 798 ADOPTING WATER USE EFFICIENCY GOALS AND PERFORMANCE MEASURES FOR THE DISTRICT'S DRINKING WATER COMPREHENSIVE WATER SYSTEM PLAN. Commissioner Grant second the motion. Motion passed unanimously.

6c) Approve Work Order No. 2 with Murraysmith for Engineering Services
Walters first provided a brief overview of the *Planning Studies for Capital Improvement Projects* (CIPs) for the Industrial Water System. Previously, Murray Smith and Associates completed the *2010 Water Supply Comprehensive CIP Plan* for the District and determined this summary of improvements:

Water Treatment Plant 1 CIPs	$30,890,000
Water Treatment Plant 2 CIPs	$14,010,000
Distribution CIPs	$44,180,000
Surface Storage	$29,000,000
Total Cost All CIPs:	$118,080,000

One result of the 2010 Plan was a total rebuild of *Water Treatment Plant No. 2*, including a new campus of buildings and new settling basins. Puget Sound Energy owned the substation which powered the water plant. The District purchased the substation and did several reconfigurations to better serve Water Treatment Plant 2.

Distribution CIPs included installing isolation valves (Douglas and Aldergrove Roads), upgrades to "D" Station and cathodic protection. Other projects included installing a parallel distribution main (Douglas & Aldergrove Roads) and a parallel 36" distribution main from the Intertie to "D" Station, but these have not been completed.

In October 2019, RH2 Engineering completed the *Industrial Water Supply System Capital Improvement Plan.* The focus of the projects listed is reliability of service. The summary of Capital Improvement Projects and Costs:

Water Treatment Plant 1 CIPs	$40,375,000
Water Treatment Plant 2 CIPs	$14,010,000
Distribution CIPs	$45,900,000

AGENDA ITEM # 6b
August 24, 2021

PUBLIC UTILITY DISTRICT NO.1
of Whatcom County
1705 Trigg Road ● Ferndale, WA 98248
P: (360) 384-4288 ● F: (360) 384-4849

Memo

To: Commissioners Deshmane, Grant, and Murphy

From: Stephan Jilk – General Manager

Date: August 24, 2021

Re: Approve Resolution No. 798 – Water Use Efficiency Goals

Requested Action – APPROVE RESOLUTION NO. 798 ADOPTING WATER USE EFFICIENCY GOALS AND PERFORMANCE MEASURES FOR THE DISTRICT'S DRINKING WATER COMPREHENSIVE WATER SYSTEM PLAN.

Background – The District owns and operates the Grandview-Northgate-Interstate 5 Industrial Center drinking water and fire water system. In 2003, Washington State Legislature passed the Municipal Water Law (MWL) to address increasing demands on the state's water resources. It accomplished (1) added flexibility in the use of municipal water rights to serve growing communities by eliminating some of the risk of losing those municipal rights to the state; and (2) In exchange for this water right flexibility, the law requires municipalities to use water efficiently.

The *Water Use Efficiency Program* became effective on January 22, 2007, and requires that water systems serving less than 1,000 connections set goal and performance measures to update these goals and measures at least every six years.

The Municipal Water Law (RCW 90.03.015(3)) says the Water Use Efficiency (WUE) requirements apply to all water systems defined as municipal water suppliers. A municipal water supplier is "an entity that supplies water for municipal water supply purposes." (RCW 90.03.015). As part of the update to the District's Water System Plan, a WUE program must be developed and implemented.

The water system at Grandview-Northgate-Interstate 5 Industrial Center meets the criteria of less than 1,000 connections and the following goals and measures for the Water Use Efficiency program are proposed:

Goals:

1. Maintain 10% or less distribution leakage rate for the next six years beginning January 1, 2022; and,
2. Reduce seasonal outdoor water use by two to three percent every two years or a minimum of one percent per year.

Performance Measures:

- Continue to meter all customers and sources.
- Develop and implement a program and schedule for meter replacement where calibration of meter is not warranted.
- Continue to follow System Leak Detection and Repair Protocol, which includes notifying customers of high variance water consumption.
- Continue water consumption history on customer's monthly bill.
- Add conservation tips periodically to customer bills.
- Develop educational outreach methods or incentives to lower seasonal use.

Fiscal Impact – There is no fiscal impact. This Project is funded for 2021, as part of the approved 2021 Water System budget.

Recommended Action – APPROVE RESOLUTION NO. 798 ADOPTING WATER USE EFFICIENCY GOALS AND PERFORMANCE MEASURES FOR THE DISTRICT'S DRINKING WATER COMPREHENSIVE WATER SYSTEM PLAN.

RESOLUTION NO. 798

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY ("DISTRICT") ADOPTING WATER USE EFFICIENCY GOALS AND PERFORMANCE MEASURES

WHEREAS, in 2003 the Washington State passed House Bill 1338, known as the Municipal Water Law (MWL), to address increasing demands on our state's water resources; and

WHEREAS, the Department of Health (DOH) was directed to oversee and enforce the Water Use Efficiency (WUE) Program to help support the goal of ensuring a safe and reliable drinking water supply; and

WHEREAS, the Water Use Efficiency Program became effective on January 22, 2007 and requires that water systems serving less than 1000 connections set goals and performance measures to update these goals and measure at least every six years; and

WHEREAS, the Commissioners have considered staff recommendations on the Districts water use efficiency goals and performance measures;

NOW, THEREFORE, BE IT RESOLVED, that the Commissioners of Public Utility District No.1 of Whatcom County do hereby adopt the following goals and measures that will be included in the District's conservation program:

Goals for WUE Program

1. Maintain 10% or less distribution leakage rate for the next six years beginning January 1, 2022
2. Reduce seasonal outdoor water use by 2 to 3 percent every 2 years, or a minimum of 1 percent per year

Performance Measures for WUE Program

- Continue to meter all customers and sources.
- Develop and implement a program and schedule for meter replacement where calibration of meters is not warranted.
- Continue to follow System Leak Detection and Repair Protocol which includes notifying customers of high variance water consumption.
- Continue water consumption history on customer's monthly bill.
- Add conservation tips periodically to customer bills.
- Develop educational out-reach methods or incentives to lower seasonal use.

ADOPTED by the Commission of the Public Utility District No. 1 of Whatcom County at its regular meeting held on the 24th day of August 2021.

Public Utility District No. 1
of Whatcom County

_____
Atul Deshmane, President/Commissioner

_____
Christine Grant, Secretary/Commissioner

_____
Mike Murphy, Commissioner

WILSON ENGINEERING

Curt Schoenfelder <cschoenfelder@wilsonengineering.com>

Copy of Your Responses: Water Use Efficiency Goal Setting Public Forum *

2 messages

Dave Olson <dave@watersystemservices.net> Thu, Aug 5, 2021 at 12:06 PM
To: Curt Schoenfelder <cschoenfelder@wilsonengineering.com>, Rebecca Schlotterback <rebeccas@pudwhatcom.org>, Ann Grimm <Anngrimm@pudwhatcom.org>

WSP Team,

Please find below for documenting one element of public notice regarding the 8/24/21 Water Use Efficiency Forum.

Dave

From: WA Dept of Health <SurveySupport@doh.wa.gov>
Sent: Thursday, August 5, 2021 11:45 AM
To: Dave Olson <dave@watersystemservices.net>
Subject: Copy of Your Responses: Water Use Efficiency Goal Setting Public Forum *

Your submission has been received for:
Water Use Efficiency Goal Setting Public Forum *

---

1. Water System Name:
Grandview-Northgate Industrial Park

2. ID Number:
00638N

3. County:
Whatcom

4. Contact Name:
Dave Olson

5. Phone Number with Area Code:
360-739-5661

6. Date and Time of Public Forum:
August 24, 2021 @ 8AM

7. Location of Public Forum: Street Address:
General Commissioner Meeting by Zoom

8. Location - City, State and Zip Code:
Ferndale, WA 98248

9. Purpose of Forum:

Water Use Efficiency Goal Setting

10. Where to find more information about goal:

www.pudwhatcom.org

11. Directions to Public Forum:

The Forum will take place during the regularly scheduled commissioner meeting held at 8AM on August 24, 2021. The Zoom meeting information is available on the PUD Website at www.pudwhatcom.org

12. If you would like to receive email confirmation of your submission, please enter your email address in the space below.

dave@watersystemservices.net

Ann Grimm <Anngrimm@pudwhatcom.org> Thu, Aug 5, 2021 at 12:27 PM
To: Dave Olson <dave@watersystemservices.net>, Curt Schoenfelder <cschoenfelder@wilsonengineering.com>, Rebecca Schlotterback <rebeccas@pudwhatcom.org>

Thank you

[Quoted text hidden]

August 3, 2021

Steve Jilk, General Manager
PUD No. 1 of Whatcom County
PO Box 2308
Ferndale, WA 98248

Re: Comprehensive Drinking Water System Plan Update 2021

Dear Steve:

The Draft Drinking Water System Plan Update has been sent to you via sharefile site for review, distribution, and discussion as appropriate prior to the information meeting scheduled for August 10.

Overlapping and adjacent water purveyors, as listed below for both the Grandview-Northgate and Cherry Point service areas, are notified by this letter that the Draft Drinking Water System Plan Update is available for review at the PUD No 1 of Whatcom County website: https://www.pudwhatcom.org/. Any written comments should be sent to the PUD at the address above no later than August 20.

<u>Grandview-Northgate Service Area</u>
City of Ferndale (and UGA)
Custer Water Association
Infra Pacific Water System
Double L Mobile Home Park
Fairfield Mobile Home Park

<u>Cherry Point Service Area</u>
BP-Cherry Point Refinery
Intalco Aluminum Corporation
Phillips 66 Company
Rubicon Property 1 LLC
Pleasant Valley Water System
Old Settlers Water Association
Birch Bay Water & Sewer District
Grandview Beach Water Association
Barleans Water System
Neptune Beach Water Association
Sandy Point Improvement Company

Please feel free to contact me with any comments or questions.

Regards,

Curt Schoenfelder, P.E.
Wilson Engineering, LLC
360-733-6100 ext. 1233
cschoenfelder@wilsonengineering.com

cc:
City of Ferndale, Attn: Michael C. Olinger, PO Box 936, Ferndale, WA 98248
Custer Water Association, Attn: Joy Moore, PO Box 575, Custer, WA 98240
Infra Pacific Water System, Attn: Klaus Klix, 7135 Delta Line Rd, Ferndale, WA 98248
Double L Mobile Home Park, Attn: Julia Olson, PO Box 1268, Ferndale, WA 98248
Fairfield MHP, PO Box 1268, Attn: Julia Olson, Ferndale, WA 98248
BP-Cherry Point Refinery, Attn: James Verburg, 4519 Grandview Ave, Blaine, WA 98230
Intalco Aluminum Corp. WS, Attn: Joseph A. Sarr, 4050 Mountain View Rd, Ferndale, WA 98248
Phillips 66 Company, Attn: David Schmidtz, PO Box 8, Ferndale, WA 98248
Rubicon Property 1 LLC, Attn: Dave A. Olson, 6912 Hannegan Rd, Suite 105, Lynden, WA 98264
Pleasant Valley Water System, Attn: Sarah Berg, 7008 Kickerville Rd, Ferndale, WA 98248
Old Settlers Water Association, Attn: Sara Kuljis, PO Box 604, Custer, WA 98240
Birch Bay Water & Sewer District, Attn: Michael B. Sowers, 7096 Pt Whitehorn Rd, Birch Bay, WA 98230
Grandview Beach Water Assoc Inc, Attn: Rick Hann, 5513 Maple Way, Blaine, WA 98230
Barleans, Attn: Joel Matteson, 3660 Slater Rd, Ferndale, WA 98248
Neptune Beach Water Assoc, Attn: Jeff McKay, 4693 Sucia Dr, Ferndale, WA 98248
Sandy Point Improvement Co, Attn: John W. Mercer, 6912 Hannegan Rd #105, Lynden, WA 98264

From: Tamela S. Smart <TamelaS@lummi-nsn.gov>
Sent: Wednesday, August 11, 2021 10:14 AM
To: Steve Jilk <stevej@pudwhatcom.org>
Cc: Lena A. Tso <LenaT@lummi-nsn.gov>; Jolivette, Stephanie (DAHP) <stephanie.jolivette@dahp.wa.gov>
Subject: Re: Whatcom PUD SEPA Notice & Checklist

Dear Stephan Jilk,
The Lummi Nation has received notice of the proposed PUD No. 1 of Whatcom County Adoption of Comprehensive Drinking Water System Plan and is responding as an affected tribe. The Lummi Nation Tribal Historic Preservation Office (LNTHPO) has reviewed the distributed SEPA documents. Based on this review, the LNTHPO does not wish to comment on this non-project action at this time. We would like to be consulted with on a project by project basis.

These comments are based on the information available at the time of the review. The LNTHPO should review any changes related to the proposed project. Should you have any questions or concerns, please do not hesitate to contact me at 360-927-2944 or via email at tamelas@lummi-nsn.gov.

Sincerely,

Tamela S. Smart, M.A.

Deputy THPO/Compliance Officer

Culture Department, Lummi Nation

2665 Kwina Road, Bellingham, WA 98226

Cell: 360-927-2944

Email: TamelaS@lummi-nsn.gov

Whatcom County Consistency Statement

Washington State Department of Health

Local Government Consistency Determination Form

Water System Name: PUD No. 1 of Whatcom County – Grandview-Northgate Industrial Park PWS ID: 00638N

Planning/Engineering Document Title: Comprehensive Drinking Water System Plan Update 2021 Plan Date: 9/28/21

Local Government with Jurisdiction Conducting Review: Whatcom County Planning & Development

Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development regulations** (WAC 246-290-108). Submittals under Section 105 require a local consistency determination if the municipal water supplier requests a water right place-of-use expansion. The review must address the elements identified below as they relate to water service.

By signing this form, the local government reviewer confirms the document under review is consistent with applicable local plans and regulations. If the local government reviewer identifies an inconsistency, he or she should include the citation from the applicable comprehensive plan or development regulation and explain how to resolve the inconsistency, or confirm that the inconsistency is not applicable by marking N/A. See more instructions on reverse.

	For use by water system	For use by local government
Local Government Consistency Statement	**Identify the page(s) in submittal**	**Yes or Not Applicable**
a) The water system service area is consistent with the adopted land use and zoning within the service area.	Fig 1-8, Tab2-1, 2.9	Yes
b) The growth projection used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 2.9, Chapter 3	Yes
c) For cities and towns that provide water service: All water service area policies of the city or town described in the plan conform to all relevant utility service extension ordinances.	NA	Not Applicable
d) Service area policies for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	Chapter 1.9	Yes
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	Chapter 1.5, various	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

11-17-21

Date

Mark Personius, Planning Director, Whatcom County
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

This checklist may be used to meet the requirements of WAC 246-290-108. When using an alternative format, it must describe all of the elements; 1a), b), c), d), and e), when they apply.

For **water system plans (WSP)**, a consistency review is required for the service area and any additional areas where a municipal water supplier wants to expand its water right's place of use.

For **small water system management programs**, a consistency review is only required for areas where a municipal water supplier wants to expand its water right's place-of-use. If no water right place-of-use expansion is requested, a consistency review is not required.

For **engineering documents,** a consistency review is required for areas where a municipal water supplier wants to expand its water right's place-of-use (water system plan amendment is required). For noncommunity water systems, a consistency review is required when requesting a place-of-use expansion. All engineering documents must be submitted with a service area map (WAC 246-290-110(4)(b)(ii)).

A) Documenting Consistency: The planning or engineering document must include the following when applicable.

a) A copy of the adopted **land use/zoning** map corresponding to the service area. The uses provided in the WSP should be consistent with the adopted land use/zoning map. Include any other portions of comprehensive plans or development regulations that relate to water supply planning.

b) A copy of the **growth projections** that correspond to the service area. If the local population growth projections are not used, explain in detail why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

c) Include water service area policies and show that they are consistent with the **utility service extension ordinances** within the city or town boundaries. *This applies to cities and towns only.*

d) All **service area policies** for how new water service will be provided to new customers.

e) **Other relevant elements** the Department of Health determines are related to water supply planning. See Local Government Consistency – Other Relevant Elements, Policy B.07, September 2009.

B) Documenting an Inconsistency: Please document the inconsistency, include the citation from the comprehensive plan or development regulation, and explain how to resolve the inconsistency.

C) Documenting a Lack of Local Review for Consistency: Where the local government with jurisdiction did not provide a consistency review, document efforts made and the amount of time provided to the local government for review. Please include: name of contact, date, and efforts made (letters, phone calls, and emails). To self-certify, please contact the DOH Planner.

Local Government Consistency Determination Form - Conditions

PUD No. 1 of Whatcom County – Grandview-Northgate Industrial Park
Comprehensive Drinking Water System Plan Update 2021

This local government consistency determination is subject to the following condition:

1. Completion of the "Declaration of Water Utility Service Areas" process (Coordinated Water System Plan Exhibit 4-1) including documenting compliance with the applicable procedures (Exhibit 4-2).

10.4 WATER RIGHTS

Groundwater Water Right Certificates and Well Logs

Northgate –Grandview Water Right

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

APPLICATION FOR CHANGE OF WATER RIGHT

☐ PURPOSE ☒ DIVERSION OR WITHDRAWAL
☒ PLACE ☒ ADDITIONAL POINT OR POINTS

NAME (Whatcom County PUD #1)
PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY
Bus. Tel. (206)733-5810
Home Tel.
Other Tel.

ADDRESS: 2011 Young Street
(CITY): Bellingham
(STATE): WA
(ZIP CODE): 98225

APPLICATION NUMBER: G1-25463
PERMIT NUMBER: G1-25463
CERTIFICATE NUMBER:

DECREED RIGHT (TITLE OF CASE): Oxy Corporation

APPROPRIATIONS MADE (GIVE DATE IF PRIOR TO JUNE 7, 1917 IF SURFACE WATER, OR JUNE 7, 1945 IF GROUND WATER)

RECEIVED JUL 08 1993 DEPT. OF ECOLOGY

IS THE WATER RIGHT RECORDED IN YOUR NAME? ☐ YES ☒ NO
IF NO, GIVE NAME RECORDED UNDER: Oxy Corporation

1. RIGHT CONSISTS OF

WATERS USED FROM (STREAM, LAKE, WELL, OR TRENCH, ETC.): 3 (three) wells and a pond
GALLONS PER MINUTE OR CUBIC FEET PER SECOND: 116 cfm, 92.8 acre feet year
WATER CURRENTLY USED FOR: Industrial, fire protection
TIME OF USE: Continuously

2. LOCATION OF PRESENT POINT OF DIVERSION OR WITHDRAWAL

ENTER BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION OR WITHDRAWAL.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
	7	39	2E	Whatcom

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, COMPLETE THIS SECTION

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

3. LEGAL DESCRIPTION OF LANDS WATER IS USED ON

That portion of the NW 1/4 of Section 7, T39N, R2E, of WM, lying southwesterly of the Great Northern right-of-way. Less roads. Together with and subject to all easements, agreements, covenants and restrictions of record.

SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	COUNTY
7	39N	1E	Whatcom

(ATTACH SEPARATE SHEET IF NECESSARY)

ARE YOU THE LEGAL OWNER OF THE ABOVE DESCRIBED LANDS? ☐ YES ☒ NO
IF NO, EXPLAIN YOUR INTEREST: PUD No. 1 of Whatcom county has been asked, and has agreed to, take over ownership and operation of this water system.

REASONS FOR THE PROPOSED CHANGE
To extend water usage to all area within the Grandview Industrial Zone. See attached map.

A MINIMUM FEE OF $10.00 MUST ACCOMPANY THIS APPLICATION

CONTINUE ON REVERSE SIDE

4. **CHANGE REQUESTED**

CHANGE WATER USE TO	TIME OF USE	GALLONS PER MINUTE OR CUBIC FEET PER SEC
N/A	N/A	N/A

5. **LOCATION OF PROPOSED POINT OF DIVERSION OR WITHDRAWAL**

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.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
Combined point of withdrawal with pond.	7	39N	1E	Whatcom

6. **IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, COMPLETE THIS SECTION**

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

ARE YOU THE OWNER OF THE LAND ON WHICH THE PROPOSED POINT OF DIVERSION OR WITHDRAWAL IS TO BE LOCATED
☐ YES ☒ NO

LEGAL DESCRIPTION OF LANDS WATER IS TO BE USED ON

Area to be served by the PUD.

SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	COUNTY

(ATTACH SEPARATE SHEET IF NECESSARY)

ARE YOU THE LEGAL OWNER OF THE ABOVE DESCRIBED LANDS
☐ YES ☒ NO

IF NO, EXPLAIN YOUR INTEREST
See first page

* PLEASE NOTE LEGAL LAND OWNER SIGNATURE AND APPLICANT SIGNATURE ARE BOTH REQUIRED. IF THE LEGAL LAND OWNER AND APPLICANT ARE THE SAME, PLEASE SIGN IN BOTH PLACES. THANK YOU.

Bradly F. Paulsen
LEGAL LANDOWNER (PLEASE PRINT)

Tom Anderson
APPLICANT'S SIGNATURE

Subscribed and sworn to before me this 6th day of July, 1998.

Carmen D. Barclay
Notary Seal 7/3/98

Bradly F. Paulsen Pres.
LEGAL LANDOWNER SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 3)

CARMEN D. BARCLAY
COMMISSION EXPIRES
NOTARY PUBLIC
MAY 15, 1997
STATE OF WASHINGTON

2802 10TH St., Anacortes, Wa. 98221
LEGAL LANDOWNER'S ADDRESS

AL Jansen
2300 Hummingbird Rd.
Ferndale, Wa

CG1-25463P

PROGRESS SHEET - APPLICATION FOR CHANGE

CERTIFICATE NO. G1-25463

NAME: Public Utility District No. 1 of Whatcom County
2011 Young Street
Bellingham, WA 98225

Appurtenant to Water Right Certificate No. G1-25463P

PURPOSE OF APPLICATION to change the place of use and add addition point of withdraw

Application originally received 7-8-93 Fee Paid $10 7-8-93

Returned for completion or correction _____

returned _____

PUBLICATION: OK'd by _____ Date _____ Notice Sent 9/14/93

Protests _____ by _____

_____ by _____

_____ by _____

Affidavit received and checked 11/12/93 Time expires 12/11/93

EXAMINATION: Made _____ by _____

CERTIFICATE: OK'd for issue by _____ Date _____

Statement of fee mailed _____ Amount $5 _____

Fee received _____

Certificate of Change Issued _____ No. _____

ECY 070-23

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PROGRESS SHEET

☐ SURFACE WATER ☒ GROUND WATER

COMPUTER INPUT
☐ APPLICATION
☐ PERMIT
☐ CERTIFICATE
☐ OTHER

NAME: Oxy Corp.,			TELEPHONE NO.: 293-5180
ADDRESS: 2202 10th St., P.O. Box 789	(CITY): Anacortes	(STATE): Wa	(ZIP CODE): 98221
ASSIGNED TO		TELEPHONE NO.	DATE ASSIGNED
ADDRESS	(CITY)	(STATE)	(ZIP CODE)
APPLICATION NO.: G [illegible]	PERMIT NO.: G125463P		CERTIFICATION NO.
DATE AMENDED	DATE CANCELLED		W.R.I.A.

APPLICATION

DATE APPLICATION RECEIVED: June 12, 1989	INITIAL $10.00 FEE RECEIVED: ☒ YES ☐ NO	DATE FEE RECEIVED: June 12, 1989
STATEMENT OF ADDITIONAL EXAMINATION FEE $	DATE SENT	DATE RECEIVED
DATE RETURNED FOR COMPLETION OR CORRECTION	DATE RECEIVED	

TEMPORARY PERMIT

APPROVED BY	DATE ISSUED

PUBLICATION

APPROVED BY	DATE APPROVED	DATE NOTICE SENT: 8-1-89
PROTESTED BY AND DATE		

DATE AFFIDAVIT RECEIVED: 9-1-89	CHECKED BY: MW	TIME EXPIRED: 9-11-89	DATE AMENDED NOTICE SENT	DATE AFFIDAVIT RECEIVED	TIME EXPIRED

DEPARTMENT OF GAME AND FISHERIES REPORT

APPROVED	PROVISO	PROTEST

EXAMINATION

DATE EXAMINATION MADE: 6-7-90	MADE BY: [illegible]	DATE REPORT OF EXAM. WRITTEN: 6-22-90	WRITTEN BY: [illegible]	CHECKED BY
DATE PERMIT FEE REQUESTED: 10-5-90	AMOUNT DUE: $ 2.00		DATE RECEIVED: 10-16-90	[illegible]

PERMIT

PERMIT APPROVED BY: [illegible]	DATE APPROVED: 11-6-90	PERMIT NO.: G125463P	DATE ISSUED: 11-15-90

BEGINNING OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO	EXTENDED TO	

WELL DRILLER'S AND/OR CONSTRUCTION REPORT

DATE SENT	DATE FILED (1) 8-30-89 / (2) 9-27-89 / (3) 12-4-89

COMPLETION OF CONSTRUCTION

DATE NOTICE SENT	DATE FILED	EXTENSION FEE
EXTENDED TO	EXTENDED TO	

PROOF OF APPROPRIATION

DATE SENT: 11-15-90	DATE FILED	EXTENSION FEE	EXTENDED TO
DATE CERTIFICATE FEE REQUESTED	AMOUNT DUE	DATE RECEIVED	DATE APPROVED FOR CERTIFICATE / APPROVED BY

CERTIFICATION

PROOF EXAM. REQUIRED ☐ YES ☐ NO	CERTIFICATE NUMBER	DATE ISSUED

REMARKS

ECY 040-1-80

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 regulat 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 regulat the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 12, 1989	G1-25463	G1-25463 P	

NAME
Oxy Corporation

ADDRESS (STREET) 2202 10th Street, Post Office Box 789 (CITY) Anacortes (STATE) Washington (ZIP CODE) 98221

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropr the following described public waters of the State of Washington, subject to existing rights and to the limititations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
3 Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	116	92.8

QUANTITY, TYPE OF USE, PERIOD OF USE
Industrial use - continuously

Fire protection - as needed (stand-by/emergency use only)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼ NE¼	7	39	2E	1	Whatcom

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of the NW¼ of the NE¼ of Section 7, Township 39 North, Range 2 East, of W.M., lyin southwesterly of the Great Northern Railroad right-of-way. Less roads. Together with and subject to al easements, agreements, covenants and restrictions of record. Situate in Whatcom County, Washington.

DESCRIPTION OF PROPOSED WORKS

Three wells: #4, 16" x 156', SWL = 42.25' - fire protection only, sprinklers in buildings and fire hydrant; #1 6" x 109', SWL = 48', and #3, 6" x 154', SWL = 48.25', industrial supply, 2" PVC supply lines to industrial parl 30 acres in size.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Complete	November 15, 1993

PROVISIONS

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

An approved measuring 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 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 Redmond, Washington,

this 15th day of November, 1990.

Department of Ecology

ENGINEERING DATA
OK_____

by Herman H. Huggins
Herman H. Huggins, Section Supervisor Water Resources

PERMIT

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
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 12, 1989	GI-25463		

NAME
Oxy Corp.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2202 10th Street, P.O. Box 789	Anacortes	WA	98221

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
3 Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
---	116	92.8

QUANTITY, TYPE OF USE, PERIOD OF USE
Industrial use - continuously

Fire protection - as needed (standy-by/emergency use only)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼ NE¼	7	39	2E	1	Whatcom

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of the NW¼ of the NE¼ of Section 7, township 39 north, range 2 east, of W.M., lying southwesterly of the Great Northern Railroad right-of-way. Less roads. Together with and subject to all easements, agreements, covenants and restrictions of record. Situate in Whatcom County, Washington.

DESCRIPTION OF PROPOSED WORKS

G1-25463

Three wells: #4, 16" x 156', SWL = 42.25' - fire protection only, sprinklers in buildings and fire hydrant; #1, 6" x 109', SWL = 48', and #3 - 6" x 154', SWL = 48.25', industrial supply, 2" PVC supply lines to industrial park 30 acres in size.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	In Use	3 years from permit issuance

REPORT

Background:

This application to withdraw 116 gpm from three wells, located about three miles north of Ferndale, for industrial use - continuously, and fire protection - as needed, was received on June 12, 1989, from the Oxy Corp., Anacortes, Washington.

Legal notice was published in The Lynden Tribune on August 9 and 16, 1989. No protests have been received.

Investigation:

A field examination was conducted on June 7, 1990. Three wells were found installed, with pumping and distribution systems started. A 32' x 48' building, on the south border of the property, houses a 16" well and a 6" well. Another 6" well is located in the southeast corner of the property - in the open. A large new (at least 100' x 100') building is located in the center of the property.

A phone interview with the Oxy Corp. president, Bradley Paulsen, on June 15, 1990, provided the following information. The 16" x 156' well (to be used only for standby fire protection) and the 6" x 154' well are installed in the pumphouse building. The 16" well is powered by a 182 horsepower diesel - powering a Fairbanks-Morse shaft drive pump - delivering 1300 - 2100 gpm, depending on pressure on the fire mains. The 6" well - about 5' from the 16" well, delivers about 30 gpm - for fire sprinkler line pressure maintenance - and industrial use. The 6" x 109' well located at the southeast corner of the property also delivers about 30 gpm - for industrial use. It is planned to install larger pumps in both 6 inch wells - to yield the full 116 gpm when pumped concurrently. A three year development schedule will be provided in order to install the larger pumps. The larger delivery - instantaneous rates - are not expected to be needed until more industrial development moves into the area. Mr. Paulsen owns the small farm house located in the northeast corner of the Corp. property. He has noticed no effect in the farmhouse well from pumping the industrial park wells. The farm well is located about 1200' north of application wells. The 16" well will be used for fire protection, on a stand-by basis.

The 16" x 156' well was installed by Armstrong Drilling on August 9, 1988. It has a static water level of 42.25', with a screen set between 112' and 144' in coarse sand - gravel - water. The driller notes a yield of 900 gpm with a 57' drawdown after 4 hours. This indicates a specific yield of 15.8 gpm per foot of drawdown.

The 6" x 109' well was installed by Hayes Well Drilling, Inc. It had a static water level of 48', and screens installed between 98 - 108' in gray gravel and water when completed on September 19, 1988. The driller shows a pump test yield of 37 gpm with a 4' drawdown in 4 hours of pumping - and a 75 gpm air test with stem set at 95' for 1 hour.

The 6" x 154' well was also installed, on 5-23-89, by Hayes. It had a static water level of 48.25', and screens set between 152 - 157' in brown gravel sand and water. A Bailer test indicated a yield of 15 gpm with a 5' drawdown in ½ hour.

Ecology water right records show an infiltration trench (reportedly 300' x 100' and 30' deep) with prior existing water rights within ¼ mile of application wells. This Ground Water Right Certificate, 1995C, is for 130 gpm and 40 acre-feet per year. It is for irrigation of 20 acres within the same legally described property (about 30 acres) as the instant application. The trench is an old abandoned gravel pit full of water. The water right may be used to irrigate the grounds in the applicant industrial park; if it is not to be used it will be relinquished.

Ecology water well report files show other wells in this vicinity, and the production wells are presumed to be exercising their right to use less than 5000 gallon per day from a well without the necessity of obtaining a water right permit (RCW 90.44.050). Also, records show many 2" wells installed within a radius of 1 mile for testing and monitoring by Arco Petroleum Company.

No wetland areas were observed during the field examination to be associated with application proposal.

Ecology quantity allocation guidelines do not provide annual allotments for industrial use. Also, until space is leased to a client and water is being used - the type of use and quantities used cannot be known. The requirements for industrial use are quite varied in types of water use. A three year development schedule will be established then, so that the first industrial users can be used to determine the annual quantity of water to be allocated here. Also, if different pumps are installed to pump more than 30 gpm from each 6" well - the actual instantaneous withdrawal rates can be determined.

Conclusion:

It is concluded that water is available for the beneficial use proposed, and that such use will not adversely affect existing rights, be detrimental to the public welfare, or impact wetlands of the state.

Recommendation:

It is therefore recommended that this application be approved and a permit issued for a maximum of 116 gpm and 92.8 acre-feet of water per year, for industrial use - continuously, and for fire protection - as needed (instantaneous and annual quantities to be as needed), subject to existing rights and the following conditions:

A certificate of water right will not be issued until a final investigation is made.

Installation and maintenance of access ports as described in Ground Water Bulletin No. 1 are required. Air lines and gauges may be installed in addition to the access ports.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

The annual quantity may be reduced when the types and numbers of business realized in this industrial park are known. (The 92.8 acre-feet initial allocation is projected from a 50% pumping schedule at a continuous 116 gpm.)

REPORT BY: [signature] DATE: 10. 5. 10

State of Washington
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)

I have examined this application and find it is: [ ] not an "action". [ ] statutorically exempt.
7/19/89 D. Moore
SIGNATURE

APPLICATION NO.	W.R.I.A.	COUNTY	PRIORITY DATE	TIME	ACCEPTED
G4-[illegible]	1	Whatcom	6-12-89		

APPLICANT'S NAME -- PLEASE PRINT: OXY Corp.

Bus. Tel. 206-293-5180
Home Tel. 206-293-3697
Other Tel. 206-293-4488

ADDRESS (STREET): 2202 10th Street, P.O. Box 789, (CITY) Anacortes, (STATE) Washington (ZIP CODE) 98221

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION: Feb. 16, 1984, Washington State

1. SOURCE OF SUPPLY

IF SURFACE WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE): N.A.
TRIBUTARY: N.A.

IF GROUND WATER
SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.): 3 Wells
SIZE AND DEPTH: 1ea. 6" x 108', 1ea. 6" x 154', 1ea. 16" x 154'.

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.): Please see attached for further breakdown of usage. 16x154 fire protection/industrial wa 6x108 well for potable/industrial water. 6x154 well for fire protection/industrial water.

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF: CUBIC FEET PER SECOND (CFS): N.A. OR GALLONS PER MINUTE (GPM): 2250 ACRE FEET PER YEAR: N.A.

Industrial Use Continued / Fire Protection Use Continued — Mr. Paulsen 7/17/89

TIMES DURING YEAR WATER WILL BE REQUIRED: Year round.

IF IRRIGATION, NUMBER OF ACRES: N.A.
IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME 1-MOBILE HOME, 2-CAMPSITES, ETC.: N.A.
IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY: N.A.

DATE PROJECT WAS OR WILL BE STARTED: 6x108--Sept. '88, 6x154--May '89 16x154--June'89
DATE PROJECT WAS OR WILL BE COMPLETED: 6x108--Sept. '89, 6x154--Oct. '89 16x154--Oct.'89

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE
2 & 3	----	Northgate Industrial Park Short Plat	7	39N	2E

ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION

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.

N.A.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N	RANGE (E. OR W.) W.M.	COUNTY
N.A.	N.A.	N.A.	N.A.	N.A.
NW1/4 NE1/4	7	39	2E	Whatcom

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 Northgate Industrial Park Short Plat, attached.

JUN 19 1989
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

WHAT IS YOUR INTEREST IN THE PROPERTY ON WHICH THE WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

Property 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

Surface water infiltration trench. DOE certified water right for irrigation.

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.)

6" x 108' Well, presently anticipate 30gpm pump. 2" Plastic supply line.

6" x 154' Well, presently anticipate 30gpm pump. 2' Plastic supply line.

16" x 154' Well, presently anticipate 1500gpm pump with 200hp. diesel driver.

8" fire water system supplying 3 fire hydrants.

These systems to be expanded as Industrial Park develops.

7. REMARKS

N.A.

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

OXY CORP

APPLICANT'S SIGNATURE

Oxy Corp.

LEGAL LANDOWNERS NAME (PLEASE PRINT)

Bradley R Poulson, President

LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 5)

2202 10TH, P.O. Box 789, ANACORTES, W. 98221

LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON
DEPARTMENT 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.....

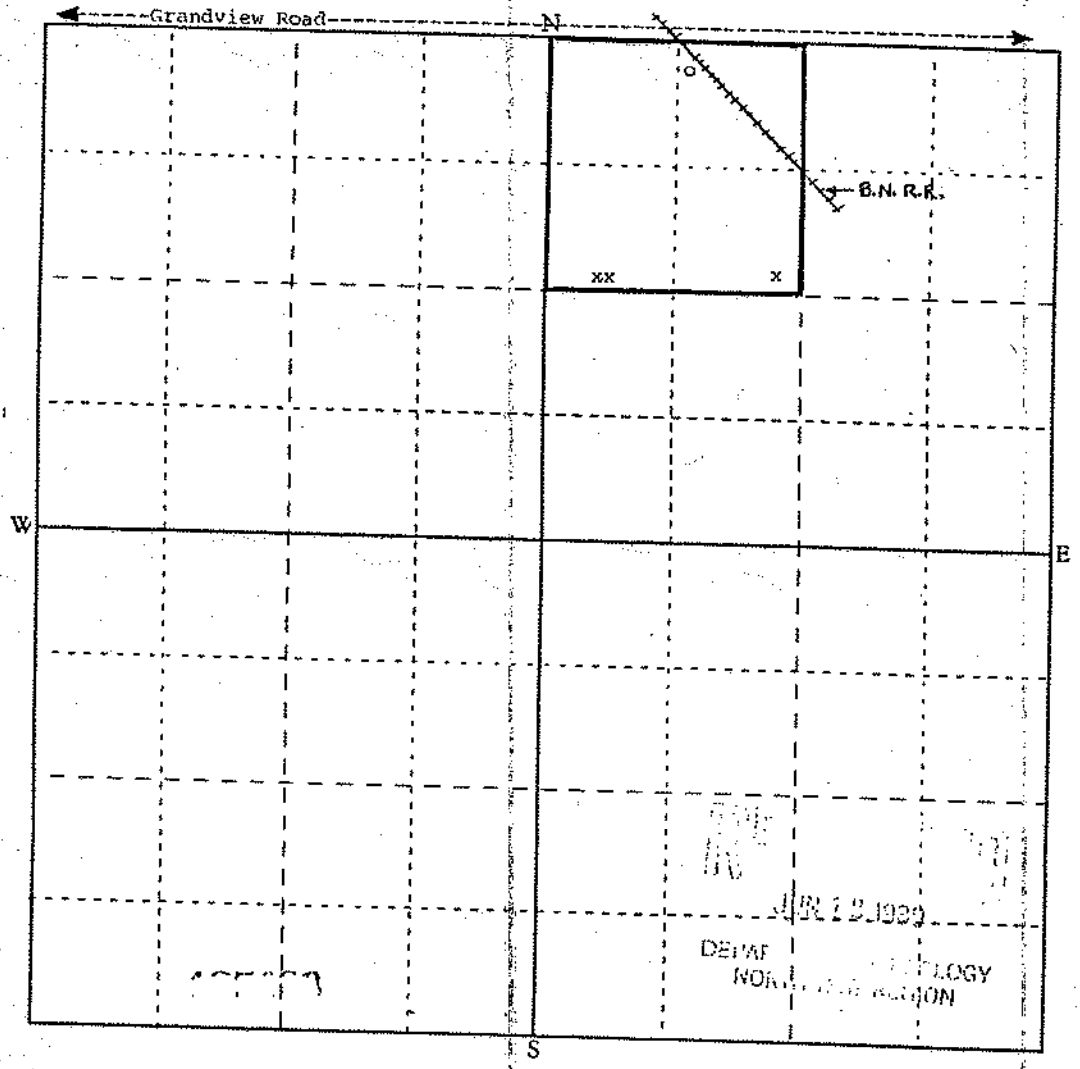
Witness my hand this .....*day of* ....., 19.....

.....
Department of Ecology

ECY 040-14
Rev 1/85

SECTION MAP

Sec. 7 Twp. 39 N. R. 2 East



Scale: 1 inch = 800 feet (each small square = 10 acres)

Show by a cross (X) the location of point of diversion (surface water source) or point of withdrawal (ground water source): For ground water applications, show by a circle (O) the locations of other wells or works within a quarter of a mile.

Indicate traveling directions from nearest town in space below.

Travel North from Ferndale on Interstate 5, Take exit 266. Turn left on Grandview Rd. and proceed across freeway to Portal Way. Continue West on Grandview Rd. Site is on your left immediately after crossing Portal Way and B.N.R.R. tracks. Turn onto site just past house at 2265 Grandview.

Detach here

Fold along scale

FEET 0 400 800 1,200 1,600 2,000 2,400 2,800 3,200 3,600 4,000 4,400 4,800 5,200

Detach this scale at the perforation, fold excess paper under or cut off excess by cutting along the scale line. This scale corresponds to the SECTION MAP above. You can read feet directly from this scale to outline property and locate points of diversion or withdrawal on the SECTION MAP. Enclose this map along with the application and $10.00 examination fee.

The Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

5022

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name Oxy Corp. Address .....

(2) LOCATION OF WELL: County Whatcom — SW ¼ NE ¼ Sec. 1 T. 37 N., R. 2 E. W.M.

and distance from section or subdivision corner

PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 112 ft. Depth of completed well 108 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +4 ft. to 98 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐ Johnson
Manufacturer's Name .....
Type Stainless Steel Model No. .....
Diam. 6 Slot size 40 from 98 ft. to 103 ft.
Diam. 6 Slot size 60 from 103 ft. to 108 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level 108 ft.
Static level 48 ft. below top of well Date 9-19-88
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? D. Hayes
Yield: 37 gal./min. with 4 ft. drawdown after 4 hrs.
" " "
" " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
0	52-0	0:10	48-0		
0:01	48-1½				
0:02	48-1				

Date of test .....
Bailer test 75 gal./min. with ..... ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Silty topsoil	0	3
Brown clay	3	11
Brown gravel	11	12
Tan sandy clay	12	14
Gray sandy clay	14	20
Gray clay and gravel	20	38
Brown gravel seepage	38	54
Brown gravel, water	54	57
Brown gravel seepage	57	64
Brown gravel, water	64	100
Gray gravel, water	100	129
Gray clay	129	

Work started 9-16, 19 88. Completed 9-17, 19 88

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hayes Well Drilling (Person, firm, or corporation) (Type or print)

Address 556 Easley Rd. Bellingham

[Signed] Steve Collett (Well Driller)

License No. 762 Date 1-27, 19 89

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

Water Right Self-Assessment

Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

Water Right Permit, Certificate, or Claim # *If water right is interruptible, identify limitation in yellow section below	WFI Source # If a source has multiple water rights, list each water right on separate line	Existing Water Rights Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold				Current Source Production – Most Recent Calendar Year Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold				10-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold				20-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold			
		Primary Qi Maximum Rate Allowed	Non-Additive Qi Maximum Rate Allowed	Primary Qa Maximum Volume Allowed	Non-Additive Qa Maximum Volume Allowed	Total Qi Maximum Instantaneous Flow Rate Withdrawn	Current Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume Withdrawn	Current Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 10 Years	10-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 10 Years	10-Year Forecasted Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 20 Years	20-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 20 Years	20-Year Forecasted Excess or (Deficiency) Qa
1 G1-25463P	S01 Grandview-Northgate	116 GPM	92.8 AFY	92.8 AFY	NA	90 GPM	26 GPM	19.4 AFY	73.4 AFY	90 GPM	26 GPM	26.5 AFY	66.3 AFY	90 GPM	26 GPM	36.3 AFY	56.5 AFY
2 Permit Exempt	S01 Praxair	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3																	
4																	
5																	
6																	
	TOTALS =	116 GPM		92.8 AFY		90 GPM	26 GPM	19.4 AFY	73.4 AFY	90 GPM	26 GPM	26.5 AFY	66.3 AFY	90 GPM	26 GPM	36.3 AFY	56.5 AFY
Column Identifiers for Calculations:		A		B		C	=A-C	D	=B-D	E	= A-E	F	=B-F	G	=A-G	H	=B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.

Application Number	New or Change Application?	Date Submitted	Quantities Requested			
			Primary Qi	Non-Additive Qi	Primary Qa	Non-Additive Qa

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased Current quantity purchased through intertie				10-Year Forecasted Purchase Forecasted quantity purchased through intertie				20-Year Forecasted Purchase Forecasted quantity purchased through intertie			
	Maximum Qi Instantaneous Flow Rate	Maximum Qa Annual Volume		Maximum Qi Instantaneous Flow Rate	Current Excess or (Deficiency) Qi	Maximum Qa Annual Volume	Current Excess or (Deficiency) Qa	Maximum Qi 10-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 10-Year Forecast	Future Excess or (Deficiency) Qa	Maximum Qi 20-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 20-Year Forecast	Future Excess or (Deficiency) Qa
1															
2															
3															
TOTALS =															
Column Identifiers for Calculations:	A	B		C	=A-C	D	=B-D	E	=A-E	F	=B-F	G	=A-G	H	=B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.

Water Right #	Conditions of Interruption	Time Period of Interruption
1		
2		
3		

ADDITIONAL COMMENTS:

10.5 DOCUMENTS INCORPORATED BY REFERENCE

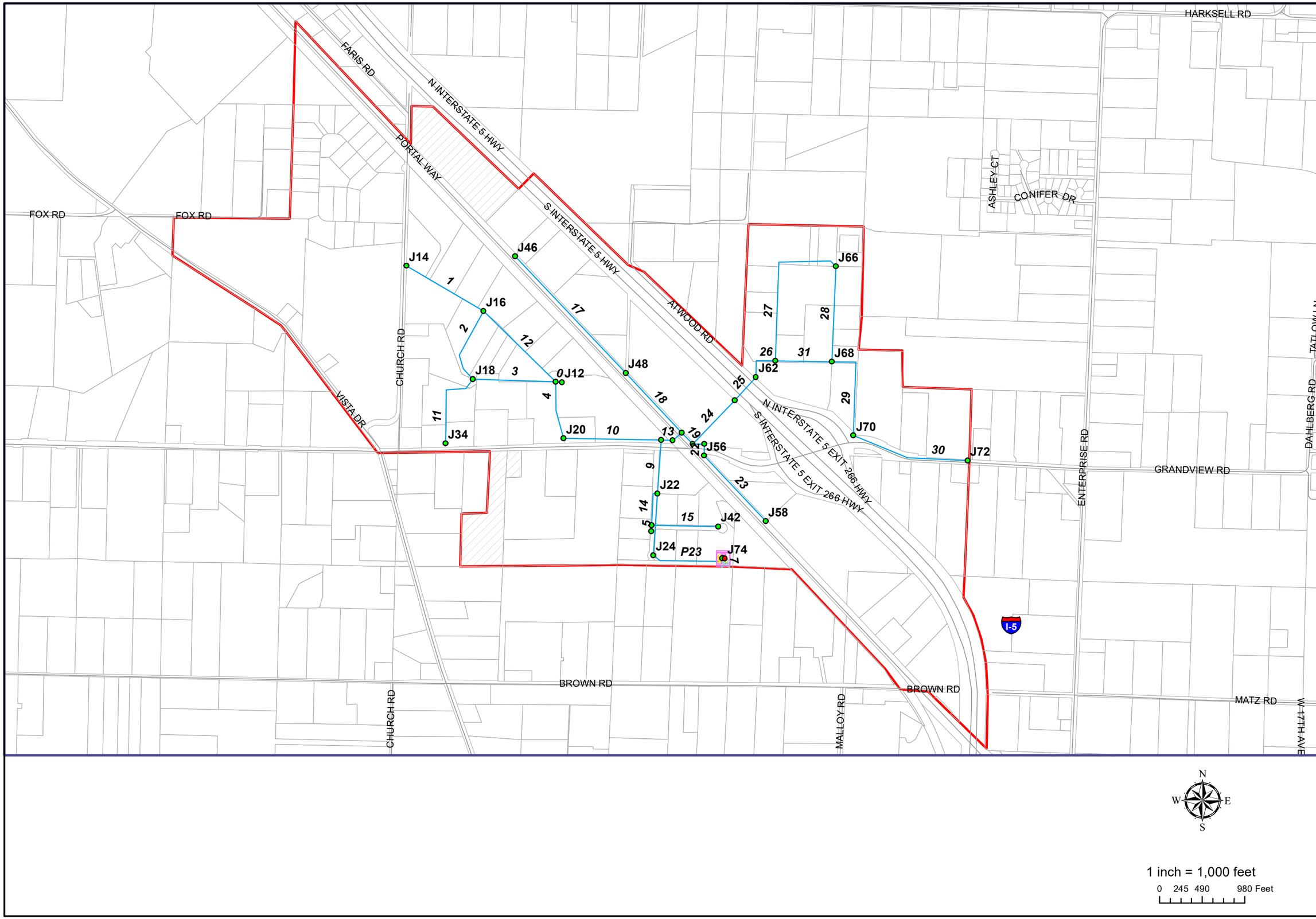
Standard Specifications & Standard Plans

Public Utility District No. 1 of Whatcom County, 2004.

Available upon request.

Appendix A

Distribution System Analysis – Hydraulic Modeling



CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -	DRAWN BY RDN	CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

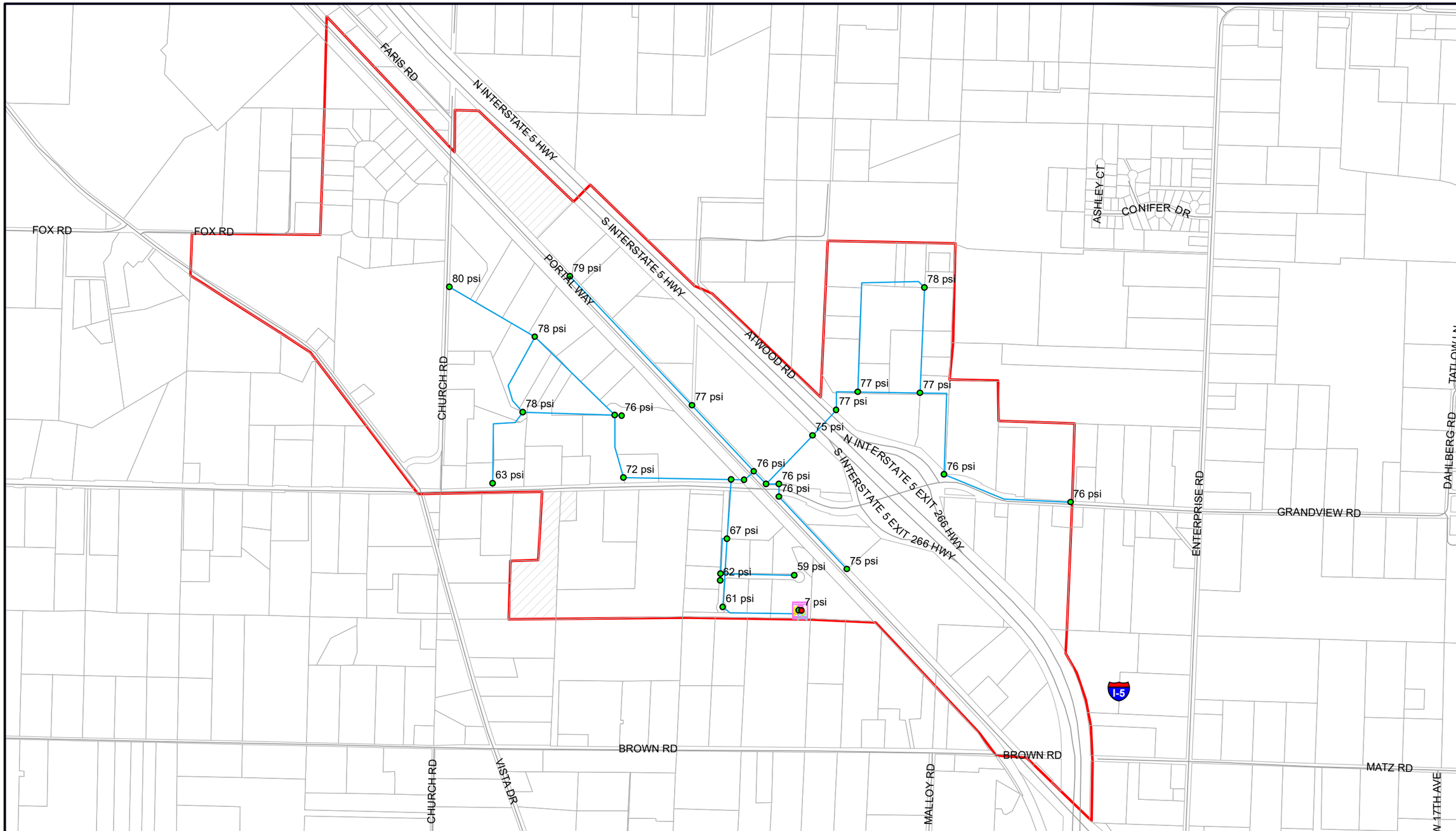
FIGURE A
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
NODE AND PIPE IDs

DATE 5-25-2021	SCALE AS SHOWN	PROJECT 2020-023

SHEET 1 OF 1

PEAK HOURLY DEMAND ANALYSIS

1. Figure A-1 – Existing System Pressures
2. Figure A-2 – 20-yr Projected (2040) System Pressures
3. Figure A-3 – Projected Build Out System Pressures.



Scenario: Existing
PHD = 65 gpm
One booster pump running, discharge pressure at 60 psi at pump house.
Tank level (bottom of ES) = 13 ft.

N
W E
S

1 inch = 1,000 feet
0 245 490 980 Feet

WILSON ENGINEERING
WILSONENGINEERING.COM
CIVIL
STRUCTURAL
SURVEY

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD #1
WHATCOM COUNTY WASHINGTON
FIGURE A-1
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
PHD – EXISTING

DATE 5-25-2021
SCALE AS SHOWN
PROJECT 2020-023

SHEET 1 OF 1

Existing PHD Junction Report

		ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
1	☐	J10	16	73	249	76
2	☐	J12	12	73	249	76
3	☐	J14	22	64	247	80
4	☐	J16	-14	70	249	78
5	☐	J18	-17	70	249	78
6	☐	J20	0	83	249	72
7	☐	J22	-20	95	250	67
8	☐	J24	0	108	250	61
9	☐	J26	0	113	270	68
10	☐	J32	0	75	249	75
11	☐	J34	21	91	237	63
12	☐	J36	0	74	249	76
13	☐	J40	0	101	244	62
14	☐	J42	21	99	235	59
15	☐	J44	0	101	244	62
16	☐	J46	36	68	249	79
17	☐	J48	0	72	249	77
18	☐	J50	-20	74	249	76
19	☐	J52	-20	75	249	76
20	☐	J54	0	74	249	76
21	☐	J56	1	75	249	76
22	☐	J58	20	76	249	75
23	☐	J60	0	76	249	75
24	☐	J62	0	71	249	77
25	☐	J64	0	72	249	77
26	☐	J66	4	69	249	78
27	☐	J68	-19	71	249	77
28	☐	J70	0	73	249	76
29	☐	J72	21	75	249	76
30	☐	J74	0	113	128	7

Existing PHD Pipe Report

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
1	☐	0	J10	J12	74	2	130	6	1	0	1	Open	0
2	☐	1	J14	J16	1,029	3	130	-22	1	2	2	Open	0
3	☐	10	J20	J32	1,121	6	130	-40	0	0	0	Open	0
4	☐	11	J18	J34	978	2	130	21	2	12	13	Open	0
5	☐	12	J16	J10	1,162	6	130	-7	0	0	0	Open	0
6	☐	13	J32	J36	136	6	120	23	0	0	0	Open	0
7	☐	14	J22	J40	415	2	130	22	2	5	13	Open	0
8	☐	15	J40	J42	767	2	130	21	2	10	12	Open	0
9	☐	16	J40	J44	70	2	130	0	0	0	0	Open	0
10	☐	17	J46	J48	1,848	6	120	-36	0	0	0	Open	0
11	☐	18	J48	J50	941	6	120	-36	0	0	0	Open	0
12	☐	19	J50	J52	183	6	120	8	0	0	0	Open	0
13	☐	2	J16	J18	904	3	130	-1	0	0	0	Open	0
14	☐	20	J52	J54	133	6	120	21	0	0	0	Open	0
15	☐	21	J36	J50	134	6	140	23	0	0	0	Open	0
16	☐	22	J54	J56	135	6	140	21	0	0	0	Open	0
17	☐	23	J56	J58	1,034	6	120	20	0	0	0	Open	0
18	☐	24	J52	J60	698	6	120	6	0	0	0	Open	0
19	☐	25	J60	J62	362	6	140	6	0	0	0	Open	0
20	☐	26	J62	J64	410	6	120	6	0	0	0	Open	0
21	☐	27	J64	J66	1,819	6	120	2	0	0	0	Open	0
22	☐	28	J66	J68	1,097	6	120	-2	0	0	0	Open	0
23	☐	29	J68	J70	1,123	6	120	21	0	0	0	Open	0
24	☐	3	J18	J10	955	6	130	-5	0	0	0	Open	0
25	☐	30	J70	J72	1,367	6	120	21	0	0	0	Open	0
26	☐	31	J64	J68	649	6	120	4	0	0	0	Open	0
27	☐	32	J10	J12	74	2	130	6	1	0	1	Open	0
28	☐	4	J10	J20	663	6	130	-40	0	0	0	Open	0
29	☐	5	J22	J24	711	6	130	-65	1	0	0	Open	0
30	☐	6	J26	PR01	10	6	130	65	1	0	0	Open	0
31	☐	7	T5000	J74	60	6	130	65	1	0	0	Open	0
32	☐	9	J32	J22	618	6	130	-63	1	0	0	Open	0
33	☐	P11	J74	U7000	10	3	130	33	1	0	4	Open	0
34	☐	P13	U7000	J26	10	3	130	33	1	0	4	Open	0
35	☐	P15	J74	U7002	10	3	130	33	1	0	4	Open	0

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
36	☐	P17	U7002	J26	10	3	130	33	1	0	4	Open	0
37	☐	P19	J74	U7004	10	3	130	0	0	0	0	Open	0
38	☐	P21	U7004	J26	10	3	130	0	0	0	0	Open	0
39	☐	P23	PR01	J24	903	6	130	65	1	0	0	Open	0

Existing PHD Pump Report

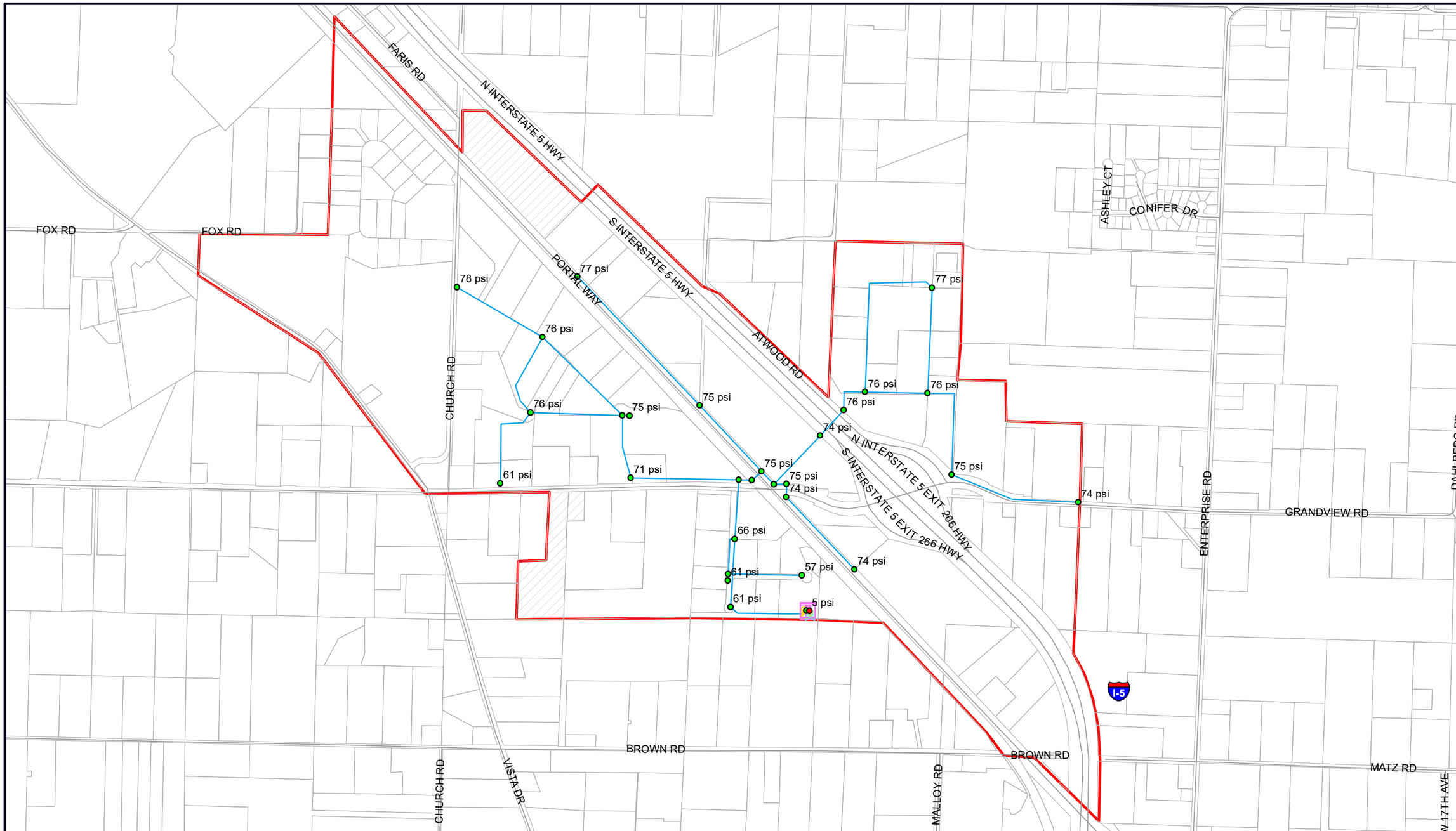
		ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)	Status	Setting	Available NPSH (ft)	Cavitation Index
1	☐	U7000	112	7	69	33	142	Open	1	50	0
2	☐	U7002	113	7	68	33	142	Open	1	48	0
3	☐	U7004	113	6	68	0	0	Closed	0	0	0

Existing PHD Tank Report

		ID	Flow (gpm)	Elevation (ft)	Head (ft)	% Full (%)	Level (ft)	Overflow Volume (ft3)	Total Overflow Volume (ft3)
1	☐	T5000	-65	115	128	86	13	0	0

Existing PHD Valve Report

		ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Status	Setting
1	☐	PR01	6	112	68	60	65	1	20	Active	60



Scenario: 20-yr Projected (2040)
PHD = 126 gpm
Two booster pumps running, discharge pressure at 60 psi at pump house.
Tank level (bottom of ES) = 10.7 ft (use 10 ft).

1 inch = 1,000 feet

0 245 490 980 Feet

CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -	DRAWN BY RDN	CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE A-2
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
PHD – FUTURE 20-YR PROJECTION

DATE 5-25-2021	SCALE AS SHOWN	PROJECT 2020-023

SHEET 1 OF 1

20 yr Projected PHD Junction Report

		ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
1		J10	31	73	246	75
2		J12	23	73	246	75
3		J14	23	64	244	78
4		J16	-8	70	246	76
5		J18	-15	70	246	76
6		J20	1	83	246	71
7		J22	-20	95	248	66
8		J24	0	108	249	61
9		J26	0	113	267	67
10		J32	0	75	247	74
11		J34	23	91	232	61
12		J36	0	74	247	75
13		J40	1	101	242	61
14		J42	22	99	231	57
15		J44	0	101	242	61
16		J46	50	68	246	77
17		J48	0	72	247	75
18		J50	-20	74	247	75
19		J52	-20	75	247	74
20		J54	0	74	247	75
21		J56	2	75	247	74
22		J58	20	76	247	74
23		J60	0	76	247	74
24		J62	0	71	247	76
25		J64	0	72	247	76
26		J66	8	69	247	77
27		J68	-18	71	247	76
28		J70	0	73	247	75
29		J72	22	75	247	74
30		J74	0	113	125	5

20 yr Projected PHD Pipe Report

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
1	☐	0	J10	J12	74	2	130	12	1	0	4	Open	0
2	☐	1	J14	J16	1,029	3	130	-23	1	2	2	Open	0
3	☐	10	J20	J32	1,121	6	130	-78	1	1	1	Open	0
4	☐	11	J18	J34	978	2	130	23	2	14	14	Open	0
5	☐	12	J16	J10	1,162	6	130	-13	0	0	0	Open	0
6	☐	13	J32	J36	136	6	120	44	1	0	0	Open	0
7	☐	14	J22	J40	415	2	130	23	2	6	15	Open	0
8	☐	15	J40	J42	767	2	130	22	2	11	14	Open	0
9	☐	16	J40	J44	70	2	130	0	0	0	0	Open	0
10	☐	17	J46	J48	1,848	6	120	-50	1	1	0	Open	0
11	☐	18	J48	J50	941	6	120	-50	1	0	0	Open	0
12	☐	19	J50	J52	183	6	120	14	0	0	0	Open	0
13	☐	2	J16	J18	904	3	130	-2	0	0	0	Open	0
14	☐	20	J52	J54	133	6	120	22	0	0	0	Open	0
15	☐	21	J36	J50	134	6	140	44	1	0	0	Open	0
16	☐	22	J54	J56	135	6	140	22	0	0	0	Open	0
17	☐	23	J56	J58	1,034	6	120	20	0	0	0	Open	0
18	☐	24	J52	J60	698	6	120	12	0	0	0	Open	0
19	☐	25	J60	J62	362	6	140	12	0	0	0	Open	0
20	☐	26	J62	J64	410	6	120	12	0	0	0	Open	0
21	☐	27	J64	J66	1,819	6	120	5	0	0	0	Open	0
22	☐	28	J66	J68	1,097	6	120	-3	0	0	0	Open	0
23	☐	29	J68	J70	1,123	6	120	22	0	0	0	Open	0
24	☐	3	J18	J10	955	6	130	-10	0	0	0	Open	0
25	☐	30	J70	J72	1,367	6	120	22	0	0	0	Open	0
26	☐	31	J64	J68	649	6	120	7	0	0	0	Open	0
27	☐	32	J10	J12	74	2	130	12	1	0	4	Open	0
28	☐	4	J10	J20	663	6	130	-77	1	0	1	Open	0
29	☐	5	J22	J24	711	6	130	-125	1	1	2	Open	0
30	☐	6	J26	PR01	10	6	130	125	1	0	2	Open	0
31	☐	7	T5000	J74	60	6	130	125	1	0	2	Open	0
32	☐	9	J32	J22	618	6	130	-122	1	1	2	Open	0
33	☐	P11	J74	U7000	10	3	130	63	3	0	13	Open	0
34	☐	P13	U7000	J26	10	3	130	63	3	0	13	Open	0
35	☐	P15	J74	U7002	10	3	130	63	3	0	13	Open	0

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
36	☐	P17	U7002	J26	10	3	130	63	3	0	13	Open	0
37	☐	P19	J74	U7004	10	3	130	0	0	0	0	Open	0
38	☐	P21	U7004	J26	10	3	130	0	0	0	0	Open	0
39	☐	P23	PR01	J24	903	6	130	125	1	1	2	Open	0

20 yr Projected PHD Pump Report

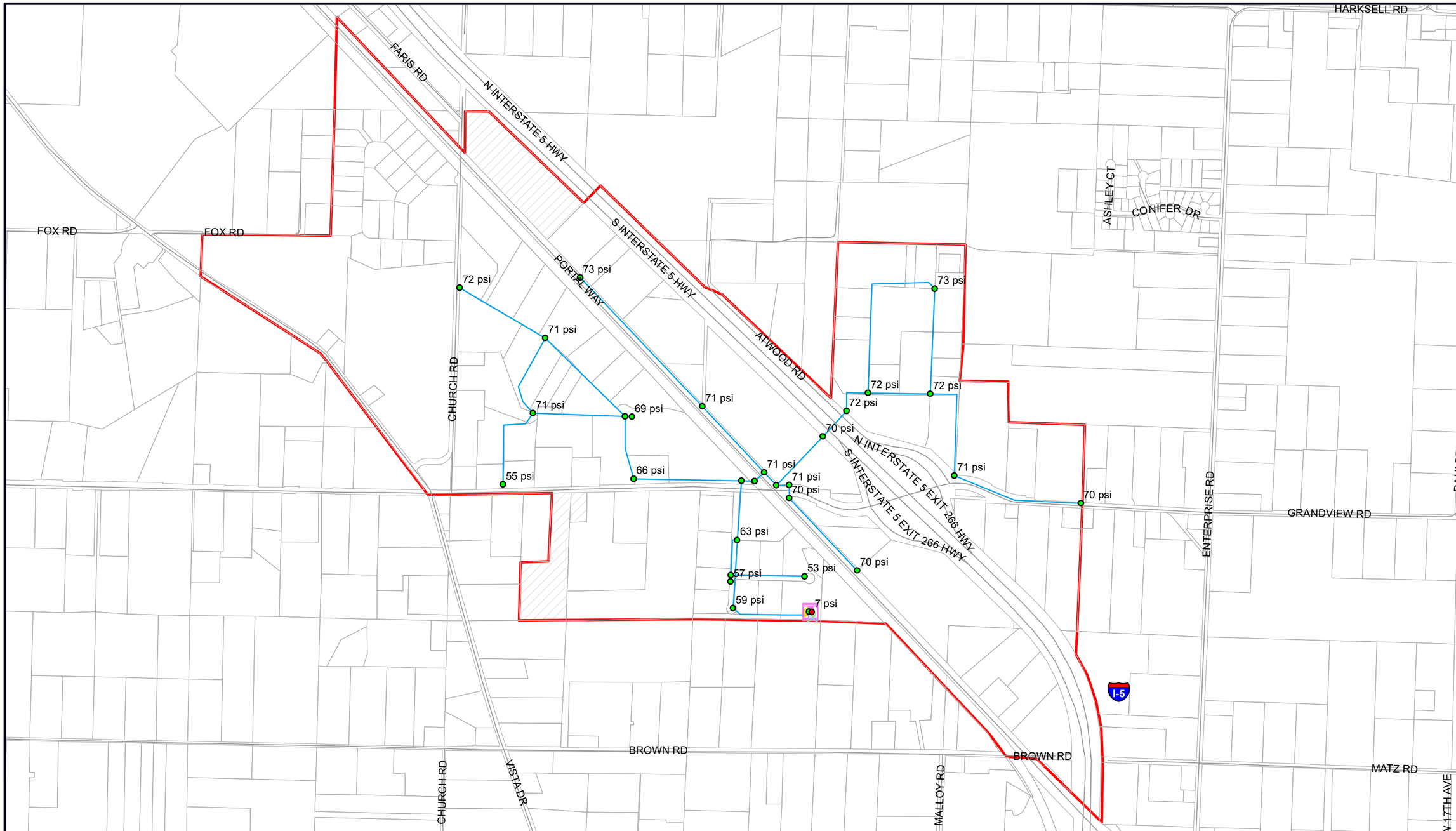
		ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)	Status	Setting	Available NPSH (ft)	Cavitation Index
1	☐	U7000	112	6	67	63	142	Open	1	47	0
2	☐	U7002	113	5	67	63	142	Open	1	45	0
3	☐	U7004	113	5	66	0	0	Closed	0	0	0

20 yr Projected PHD Tank Report

		ID	Flow (gpm)	Elevation (ft)	Head (ft)	% Full (%)	Level (ft)	Overflow Volume (ft3)	Total Overflow Volume (ft3)
1	☐	T5000	-125	115	125	64	10	0	0

20 yr Projected PHD Valve Report

		ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Status	Setting
1	☐	PR01	6	112	67	60	125	1	16	Active	60



Scenario: Build Out
PHD = 254 gpm
Two booster pumps running, discharge pressure at 60 psi at pump house.
Tank level (bottom of ES) = 14 ft, assumes new 30' diam. x 20' ht tank.

1 inch = 1,000 feet

0 245 490 980 Feet

WILSON ENGINEERING
WILSONENGINEERING.COM
CIVIL
STRUCTURAL
SURVEY

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE A-3
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
PHD - BUILD OUT

DATE 5-25-2021
SCALE AS SHOWN
PROJECT 2020-023

SHEET 1 OF 1

Projected Build Out PHD Junction Report

		ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
1		J10	62	73	233	69
2		J12	47	73	232	69
3		J14	26	64	230	72
4		J16	4	70	233	71
5		J18	-9	70	233	71
6		J20	1	83	235	66
7		J22	-20	95	241	63
8		J24	0	108	245	59
9		J26	0	113	265	66
10		J32	0	75	238	70
11		J34	25	91	216	55
12		J36	0	74	237	71
13		J40	2	101	233	57
14		J42	25	99	220	53
15		J44	0	101	233	57
16		J46	81	68	235	73
17		J48	0	72	237	71
18		J50	-20	74	237	71
19		J52	-20	75	237	70
20		J54	0	74	237	71
21		J56	5	75	237	70
22		J58	20	76	237	70
23		J60	0	76	237	70
24		J62	0	71	237	72
25		J64	1	72	237	72
26		J66	16	69	237	73
27		J68	-15	71	237	72
28		J70	0	73	237	71
29		J72	23	75	237	70
30		J74	0	113	129	7

Projected Build Out PHD Pipe Report

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
1	☐	0	J10	J12	74	2	130	24	2	1	15	Open	0
2	☐	1	J14	J16	1,029	3	130	-26	1	3	3	Open	0
3	☐	10	J20	J32	1,121	6	130	-158	2	3	2	Open	0
4	☐	11	J18	J34	978	2	130	25	3	17	17	Open	0
5	☐	12	J16	J10	1,162	6	130	-27	0	0	0	Open	0
6	☐	13	J32	J36	136	6	120	90	1	0	1	Open	0
7	☐	14	J22	J40	415	2	130	27	3	8	19	Open	0
8	☐	15	J40	J42	767	2	130	25	3	13	17	Open	0
9	☐	16	J40	J44	70	2	130	0	0	0	0	Open	0
10	☐	17	J46	J48	1,848	6	120	-81	1	2	1	Open	0
11	☐	18	J48	J50	941	6	120	-81	1	1	1	Open	0
12	☐	19	J50	J52	183	6	120	29	0	0	0	Open	0
13	☐	2	J16	J18	904	3	130	-4	0	0	0	Open	0
14	☐	20	J52	J54	133	6	120	25	0	0	0	Open	0
15	☐	21	J36	J50	134	6	140	90	1	0	1	Open	0
16	☐	22	J54	J56	135	6	140	25	0	0	0	Open	0
17	☐	23	J56	J58	1,034	6	120	20	0	0	0	Open	0
18	☐	24	J52	J60	698	6	120	25	0	0	0	Open	0
19	☐	25	J60	J62	362	6	140	25	0	0	0	Open	0
20	☐	26	J62	J64	410	6	120	25	0	0	0	Open	0
21	☐	27	J64	J66	1,819	6	120	10	0	0	0	Open	0
22	☐	28	J66	J68	1,097	6	120	-6	0	0	0	Open	0
23	☐	29	J68	J70	1,123	6	120	23	0	0	0	Open	0
24	☐	3	J18	J10	955	6	130	-20	0	0	0	Open	0
25	☐	30	J70	J72	1,367	6	120	23	0	0	0	Open	0
26	☐	31	J64	J68	649	6	120	14	0	0	0	Open	0
27	☐	32	J10	J12	74	2	130	24	2	1	15	Open	0
28	☐	4	J10	J20	663	6	130	-156	2	2	2	Open	0
29	☐	5	J22	J24	711	6	130	-254	3	4	6	Open	0
30	☐	6	J26	PR01	10	6	130	254	3	0	6	Open	0
31	☐	7	T5000	J74	60	6	130	254	3	0	6	Open	0
32	☐	9	J32	J22	618	6	130	-248	3	3	6	Open	0
33	☐	P11	J74	U7000	10	3	130	127	6	0	48	Open	0
34	☐	P13	U7000	J26	10	3	130	127	6	0	48	Open	0
35	☐	P15	J74	U7002	10	3	130	127	6	0	48	Open	0

		ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	Flow Reversal Count
36	☐	P17	U7002	J26	10	3	130	127	6	0	48	Open	0
37	☐	P19	J74	U7004	10	3	130	0	0	0	0	Open	0
38	☐	P21	U7004	J26	10	3	130	0	0	0	0	Open	0
39	☐	P23	PR01	J24	903	6	130	254	3	5	6	Open	0

Projected Build Out PHD Pump Report

		ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)	Status	Setting	Available NPSH (ft)	Cavitation Index
1	☐	U7000	112	7	66	127	137	Open	1	50	0
2	☐	U7002	113	7	66	127	137	Open	1	49	0
3	☐	U7004	113	7	65	0	0	Closed	0	0	0

Projected Build Out PHD Tank Report

		ID	Flow (gpm)	Elevation (ft)	Head (ft)	% Full (%)	Level (ft)	Overflow Volume (ft3)	Total Overflow Volume (ft3)
1	☐	T5000	-254	115	129	68	14	0	0

Projected Build Out PHD Valve Report

		ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Status	Setting
1	☐	PR01	6	112	66	60	254	3	14	Active	60

Appendix B
Water Quality Data & Monitoring Plans

Coliform Monitoring Plan

Disinfection Byproduct (DBP) Monitoring Plan

Water Quality Monitoring Schedule

Water Quality Monitoring Lab Reports

Coliform Monitoring Plan

REICHHARDT & EBE ENGINEERING, INC
CONSULTING ENGINEERS
2285 Grandview Road • Ferndale, WA 98248 • Telephone 360-366-3456 • Fax: 360-366-3415

June 15, 1995

John P. Thielemann, P.E.
Regional Engineer, NW Drinking Water Operations
Department of Health
1511 Third Avenue, Suite 719
Seattle, WA 98101-1632

Re: Grandview/Northgate Water system
Submittal 93-0505

Dear Mr. Thielemann:

The above referenced system is complete, and the as-built drawings are in progress. The improvements consisted of tying two Group B systems together and providing a water storage tank and booster pumps. As soon as the drawings are completed we will submit the Construction Report. In the meantime, the enclosed Coliform Monitoring Plan is presented for your review and approval. The former Group B Northgate Water System (ID No. 638N) is the source for this system, and we intend to begin using the Plan on an interim basis for our monthly samples. Our first sample will be taken in June and submitted under the number 638N. When the system and the Coliform Monitoring Plan are approved we will use the appropriate assigned ID number.

Please call me if you have any questions or require additional information.

Sincerely,

Carl F Reichhardt

Carl F. Reichhardt, P.E.

Copy: Tom Anderson, PUD No. 1
Anne Atkeson, Co. Health Dept.

COLIFORM MONITORING PLAN

System Information

WATER SYSTEM NAME	COUNTY	SYSTEM I.D. NUMBER
Grandview/Northgate Water System	Whatcom	93-0505

PEAK POPULATION SERVED	SERVICE CONNECTIONS
100 current, 600 future	Industrial 10 current, 35 future

SOURCE	DOH SOURCE NUMBER	CATEGORY	WELL DEPTH
		Well	108

TREATMENT	TREATMENT PROCESS	PURPOSE	STORAGE	STORAGE CAPACITY
	none			35,000

Sampling Information

NUMBER OF ROUTINE SAMPLES REQUIRED MONTHLY BY REGULATION		NUMBER OF SAMPLE SITES NEEDED TO REPRESENT THE DISTRIBUTION SYSTEM	

	TYPE	SITE #	LOCATION
SAMPLE SITE GROUP	ROUTINE	N3	Tree Island Co. 6823 Northgate
	REPEAT	N7	J.H.Kelly Co. 2257 Northgate Spur
	REPEAT	G13	Jansen Inc. 2380 Grandview
	REPEAT	Source	Wellhouse Northgate
SAMPLE SITE GROUP	ROUTINE	G18	Ocean Kayak 2460 Grandview
	REPEAT	G16	Kona Bicycle 2455 Grandview
	REPEAT	G15	Zodiac 6910 Salashan Loop
	REPEAT	Source	Wellhouse Northgate
SAMPLE SITE GROUP	ROUTINE	G11	Pacific Structural Syst. 2280 Salashan
	REPEAT	G9	Essex Lumber 2470 Grandview
	REPEAT	G13	Jansen Inc. 2380 Grandview
	REPEAT	Source	Wellhouse Northgate

For maximum coverage of different branches of the distribution system, a decision to rotate the required routine sample(s) among different sample sites may be made. It is recommended that ROUTINE sampling sites be tested about 4 times per year or more often.

ROTATION SCHEDULE

MONTH	SAMPLE SITE(S)	MONTH	SAMPLE SITE(S)
JANUARY	N3	JULY	N3
FEBRUARY	G18	AUGUST	G18
MARCH	G11	SEPTEMBER	G11
APRIL	N3	OCTOBER	N3
MAY	G18	NOVEMBER	G18
JUNE	G11	DECEMBER	G11

The month after a coliform positive sample, five follow-up samples must be submitted. Describe below the method of selecting the follow-up sites. Sites designated as other sampling sites may be also used. List any sites which will routinely be used as follow-up sites.

MONTH AFTER FOLLOW-UP SAMPLE SITES
Source, Closest Site Upstream, Closest Site Downstream

PREPARATION INFORMATION

SYSTEM NAME	DATE PLAN COMPLETED	DATES MODIFIED
Grandview Northgate Water System (Light Industrial parks)	6/15/95	

NAME OF PLAN PREPARER	POSITION	DAYTIME PHONE #
Carl F. Reichhardt, P.E.	Engineer	(206) 366-3456

STATE REVIEWER	DATE LAST REVIEW

PAGE # 2

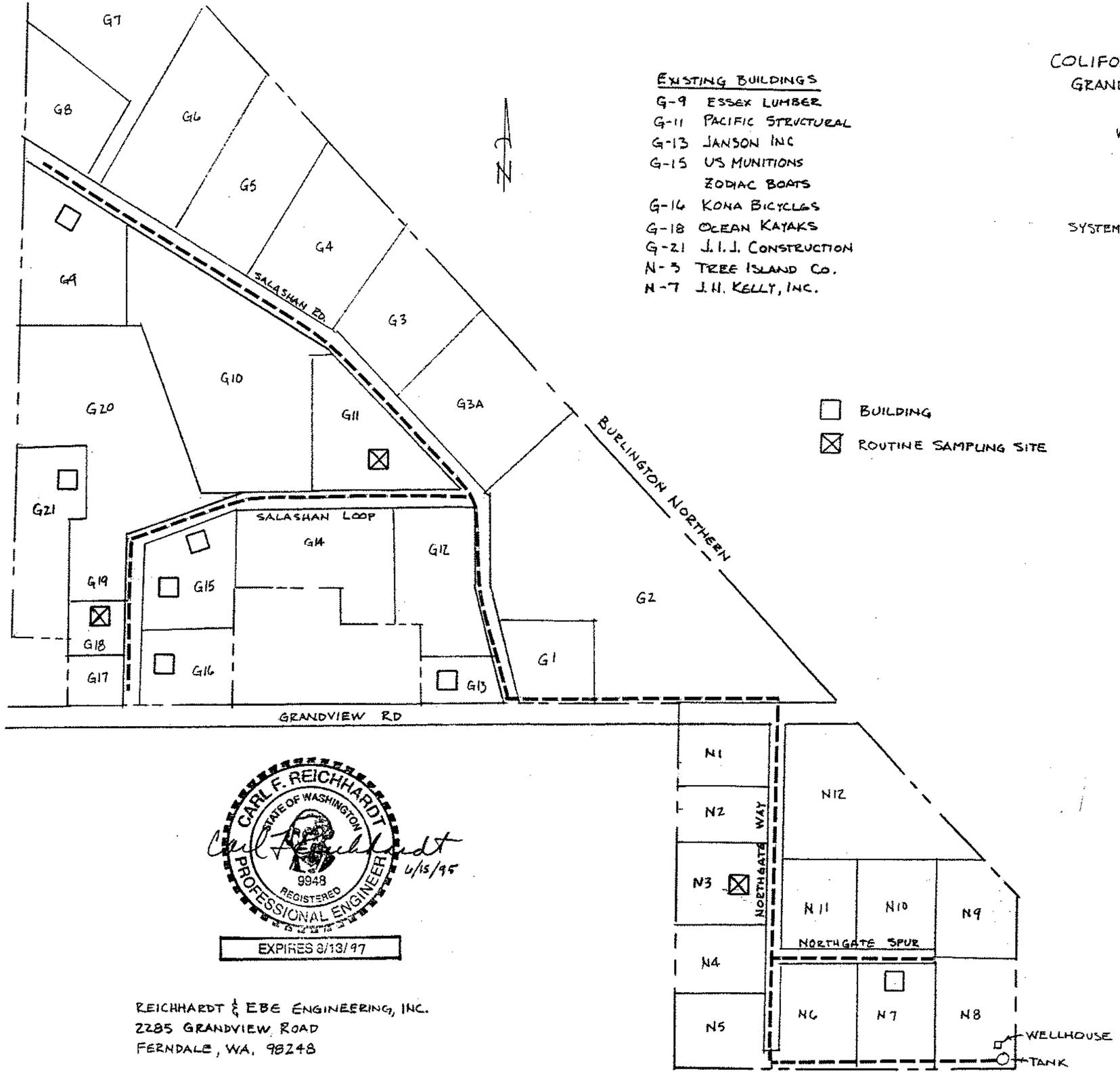
COLIFORM MONITORING PLAN
GRANDVIEW / NORTHGATE WATER SYSTEM

WHATCOM CO, WASHINGTON
6/15/95

SYSTEM I.D. 93-0505 (SUBMITTAL NO.)
FORMERLY 638 N

EXISTING BUILDINGS

G-9 ESSEX LUMBER
G-11 PACIFIC STRUCTURAL
G-13 JANSON INC
G-15 US MUNITIONS
ZODIAC BOATS
G-16 KONA BICYCLES
G-18 OCEAN KAYAKS
G-21 J.I.J. CONSTRUCTION
N-3 TREE ISLAND CO.
N-7 J.H. KELLY, INC.



□ BUILDING
⊠ ROUTINE SAMPLING SITE

CARL F. REICHHARDT
STATE OF WASHINGTON
9948
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 8/13/97

Carl F. Reichhardt 6/15/95

REICHHARDT & EBE ENGINEERING, INC.
2285 GRANDVIEW ROAD
FERNDALE, WA. 98248

Disinfection ByProduct (DBP) Monitoring Plan

DBP Monitoring Plan
(Reduced Triennial Schedule)

This template should be used by:
* Groundwater systems who serve less than 500 population on reduced monitoring

For more information, refer to the Reference Sheets on the separate tabs

System Name:	Whatcom County PUD No. 1 - Grandview-Northgate
PWSID#:	00638 N
Population:	400
Type of Source Water:	Groundwater
Completed by:	Wilson Engineering, Water System Services
Date:	12/7/2021

Routine Monitoring Requirments

Monitoring Frequency:	**Reduced Triennial**
Number of TTHM Samples Required:	1
Number of HAA5 Samples Required:	1

Monitoring Locations and Month Assigned

Monitoring Location (Name of Site)	Month Assigned
Kona, 2455 Salashan Loop	August

Determining Compliance for TTHM and HAA5

Our system is required to monitor triennially. Compliance will be achieved if the TTHM and the HAA5 at each monitoring location is less than or equal to 0.080 mg/L for TTHM and less than or equal to 0.060 mg/l for HAA5. If these levels are exceeded the monitoring frequency will be increased to quarterly.

To remain on reduced monitoring:
The TTHM LRAA must be less than or equal to 0.060 mg/l AND the HAA LRAA must be less than or equal to 0.045 mg/l at each monitoring location. If these levels are exceeded, but the MCL is not exceeded, the monitoring frequency will be returned to annual.

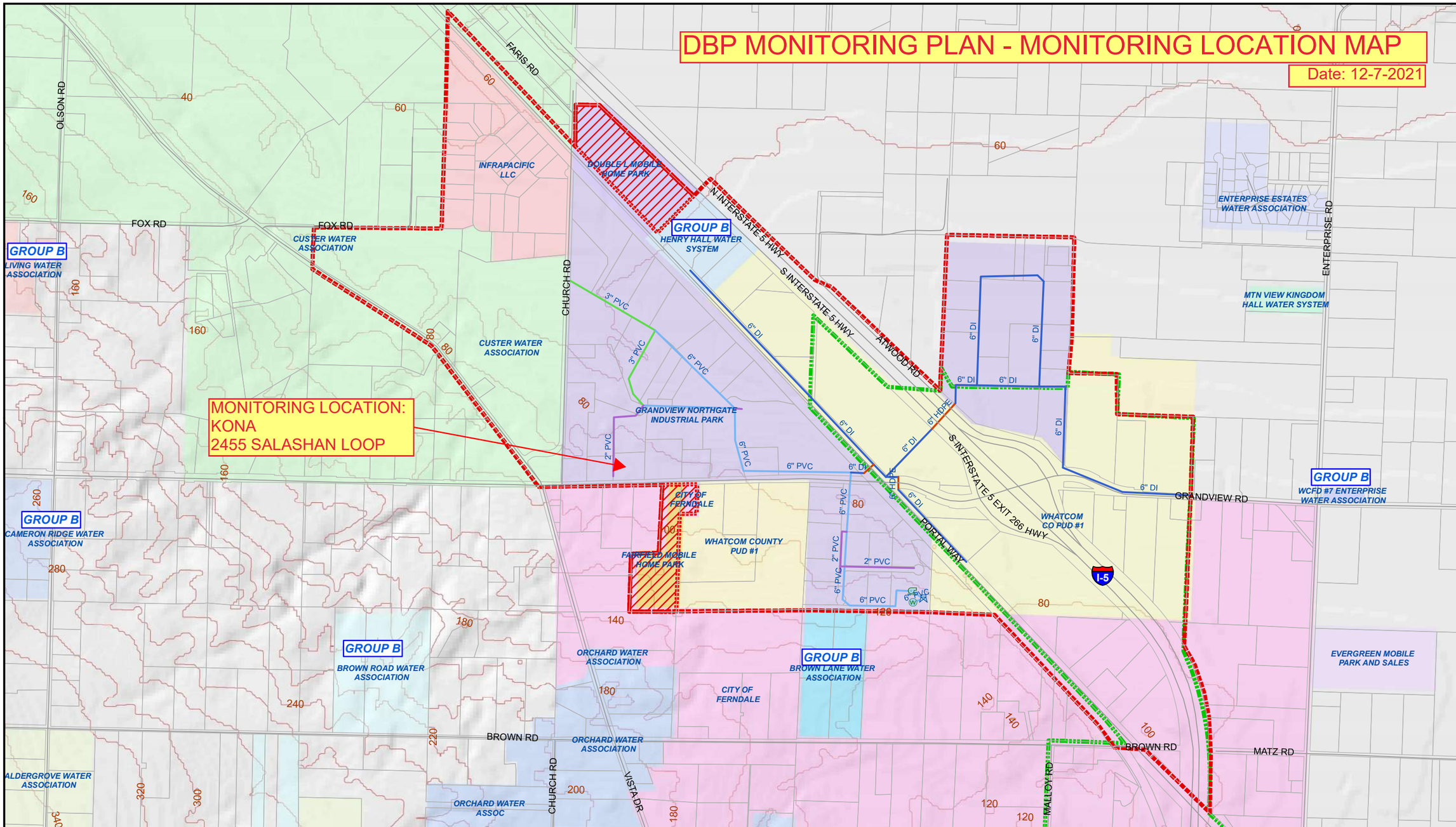
Disinfectant Residual Monitoring
Chlorine residuals must be measured at the same time and place as routine or repeat coliform samples
MRDL for chlorine and chloramines = 4.0 mg/l as Cl_2

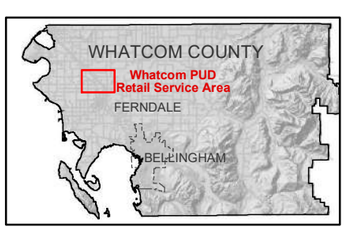
Determining Compliance for disinfectant residuals
Compliance is based on the running annual average (RAA) of 12 consecutive months
Daily residual measurements will / will not be included in the compliance calculations (circle one)

(Attach a distribution map with sample locations. You will need to print a hard copy for your records and make it available upon request. You do not need to submit a copy to DOH. If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.)

DBP MONITORING PLAN - MONITORING LOCATION MAP

Date: 12-7-2021





ADJACENT PURVEYORS:

CUSTER WATER ASSOCIATION
INFRAPACIFIC LLC
DOUBLE L MOBILE HOME PARK
CUSTER WATER ASSOCIATION
CITY OF FERNDALE
FAIRFIELD MOBILE HOME PARK
HENRY HALL WATER SYSTEM
ENTERPRISE ESTATE WATER ASSOCIATION
MTN VIEW KINGDOM HALL WATER SYSTEM
WCFD#7 ENTERPRISE WATER ASSOCIATION
EVERGREEN MOBILE PARK AND SALES
BROWN LANE WATER ASSOCIATION
ORCHARD WATER ASSOCIATION
BROWN ROAD WATER ASSOCIATION
CAMERON RIDGE WATER ASSOCIATION
LIVING WATER ASSOCIATION

Legend

Pump Station
Reservoir
Groundwater Well

Water Mains
2" PVC
3" PVC
6" DI
6" HDPE
6" PVC

Whatcom PUD Retail Service Area
Whatcom PUD Proposed Service Area Addition
Ferndale City Limits

N W E S

1 inch = 1,003 feet
0 250 500 1,000 Feet

WILSON ENGINEERING
CIVIL STRUCTURAL SURVEY
WILSONENGINEERING.COM

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD NO. 1
WHATCOM COUNTY WASHINGTON
FIGURE 1-5
GRANDVIEW-NORTHGATE RETAIL SERVICE AREA

DATE 6/29/2020
SCALE AS SHOWN
PROJECT 2020-023
SHEET 1 OF 1

Water Quality Monitoring Schedule

Water Quality Monitoring Schedule

System: GRANDVIEW-NORTHGATE INDUSTRIAL PARK **PWS ID: 00638 N** **Region: NORTHWEST**
Contact: Devin B Crabtree **Group: A - NTNC** **County: WHATCOM**

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021
Coliform Monitoring Population	400	400	400	400	400	400	400	400	400	400	400	400
Number of Routine Samples Required	1	1	1	1	1	1	1	1	1	1	1	1

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Lead and Copper	5	Jan 2018 - Dec 2020	standard - 3 year	09/29/2017	***Jun 2020***	
Asbestos	0	Jan 2020 - Dec 2028	waiver - 9 year			
Total Trihalomethane (THM)	1	Jan 2018 - Dec 2020	standard - 3 year	08/16/2017	***Aug 2020***	
Halo-Acetic Acids (HAA5)	1	Jan 2018 - Dec 2020	standard - 3 year	08/16/2017	***Aug 2020***	

Water Quality Monitoring Schedule

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:
- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S01 *NORTHGATE IND. PK. ASSOC. AGK350* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2020 - Dec 2020	standard - 1 year	09/16/2019	***Sep 2020***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	09/16/2019	Sep 2028
Arsenic	1	Jan 2020 - Dec 2022	standard - 3 year	09/16/2019	Sep 2022
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	09/16/2019	Sep 2022
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/04/2015	Aug 2021
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/20/2018	
Pesticides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/20/2018	
Soil Fumigants	1	Jan 2014 - Dec 2022	waiver - 9 year	09/20/2018	

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	*Due Date*
Measure chlorine residuals and submit monthly reports if your system uses continuous chlorination:	monthly
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2020
Submit CCR certification form to ODW (Community systems only):	10/01/2020
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2020
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Northwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding DBPs:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Ingrid Salmon: (253) 395-6775 or ingrid.salmon@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

Water Quality Monitoring Lab Reports

Available online at DOH Sentry website (https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx).

Appendix C
Design and Construction Standards

Whatcom County Public Utility District No. 1

Grandview-Northgate Water System

WATER DESIGN STANDARDS
AND
CONSTRUCTION STANDARDS AND DETAILS

DECEMBER, 2021

TABLE OF CONTENTS

1. DRAWING STANDARDS 1

2. RECORD / AS-BUILT DRAWING STANDARDS 2
   2.1 RECORD/AS-BUILT DRAWING CATEGORIES 2
   2.2 RECORD/AS-BUILT DRAWING REQUIREMENTS 2

3. WATER PROJECT DESIGN STANDARDS 3

4. WATER CONSTRUCTION STANDARDS AND DETAILS 5
   4.1 WATER MAINS 5
   4.2 WATER SERVICES 6

1. DRAWING STANDARDS

The design drawings for the proposed water main extension shall be prepared in accordance with the following drawing standards.

1. All plans shall be on a reproducible cut sheet, 24" X 36", and shall include: title block and general notes.

2. Scale for plan and profile drawings shall be 1" = 50 ' minimum for horizontal, and 1" = 5' or 1" = 10' for vertical.

3. Drawings shall contain the following information:
   - A. Current plat information.
   - B. Maximum 2-foot contour.
   - C. ***WC PUD No. 1 vertical datum***. Current conversions to U.S.G.S. Datum shall be shown.
   - D. Relationship of the water extension to existing and proposed utilities including water, sewer, storm, electrical, gas, cable etc.
   - E. Relationship of the water extension to street paving, curb, gutters, sidewalks, rights-of-way, and utility easements.
   - F. Scale, north arrow, legend, datum, vicinity map, and general notes. The Developer shall also provide the description, location and elevation of all bench mark data available on the project site and this information, wherever possible, shall be indicated on the maps furnished by the Developer.
   - G. Plans shall be sealed by a Professional Engineer licensed in Washington.

4. When more than one sheet is required to cover all of the construction area, an overall drawing will be required.

5. The construction plans shall be prepared by a person experienced in plan preparation and the work shall conform to established standards of workmanship.

6. For PUD projects, the PUD's Engineer for the specific project will prepare construction plans. For Developer extensions, the construction plans shall be reviewed by the PUD. The Developer shall submit two (2) sets of plans for review by the PUD. Upon completion of the project, the Developer shall submit one (1) reproducible mylar and one (1) disk with electronic drawing files of the certified record/as-built drawings.

7. All applicable construction standards and details including standard details shall be shown on the plans.

2. RECORD / AS-BUILT DRAWING STANDARDS

The following general standards are set forth here as a guide for Record/As-built drawings.

2.1 RECORD/AS-BUILT DRAWING CATEGORIES

There are two distinct categories for the preparation of Record/As-built drawings. The first category is for Contractors with whom the PUD has directly contracted to perform construction work. The second category covers Developer Constructed Facilities.

2.1.1 FOR PUD CONTRACTS: Before final acceptance, the Contractor shall provide the PUD with a <u>certified</u> (signed and dated) record/as-built drawing print. The record/as-built drawings shall include the information listed in Section 2.2.

2.1.2 FOR DEVELOPER CONSTRUCTED FACILITIES: Where the PUD provides inspection, the PUD will provide the Developer with the record/as-built information collected by the inspector. Before final acceptance, the Developer shall provide the PUD with mylar prints and electronic files of the record/as-built drawings. These as-built drawings shall include the information listed in Section 2.2. The PUD will check and certify the as-built drawings.

2.2 RECORD/AS-BUILT DRAWING REQUIREMENTS

The record/as-built drawings shall include the exact location of all water mains and services and the approximate location of all other underground and above ground utilities and shall include the following location information:

Water Mains and water services:

A. The location of all vertical and horizontal bends in the water system. Stationing shall be along the length of the extension.

B. The location of all water valves, hydrants, hydrant valves, and blow-offs with distance along centerline and distance from the centerline.

C. The location of all utilities within easements. This will include distances to the utilities from the easement lines.

D. Stationing of service tap on the main. Stationing shall be cumulative along the length of the extension.

E. Distance from main to property stop/meter.

F. Distance from tap to a point opposite (at 90 degrees) the property stop/meter along main, and station this point.

G. Distance from this point on the main to the property stop/meter (distance 90 degrees).

H. Depth of all services.

3. WATER PROJECT DESIGN STANDARDS

The following materials schedule is for the construction of water mains and service lines to meet the standards of Whatcom County Public Utility District (PUD) No. 1 Grandview-Northgate potable water system.

- All materials in substantial contact with potable water shall be ANSI/NSF Standard 61 certified.
- All water mains shall be PVC (polyvinylchloride) C-900 Class 150 minimum, Ductile Iron Class 52, or HDPE DR11 (PE 4710). Minimum size shall be eight (8) inches nominal inside diameter or as otherwise justified.
- Cul-de-sacs lines may be six (6) inch diameter.
- All main line valves shall be resilient seat gate valves. All valves and fittings shall be of the MJ (Mechanical Joint) or FL (Flanged) class "200."
- All service saddles shall be painted saddles with stainless steel straps.
- All corporation cocks shall either be Ford or Jones brand.
- Meters shall be purchased from the PUD. Meter boxes shall be Carson 1419 Box and Lid with Cast Iron Reader Lid for non-traffic areas, and Carson 1118 BCF w/ Cast Iron Reader Lid for traffic areas, or equivalent. Size of meter boxes shall be as appropriate for larger meter sizes.
- Meter setters shall be Ford Model VH72-12W-11-33-GNL 5/8" X ¾", or equivalent, w/ lockable angle shut off on inlet and single check valve outlet. Meter setter size shall be as appropriate for larger meter sizes.
- All service lines shall be 200 PSI poly pipe.
- All male and female adapters shall be Ford or Jones brand heavy brass.
- Any insert coupling shall be brass.
- Curb stops (if used) shall be Ford brand neoprene ball valves.
- All dead-end lines must have a two (2) inch blow-off assembly.
- All main lines shall be uniformly bedded and supported.
- **Testing:** Water mains shall be tested at 225 psi, or 150 psi in excess of that under which they will operate, whichever is greater, and checked for leaks prior to completion of back filling. All leaks, if any, shall be repaired and the line re-tested to ensure the integrity of the line.
- All valves shall be supported with concrete blocks. Tees and elbows shall be supported with thrust blocks made of poured concrete.
- All saddles shall be positioned horizontal or at a 45^0 angle up from horizontal position.
- Newly constructed water lines shall be chlorinated and then tested for coliform bacteria per WSDOT Standard Specifications 7-09.3(24) and per Health Department regulations.
- All road crossings must meet Whatcom County construction requirements.
- All construction must be mapped and "as built" blueprints shall be filed with the Association.

1. Minimum design criteria, unless the PUD criteria is more stringent, shall be in accordance with the current "Water System Design Manual", WA State Department of Health.

2. Minimum pipe size for lines is eight (8) inches in diameter. Six (6) inch diameter pipe may be allowed at the discretion of the PUD when future extension is not anticipated, such as a

cul-de-sac. Dead-end lines are only permitted where there is a cul-de-sac and where it is not possible to make a loop. Blow-offs shall be installed at the end of a dead-end line.

3. Water system improvements are subject to the following criteria:

   A. All water system construction and reconstruction shall be done pursuant to a design that, when fully implemented, will provide the flow requirements of the Comprehensive Water System Plan.

   B. The minimum pressures allowed by the PUD at any time are 30 psi under peak hourly demand.

   C. For water system extensions, the Developer or ULID will be required to install, as a minimum, the size of improvements required by the PUD's Water System Plan. A Latecomers agreement can be created if the sizing was in excess of that required by the Developer or ULID.

   D. When any new development increases the flow requirements, the Developer shall upgrade the existing water system to support the changes.

4. Utilities shall be extended through the property to allow for future extension, expansion and continuation of the PUD's distribution system or for conformance with the Comprehensive Water System Plan.

5. A minimum of ten (10) feet recorded easement must be provided each side of the edge of the pipe.

6. The minimum cover on water mains shall be three (3) feet unless otherwise approved by the A.

7. Valves 12 inches or less shall be resilient seated gate valves (AWWA C-509/C-515). All valves installed outside the pavement section shall be furnished with an approved valve marker.

8. Valves shall be installed along the water main at intervals not to exceed 800 feet. Gate valves shall be placed at all junction points, such that there are valves on at least 2 of 3 legs of a tee, or 3 of 4 legs of a cross.

9. Minimum separation of potable water mains and sanitary sewer lines shall be in accordance with the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.

10. Water mains shall be graded on an upward slope to a high point where a combination air/vacuum release valve shall be installed. See Section 4.1, Water Main Construction Details for additional information.

4. WATER CONSTRUCTION STANDARDS AND DETAILS

The following general standards of materials and construction are set forth here as a guide for water projects.

4.1 WATER MAINS

1. All work and materials shall conform to the current Standard Specifications for Road, Bridge and Municipal Construction (DOT/APWA) as prepared by Washington State Department of Transportation and the Washington State Chapter of the American Public Works Association, Whatcom County Development Standards, these PUD Water Design Standards and Construction Standards and Details, and the instructions and recommendations of the Manufacturer of the material concerned. In case of a conflict between the above standards, the more stringent shall apply. All work and materials shall be subject to the approval of the PUD.
2. While cutting or working with asbestos cement pipe, all Federal, State and Local regulations must be observed. Any work with AC pipe shall be done by certified personnel.
3. All water pipe materials, trenching, bedding, installation and testing shall conform to WSDOT/APWA Specifications 7-09, AWWA C-600 and C-651, and PUD Water Construction Standards and Details. Backfill under pavement shall consist of material conforming to WSDOT/APWA 9-03.19. Backfilling of trenches shall be in accordance with WSDOT/APWA 7.08.3(3) (Compaction to 95% maximum density under pavement, 85% in open areas).
4. Water main pipe shall be C900 PVC Class 150 (minimum), meeting the requirements of WSDOT/APWA Specification 9-30.2(5), or Ductile Iron meeting WSDOT/APWA Specification 9-30.1(1), or HDPE meeting 9-30.1(6).
5. All Ductile Iron water fittings shall conform to WSDOT/APWA Section 9-30.2 (1).
6. All valves shall have a minimum pressure rating of 200 psi. Gate valve installation shall conform WSDOT/APWA Section 7-12. Gate Valves for water mains shall conform to the latest revision AWWA C509/C515 Standard for Resilient Seated Gate Valves. Valves shall be Waterous Series 500 or equal.
7. All water main pipe installations shall be bedded with pipe zone gravel backfill per WSDOT 9-03.12(3). The bedding cross-section shall be blocked with impervious material (i.e. clay or concrete) at least every 800 feet and the trench drained to daylight or to a storm drain.
8. Minimum separation of water mains and sanitary sewer lines shall be ten (10) feet horizontally for parallel pipe, and eighteen (18) inches vertically with water on top for perpendicular or oblique crossings, measured from the bottom of the water pipe to the crown of the sewer pipe. Situations occurring with less than the minimum separation as required shall be in accordance with Section C1-9.1 Required Separation Between Water Lines and Sanitary Sewers of the current edition of the “Criteria for Sewage Works Design” published by the Washington State Department of Ecology.
9. Contractor shall mark all underground water mains and service lines with 2-inch wide

detectable metalized tape: Blue tape for water mains, brightly colored and bearing an imprint identifying the type of line buried below. The detector tape shall be buried 8 to 12 inches below finished grade.

10. A cast iron valve box and an approved marking post shall be installed with each valve in accordance with WSDOT/APWA Section 7-12.3(1). American Flow Control's Trench Adapter valve box may be substituted. Where a valve operating nut is over 4' lower than grade, the AFC Trench Adapter valve box and stem extension combination (or approved equal) must be used. Valve marking posts are required for all valves not installed in pavement.

11. The PUD or their appointed representative shall witness all testing. The Contractor shall provide the PUD 48 hours notice prior to conducting any tests.

12. All water line and appurtenances shall be pressure tested at 225 psi, or 150 psi in excess of that under which they will operate, whichever is greater, in accordance with WSDOT/APWA Specification 7-09.3(23).

13. The Contractor shall disinfect, flush and provide a satisfactory coliform bacteriological testing report to the PUD in accordance with WSDOT/APWA Section 7-09.3(24). The Contractor shall also provide two chlorine concentration test reports to show the initial chlorine concentration is at least 50 mg/L, and to show the 24-hour residual chlorine concentration is at least 25 mg/L. All tests must be performed by a DOH-certified testing laboratory and sample-taking shall be witnessed by the PUD or their appointed representative.

14. The PUD must receive a satisfactory coliform bacteriological testing report before new water mains are connected to existing mains and placed in service.

15. Chlorinated flush water must be disposed of either into an approved sanitary sewer system OR dechlorinated prior to release in accordance with WSDOT/APWA Section 7-09.3(24). The Contractor shall coordinate with PUD staff to ensure the rate of disposal does not overload any receiving systems or water bodies.

16. A licensed professional engineer must certify that construction conformed to the approved construction documents. The professional engineer must submit a Construction Completion Report form and Pressure, Leakage, and Bacteriological Testing Report form for distribution main projects to the PUD GV-NG system to be filed and available upon request by the DOH.

4.2 WATER SERVICES

4.1 **FOR PUD CONTRACTS:** The Contractor is responsible for providing and installing equipment for water service connections. The Contractor shall keep track of the meter serial numbers and readings for both the meters removed and the meters installed. A Meter Replacement Log or equivalent shall be filled out and returned to the PUD. The removed meters shall be returned to the PUD.

4.2 **FOR DEVELOPER CONSTRUCTED FACILITIES:** The Developer is responsible for installing the water service from the water main to property line for new main construction.

The Property Owner is responsible for installing water service from property line to building(s). The meter assembly must be purchased from the PUD. The PUD will install meter assemblies when the Property Owner requests service.

2. Staking of lots and/or property lines to assure correct water service locations is the responsibility of the Developer and/or Property Owner. Locations are to be as shown on the approved drawings. Errors due to failure to provide a property survey or due to changing lot locations during final plat approval shall be corrected by the Developer and/or Property Owner immediately.

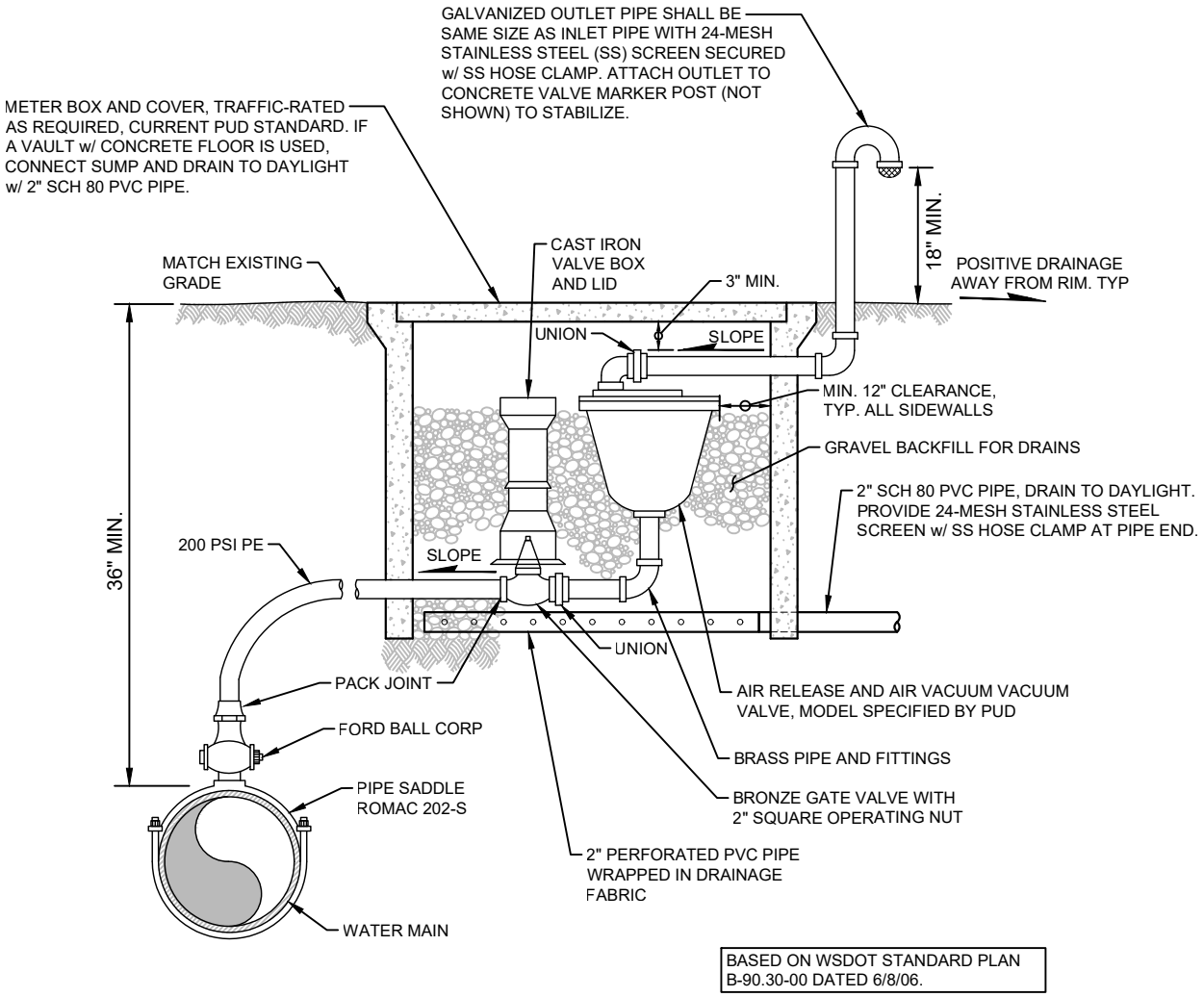
3. Side sewer lines and water service lines shall maintain a minimum horizontal separation of four (4) feet and a vertical separation of eighteen (18) inches with water installed above sewer, from the mains to the property line. Service lines shall be installed in separate trenches.

4. Water service materials and installation shall be in accordance with the Water Service Connection Detail.

STANDARD DETAILS

Details included are:

- Exhibit 1: Combination Air Release / Air Vacuum Valve Assembly Detail
- Exhibit 2: Temporary Connection Detail
- Exhibit 3: Water Sampling Station Detail
- Exhibit 4a: Blow-Off Assembly Type 1 Detail
- Exhibit 4b: Blow-Off Assembly Type 2 Detail
- Exhibit 5a: Thrust Blocking Schedule – 1
- Exhibit 5b: Thrust Blocking Schedule – 2
- Exhibit 6: Trenching and Backfill Detail
- Exhibit 7: Water Service Connection Detail
- Exhibit 8: Reverse Thrust Block Detail
- Exhibit 9: Water Main Stovepipe Detail
- Exhibit 10: Surface Repair Details
- Exhibit 11: Dual Check Valve Assembly (DVCA) Detail



NOTES:

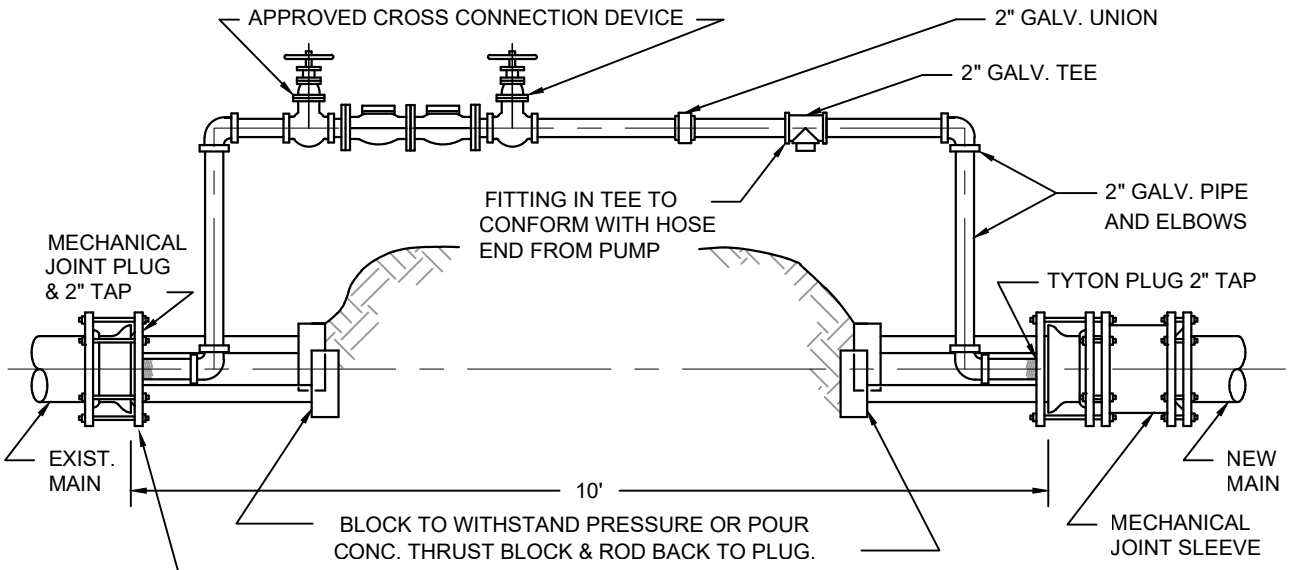
1. THE SIZE OF THE COMBINATION AIR RELEASE / AIR VACUUM VALVE SHALL BE SPECIFIED IN THE CONTRACT. THE PIPING AND VALVES SHALL BE THE SAME SIZE AS THE COMBINATION AIR RELEASE / AIR VACUUM VALVE.
2. LOCATE AT THE HIGH POINT OF THE MAIN, TAP TOP OF MAIN.
3. METER BOX OR VAULT STYLE SHALL BE AT DISCRETION OF WHATCOM COUNTY PUD #1.

COMBINATION AIR RELEASE / AIR VACUUM VALVE ASSEMBLY

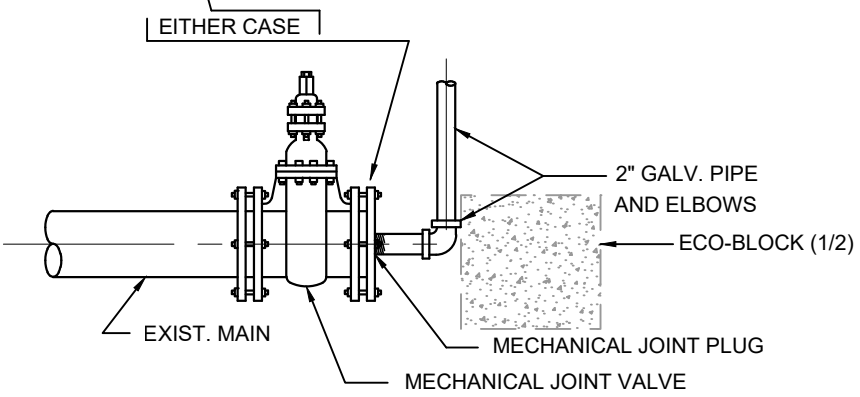
NOT TO SCALE

WILSON ENGINEERING WILSONENGINEERING.COM	CIVIL STRUCTURAL SURVEY	WC PUD#1 – GRANDVIEW / NORTHGATE WHATCOM COUNTY WASHINGTON EXHIBIT 1 COMBINATION AIR RELEASE / AIR VACUUM VALVE ASSEMBLY DETAIL	DATE NOV 2021 SCALE NTS JOB NO. 2020-023 SHEET 1 OF 1

PRIOR TO INSTALLATION A COPY OF THE CURRENT (7-10 DAYS) CERTIFICATION MUST BE PROVIDED TO THE UTILITY.



CASE "A" HOOK UP TO OPEN BELL



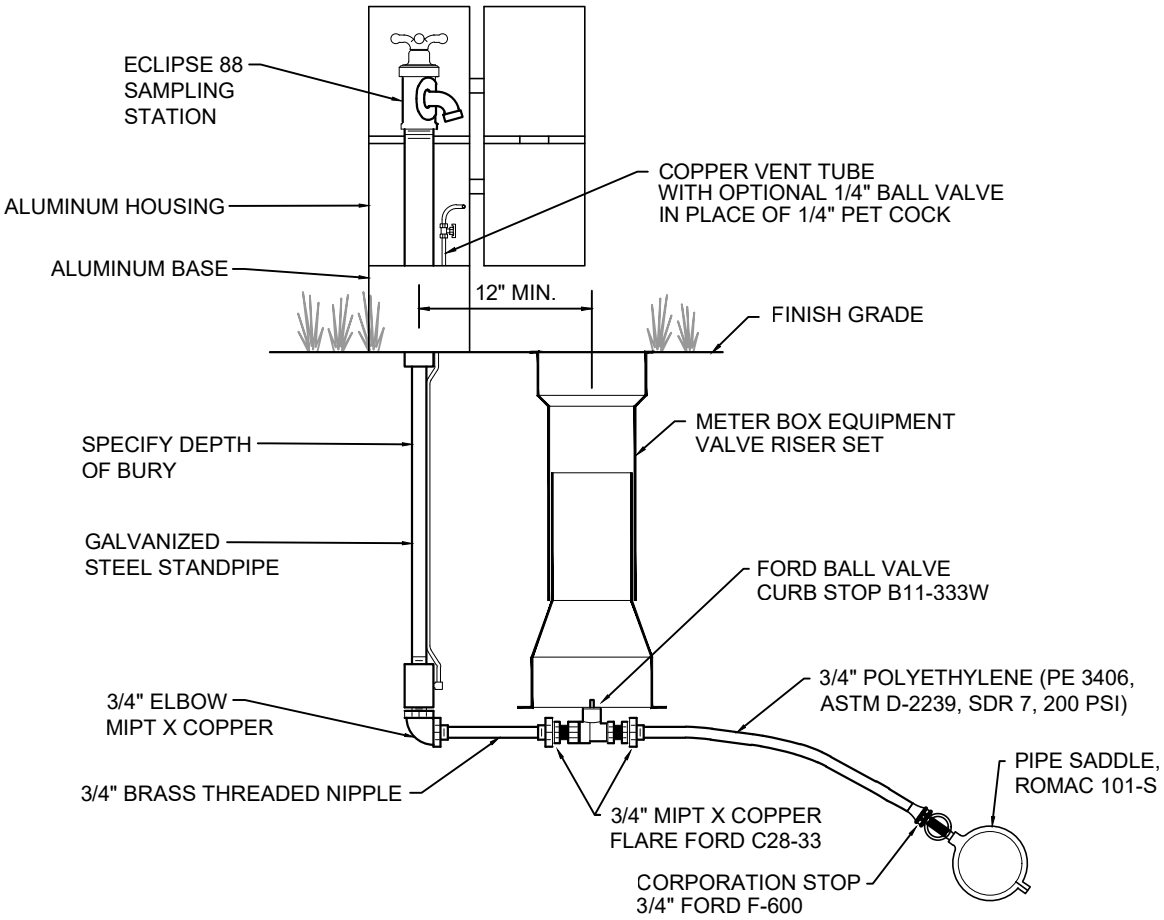
NOTE:
CONTRACTOR SHALL PROVIDE DISINFECTION OF CONNECTION IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION SECTION 7-09.3(24).

CASE "B" HOOK UP TO FLANGE OF MAIN VALVE

TEMPORARY CONNECTION

NOT TO SCALE

WILSON ENGINEERING WILSONENGINEERING.COM CIVIL STRUCTURAL SURVEY	WC PUD#1 - GRANDVIEW / NORTHGATE WHATCOM COUNTY WASHINGTON EXHIBIT 2 TEMPORARY CONNECTION DETAIL	DATE MAY 2020 SCALE NTS JOB NO. 2020-023	SHEET 1 OF 1



NOTES:

1) SAMPLING STATIONS SHALL BE A 2.5' BURY, WITH A 3/4" FIP INLET, AND A (3/4" HOSE OR UNTHREADED) NOZZLE.

2) ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE, ALUMINUM-CAST HOUSING. HOUSING SHALL BE PAINTED GREEN.

3) WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY.

4) ALL WORKING PARTS WILL ALSO BE OF BRASS AND BE REMOVABLE FROM ABOVE GROUND WITH NO DIGGING.

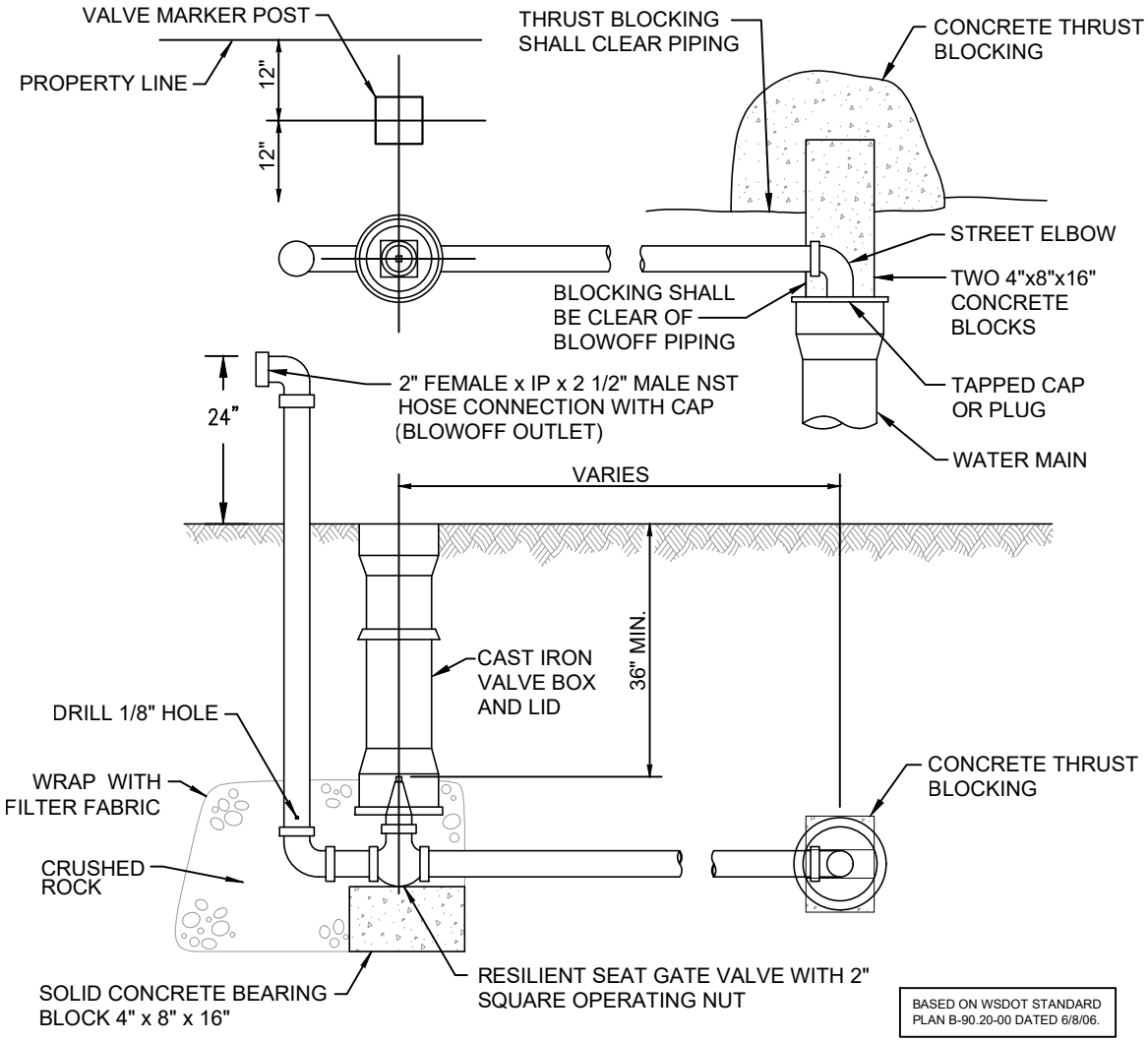
5) EXTERIOR PIPING SHALL BE GALVANIZED STEEL OR BRASS PIPE.

6) A COPPER VENT TUBE WILL ENABLE EACH STATION TO BE PUMPED FREE OF STANDING WATER TO PREVENT FREEZING AND TO MINIMIZE BACTERIA GROWTH.

7) SAMPLING STATION SHALL BE ECLIPSE NO. 88, MANUFACTURED BY KUPFERLE FOUNDRY, ST. LOUIS, MO 63102.

WATER SAMPLING STATION

NOT TO SCALE



BASED ON WSDOT STANDARD PLAN B-90.20-00 DATED 6/8/06.

NOTES:

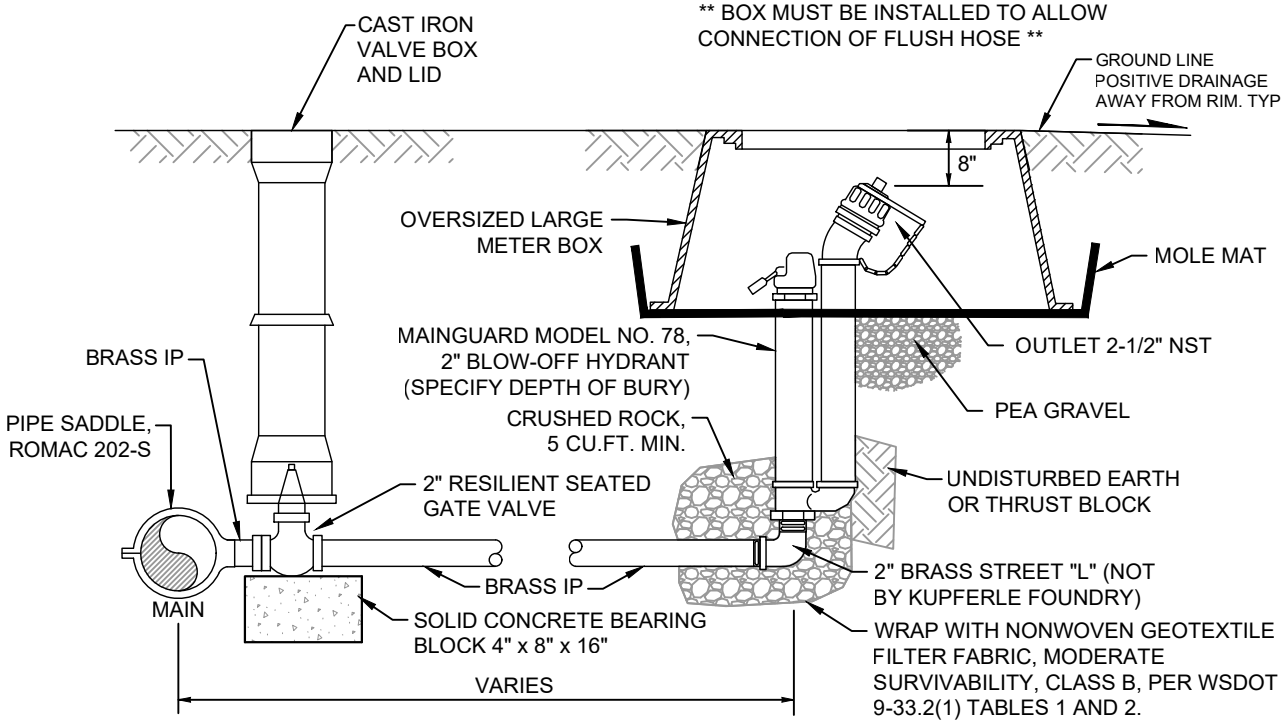
1. PAINT PIPE THREADS WITH ASPHALT PAINT AFTER ASSEMBLY.
2. ALL PIPING SHALL BE GALVANIZED STEEL.
3. VALVE AND PIPING TO VALVE SHALL BE 2" UNLESS OTHERWISE NOTED ON PLANS.
4. LOCATE BLOWOFF OUTLET NEAR PROPERTY CORNER IF POSSIBLE.
5. FILTER FABRIC TO BE NONWOVEN GEOTEXTILE FABRIC, MODERATE SURVIVABILITY, CLASS B, PER WSDOT 9-33.2(1) TABLES 1 AND 2.

BLOW-OFF ASSEMBLY TYPE 1

NOT TO SCALE

LOCATE METER BOX IN A LOCATION TO MINIMIZE THE RISK OF FLOODING. WHERE POSSIBLE, INSTALL 2-IN PERF PIPE WRAPPED IN DRAINAGE FABRIC UNDER METER BOX AND 2-IN SCH80 PVC DRAIN TO DAYLIGHT w/ 24-MESH STAINLESS STEEL SCREEN AND SS HOSE CLAMP AT PIPE END.

** BOX MUST BE INSTALLED TO ALLOW CONNECTION OF FLUSH HOSE **



BLOW-OFF HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE, WITH AN OVERALL LENGTH AS REQUIRED FOR BURY DEPTH AND OTHER CLEARANCE REQUIREMENTS AS SHOWN ON THE DETAIL, OR AS DIRECTED BY WC PUD #1. SET UNDERGROUND IN AN OVERSIZED LARGE METER BOX, STYLE AND TYPE PER PUD CURRENT STANDARD. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST LOUIS, MO, OR APPROVED EQUAL.

TYPICAL APPROXIMATE OVERALL LENGTH 6" SHORTER THAN NORMAL DEPTH OF BURY. MINIMUM OPENING IN METER BOX SHOULD BE 10".

BLOW-OFF ASSEMBLY TYPE 2

NOT TO SCALE

MINIMUM REQUIRED BEARING AREA (SQ FT)					
	Tees/ ends	90°	45°	22.5°	11.25°
PIPE	A	B	C	D	E
4"	3.1	4.4	2.4	1.2	1.0
6"	7.1	10.0	5.4	2.8	1.4
8"	12.6	17.8	9.6	4.9	2.5
10"	19.6	27.8	15.0	7.7	3.9
12"	28.3	40.0	21.6	11.0	5.5
14"	38.5	54.4	29.5	15.0	7.5

1) THE TABLE PROVIDES THE MINIMUM CONCRETE BEARING SURFACE OF THRUST BLOCKS & ARE BASED ON THE FOLLOWING PARAMETERS:

   - 250 PSI INTERNAL FLUID PRESSURE
   - 1,000 PSF SOIL BEARING CAPACITY

   DEVIATIONS FROM THESE CONDITIONS REQUIRE RECALCULATING SIZE OF THRUST BLOCK

2) CONCRETE SHALL BE CAST-IN-PLACE WITH A MIN 1/4 SQ FT BEARING AGAINST THE FITTING

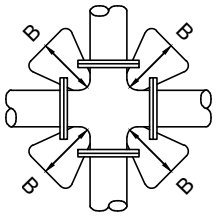
3) CONCRETE SHALL BEAR AGAINST FITTING ONLY AND NOT ADJACENT PIPING. CONCRETE SHALL NOT IMPEDE DISMANTLING JOINT OR FITTING.

4) BLOCKING SHALL WITHSTAND BOTH THE TEST PRESSURE AND ALL OPERATING PRESSURES.

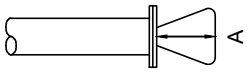
5) IF VERTICAL BENDS ARE REQUIRED TO INSTALL WATERMAIN, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CONSTRUCTION DETAILS.

6) BEARING AREA MAY BE REDUCED OR ELIMINATED BY USING TIE RODS OR RESTRAINED JOINTS, WHEN DESIGNED AND SEALED BY A P.E.

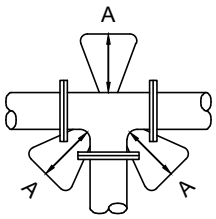
7) VALVES & FITTINGS MUST BE ENCASED IN PE IN ACCORDANCE WITH AWWA C-105 PRIOR TO INSTALLING THE THRUST BLOCKING.



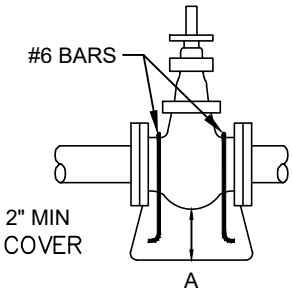
CROSS



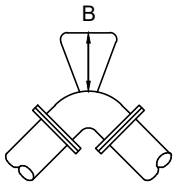
CAP OR PLUG



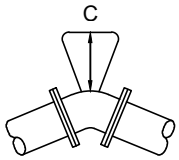
TEE



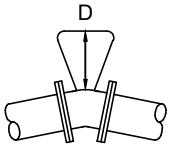
IN-LINE GATE VALVE



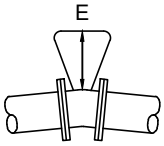
90° BEND



45° BEND



22-1/2° BEND



11-1/4° BEND

THRUST BLOCK SCHEDULE - 1

NOT TO SCALE

WILSON ENGINEERING
WILSONENGINEERING.COM

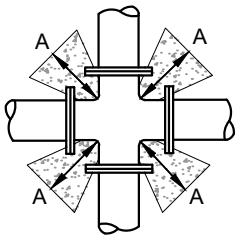
CIVIL
STRUCTURAL
SURVEY

WC PUD#1 - GRANDVIEW / NORTHGATE

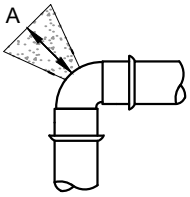
WHATCOM COUNTY WASHINGTON

EXHIBIT 5a
THRUST BLOCKING SCHEDULE - 1

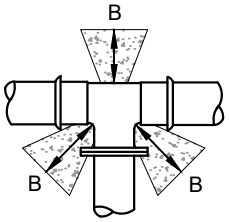
DATE	SHEET
MAY 2020	1
SCALE	OF
NTS	1
JOB NO.	
2020-023	



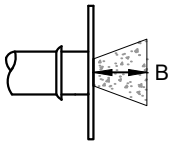
CROSS



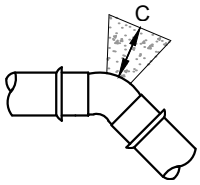
90° BEND



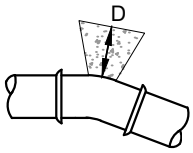
TEE



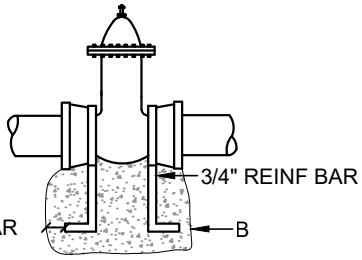
CAP or PLUG



45° BEND

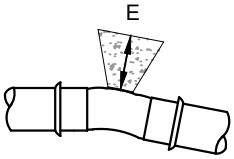


22 1/2° BEND



IN-LINE GATE VALVE

(PARTIAL RESTRAINT MUST BE PROVIDED BY PIPELINE BEYOND VALVE)

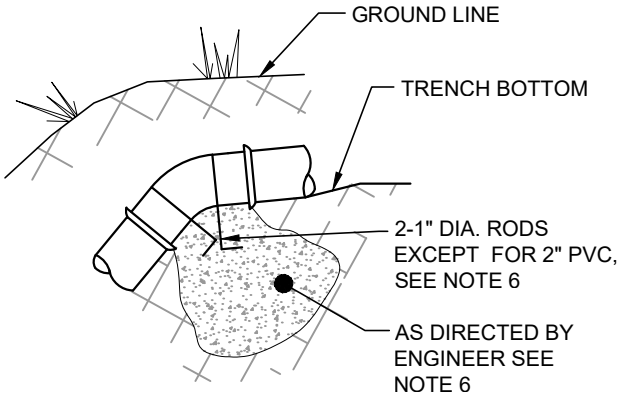


11 1/4° BEND

THRUST BLOCK TABLE

MINIMUM BEARING AREA AGAINST UNDISTURBED SOIL IN SQUARE FEET

PIPE SIZE	A	B	C	D	E
4"	2	2	2	2	2
6"	4	3	2	2	2
8"	7	5	4	2	2
10"	11	8	6	3	2
12"	16	12	9	5	3
16"	29	20	16	8	4
20"	45	32	24	13	6



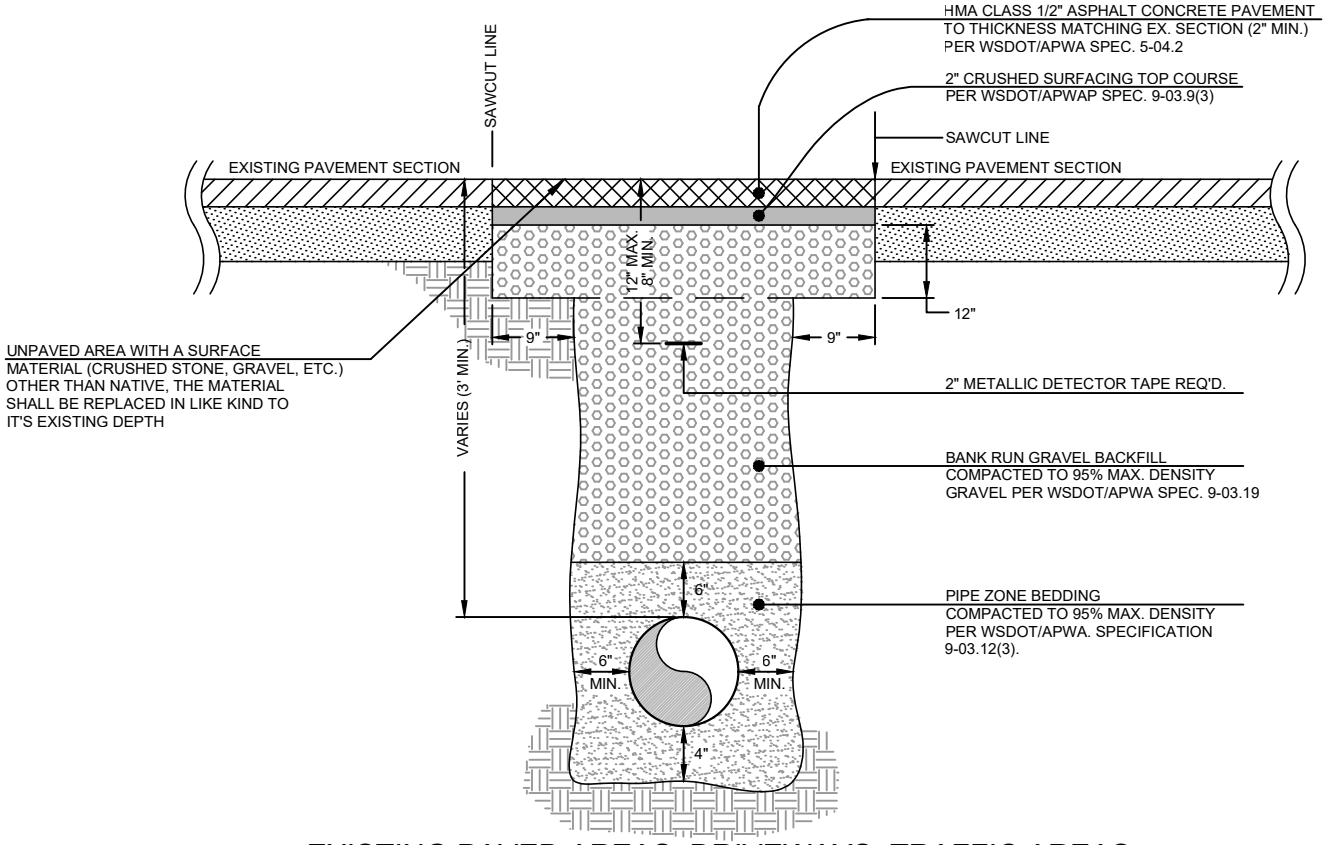
VERTICAL BEND

NOTES

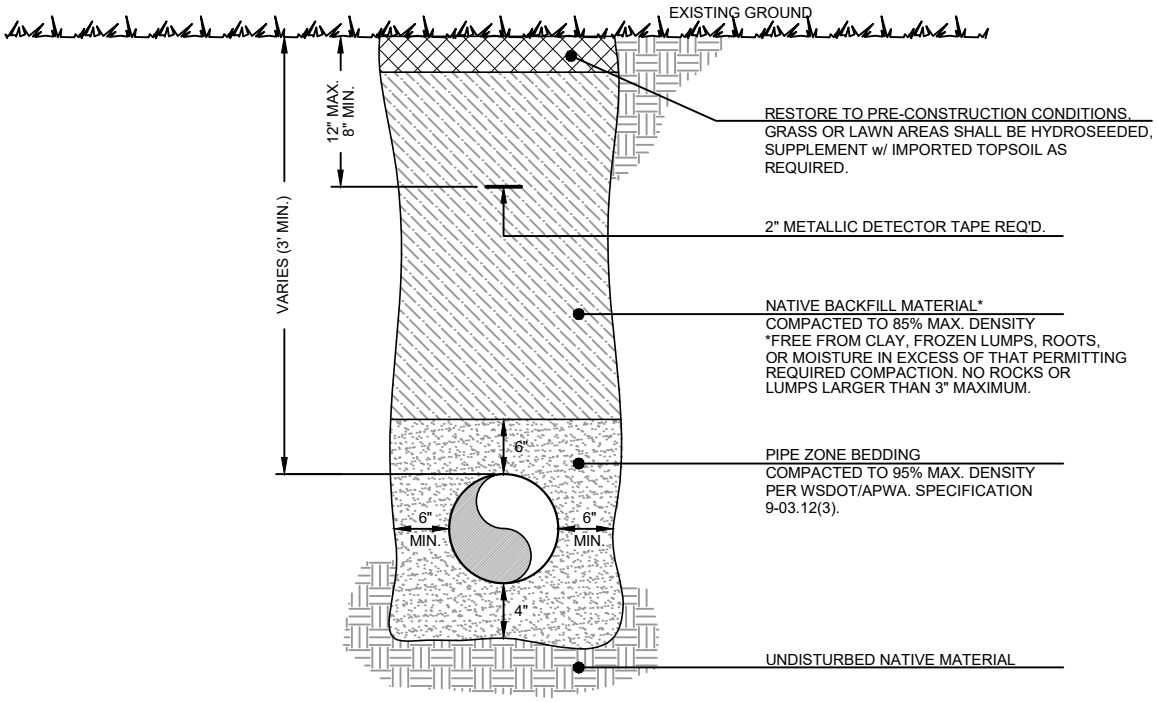
1. SQUARE FEET OF CONCRETE THRUST BLOCK AREA IS BASED ON 200 P.S.I. INTERNAL PRESSURE, A SOIL SAFE BEARING OF 2000 POUNDS PER SQUARE FOOT .
2. BEARING AREA MUST BE ADJUSTED FOR INTERNAL PRESSURES AND LOWER SOIL BEARING VALUES.
3. CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
4. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING JOINT.
5. THE CONTRACTOR SHALL INSTALL BLOCKING WHICH IS ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
6. STAINLESS STEEL BANDING SHALL BE USED AT 2" PVC VERTICAL BENDS INSTEAD OF 1" RODS. CONTACT ENGINEER FOR SIZING OF THRUST BLOCK AND DETAILS.
7. ALL BENDS, TEES & CROSSES SHALL INCLUDE RESTRAINED JOINTS (ROMAC GRIPPER) AS WELL AS THRUST BLOCKING.

THRUST BLOCK SCHEDULE - 2

NOT TO SCALE



EXISTING PAVED AREAS, DRIVEWAYS, TRAFFIC AREAS

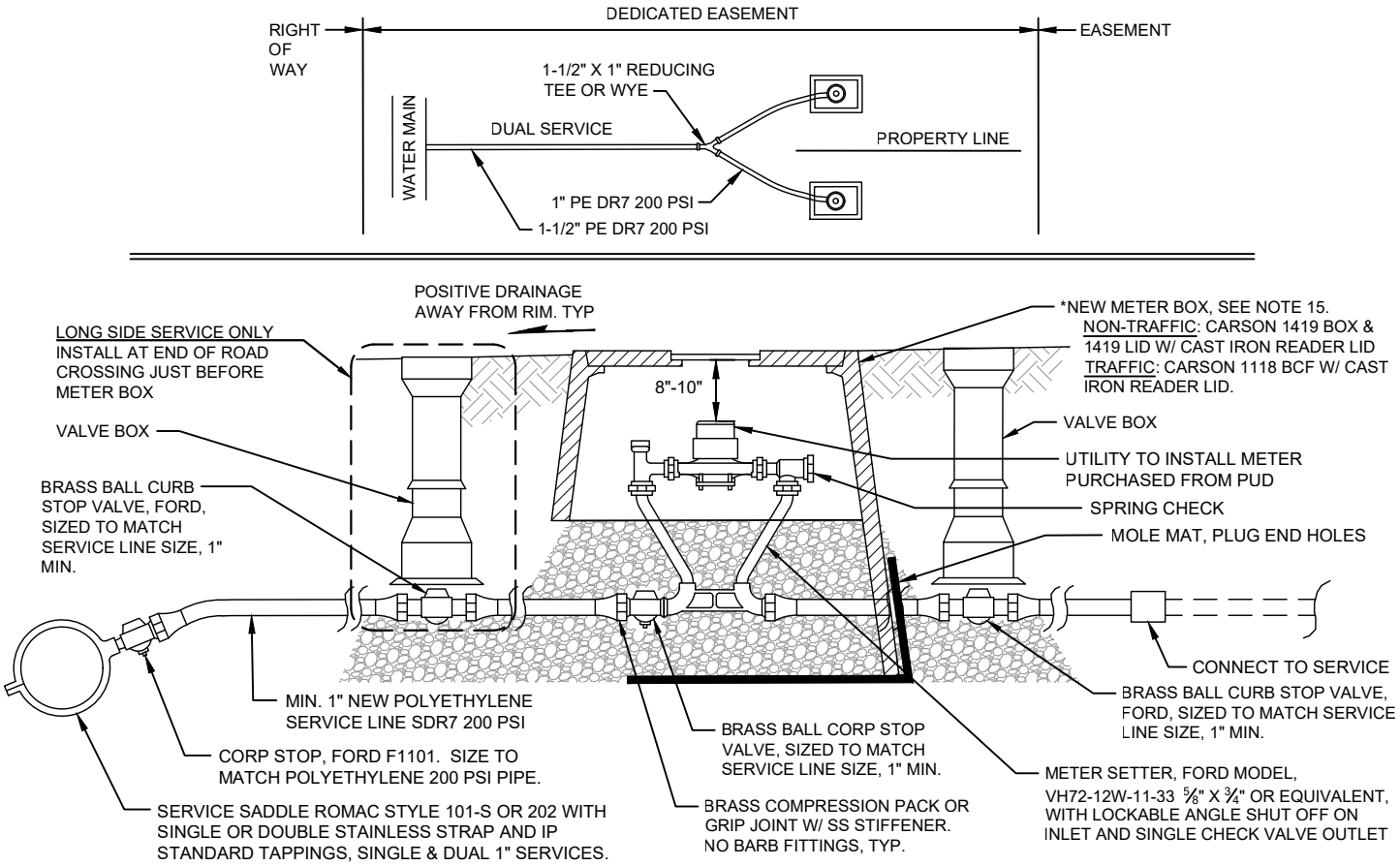


UNPAVED AND NON-TRAFFIC AREAS

TYPICAL TRENCHING AND BACKFILL

NOT TO SCALE

WILSON ENGINEERING WILSONENGINEERING.COM	CIVIL STRUCTURAL SURVEY	WC PUD#1 - GRANDVIEW / NORTHGATE WHATCOM COUNTY WASHINGTON EXHIBIT 6 TRENCHING AND BACKFILL DETAIL	DATE MAY 2020 SCALE NTS JOB NO. 2020-023 SHEET 1 OF 1



NOTES:

1. ALL FITTINGS SHALL BE BRASS.
2. ALL SERVICE CONNECTIONS TO WATER MAINS SHALL BE MADE USING SADDLES OF THE SIZE AND TYPE SUITABLE FOR USE WITH THE PIPE BEING INSTALLED. SADDLES SHALL BE ROMAC 101-S (101N-H FOR HDPE MAINS) WITH IP TAP, OR APPROVED EQUIVALENT. (FOR WATER SERVICES SIZED 1-1/2 INCH AND GREATER, SADDLES SHALL BE ROMAC 202-S, OR APPROVED EQUIVALENT.)
3. CORPORATION TAPS SHALL MAKE AS NEARLY AS POSSIBLE A 45 DEGREE ANGLE OFF THE VERTICAL CENTER LINE OF THE MAIN. NO TAP IS TO BE MADE ON THE TOP OF A WATER MAIN OR OFF THE REVERSE SIDE OF THE PIPE.
4. CORPORATION STOPS SHALL BE FORD F1101, SIZED TO MATCH POLYETHYLENE PIPE, WITH INLET I.P. STANDARD THREAD AND OUTLET COMPATIBLE WITH POLYETHYLENE PIPING, COMPRESSION FITTINGS ONLY, WITH NO SPECIAL ADAPTERS.
5. SERVICE PIPING SHALL BE POLYETHYLENE, PE 3406, ASTM D-2239, SDR 7, 200 PSI, IP SIZE AND SHALL CONFORM TO THE REQUIREMENTS OF AWWA C-901. MINIMUM SERVICE SIZE SHALL BE 1 INCH TO PROPERTY LINE FOR SINGLE FAMILY RESIDENCES AND 1-1/2" FOR DUAL SERVICE INSTALLATIONS.
6. THE WATER SERVICE PIPE SHALL HAVE A MINIMUM OF 24 INCHES DEPTH AND A MAXIMUM OF 36 INCHES DEPTH, INCLUDING UNDER DITCH SECTIONS.
7. IN LANDSCAPE AREAS METER BOXES SHALL BE CARSON 1419 W/ CAST IRON READER LID, OR CURRENT PUD STANDARD. METER BOX SHALL BE LOCATED WITHIN ONE (1) FOOT OF THE PROPERTY LINE WITHIN THE DEDICATED UTILITY EASEMENT AND AS CLOSE TO THE PROPERTY CORNER AS POSSIBLE. TOP OF THE BOX SHALL BE 2" ABOVE THE FINISHED GRADE. METER BOXES IN TRAFFIC AREAS SHALL BE CARSON 1118BCF W/ CAST IRON READER LID FLUSH WITH FINISHED GRADE.
8. U BRANCH SHALL BE FORD UV6342-W OR APPROVED EQUAL.
9. SINGLE CHECK VALVE SHALL BE INCORPORATED INTO METER SETTER.
10. DETECTOR TAPE SHALL BE INSTALLED WITH ALL SERVICE LINES. DETECTOR TAPE SHALL BE CENTERED OVER PIPE, ONE FOOT ABOVE SERVICE LINE.
11. NEW SERVICES ARE TO BE PRESSURE TESTED ALONG WITH THE NEW MAIN. NO USE OF WATER THROUGH A NEWLY INSTALLED SERVICE SHALL BE ALLOWED UNTIL WATER MAIN AND SERVICE INSTALLATION HAS BEEN INSPECTED, PRESSURE TESTED, CHLORINATED AND A SATISFACTORY BACTERIA TEST RECEIVED. AFTER INSTALLATION, THE SERVICE CONNECTION SHALL BE FLUSHED PRIOR TO CONNECTING THE METER. NO SERVICE IS TO BE COVERED UNTIL THE OWNER'S INSPECTOR HAS INSPECTED THE INITIAL INSTALLATION. ALL CORPORATIONS MUST BE IN AN ON POSITION AND ALL ANGLE VALVES MUST BE IN THE OFF POSITION.
12. SERVICE TESTING SHALL BE DONE AFTER WATER MAIN TESTING. DURING THE INSPECTION, EVERY SERVICE SHALL BE TURNED ON TO ITS FULL CAPACITY TO CHECK FLOW AND GUARANTEE THAT EACH SERVICE LINE HAS BEEN FLUSHED.
13. WATER METERS SHALL BE 5/8" X 3/4", US GALLON, BOTTOM LOAD, SEALED REGISTER, FROST BOTTOM, MASTER METER RADIO READ DIALOGUE 3G. TO BE PURCHASED FROM AND INSTALLED BY THE PUD.
14. CASING SHALL BE PROVIDED FOR ALL SERVICE LINES WITHIN ROADWAY. CASING SHALL BE INSTALLED FOR THE WIDTH OF PAVEMENT PLUS 5-FEET EACH SIDE. CASING SHALL BE HDPE SDR 11.
15. WHERE POSSIBLE, INSTALL 2-IN PERF PIPE WRAPPED IN DRAINAGE FABRIC UNDER METER BOX AND 2-IN SCH80 PVC DRAIN TO DAYLIGHT w/ 24-MESH STAINLESS STEEL SCREEN AND SS HOSE CLAMP AT PIPE END.

*NOTE: THE PUD RESERVES THE RIGHT TO CHANGE THE METER AND METER BOX STANDARD. CONTRACTOR AND DEVELOPER SHALL CONFORM TO THE CURRENT PUD STANDARD FOR THESE ITEMS AT THE TIME THE PROJECT IS CONSTRUCTED.

WATER SERVICE CONNECTION

NOT TO SCALE

WILSON ENGINEERING
WILSONENGINEERING.COM

CIVIL
STRUCTURAL
SURVEY

WC PUD#1 - GRANDVIEW / NORTHGATE

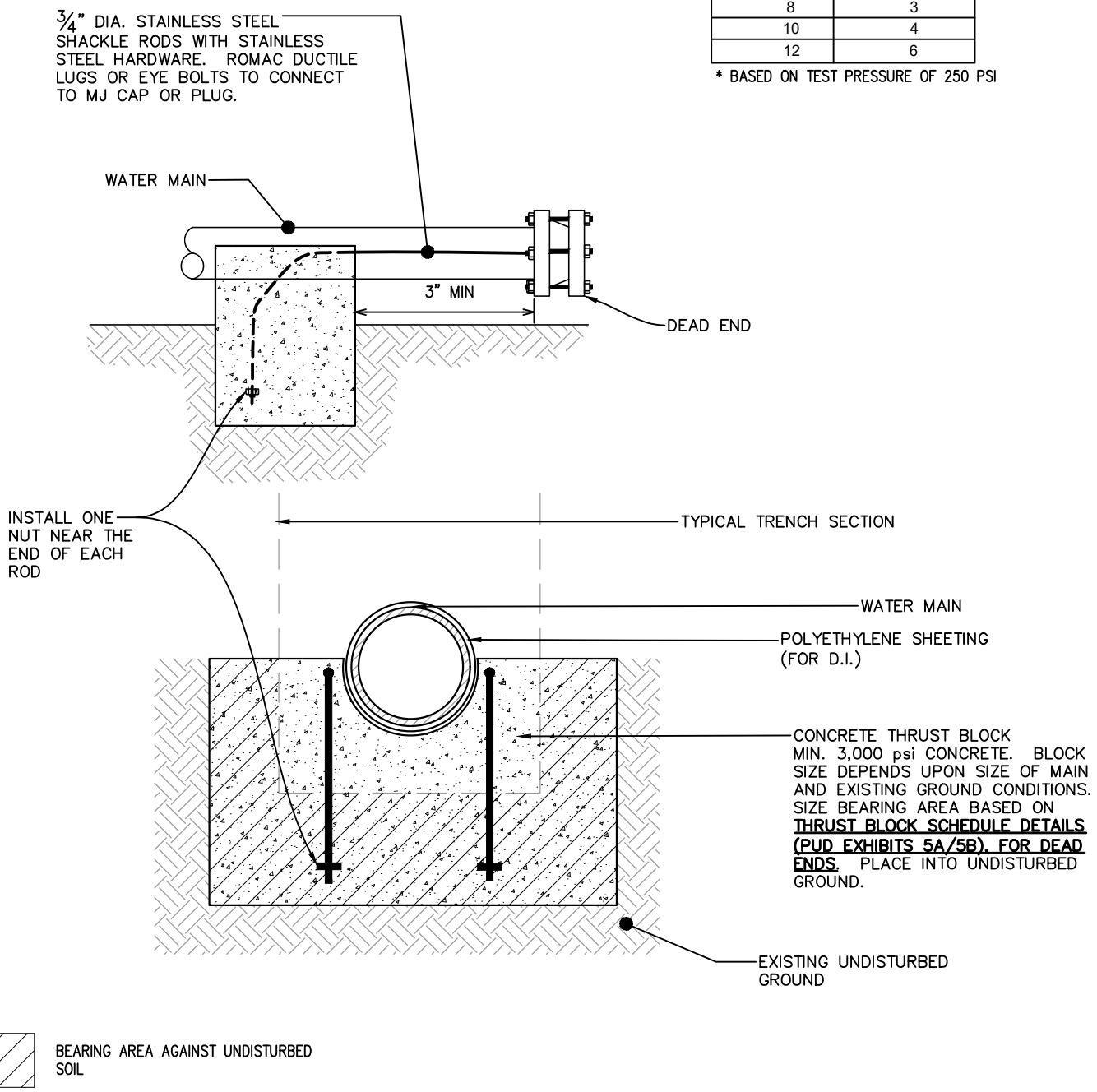
WHATCOM COUNTY WASHINGTON

EXHIBIT 7
WATER SERVICE CONNECTION DETAIL

DATE	SHEET
NOV 2021	1
SCALE	OF
NTS	
JOB NO.	
2020-023	1

WATER MAIN DIAMETER (IN)	NUMBER OF SHACKLE RODS*
4	2
6	2
8	3
10	4
12	6

* BASED ON TEST PRESSURE OF 250 PSI



REVERSE THRUST BLOCK

NOT TO SCALE

WILSON ENGINEERING
WILSONENGINEERING.COM

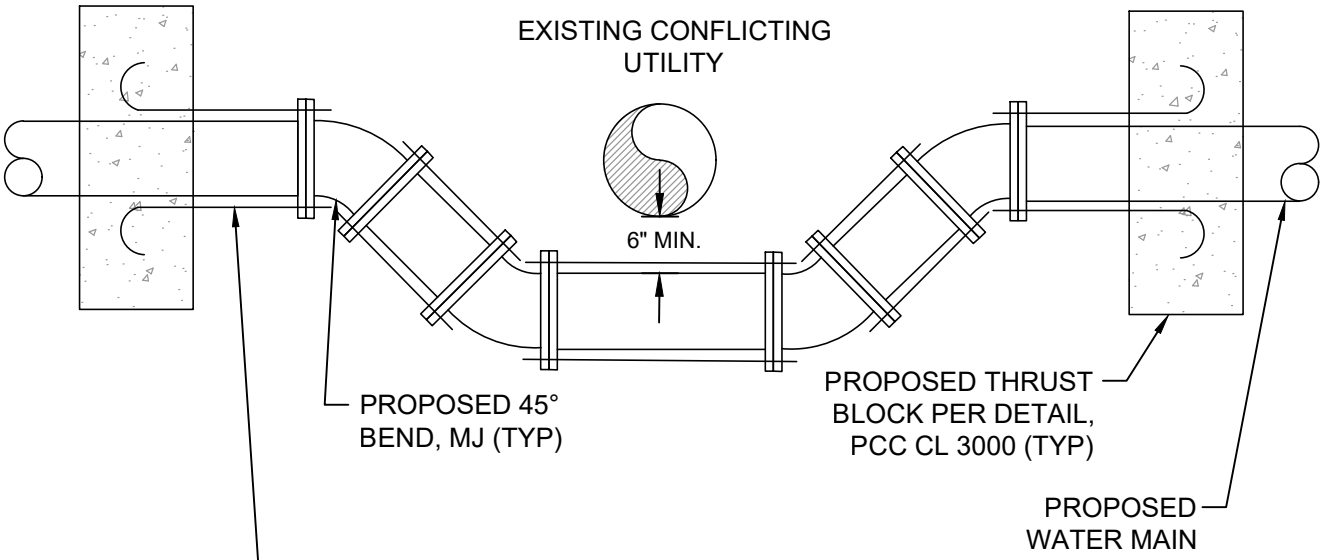
CIVIL
STRUCTURAL
SURVEY

WC PUD #1 - GRANDVIEW NORTHGATE

WHATCOM COUNTY WASHINGTON

EXHIBIT 8
REVERSE THRUST BLOCK DETAIL

DATE	SHEET
MAY 2020	1
SCALE	OF
NTS	1
JOB NO.	
2020-023	

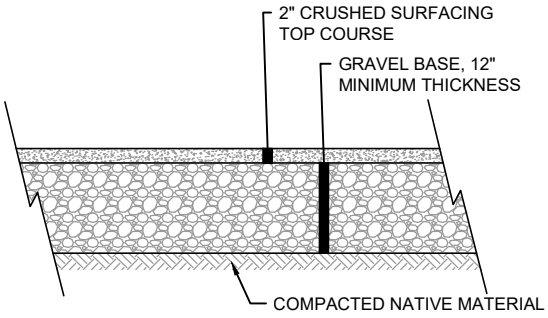


SHACKLE RODS SHALL BE THREADED EACH AS REQUIRED AND INSTALLED WITH ROMAC DUCTILE LUGS. 3/4" MINIMUM SHACKLE ROD SIZE, OR FITTING BOLT SIZE, WHICHEVER IS GREATER. TIE RODS SHALL BE HEAVILY COATED WITH ASPHALT AFTER INSTALLATION OR BE STAINLESS STEEL WITH STAINLESS STEEL HARDWARE. RESTRAINED JOINTS MAY BE SUBSTITUTED FOR TIE RODS UPON APPROVAL BY PUD.

WATER MAIN STOVEPIPE

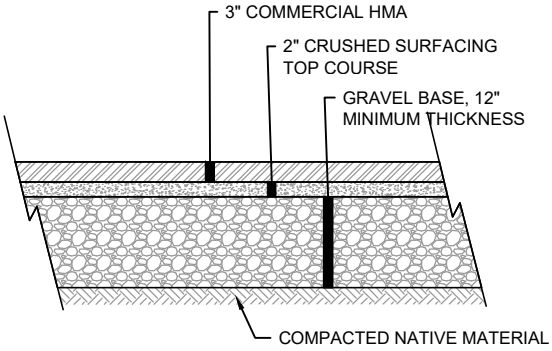
NOT TO SCALE

WILSON ENGINEERING WILSONENGINEERING.COM CIVIL STRUCTURAL SURVEY	WC PUD#1 - GRANDVIEW / NORTHGATE WHATCOM COUNTY WASHINGTON EXHIBIT 9 WATER MAIN STOVEPIPE DETAIL	DATE MAY 2020 SCALE NTS JOB NO. 2020-023	SHEET 1 OF 1



GRAVEL SURFACE/DRIVEWAY REPAIR

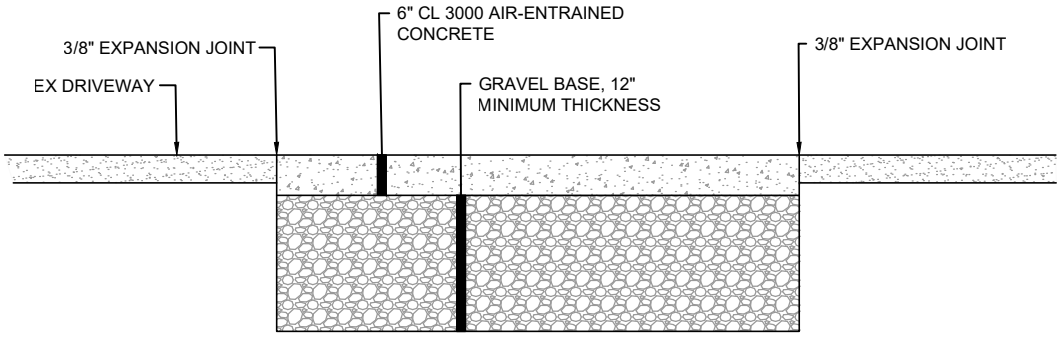
NOT TO SCALE



ASPHALT APRON/DRIVEWAY REPAIR

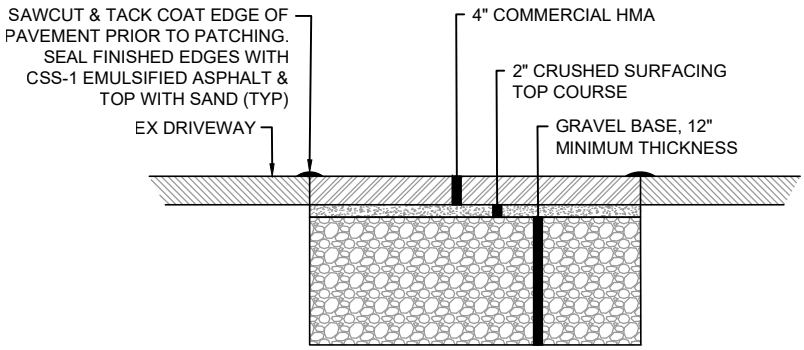
NOT TO SCALE

NOTE:
1. WHEN THE DRIVEWAY WIDTH EXCEEDS 15', CONSTRUCT A FULL EXPANSION JOINT WITH 3/8" JOINT FILLER ALONG THE DRIVEWAY CENTERLINE. CONSTRUCTION EXPANSION JOINTS PARALLEL WITH THE CENTERLINE AS REQUIRED AT 15' MAXIMUM SPACING WHEN DRIVEWAY WIDTHS EXCEED 30'.



CONCRETE DRIVEWAY REPAIR

NOT TO SCALE



ROADWAY PAVEMENT REPAIR

NOT TO SCALE

WILSON ENGINEERING

WILSONENGINEERING.COM

CIVIL
STRUCTURAL
SURVEY

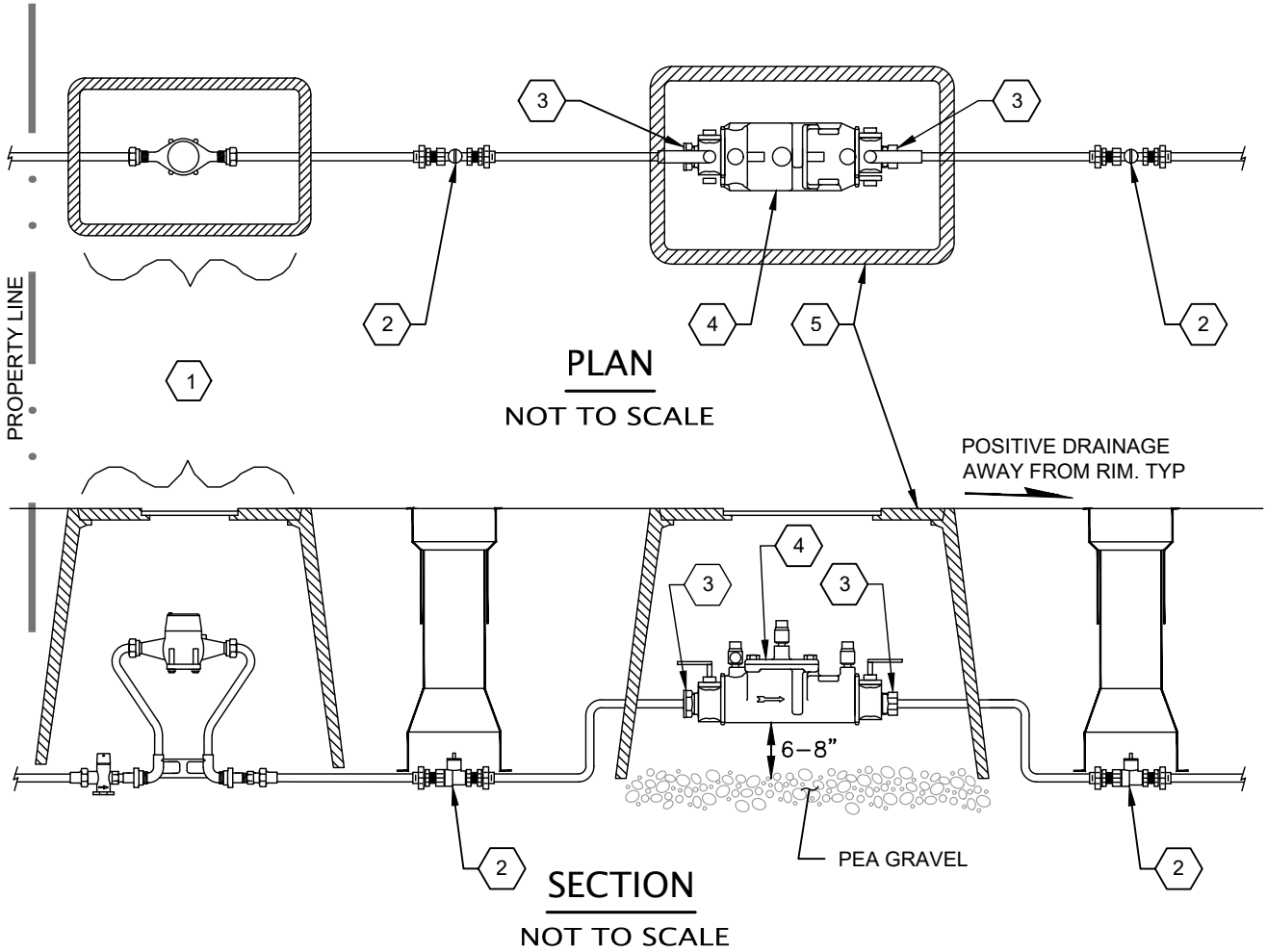
WC PUD #1 - GRANDVIEW-NORTHGATE

WHATCOM COUNTY WASHINGTON

EXHIBIT 10

SURFACE REPAIR DETAILS

DATE	SHEET
MAY 2020	1
SCALE	OF
NTS	1
JOB NO.	
2023-023	



KEYED NOTES

1 = WATER SERVICE CONNECTION DETAIL PER PUD EXHIBIT 7

2 = BRASS BALL CURB STOP, FORD, WITH VALVE BOX

3 = UNION

4 = DOUBLE CHECK VALVE ASSEMBLY (DCVA) BACKFLOW PREVENTER

5 = METER BOX & LID PER PUD EXHIBIT 7 WATER CONNECTION DETAIL METER BOX REQUIREMENTS. INCREASE SIZE AS NECESSARY TO FIT DCVA.

NOTES

1. DCVA MUST BE ON WASHINGTON STATE DOH APPROVED LIST.
2. DEPTH MAY VARY DUE TO SITE CONDITIONS, BUT SHALL NOT BE LESS THAN 24-INCHES OR GREATER THAN 36-INCHES.
3. ADDITIONAL ROOM MAY BE REQUIRED FOR TESTING & MAINTENANCE. PROVIDE SIZE AND TYPE OF METER BOX AND LID IN ACCORDANCE WITH PUD REQUIREMENTS.
4. FOR INSTALLATIONS EXPOSED TO FREEZING, PROTECTION MAY BE REQUIRED.
5. IF FLOODING HAZARD EXISTS, TEST COCKS MUST BE PLUGGED. LOCATE METER BOX IN A LOCATION TO MINIMIZE THE RISK OF FLOODING. WHERE POSSIBLE, INSTALL 2-IN PERF PIPE WRAPPED IN DRAINAGE FABRIC UNDER METER BOX AND 2-IN SCH80 PVC DRAIN TO DAYLIGHT w/ 24-MESH STAINLESS STEEL SCREEN AND SS HOSE CLAMP AT PIPE END.
6. DCVA MUST BE TESTED UPON INSTALLATION AND THEN ANNUALLY THEREAFTER. ALL TESTING MUST BE PERFORMED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE FOLLOWING ADDRESS:

   PUD #1 OF WHATCOM COUNTY
   1705 TRIGG ROAD
   FERNDALE, WA 98248

7. DCVA MUST BE TESTED IF MOVED OR REPAIRED.

WILSON ENGINEERING
WILSONENGINEERING.COM
CIVIL
STRUCTURAL
SURVEY

WC PUD #1 - GRANDVIEW-NORTHGATE

WHATCOM COUNTY WASHINGTON

EXHIBIT 11

DUAL CHECK VALVE ASSEMBLY (DVCA) DETAIL

DATE	SHEET
NOV 2021	1
SCALE	OF
NTS	1
JOB NO.	
2023-023	

Appendix D
Financial Data

APPENDIX D (CHAPTER 9)

FINANCIAL PROGRAM

The PUD manages three enterprise funds: Grandview-Northgate Water System, the Industrial Water System, and Electric Utility. The Grandview-Northgate water system stands on its own financially and operationally from the other enterprise funds the District operates. The Grandview-Northgate water system service area identified in Chapter 1includes both a potable and fire system serving light industrial, and commercial customers and no residential customers.

9.1 FINANCIAL VIABILITY

In 2017, the District completed a rate study with FCS Group. The focus of the study was the Industrial Water and Grandview-Northgate Water systems. The study included a Revenue Requirement analysis, which identifies the total revenue requirement needed to fully fund a system, including recommended reserves, a Cost of Service Analysis, which looks at the equitable distribution of costs to different customers, and Rate Design, which combines the previous two, collecting the needed revenue equitably from customers. The District continues to use the rate study models to verify and fine-tune its existing approach to budgeting and rate setting to achieve and maintain financial viability.

9.2 PAST INCOME AND EXPENSES

The Statement of Revenues, Expenses, and Changes in Net Assets, along with the Statement of Net Position for the years 2015 through 2019 are below:

STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET ASSETS

	2015	2016	2017	2018	2019
No. of Connections	38	40	37	40	37
Water Consumption (g)	7,333,237	7,480,385	7,003,675	8,733,242	9,445,719
Revenue					
Water Sales	$ 187,006	$ 198,414	$ 197,443	$ 235,558	$ 252,933
Assessment Income	226,370	435,501	242,187	173,751	144,705
Interest Income	4,240	5,440	5,141	9,853	14,822
Capital Contributions	-	80,000	8,000	-	-
Other Income	13	28	1,345	221	265
	$ 417,629	**$ 719,383**	**$ 454,116**	**$ 419,383**	**$ 412,725**
Expenses					
Purchased Power and Chemicals	6,830	6,591	7,505	8,380	8,566
Operations & Maintenance	101,622	94,614	95,212	96,297	91,217
Administration	51,604	33,743	23,795	19,455	24,512
Utility Tax	9,143	10,760	10,482	11,857	12,761
Depreciation and Amortization	83,707	84,316	84,924	77,381	83,441
Interest Expense	122,715	106,623	132,058	30,211	27,164
Interfund		1,350	1,350	79,607	746,076
	$ 375,621	**$ 337,997**	**$ 355,326**	**$ 323,188**	**$ 993,737**
Change in Net Position	**$ 42,008**	**$ 381,386**	**$ 98,790**	**$ 96,195**	**$(581,012)**

STATEMENT OF NET POSITION

	2015	2016	2017	2018	2019
ASSETS					
Cash	79,560	210,886	279,685	332,572	398,797
Receivable	15,525	19,101	19,319	26,811	23,294
Bond Issue	15,308	119,610	16,609	14,948	13,287
Bond Reserves	249,088	141,919	-	-	-
LUD Reserves	265,216	57,761	272,183	274,949	253,836
Capital Assets	3,247,722	3,243,181	3,243,181	3,224,887	3,224,887
Depreciation	(1,012,418)	(1,083,597)	(1,159,317)	(1,216,742)	(1,292,462)
	2,860,001	**2,708,861**	**2,671,660**	**2,657,425**	**2,621,639**
LIABILITIES					
AP	876	2,335	579	4,993	1,035
Employee Payable				1,574	243
Insurance Reserve		1,186	1,128	970	396
Tax Liability	724	848	790	940	952
Interfund	90,000	90,000	90,000	119,607	812,017
Deposits					4,685
Bonds - principal & Int	2,129,584	1,594,289	1,460,167	1,314,150	1,168,133
	2,221,184	**1,688,658**	**1,552,664**	**1,442,234**	**1,987,461**
NET POSITION	**638,817**	**1,020,203**	**1,118,995**	**1,215,189**	**634,177**

These statements reflect both the Grandview-Northgate potable system and separate fire system. In 2019, the Grandview-Northgate fire system was inter-connected to the Industrial Water utility in order to provide a more consistent, reliable source of nonpotable water. The interfund activity is a result of this inter-connection cost.

9.3 BALANCED OPERATIONAL BUDGET

The District prepares a budget annually for the Grandview-Northgate water system. It includes expected expenses, capital project requirements, additional reserve requirements and debt service. Adjustments to rates are recommended in order to keep rates as low as possible, while insuring long-term financial viability. Included in the budget process, a forecast of future year's revenue requirements is made in order to plan for smoothing rate increases, or planning for any capital improvement funding.

Below is the current funding plan for the Grandview system forecasted out the next ten years.

Revenue Requirement - Fund 411	2020	2021	2022	2023	2024	2025	2026-2030
Revenues @ Existing Rates							
Rate Revenues Under Existing Rates	$ 252,933	$ 252,933	$ 252,933	$ 252,933	$ 252,933	$ 252,933	$ 1,264,663
Non-Rate Revenues	7,577	8,522	7,456	6,564	6,244	6,030	35,066
Total Revenues	**$ 260,510**	**$ 261,455**	**$ 260,388**	**$ 259,496**	**$ 259,177**	**$ 258,963**	**$ 1,299,730**
Expenses							
Cash Operating Expenses	$ 145,418	$ 192,543	$ 222,865	$ 203,752	$ 209,937	$ 216,434	$ 1,190,520
Existing Debt Service short	-	-	-	-	-	20,464	62,221
Rate Funded Capital	80,000	82,000	85,000	88,000	91,000	81,000	382,000
Total Expenses	**$ 225,418**	**$ 274,543**	**$ 307,865**	**$ 291,752**	**$ 300,937**	**$ 317,898**	**$ 1,634,741**
Net Surplus (Deficiency)	**$ 35,092**	**$ (13,088)**	**$ (47,477)**	**$ (32,256)**	**$ (41,760)**	**$ (58,936)**	**$ (335,011)**
Additions to Meet Coverage	-	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 35,092**	**$ (13,088)**	**$ (47,477)**	**$ (32,256)**	**$ (41,760)**	**$ (58,936)**	**$ (335,011)**
Annual Rate Increase	**1.00%**	**4.00%**	**4.00%**	**4.00%**	**4.00%**	**4.00%**	**20.00%**
Cumulative Rate Increase	**1.00%**	**5.04%**	**9.24%**	**13.61%**	**18.16%**	**22.88%**	**49.50%**
Rate Revenues After Rate Increase	$ 255,251	$ 264,829	$ 275,422	$ 286,439	$ 297,897	$ 309,812	$ 1,745,166
Incremental Rate Revenues	$ 2,319	$ 11,896	$ 22,489	$ 33,506	$ 44,964	$ 56,880	$ 480,502
Additional Taxes from Rate Increase	$ 117	$ 598	$ 1,131	$ 1,685	$ 2,261	$ 2,860	$ 24,164
Net Cash Flow After Rate Increase	**37,294**	**(1,790)**	**(26,119)**	**(434)**	**943**	**(1,798)**	**117,873**
Coverage After Rate Increase: Revenue Bonds Only	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Coverage After Rate Increase: All Debt	**0.73**	**0.52**	**0.39**	**0.57**	**0.61**	**0.65**	**n/a**

Fund Balances - Fund 411	2020	2021	2022	2023	2024	2025	2026-2030
OPERATING FUND							
Beginning Balance	$ 54,891	$ 92,185	$ 90,395	$ 64,276	$ 63,842	$ 64,785	$ 59,868
plus: Net Cash Flow after Rate Increase	37,294	(1,790)	(26,119)	(434)	943	(4,916)	121,327
plus: Transfers In	-	-	-	-	-	-	-
less: Transfers Out	-	-	-	-	-	-	(134,192)
Ending Balance	**$ 92,185**	**$ 90,395**	**$ 64,276**	**$ 63,842**	**$ 64,785**	**$ 59,868**	**$ 47,003**
Minimum Target Balance	*$ 28,904*	*$ 36,651*	*$ 41,635*	*$ 38,493*	*$ 39,510*	*$ 40,578*	*$ 46,667*
CAPITAL FUND							
Beginning Balance	$ 323,907	$ 336,362	$ 282,000	$ 261,175	$ 244,788	$ 232,585	$ 224,047
plus: Rate Funded Capital	80,000	82,000	85,000	88,000	91,000	81,000	382,000
plus: Transfers In	-	-	-	-	-	-	134,192
less: 403-411 loan, fire connection	(65,000)	(65,000)	(65,000)	(65,000)	(65,000)	(65,000)	(325,000)
plus: Interest Earnings	6,154	6,391	5,358	4,962	4,651	4,419	28,342
less: Capital Expenditures	(8,698)	(77,753)	(46,183)	(44,350)	(42,854)	(28,957)	(270,000)
Ending Balance	**$ 336,362**	**$ 282,000**	**$ 261,175**	**$ 244,788**	**$ 232,585**	**$ 224,047**	**$ 173,581**
Minimum Target Balance	*$ 48,811*	*$ 50,006*	*$ 51,127*	*$ 53,055*	*$ 53,766*	*$ 36,174*	*$ 36,174*
EMERGENCY RESERVE							
Beginning Balance	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
plus: Transfers In	-	-	-	-	-	-	-
less: Transfers Out	-	-	-	-	-	-	-
Ending Balance	**$ 20,000**	**$ 20,000**	**$ 20,000**	**$ 20,000**	**$ 20,000**	**$ 20,000**	**$ 20,000**
Minimum Target Balance	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*

9.4 CAPITAL IMPROVEMENT FUNDING PLAN

The District is currently self-funding the capital improvement program from rates and fees. The Rate Funded Capital expense and corresponding Capital Fund Expense are included in the forecast. Debt funded capital improvements is an option should it be necessary for future projects.

Currently, the District has one outstanding loan connected with the potable system. It consists of bonds, originally issued in 2007, to fund a water line (potable and fire) extension. The debt service is paid by assessments made by the participants in the Local Utility District (LUD). The debt service on this is forecasted to exceed the assessments, starting in 2025. The Existing Debt Service Short is shown above under the Revenue Requirements. The shortages are included in the extended cash forecast beyond 2025, with the debt service ending in 2027 and the last assessment payment in 2028.

The capital projects are forecasted out ten years during the budget process in order to plan for use of capital funds or identify any need for issuing debt. The capital project expenses below are included in the Capital Expenditures line above under the Capital Fund.

GRANDVIEW CIP BUDGET		2020 PROJECTED	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	2026-2030 BUDGET
GVL	PROJECT MANAGEMENT	$ -	$ 3,486	$ 2,094	$ 2,030	$ 1,977	$ 1,490	$ 13,500
GVP-3	Grandview Potable System Improvements	1,178	40,000	25,000	25,000	25,000	25,000	256,500
	Total Grandview CIP Projects	**$ 1,178**	**$ 43,486**	**$ 27,094**	**$ 27,030**	**$ 26,977**	**$ 26,490**	**$ 270,000**

9.5 RESERVES

The District maintains several different Reserve Funds

- **Operating Reserve Fund** – The District has set this to be equal to 60 days operating expenses. The rate models used adjust this reserve as expenses increase. The reserve is held as a minimum cash level in the operating funds. There is not a separate reserve account.
- **Capital Reserve Fund** – The District has set this to be equal to 1.5% of capital assets value. Again, the rate models automatically adjust as assets are added or removed. Each year, the budget includes a rate funded capital contribution, which at minimum, is equal to depreciation. This reserve is held as a minimum cash level in the capital fund. There is not a separate reserve account.
- **Emergency Reserve Fund** – Across the three enterprise funds, a combined balance was decided to be established at $350,000. That amount is proportionally split across the three utilities based on their asset value. Currently, the Grandview portion is set at $20,000. This reserve amount is reviewed annually during the budget process.
- **Additional Reserve** – Currently, the District has decided to increase reserves in light of the impending retirement and cash-out of several senior staff members. The Grandview portion is $5,000.
- **Bond Reserves** – The current debt held by Grandview is not required to hold any bond reserves. In 2015 and 2016, the District did have bond reserves set aside.
- **LUD Reserves** – These are funds collected on our behalf by Whatcom County for assessments connected to the Local Utility District (LUD) in the Grandview service area. The funds are held and only used for the debt service related to the 2007 line extension.

9.6 WATER RATE EVALUATION

The District completed a rate study in 2017 with FCS Group. The study included a Revenue Requirement analysis, which identifies the total revenue requirement needed to fully fund a system, including recommended reserves, a Cost of Service Analysis, which looks at the equitable distribution of costs to different customers, and Rate Design, which combines the previous two, collecting the needed revenue equitably from customers. The District continues to use the rate study models to verify and fine-tune its existing approach to budgeting and rate setting to achieve and maintain financial viability.

9.6.1 Affordability

The District serves only light industrial and commercial customers and no residential customers. Therefore, the District does not compare the current and future water rates for a typical single-family home with an affordability metric of the geographical area served.

9.6.2 Rates In Support of Water Use Efficiency (conservation rates)

"WAC 246-290-810(j) requires water system to evaluate the feasibility of adopting and implementing a rate structure that encourages water demand deficiency. This is often done by adopting and implementing an inclining and/or seasonal block rate that charges more for each unit of water through progressively higher cost tiers. While this approach is viable for residential communities targeting general indoor use and particularly outdoor use, the light industrial and commercial customers of the District do not generally have outdoor use and the indoor use is primarily washroom sinks and toilets with no shower facilities. Process water used by the industrial and commercial customers varies greatly and it is difficult to establish and apply an equitable rate structure where conservation opportunities are very limited and very specific if any to the given customer.

9.6.3 Water Rates and Fees

New customers are responsible for the cost of installing the new connection onto the system, with the District's oversight and guidance. The connection fees are based on the existing assets and possible connections. The connection fees to hook up to the potable system and monthly charges in 2020 are shown in the table below:

METER SIZE	MCE FACTOR	POTABLE CONNECTION FEE	MONTHLY FIXED METER FEE
0.75	1.00	$ 4,404	$ 60.00
1.00	1.67	$ 7,339	$ 100.20
1.50	3.33	$ 14,680	$ 199.80
2.00	5.33	$ 23,487	$ 319.80

The cost of the potable water is set annually and is $11.59/ccf for 2020.

9.7 Utilities and Transportation Commission

The District is not regulated by the Utilities and Transportation Commission

9.8 Washington State Auditor's Office

The District is audited annually and received a clean audit for the last 14 years.

Appendix E
Wellhead Protection Plan

Whatcom County Public Utility District No. 1

Grandview-Northgate Water System

WELLHEAD PROTECTION PLAN

Prepared for:

Public Utility District No. 1
of Whatcom County
1705 Trigg Rd
Ferndale, Washington 98248

By

Wilson Engineering, LLC

April 21, 2020

Contents

1. Introduction 1
1.1 Background 1
1.2 Purpose 1
1.3 Plan Overview 1
2. Hydrology 2
2.1 Location 2
2.2 Well System 2
2.3 Hydrogeology 2
2.4 Aquifer Susceptibility 2
3. Identification of the Wellhead Protection Areas 3
3.1 Background 3
3.2 Methods 3
3.3 Results 4
4. Potential Contaminant Source Inventory 4
4.1 Methods 4
4.2 Results 4
5. Management Strategy 5
5.1 Sanitary Control Area 5
5.2 Wellhead Protection Area 5
6. Contingency Planning 6
6.1 Alternative Supply 6
6.2 Emergency Response 6
7. Concluding Remarks 6
8. Figures 6
9. Appendices 6

1. Introduction

1.1 Background

Congress enacted the Safe Drinking Water Act (SDWA) in 1974 with the goal of providing safe drinking water to all users of public water supplies. The SDWA gave the U.S. Environmental Protection Agency (EPA) the authority to develop a uniform national drinking water program, and to establish national standards for known or suspected drinking water contaminants. The 1986 SDWA amendments authorized two new provisions for groundwater protection. One of these was the Wellhead Protection (WHP) program. The SDWA allows each state to design its own WHP program in order to maximize program effectiveness at the local level. Each state's WHP activities are designed to protect land areas surrounding public water supply well in order to prevent groundwater contaminations.

The state of Washington requires that all Group A water systems (those serving fifteen or more connections or twenty-five or more people) develop WHP plans, as stated in the Washington Administrative Code (WAC 246-290). The Washington Department of Health (DOH) has established requirements, guidelines and materials to aid water systems. This assistance is provided at no cost to water systems through funding provided by the DOH and EPA.

1.2 Purpose

The purpose of WHP is to provide an organized approach to effectively protect drinking water supplies from contamination. The program seeks to identify and manage potential contaminant sources near public water supply wells in order to prevent future contamination. WHP safeguards the health of community residents and avoids negative financial impacts associated with contamination. The costs of contamination typically include the investigation of sites, installing treatment facilities, and/or locating new water sources, to name just a few. In fact, Washington State health officials have identified nearly twenty different direct and indirect costs associated with well contaminations. To avoid these costs and ensure a safe quality water supply, we need to protect groundwater at its source. WHP is a straightforward and cost-effective method of accomplishing this goal.

1.3 Plan Overview

This WHP Plan includes the following elements:

- A completed susceptibility assessment.
- Identification of the WHP zones.
- An inventory of potential contaminant sources and land use activities.
- A discussion of the management strategy.
- Contingency and emergency response planning.
- Supporting information and documentation.

Upon completion of these elements, a Group A water system is expected to meet or exceed the requirements of Washington State's WHP program.

2. Hydrology

2.1 Location

The Public Utility District No. 1 of Whatcom County (PUD) Grandview-Northgate Industrial Park (GV-NG) potable water system is located in Whatcom County, Washington, adjacent and overlapping the north end of Ferndale City Limits along Interstate 5. The attached Figure 5-1 Wellhead Protection Area map shows the location. The system has approximately 40 active water users that are all light-impact industrial zoned. All active users are metered. The surrounding area consists primarily of low density urban or rural land uses.

2.2 Well System

The PUD GV-NG potable system provides public water through the use of groundwater. The GV-NG service area is serviced by a single well located on land privately owned by Oxy Corp and located between Portal Way and Northgate Spur approximately one-quarter mile south of Grandview Road. The PUD maintains water rights to the well (reference Chapter 4 of the Water System Plan) that is designated as source S01 by DOH. The well fills a nominal 35,000-gallon plastic-lined corrugated steel water tank. The water use for the system was metered at 9,620,440 gallons for the year 2019.

2.3 Hydrogeology

The northwest portion of Whatcom County (County) has both extensive unconfined shallow water table aquifers as well as a deep confined aquifer. Aquifers in the County generally occur in permeable glacial deposits and stream valleys in the western part of the County, and in fractured bedrock and localized narrow stream valleys in the mountainous eastern part of the County. The aquifers in the western part of the County are most productive and are part of the Puget Sound Aquifer System described by Vaccaro et al. (1998). A portion of this aquifer system extends northward into Canada, as described by the Abbotsford-Sumas Aquifer International Task Force in 1994 (Parametrix 2005).

The Abbotsford-Sumas aquifer is the principle aquifer of the region, covering an area approximately 100 square miles in size, with vertical depth ranging from 40 to 80 feet. Groundwater in the County typically flows from recharge areas in the uplands towards the Nooksack River and Sumas River, which are regional discharge areas. Groundwater contributes significantly to base flow (low flow inputs) to streams, as well as discharging to the Marine waters of the County (Parametrix 2005). (Source: USGS/2009).

Other than this general information, direct hydrogeologic information is unavailable for the area. In most cases, we can use three readily available indicators to predict hydrogeologic flow net behavior: groundwater and surface water connectivity, geomorphology, and local geology.

The well field is located in an area where the underground conditions are primarily identified as clay, sandy clay, and gravel.

2.4 Aquifer Susceptibility

Susceptibility is determined by conditions that affect the movement of groundwater and potential contaminants, from the land surface into an aquifer. Susceptibility is a qualitative measure of how quickly and how far groundwater must travel to reach a water source (well or spring). Vulnerability is directly

related to a source's susceptibility and the proximity of potentially hazardous activities, such as the use or storage of chemicals.

Confining units are critical to susceptibility determinations. In general, a confining unit is any earth material that does not readily transmit water. Typically layers of clay or shale may act as confining units, depending upon their thickness and lateral extent. When confining layers are present, wells are less susceptible to contamination because the layers impede the movement of contaminants from the land surface into underlying aquifers.

The PUD has provided a GV-NG system Groundwater Contaminations Susceptibility Assessment Survey Form for the well source (S01) to DOH in the past. According to the DOH Source Water Assessment Program (SWAP) Mapping Application (https://fortress.wa.gov/doh/swap/index.html) S01 received Moderate susceptibility rating from DOH. These ratings are based on several specific factors reported in the Susceptibility Assessment Survey. These factors include well depth, well seal, and the presence of confining units. The presence or condition of these factors can diminish the possibility that contaminants originating at the land surface could potentially affect the well.

DOH also uses the Susceptibility Assessment to classify the overall vulnerability of an active well. Vulnerability is composed of two factors: the physical susceptibility (as noted above) and the source's risk of exposure to contaminants. The risk of exposure to contaminants is determined by whether or not contaminants are used in the area, or detected in the water supply. The vulnerability rating for S01 is unknown.

3. Identification of the Wellhead Protection Areas

3.1 Background

Aquifer recharge occurs through the infiltration of precipitation and surface water into areas where the aquifer lies at or near the soil surface, or where confining units are thin or absent, permitting further infiltration into the aquifer. Identifying all land areas that contribute to recharge areas for wells is a technical and time-consuming process. Furthermore, they may include vast, difficult to manage areas. To remedy these problems, the WHP program focuses protection efforts near the wellhead.

3.2 Methods

Several different methods may be used to determine the WHP areas. The most straightforward method accepted by DOH is a calculated fixed radius (CFR). This method is also part of the Susceptibility Assessment, which is used to grant monitoring waivers. The CFR is an excellent preliminary WHP delineation method because it is easily implemented, but it may not be very accurate depending upon site-specific conditions. Therefore, other more complex delineation methods such as computer modeling and hydrogeologic mapping are encouraged, but not always be required or practical for small systems.

Regardless of the method used, DOH requires that the WHP areas include the sanitary control zone, along with the one, five, and ten-year time of travel zones for groundwater. "Time of Travel" refers to the amount of time it would take for a particle of groundwater entering the aquifer at the boundary of the zone to reach the well after one-half (six months), one, five, or ten years of pumping.

3.3 Results

The CFR utilizes a volumetric flow equation to determine the WHP area radii:

$$R = [(Q \times t) / (\pi \times n \times H)]^{(1/2)}$$

Where: R, calculated radius of protection zone (ft) = see table below
Q, pumping rate of well per year (cu.ft./yr) = 8,151,016 cu.ft./yr (based on instantaneous groundwater right Qi = 116 gpm)
t, time of travel (years) = 0.5, 1, 5, 10 years
π, pi = 3.14
n, estimated porosity (if unknown = 0.22) = 0.22
H, open interval or length of well screen (ft) = 10 ft

WHP Zone, t	Radius (ft)
0.5 year	768
1 year	1,086
5 year	2,428
10 year	3,434

It is important to emphasize that the WHP areas demonstrated here is a useful planning tool, but does not represent actual groundwater capture zones for the wells. Conclusive WHP area delineation would, however, require more specific information and valuable resources that are not currently available.

The attached Figure 5-1 Wellhead Protection Area map shows the calculated WHP areas.

4. Potential Contaminant Source Inventory

4.1 Methods

A desktop aerial imagery survey was conducted of the WHP zones in order to inventory potential sources of contamination and identify land use activities that may pose threats to groundwater quality.

4.2 Results

The GV-NG source well is located on private property and the WHP areas overlap numerous private properties, Interstate 5, BNSF Railroad, and other public roadways. The attached Figure 5-2 Potential Contaminant Source Inventory shows the results of the aerial imagery survey. Note that there are numerous non-point sources of potential contamination from the categories below that are not specifically identified on Figure 5-2. The major categories of potential sources of contamination include (in no particular order):

- Storm Water
- Possible Improperly Abandoned Wells
- Household Hazardous Products
- Onsite Sewage Disposal Systems
- Hazardous Material Transportation

- Abandoned Residential/Farm Fuel Storage Tanks
- Agricultural Practices including possible Surface Watering and Manure Application
- Fueling Stations

5. Management Strategy

5.1 Sanitary Control Area

Of primary concern are impacts from activities within the sanitary control area of the well. This area should already be tightly controlled to minimize direct contamination of the well. This area should also be managed to reduce the possibility of surface flows reaching the well and traveling down the casing.

The PUD's GV-NG well is located on private property owned by Oxy Corp. The 100-ft sanitary control area is entirely within this private property. The well casing in located within the well and booster pumping station building.

WAC 246-290-135 identifies the minimum requirements for the sanitary control area for wellhead protection. The area has been designated in properly executed Declaration of Covenant, Bills of Sales, and Easements recorded with the Whatcom County Auditor's Office.

5.2 Wellhead Protection Area

The Wellhead Protection Area (WHPA) is located on various private properties and also includes Interstate 5 and BNSF Railroad. Much of the east-northeast portion of the WHPA is located within City of Ferndale city limits.

WAC 246-290-135 identifies the minimum requirements for the WHPA for wellhead protection. <u>It is recommended the PUD complete the following tasks upon adoption of this Plan</u>:

- Update every two years: complete an inventory, based on and supplemental to information presented in this Plan, including identification of site locations and owners/operators, of all known and potential groundwater contamination sources located within the defined WHPA having the potential to contaminate the source water of the well.
- Documentation of purveyor's notification to all owners/operators of known or potential sources of groundwater contamination identified above.
- Documentation of purveyor's notification to regulatory agencies and local governments of the boundaries of the WHPA and the findings of the WHPA inventory.

6. Contingency Planning

6.1 Alternative Supply

A contingency plan is needed in the event that a contamination event or natural disaster results in the temporary or permanent loss of the well. The contingency plan identifies the amount of water required to sustain the service area on a daily basis and the alternative sources of supply.

The PUD GV-NG system has several options for obtaining an emergency water supply. In the event of power failure, S01 is equipped with a portable generator and is capable of supplying an adequate supply of water from the reservoir (in conjunction with well pumping to fill the reservoir). Also, water could be trucked from a nearby water purveyor. In the event of emergencies, the County Emergency Government Office will be contacted for assistance.

6.2 Emergency Response

As with anywhere, a hazardous spill event is possible within the PUD's GV-NG WHPA, particularly in the Interstate 5 or BNSF Railroad corridors. An incident/spill response is anticipated to be provided by the local Whatcom County Fire and Rescue protection district as the first responder to any spill incidences in coordination with Emergency Management. It is also possible that WSDOT and BNSF incident response teams may be deployed. Notifications of any incidents will be addressed to the appropriate agencies.

7. Concluding Remarks

The PUD GV-NG system is in a good position to continue providing a safe and reliable drinking water supply. The PUD recognizes that the most effective way to protect its water supply is to prevent contamination. This plan serves the interest of the PUD's potable water users by protecting the drinking water supply at minimal cost to consumers, while maintaining compliance with drinking water program regulations. With the continued dedication of the Chief Water Operator and heightened awareness of groundwater protection by residents and local business/use, the GV-NG area is likely to have a clean, reliable water supply far into the future.

8. Figures

Figure 5-1: Wellhead Protection Areas
Figure 5-2: Potential Contaminant Source Inventory

9. Appendices

Appendix A: Water Facilities Inventory
Appendix B: Well Report
Appendix C: Susceptibility Assessment
Appendix D: Declaration of Covenant, Bills of Sale, Agreements and Easements
Appendix E: Sample Notification Letters

Legend

- Pump Station
- Reservoir
- Groundwater Well

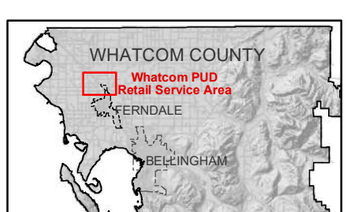
Water Mains

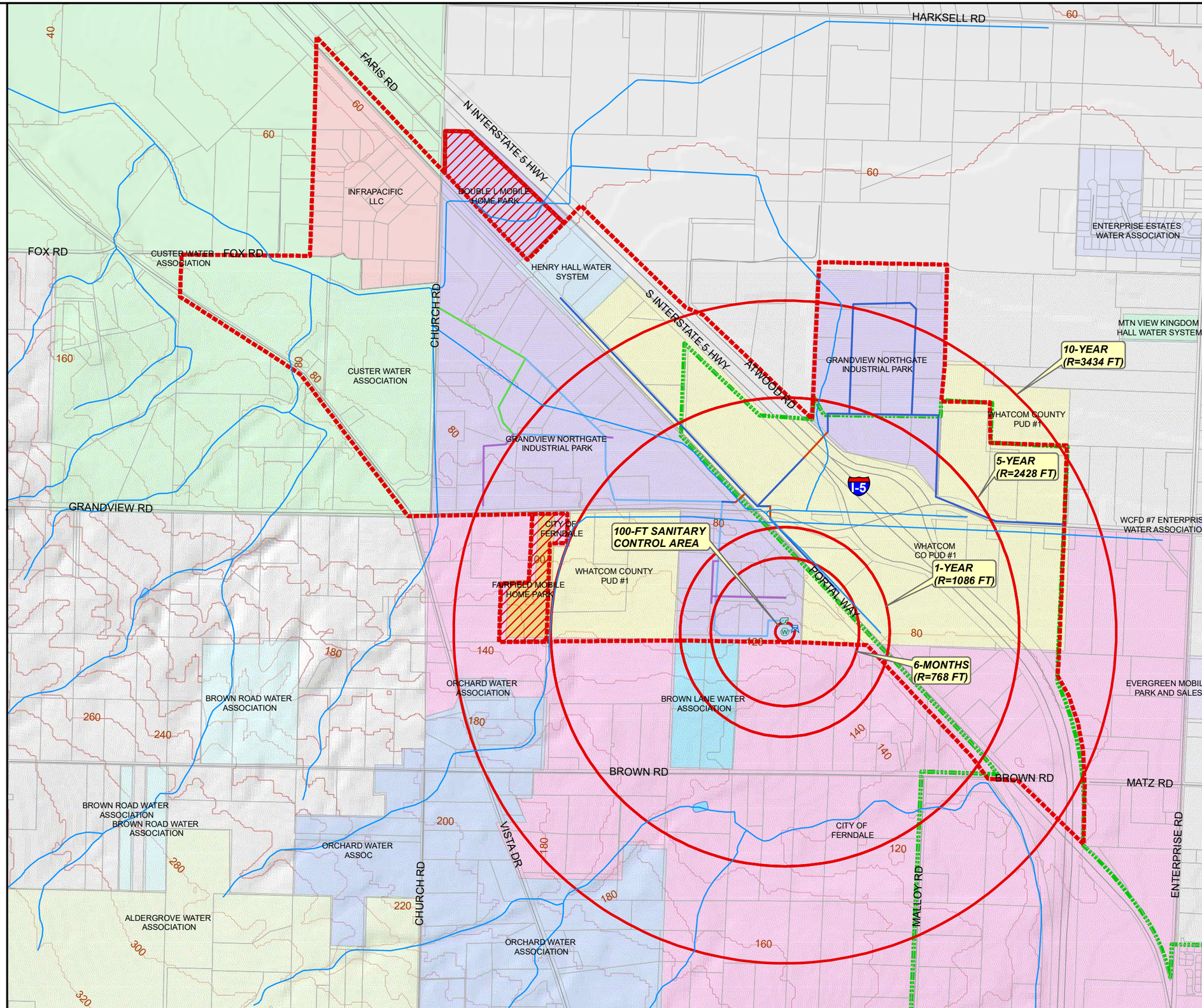
- 2" PVC
- 3" PVC
- 6" DI
- 6" HDPE
- 6" PVC
- Whatcom PUD Proposed Service Area
- Whatcom PUD Proposed Service Area Addition
- Ferndale City Limits
- Groundwater Travel Time Boundary (Based on Water Right Qi)

N
W E
S

1 inch = 1,000 feet

0 245 490 980 Feet





CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE 5-1
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
WELLHEAD PROTECTION AREA

DATE 4-30-2021
SCALE AS SHOWN
PROJECT 2020-023

SHEET 1 OF 1

Legend

- Pump Station
- Reservoir
- Groundwater Well

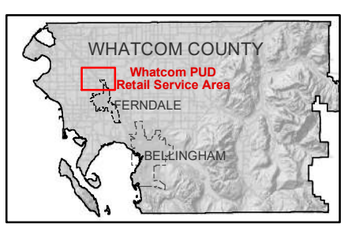
Water Mains

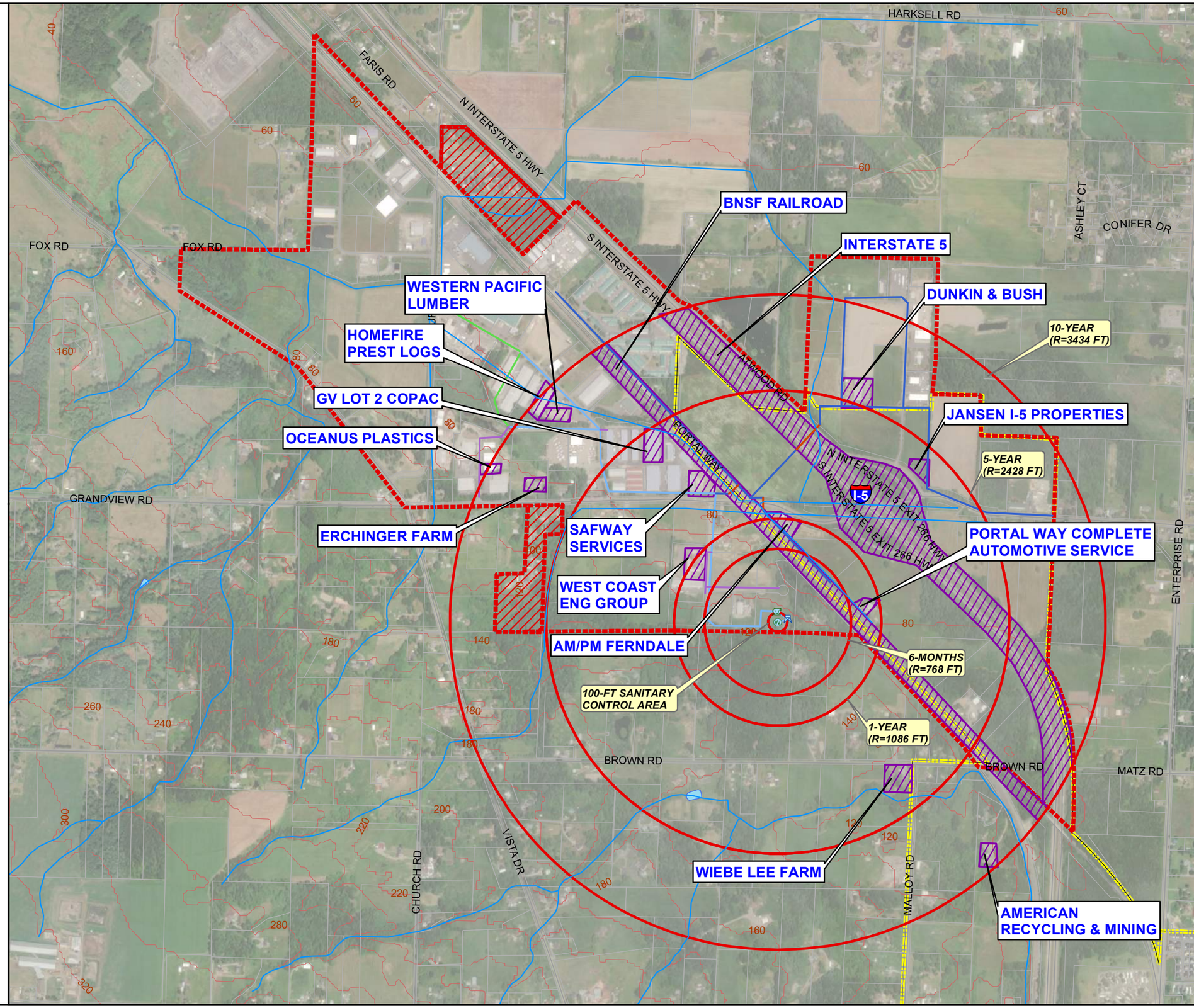
- 2" PVC
- 3" PVC
- 6" DI
- 6" HDPE
- 6" PVC
- Potential Contaminant Sources
- Whatcom PUD Proposed Service Area Addition
- Whatcom PUD Proposed Service Area
- Ferndale City Limits
- Groundwater Travel Time Boundary (Based on Water Right Qi)

N
W E
S

1 inch = 1,000 feet

0 245 490 980 Feet





CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE 5-2
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
POTENTIAL CONTAMINANT SOURCE INVENTORY

DESIGNED BY	DRAWN BY	CHECKED BY
-	RDN	-

DATE	SCALE	PROJECT
4-30-2021	AS SHOWN	2020-023

SHEET 1 OF 1

APPENDIX A
WATER FACILITIES INVENTORY

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 3
Updated: 10/15/2019

Printed: 2/17/2020
WFI Printed For: On-Demand
Submission Reason: Contact Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00638 N	GRANDVIEW-NORTHGATE INDUSTRIAL PARK	WHATCOM	A	NTNC

6. PRIMARY CONTACT NAME & MAILING ADDRESS

DEVIN B. CRABTREE [OPERATOR]
PUD # 1 OF WHATCOM COUNTY
1705 TRIGG RD
FERNDALE, WA 98248

7. OWNER NAME & MAILING ADDRESS

PUD #1 OF WHATCOM COUNTY
DEVIN B. CRABTREE
1705 TRIGG RD
FERNDALE, WA 98248

WATER SYSTEM

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone: (360) 384-4288 x24
Primary Contact Mobile/Cell Phone: (360) 739-0676
Primary Contact Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 384-4849 E-mail: xxxxxxxxxxxxxxxxxxxx

10. OWNER CONTACT INFORMATION

Owner Daytime Phone: (360) 384-4288 x24
Owner Mobile/Cell Phone: (360) 296-3260
Owner Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 384-4849 E-mail: xxxxxxxxxxxxxxxxxxxx

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- [ ] Agricultural
- [x] Commercial / Business
- [ ] Day Care
- [ ] Food Service/Food Permit
- [ ] 1,000 or more person event for 2 or more days per year
- [ ] Hospital/Clinic
- [x] 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
- [x] Special District
- [ ] State

14. STORAGE CAPACITY (gallons)

30,000

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 TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	NORTHGATE IND. PK. ASSOC. AGK350		X										X			Y		X					98	116	NW NE	07	39N	02E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
00638 N	GRANDVIEW-NORTHGATE INDUSTRIAL PARK	WHATCOM	A	NTNC

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		0	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	0		
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	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	49	49	
28. TOTAL SERVICE CONNECTIONS		49	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 0

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?	400	400	400	400	400	400	400	400	400	400	400	400
B. How many days per month are they present?	20	20	20	20	20	20	20	20	20	20	20	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
* Requirement is exception from WAC 246-290	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

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:** _____

WS ID	WS Name
00638	GRANDVIEW-NORTHGATE INDUSTRIAL PARK

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	2/17/2020		
Water System Id(s):	00638N		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	To	ALL
Water System Update Date	ALL	To	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	To:	ALL
Approved Connection Count	ALL	To:	ALL
Full-Time Population From:	ALL	To:	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

APPENDIX B
WELL REPORT

The Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

5022

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name Oxy Corp. Address .....

(2) LOCATION OF WELL: County Whatcom — SW ¼ NE ¼ Sec. 1 T. 37 N., R. 2 E. W.M.

and distance from section or subdivision corner

PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 112 ft. Depth of completed well 108 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +4 ft. to 98 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐ Johnson
Manufacturer's Name .....
Type Stainless Steel Model No. .....
Diam. 6 Slot size 40 from 98 ft. to 103 ft.
Diam. 6 Slot size 60 from 103 ft. to 108 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level 108 ft.
Static level 48 ft. below top of well Date 9-19-88
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? D. Hayes
Yield: 37 gal./min. with 4 ft. drawdown after 4 hrs.
" " "
" " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
0	52-0	0:10	48-0		
0:01	48-1½				
0:02	48-1				

Date of test .....
Bailer test 75 gal./min. with ..... ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Silty topsoil	0	3
Brown clay	3	11
Brown gravel	11	12
Tan sandy clay	12	14
Gray sandy clay	14	20
Gray clay and gravel	20	38
Brown gravel seepage	38	54
Brown gravel, water	54	57
Brown gravel seepage	57	64
Brown gravel, water	64	100
Gray gravel, water	100	129
Gray clay	129	

Work started 9-16, 19 88. Completed 9-17, 19 88

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hayes Well Drilling (Person, firm, or corporation) (Type or print)

Address 556 Easley Rd. Bellingham

[Signed] Steve Collett (Well Driller)

License No. 762 Date 1-27, 19 89

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

APPENDIX C
SUSCEPTIBILITY ASSESSMENT

Ground Water Contamination
Susceptibility Assessment Survey Form

Complete **one** form for **each** ground water source (well, wellfield, spring) used in your water system (photocopy as necessary).

PART I: System Information

Well owner/manager: PUD #1 of Whatcom County

Water system name: Grandview-Northgate Industrial Park

County: Whatcom

Water system ID number: 00638N Source number: S01

Well depth: 108 feet

Source name: Northgate Ind. Pk. Assoc. AGK350

WA well identification tag number: A G K - 3 5 0

❑ Well not tagged

Number of connections: 49 Population served: 400

Township: 39N Range: 02E

Section: 07 ¼ ¼ Section: NW NE

Latitude/longitude (if available): 48°53'19"N / 122°36'03"W

How was latitude/longitude determined?

_____Global positioning device_____survey_____topographical map
X_____other: Google Earth

*Please refer the instructions for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: _09_/_17_/_88_month/day/year

last reconstruction: ___/___/___month/day/year

❑ Information unavailable

2) Well driller: Hayes Well Drilling

556 Ershig Rd

Bow, WA

❑ Well driller unknown

3) Type of well: _X_ Drilled: ☒ rotary ❑ bored ❑ cable (percussion) ❑ Dug

___ other: ❑ spring(s) ❑ lateral collector (Ranney)

❑ driven ❑ jetted ❑ other:_____

4) Well report available ☒ Yes (attach copy to form) ❑ No

5) Average pumping rate: 116 (gallons/min)

Source of information WFI

If not documented, how was pumping rate determined?_____

❑ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

☒ disinfection ❑ filtration ❑ carbon filter ❑ air stripper ❑ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Microbial organisms

7) If source is chlorinated, is a chlorine residual maintained: ☒ Yes ❑ No

Residual level: 0.55-0.75 mg/L (At the point closest to the source.)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

☐ <20 ft ☐ 20-50ft ☒ 50-100ft ☐ 100-200ft ☐ >200ft

☐ information unavailable

2) Depth to ground water (static water level):

☐ <20ft ☒ 20-50ft ☐ 50-100ft ☐ >100ft

☐ flowing well/spring (artesian)

How was water level determined?

☒ well log ☒ other pump test

☐ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

_____ psi (pounds per square inch) **or**

_____feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ☐ Yes ☐ No

5) Wellhead elevation (height above mean sea level): 112 feet

How was elevation determined? ☐ topographic map ☐ Drilling/Well Log ☐ altimeter

☒ other: Google Earth

☐ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

X evidence of a confining layer in well log

_____ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ☐ Yes ☒ No

☐ information unavailable

7) Sanitary setback:

❑ < 100ft* ☒ 100-120ft ❑ 120-200 ft ❑ >200ft

* If less than 100ft, describe the site conditions:

_____

_____

_____

_____

8) Wellhead construction:

☒ wellhead enclosed in a wellhouse

❑ controlled access (describe): _____

_____

❑ other uses for wellhouse (describe): _____

_____

❑ no wellhead control

9) Surface seal:

☒ 18 ft

❑ <18 ft (no Department of Ecology approval)

❑ <18 ft (Approved by Ecology, include documentation)

❑ depth of seal unknown

❑ no surface seal

10) Annual rainfall (inches per year):

❑ <10 in/yr ❑ 10-25 in/yr ☒ >25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 9,620,440 (gallons)

How was this determined?

☒ meter

❑ estimated: ❑ pumping rate (_____)

❑ pump capacity (_____)

❑ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

NOTE: CALCULATIONS BELOW REFLECT USING CONSERVATIVE INSTANTANEOUS WATER RIGHT, Qi = 116 GPM, OR 60,969,600 GAL/YR

6-month ground water travel time: 768 feet

1-year ground water travel time: 1,086 feet

5-year ground water travel time: 2,428 feet

10-year ground water travel time: 3,434 feet

Information available on length of screened/open interval?

☒ Yes ❑ No

Length of screened/open interval: 10 feet

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6- month time of travel boundary?

❑ Yes ☒No (mark and identify on map)

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6-month time of travel boundary?

❑ Yes ☒No (mark and identify on map)

Comments: _____

PART V: Assessment of Water Quality

1) **Regional sources of risk to ground water**:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five-year ground water travel time. If you do not know if one of the following is present, mark the "unknown" space.

	6-month	1-year	5-year	unknown
• likely pesticide application	X	X	X	
• stormwater injection wells				X
• other injection wells				X
• abandoned ground water well				X
• landfills, dumps, disposal areas				X
• known hazardous materials clean-up site				X
• water system(s) with known quality problems				
• population density >1 house/acre				
• residences commonly have septic tanks	X	X	X	
• Wastewater treatment lagoons				
• sites used for land application of waste				X

Mark and identify on map any of the risks listed above which are located within the 6-month time of travel boundary. (Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.)

If other recorded or potential sources of ground water contamination exist within the ten-year time of travel circular zone around your water supply, please describe:

Within 1-yr time of travel zone – AM/PM Ferndale (Toxic materials), West Coast Engineering Group (Hazardous waste).

Within 5-yr time of travel zone – Wiebe Lee Farm (Stormwater quality, non-point source), Jansen Inc I5 Properties (Stormwater quality), GV Lot 2 COPAC (Stormwater quality), Portal Way Complete Automotive Service (Hazardous waste), Safway Services (Hazardous waste).

Within 10-yr time of travel zone – Homefire Prest Logs (Stormwater quality), Western Pacific Lumber (Stormwater quality), Erchinger Farm (Stormwater quality, non-point source), Oceanus Plastics (Hazardous waste), Dunkin & Bush (Hazardous waste), American Recycling & Mfng (Toxic materials).

Within some portion of all time of travel zones – Interstate 5, BNSF Raiload

2) **Source-specific water quality records**: For each type of test below, mark the row that applies to the sample results for this source. Consider all the sample results from the past 12 years. (MCLs are noted next to the specific test or listed in assistance package.)

A. **Nitrate:** (Nitrate MCL = 10 mg/l)

Results greater than MCL	_____
<2 mg/liter nitrate	X_____
2-5 mg/liter nitrate	_____
<5 mg/liter nitrate	_____
Nitrate sampling records unavailable	_____

B. **VOCs:** (VOC detection level is 0.5 ug/l or 0.0005 mg/l)

Results greater than MCL or SAL	_____
VOCs detected at least once	_____
VOCs never detected	X_____
VOC sampling records unavailable	_____

C. **EDB/DBCP:**
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

EDB/DBCP detected below MCL at least once	_____
EDB/DBCP detected above MCL at least once	_____
EDB/DBCP never detected	X_____
EDB/DBCP tests required but not yet completed	_____
EDB/DBCP tests not required	_____

D. **Other SOCs (Pesticides):**

Other SOCs detected (pesticides and other synthetic organic chemicals)	_____
Other SOC tests performed but none detected (list test methods in comments)	X_____
Other SOC tests not performed	_____

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here:_____Standard "PEST1-GENERAL PESTICIDE SUITE" test methods.

E. **Bacterial contamination:**

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records)? _____

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source? _____

Source sampling records for bacteria unavailable X_____

PART VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for these sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10-year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

❑ Yes ☒ No

Describe with references to map produced in Part IV:

_____

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

❑ Yes ☒ No

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

☒ Yes ❑ No

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

☒ Yes ❑ No

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within…

	YES	NO	unknown
<6-month travel time	_____	X_____	_____
6 month—1 year travel time	_____	X_____	_____
1—5 year travel time	_____	X_____	_____
5—10 year travel time	_____	X_____	_____

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within…

	YES	NO	unknown
<1-year travel time	_____	X_____	_____
1—5 year travel time	_____	_____	X_____
5—10 year travel time	_____	_____	X_____

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

___None known._____

_____

_____

_____

_____

_____

_____

FORM COMPLETED BY:

_Wilson Engineering, Curt Schoenfelder, PE_____4/23/2020_____
Print Name Date

_____
Signature

Legend

- Pump Station
- Reservoir
- Groundwater Well

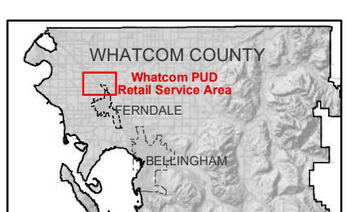
Water Mains

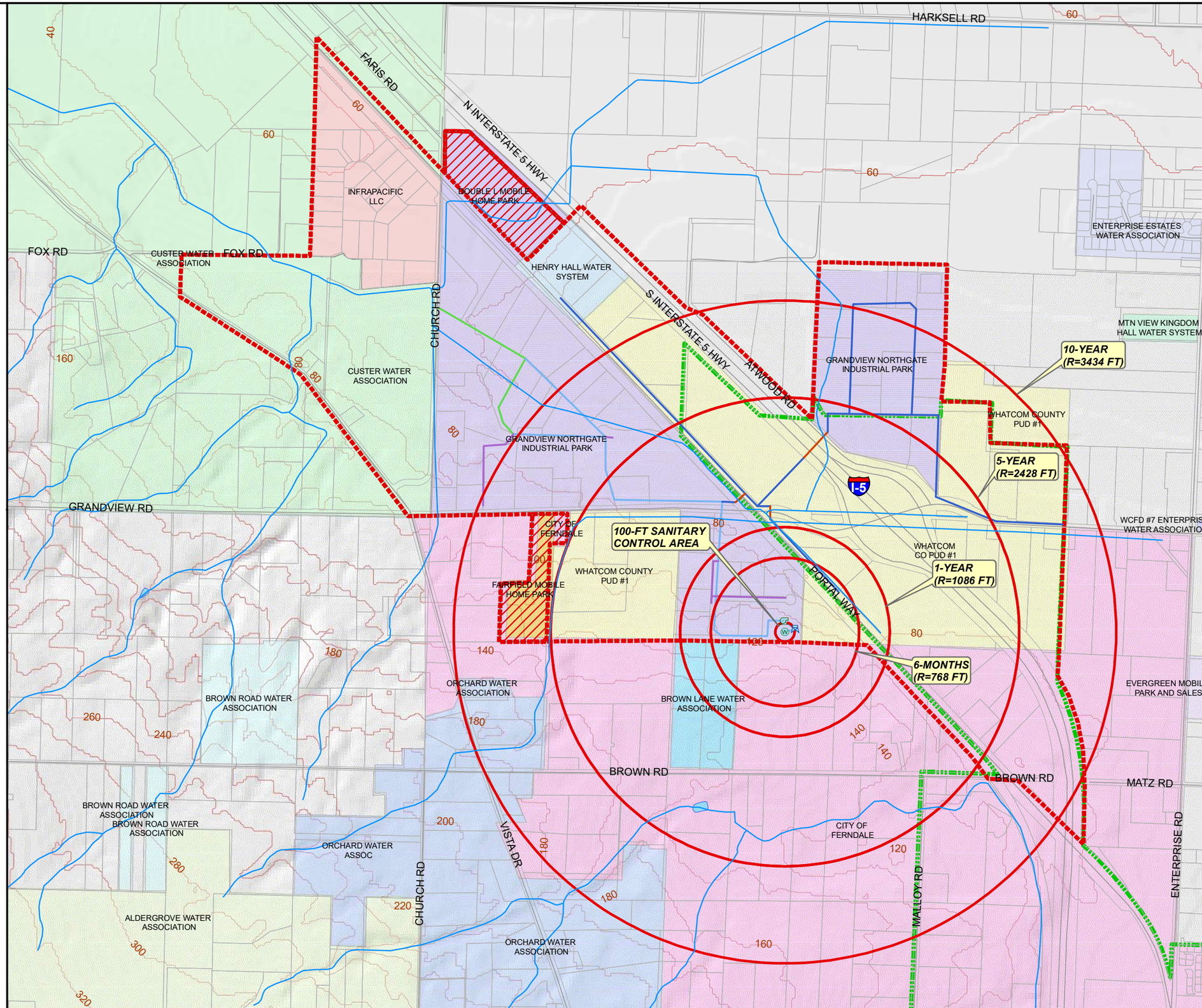
- 2" PVC
- 3" PVC
- 6" DI
- 6" HDPE
- 6" PVC
- Whatcom PUD Proposed Service Area
- Whatcom PUD Proposed Service Area Addition
- Ferndale City Limits
- Groundwater Travel Time Boundary (Based on Water Right Qi)

N
W E
S

1 inch = 1,000 feet

0 245 490 980 Feet





CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

DESIGNED BY -
DRAWN BY RDN
CHECKED BY -

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE 5-1
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
WELLHEAD PROTECTION AREA

DATE 4-30-2021
SCALE AS SHOWN
PROJECT 2020-023

SHEET 1 OF 1

Legend

- Pump Station
- Reservoir
- Groundwater Well

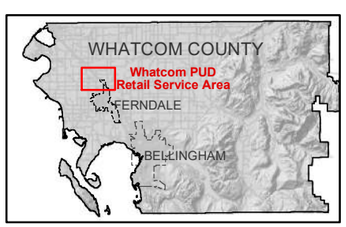
Water Mains

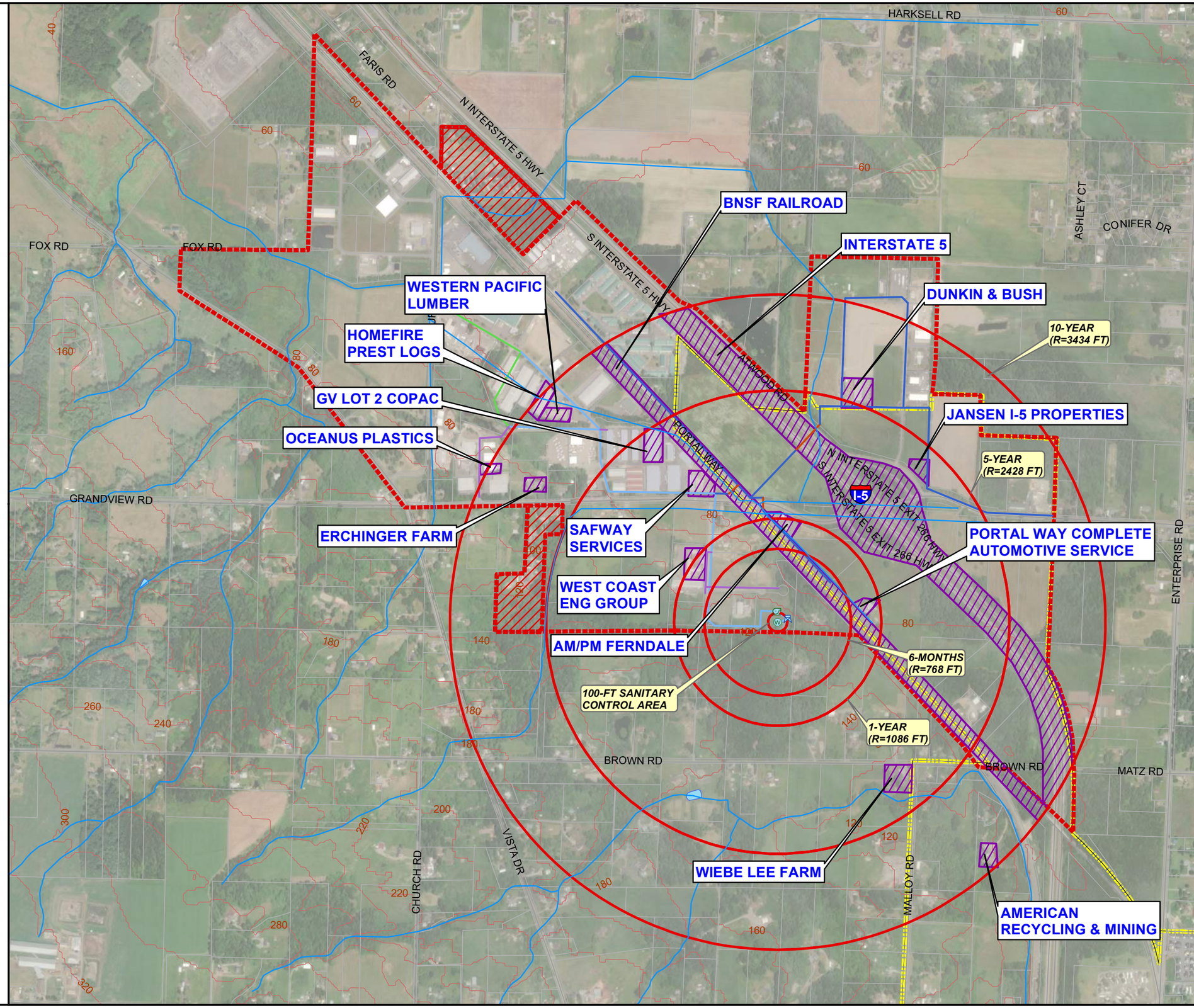
- 2" PVC
- 3" PVC
- 6" DI
- 6" HDPE
- 6" PVC
- Potential Contaminant Sources
- Whatcom PUD Proposed Service Area Addition
- Whatcom PUD Proposed Service Area
- Ferndale City Limits
- Groundwater Travel Time Boundary (Based on Water Right Qi)

N
W E
S

1 inch = 1,000 feet

0 245 490 980 Feet





CIVIL
STRUCTURAL
SURVEY

WILSON ENGINEERING
WILSONENGINEERING.COM

WHATCOM COUNTY PUD #1

WHATCOM COUNTY WASHINGTON

FIGURE 5-2
GRANDVIEW-NORTHGATE INDUSTRIAL PARK
POTENTIAL CONTAMINANT SOURCE INVENTORY

DESIGNED BY	DRAWN BY	CHECKED BY
-	RDN	-

DATE	SCALE	PROJECT
4-30-2021	AS SHOWN	2020-023

SHEET 1 OF 1

APPENDIX D
DECLARATION OF COVENTANT, BILLS OF SALE, AGREEMENTS AND EASEMENTS

DECLARATION OF COVENANT

Know all men by these presents that I (we) the undersigned, owner(s) in fee simple of the land described herein, hereby declare this covenant and place same on record.

I (we), the grantor(s) herein, am (are) the owner(s) in fee simple of (an interest in) the following described real estate situated in Whatcom County, State of Washington, to wit:

That portion of the Northwest quarter of the Northwest quarter of Section 7, Township 39 North, Range 2 East, of W.M., lying Southwesterly of the Great Northern Railroad Right-of-Way. Less roads.

on which the grantor(s) owns and operates a well and waterworks supplying water for public use located on said real estate, to wit:

Lots 2 & 3, Northgate Industrial Park Short Plat. Same legal as above.

and grantor(s) is (are) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of said grantor(s) land which might contaminate said water supply.

NOW, THEREFORE, the grantor(s) agree(s) and covenant(s) that said grantor(s), his (her) (their) heirs, successors and assigns will not construct, maintain, or suffer to be constructed or maintained upon the said land of the grantor(s) and within 100 (_____) feet of the well herein described, so long as the same is operated to furnish water for public consumption, any potential source of contamination, such as cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintenance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

These covenants shall run with the land and shall be binding on all parties having or acquiring any right, title, or interest in the land described herein or any part thereof, and shall inure to the benefit of each owner thereof.

WITNESS _____ hand ____ this 7th day of March, 19 90

OXY CORP (Seal)

J.W. Macy, VP

Grantor(s)

WHATCOM COUNTY
BELLINGHAM, WA
03/07/90 11:47 AM
REQUEST OF: OXY CORP
Shirley Forslof, AUDITOR
BY: RO, DEPUTY
$7.00 D/RC
Vol: 139 Page: 1459
File No: 9003070046

State of Washington)
County of WHATCOM) ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this 7th day of MARCH, 19 90, personally appeared before me J. W. MACY

to me known to be the individual ____ described in and who executed the within instrument, and acknowledge that he (they) signed and sealed the same as HIS free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

Notary Public in and for the State of Washington, residing at Bellingham, WA

ILLIP H. JONES, M.D. M.P.H.
District Health Officer

Administrative and Clinic
Phone 676-6720
County 384-1528

Environmental Health
Phone 676-6724
County 384-1565

BELLINGHAM & WHATCOM COUNTY DISTRICT DEPARTMENT OF PUBLIC HEALTH

Community Health Center — 509 Girard Street
P.O. Box 935
Bellingham, Washington 98227

Fee $ 178.00 Receipt # B563 Received by J Date September 7 1988

PUBLIC WATER SUPPLY SOURCE APPLICATION

Name of Owner Northgate Industrial Park (Oxy Corp.) Phone 206-293-4488 206-293-5180

Mailing Address P.O. Box 789, Anacortes, WA. 98221

Installation Location

(2265 GRANDVIEW)

NSEW Side of Grandview Rd. 1/4 Miles NSEW of I-5 Rd.

Plat or Subdivision Name Northgate Industrial Park Number ____ Sec. 7 Twn. 39 Rg. 2

This water supply source complies, at this time, with the minimum standards for public water supplies (WAC 248-54) in the following:

Site Location	Date Approved Sept 7 19 88, By AA	
Construction*	Date Approved 10/9/ 19 89, By AA	
Bacteriological Laboratory #900304S	Date Approved _____ 19___, By AA	
Chemical	Date Approved _____ 19___, By AA	

Comments: Must own or have restrictive covenant for 100' around well.

This water supply source is ✓ is not ____ approved.

Anne E. Atkeson
Environmental Health Specialist

Date _____ 19___

*Examination of water supply source is partially based upon visual examination. The Health Department is not responsible for defects or omissions in construction which are concealed and not apparent.

3/86

It is agreed that Oxy Corporation and JIJ Construction Company will join their existing fire and potable water systems servicing the Grandview Industrial Park and the Northgate Industrial Park to jointly service both areas. The pumping and transmission lines will be upgraded as needed to meet Whatcom County and Public Utility Department requirements.

It is understood that the water supply system will be transferred to the existing P.U.D. when approved by the Commissioners.

Dated this 6th day of Sept. 1991.

JIJ CONSTRUCTION CO, INC.

BY _____
Al Jansen, Pres.

OXY CORPORATION

BY _____

DRAFT COPY

WATER SYSTEM TAKEOVER AGREEMENT
(Oxy-Jansen to Whatcom PUD #1)

THIS AGREEMENT made and entered into this _____ day of _____, 1993, by and between WHATCOM COUNTY PUBLIC UTILITY DISTRICT #1, hereinafter referred to as "PUD"; and JANSEN, INC., hereinafter referred to as "Jansen"; and OXY CORP., hereinafter referred to as "Oxy". Oxy and Jansen have formed a joint venture, hereinafter referred to as "Oxy-Jansen".

RECITAL:

Jansen and Oxy separately own substantial portions of land and buildings located within the Grandview Industrial Zone (hereinafter referred to as the "Zone") in Whatcom County, as depicted on Exhibit "1", attached. The Jansen and Oxy tracts within the Zone are depicted respectively in green and yellow on Exhibit "1", and are commonly known as the "Grandview Binding Site Plan" ("Grandview Tract") and the "Northgate Binding Site Plan" ("Northgate Tract") respectively. Collectively, the Grandview and Northgate Tracts shall be referred to as the "Tracts." Each have constructed on their respective Tracts domestic and fire flow water systems which systems, if combined as outlined on Exhibit "2", (attached) together with the water rights appurtenant thereto, could provide enough potable and fire flow water to service the projected water needs of their respective Tracts, i.e., see Binding Site Plans for the Grandview and Northgate Tracts, attached hereto and marked Exhibits "3" and "4" respectively. The Oxy and Jansen water facilities as set forth in detail on Exhibits "3" and "4" will be connected by Oxy-Jansen in accordance with the specifications as set forth on Exhibit "5", attached hereto.

The Oxy-Jansen joint venture was formed by Oxy and Jansen for the purpose of upgrading and combining their respective water systems into one system for eventual takeover by the PUD.

Oxy-Jansen has reached an agreement whereby it will convey the completed and combined Oxy and Jansen water systems to the PUD, which in turn will own, maintain and operate said water systems as one of its satellite utilities (as authorized by CWSP) under certain terms and conditions, the details of which are set forth as follows:

Section 1. Upon completion of the water systems as set forth in Exhibits "3", "4" and "5", Oxy-Jansen agrees to convey and assign its entire interest in said combined water systems, together with reasonable and necessary water utility easements, to the PUD. If built in accordance with Exhibits "3", "4" and "5", the PUD acknowledges that the water system will meet AWWA standards and specifications. The PUD engineer has approved the system as described in Exhibits "3", "4" and "5" and to the best of the PUD's knowledge, the completed combined water systems should meet the approval of the Washington State Department of Health and all other state, local and federal (governmental) approvals. If the combined system is completed in accordance with Exhibits "3", "4" and "5", the PUD will accept the same within two weeks after the system has been approved by all governmental authority necessary for the system to be legally operational. The PUD agrees to accept the conveyance of the combined Oxy-Jansen water systems, provided said combined system is built in accordance with AWWA standards and specifications and, as in all other respects,

DRAFT COPY

accepted and approved by the PUD's engineer, Washington State Department of Health and any other state, local county or governmental agency that may have approval authority in this area.

Section 2. Upon the PUD's acceptance of the combined water systems, Oxy-Jansen shall convey all easements, water rights appurtenant to said system and in all other respects sign any and all reasonable and necessary documents that may be necessary to allow the PUD to own, take over, maintain and operate the water system as its own. The water system to be received shall be free and clear of all liens and encumbrances.

Section 3. The PUD and Oxy-Jansen will cooperate one with the other for the purpose of amending and expanding the water service area of the Oxy-Jansen water permit, and increasing the water right; provided Oxy and Jansen shall not be liable for any costs or expenses associated with amending and/or expanding the water service area.

Section 4. Once the water system has been approved and turned over to the PUD, and as the future need is anticipated, the PUD will take all reasonable and necessary steps to increase the existing water right volume above the 116 gallons per minute already allocated.

Section 5. Once the PUD takeover of the combined water systems is complete, new water users within the Tracts (inside users) will not be charged a hook-up fee based on the PUD's customary hook-up fee policy as now exists (see PUD Resolution attached hereto as Exhibit "6") and as amended hereafter unless the PUD has, subsequent to this Agreement, incurred "*substantial new capital expenditures*" necessary to provide the water to said inside users. Based on current governmental standards for, and regulations of, industrial water systems, and within the limits of the combined Oxy-Jansen water right of 116 GPM, the PUD does not anticipate expending said *substantial new capital expenditures* in the future to meet the water needs within the two Tracts. In any event, once a water user is hooked up and legally withdrawing water from the system, such water user will not be exposed to subsequent hook-up fees, or additional hook-up fees as the case may be, as long as its Long or Short-Term Water Demands are not increased; i.e., the water users will not have to pay connection charges for the degree of water service they are entitled to once they are validly hooked up and receiving water, regardless of whether or not they initially were required to pay a hook-up fee. On the other hand, all other new water users hooking onto the combined water systems outside of the Northgate and Grandview Tracts, will pay the normal hookup and connection charges, a portion of which, in turn, will be disbursed by Oxy and Jansen in accordance with the PUD's normal 15-year latecomer agreement provisions, as authorized by law.*

Section 6. The monthly charge for water sold to Oxy and Jansen, and all other water users within the Northgate and Grandview Tracts, shall be based upon and in accordance with the PUD's standard policy and methodology for establishing water rates as now exist and as amended hereafter, excluding all portions of the monthly water rate charge based on the equity value of the fixed assets conveyed to the PUD under this Agreement. Subject to the exclusion as set forth in the preceding sentence, Oxy and Jansen agree to execute the PUD's standard form water users contract.**

Section 7. The Oxy-Jansen combined water right authorizes 116 GPM peak withdrawal. The PUD may not distribute potable water to water users outside of the Northgate and Grandview Tracts unless Oxy-Jansen consents thereto. Should the PUD succeed in increasing the Oxy-Jansen water right beyond 116 GPM, the Oxy-Jansen consent for the use of the increased portion of the water right will not be necessary to the extent of the increase.

Section 8. The Oxy-Jansen joint venture agrees to pay all costs necessary to develop the system for acceptance of the PUD under this contract, except for the cost of upsizing the water mains between the two industrial parks, which upsizing costs shall be borne by the PUD.

Section 9. Notwithstanding the foregoing provisions of this Agreement, this Agreement shall not be binding on the PUD unless and until the Oxy-Jansen potable water system is approved by the Department of Health of the State of Washington.

Section 10 - Miscellaneous Provisions:

(a) Notices. Any notice, request, authorization, direction or other communication as required under this Agreement shall be given in writing and be delivered in person or by first class United States mail, properly addressed and stamped with the required postage, to the intended recipient as follows:

OXY-JANSEN

PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY
2011 Young Street
Bellingham, Washington 98225

Either party may change its address specified above by giving the other party notice of such change in accordance with this paragraph. All notices, requests and authorizations of directions or other communications by a party shall be deemed delivered when mailed as provided in this paragraph or personally delivered to the other party.

(b) Governmental Authority. This Agreement is subject to the rules, regulations, orders and other requirements, now or hereafter in effect, of all governmental authorities having jurisdiction over this Agreement, the parties or either of them.

(c) No Partnership. This Agreement shall not be interpreted or construed to create an association, joint venture or partnership between the parties, nor to impose any partnership obligations or liabilities on either party. Furthermore, neither party shall have any right, power or authority to enter into any agreement or undertaking for or on behalf of, to act as or be an agent or representative of, or to otherwise bind the other party.

(d) Nonwaiver. The failure of either party to insist upon or enforce strict performance by the other party of any provision of this Agreement or to exercise any right under this Agreement shall not be construed as a waiver or relinquishment to any extent of such party's right to assert or rely upon any such provision or right in that or any other instance; rather, the same shall be and remain in full force and effect.

(e) Entire Agreement. This Agreement sets forth the entire agreement,and supersedes any and all prior agreements of the parties with respect to the subject matters hereof.

(f) No Specified Third-Party Beneficiaries. Except as otherwise specifically provided in this Agreement, there are no third-party beneficiaries of this Agreement. Nothing contained in this Agreement is intended to confer any right or interest on anyone other than the parties, their respective successors, assigns and legal representatives.

(g) Amendment. No change, amendment or modification of any provision of this Agreement shall be valid unless set forth in a written amendment to this Agreement signed by both parties.

(h) Implementation. Each party shall take such action (including, but not limited to, the execution, acknowledgment and delivery of documents) as may reasonably be requested by the other party for the implementation or continuing performance of this Agreement.

(i) Invalid Provision. The invalidity or unenforceability of any provision of this Agreement shall not affect the other provisions hereof, and this Agreement shall be construed in all respects as if such invalid or unenforceable provisions were omitted.

(j) Applicable Law. This Agreement shall be interpreted, construed and enforced in accordance with the laws of the State of Washington, except to the extent such laws may be pre-empted by the laws of the United States of America.

(k) Venue. The venue of any litigation arising out of this Agreement shall be in Whatcom County, State of Washington, or such other place as both parties may agree to in writing.

(l) Arbitration. In the event that any dispute relating to or arising from this Agreement cannot be settled by the parties, they shall submit the dispute to an arbitrator selected in the following manner: Within twenty (20) days of receiving written demand for arbitration, each party involved in the dispute shall select an individual to represent him in the selection of the arbitrator. If the individuals selected by the parties cannot agree upon an impartial arbitrator within thirty (30) days from the date written demand for arbitration is filed, the arbitrator shall be selected by a Judge of the Superior Court of the State of Washington for Whatcom County upon three (3) days' notice. Any arbitration shall be conducted in accordance with the rules of the American Arbitration Association then in effect, with any judgment upon an award entered in the Superior Court of the State of Washington for Whatcom County.

(m) Interpretation and Fair Construction of Contract. This Agreement has been reviewed and approved by each of the parties. In the event it should be determined that any provision of this Agreement is uncertain or ambiguous, the language in all parts of this Agreement shall be in all cases construed as a whole according to its fair meaning and not strictly construed for/nor against either party.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

PUBLIC UTILITY DISTRICT #1 OF WHATCOM COUNTY	JANSEN, INC.
By_____ President	By_____ President

DRAFT COPY

Attested to: OXY CORP

By_____ By_____
Secretary President

* It would appear that once the agreement is signed, the parties would also execute a latecomer's agreement, i.e., between Oxy-Jansen and the PUD. I think we should put together a latecomer's agreement form at this time without specific numbers so that we can at least get a better idea of the big picture.

** A water user's agreement which Oxy-Jansen will eventually be signing, together with the resolution setting forth how we charge water for our monthly water rates, should also be available at this time so that there is no hassle over the water rates with Oxy-Jansen once the agreement is signed and operating. I don't recall that we have a water user's agreement form. We should discuss this.

*** _____(?) Lumber, who is within the Grandview Industrial Park but outside of said tracts, is negotiating with Oxy-Jansen for part of their 116 gallon per minute water right and will want to be hooked up as an additional user sometime in the near future. It would be my suggestion that Oxy-Jansen set up a meeting with Essex and us to iron out any and all questions and issues involved, since Essex, in essence, will be our first additional hookup under the latecomer's agreement, unless Oxy-Jansen wants, somehow or other, to handle it differently subject, of course, to our approval.

GENERAL & SPE C BINDING SITE PLAN

GRANDVIEW LIGHT INDUSTRIAL PARK

PTN. SW 1/4 NW 1/4 SEC. 6, TWP. 39 N, RGE. 2 E, W.M.

WHATCOM COUNTY, WASHINGTON

LEGAL DESCRIPTION:

THAT PORTION OF SECTION 6, TOWNSHIP 39 NORTH, RANGE 2 EAST OF W.M., LYING EASTERLY OF DELTA LINE ROAD, NORTHERLY OF GRANDVIEW ROAD AND WESTERLY OF GREAT NORTHERN RAILROAD, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 6; THENCE N 86° 42' 52" E, ALONG SAID SOUTH LINE OF SAID SECTION, 259.97 FEET; THENCE N 00° 04' 50" W, 40.00 FEET TO THE TRUE POINT OF BEGINNING; THENCE N 86° 42' 52" E, 355.29 FEET; THENCE N 00° 38' 56" E, 401.91 FEET; THENCE N 86° 42' 52" E, 390.00 FEET; THENCE S 00° 38' 56" W, 111.93 FEET; THENCE N 86° 42' 52" E, 300.00 FEET; THENCE S 00 38' 56" W, 289.99 FEET; THENCE N 86° 42' 52" E, 1039.16 FEET; TO A POINT ON THE EAST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION; THENCE S 89° 07' 11" E, 550.79 FEET TO A POINT ON THE SOUTHWESTERLY BOUNDARY OF THE GREAT NORTHERN RAILROAD RIGHT-OF-WAY; THENCE N 45° 10' 28" W, 1727.36 FEET; THENCE LEAVING SAID RIGHT-OF-WAY S 87° 47' 28" W, 651.41 FEET; THENCE N 00° 38' 57" E, 325.18 FEET; THENCE N 89° 03' 29" E, 334.15 FEET RETURNING TO A POINT ON SAID RAILROAD RIGHT-OF-WAY; THENCE CONTINUING ALONG SOUTHWESTERLY BOUNDARY OF SAID RAILROAD RIGHT-OF-WAY N 45° 10' 28" W, 2230.08 FEET TO A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF DELTA LINE ROAD; THENCE SOUTHERLY ALONG SAID EAST LINE S 00° 04' 50" E, 3019.94 FEET; THENCE N 86° 42' 51" E, 229.95 FEET; THENCE S 00° 04' 50" E, 219.95 FEET TO THE NORTHERLY RIGHT-OF-WAY LINE OF GRANDVIEW ROAD SAID POINT ALSO BEING THE TRUE POINT OF BEGINNING.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

EASEMENT PROVISION:

A NON-EXCLUSIVE EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO THE POWER, TELEPHONE, CABLE TV, AND GAS COMPANIES AND THEIR RESPECTIVE SUCCESSORS AND ASSIGNS WITHIN THE PRIVATE ROADS IN THIS PLAT, IN WHICH TO INSTALL, LAY, CONSTRUCT, RENEW, OPERATE AND MAINTAIN UNDER-GROUND CONDUITS, CABLE, AND WIRES WITH NECESSARY FACILITIES AND OTHER EQUIPMENT FOR THE PURPOSE OF SERVING THIS SUBDIVISION WITH SAID UTILITIES, TOGETHER WITH THE RIGHT TO ENTER UPON THE LOTS AT ALL TIMES FOR THE PURPOSE STATED.

EASEMENT NOTE:

THIS B.S.P IS ALSO SUBJECT TO UNIDENTIFIABLE EASEMENTS AS LISTED BELOW:

PUGET POWER 755572, 1608943, 891129074
CONTINENTAL TELEPHONE 1591808
CASCADE NATURAL GAS 1573884

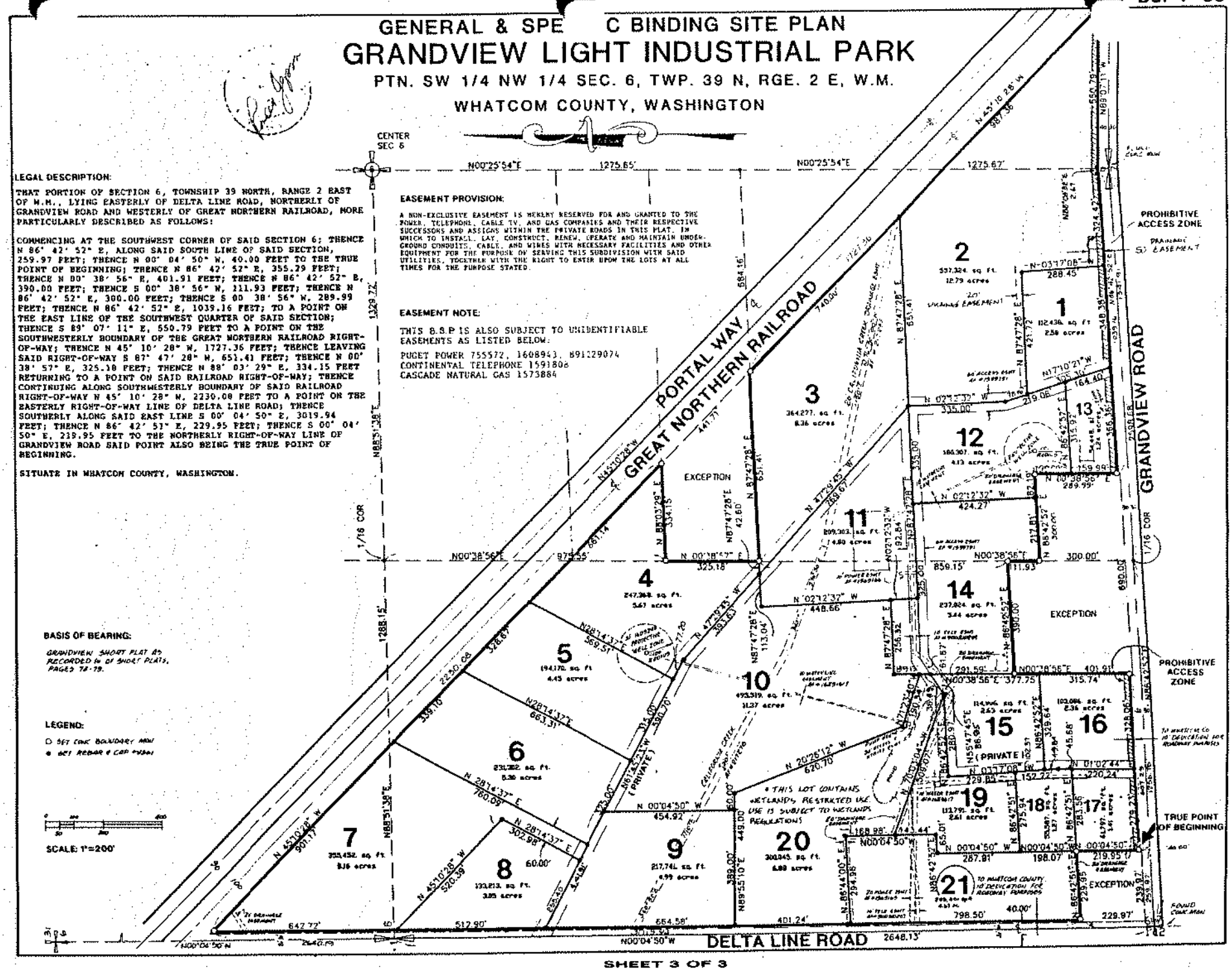
BASIS OF BEARING:

GRANDVIEW SHORT PLAT AS RECORDED IN OF SHORT PLATS, PAGES 78-79.

LEGEND:

○ SET CONC BOUNDARY MON
● SET REBAR & CAP MONS

SCALE: 1"=200'



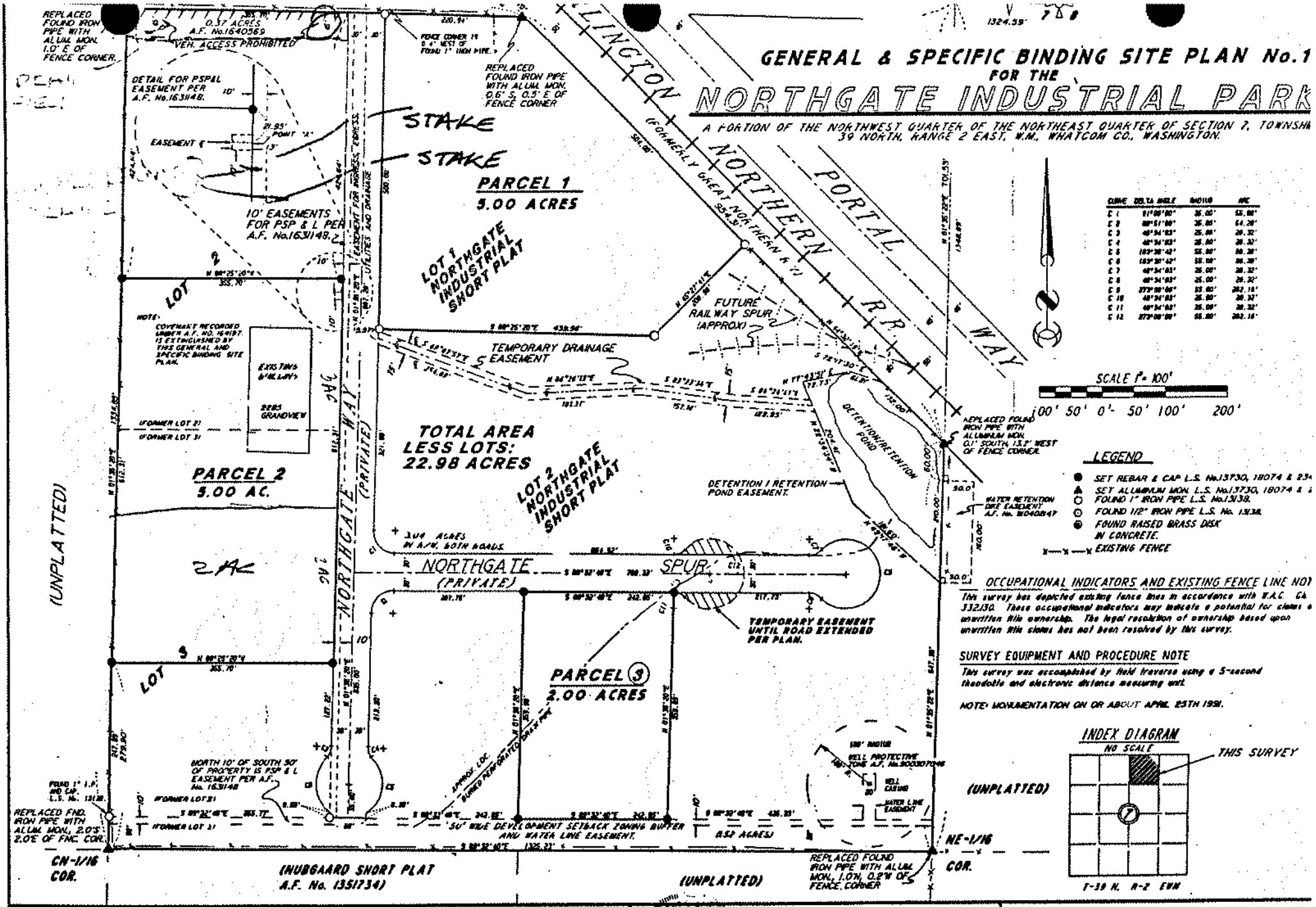
SHEET 3 OF 3

RONALD T. JEPSON & ASSOCIATES 222 GRAND AVENUE, SUITE C BELLINGHAM, WA. 98225

VOL____ PG____

GENERAL & SPECIFIC BINDING SITE PLAN No.1
FOR THE
NORTHGATE INDUSTRIAL PARK

A PORTION OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 7, TOWNSHIP 39 NORTH, RANGE 2 EAST, W.M., WHATCOM CO., WASHINGTON.



CURVE	DELTA ANGLE	RADIUS	ARC
C 1	91°08'00"	35.00'	55.68'
C 2	88°51'00"	35.00'	54.28'
C 3	48°34'03"	25.00'	20.32'
C 4	48°34'03"	25.00'	20.32'
C 5	103°30'42"	53.00'	96.39'
C 6	103°30'42"	53.00'	96.39'
C 7	48°34'03"	25.00'	20.32'
C 8	48°34'03"	25.00'	20.32'
C 9	272°08'06"	53.00'	252.15'
C 10	48°34'03"	25.00'	20.32'
C 11	48°34'03"	25.00'	20.32'
C 12	272°08'06"	53.00'	252.15'

LEGEND

- SET REBAR & CAP L.S. No.13730, 18074 & 23
- SET ALUMINUM MON. L.S. No.13730, 18074 &
- FOUND 1" IRON PIPE L.S. No.13130.
- FOUND 1/2" IRON PIPE L.S. No. 13130.
- FOUND RAISED BRASS DISK IN CONCRETE.
- EXISTING FENCE

OCCUPATIONAL INDICATORS AND EXISTING FENCE LINE NOT

This survey has depicted existing fence lines in accordance with W.A.C. Ch. 332130. These occupational indicators may indicate a potential for claims a unwritten title ownership. The legal resolution of ownership based upon unwritten title claims has not been resolved by this survey.

SURVEY EQUIPMENT AND PROCEDURE NOTE

This survey was accomplished by field traverse using a 5-second theodolite and electronic distance measuring unit.

NOTE: MONUMENTATION ON OR ABOUT APRIL 25TH 1991.

DEDICATION CERTIFICATE

Filed for record this 11th day of Sept. 19 91 at 12:00 in book 2 of Short page 67 at the request of Ayers

SURVEYOR'S CERTIFICATE

This map correctly represents a survey made by me or under my direction in conformance with the requirements of the Survey Recording Act at the request of OXY CORP. in NOV. 19 90

BARRAT G. SCOTT

29-Aug-91

Professional Land Surveyors HARRISON AYERS (206) 671-9505

BASIS OF BEARING AND SURVEY: The NORTHGATE INDUSTRIAL SHORT PLAT, Filed for record in Book 17 of Short page 59, Whatcom County, Washington.

DWN BY	DATE	JOB NO.
RJF	FEB 991	90110
CHKD BY	SCALE	SHEET

APPENDIX E
SAMPLE NOTIFICATION LETTERS

Appendix D: Sample Notification Letters

Example Letter 1 **To local jurisdictions / agencies**

Dear (Agency/Local Government):

We are writing to let you know that businesses or facilities you regulate are in our public water system wellhead protection area. Please take all reasonable steps to ensure that land use activities within this area do not contaminate our drinking water sources.

Our water company has 450 service connections, and serves about 1,071 people. The Washington State Department of Health rated our system as "highly susceptible."

The enclosed map shows the 6-month and 1-, 5- and 10-year time-of-travel boundaries for our wellhead protection area. We're also sending you a list of the facilities or activities of concern. Any groundwater contamination that occurs within this wellhead protection area has a high potential to reach our well.

Thank you for your support in protecting our drinking water.

Sincerely,

Example Letter 2 **To potential source owners/operators**

Dear (Owner/Operator):

To protect the drinking water supply for the customers of Taylor's Gulch Water System, we are developing a wellhead protection program as required by state law. As part of our wellhead protection program, we mapped the area overlying the short-term recharge zone of our drinking water supply wells. This is called our wellhead protection area.

Following the mapping of the wellhead protection area, we conducted an inventory of **potential** groundwater contamination sources within the area. The nature of your business and its location within our wellhead protection area means that your activities have the potential to affect our customers' drinking water supply.

We have notified the agency or agencies that regulate(s) your type of business/facility that you are in our wellhead protection area. You should contact them to request technical assistance to help manage your business in a way that will best prevent groundwater contamination. We realize you are already careful to protect the environment as you conduct your business. We hope that learning that you are in our wellhead protection area will result in more precautions to ensure that your activities will not affect our drinking water quality.

Sincerely,

Appendix F
Praxair Water System Documents

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 0
Updated: 08/20/2008

Printed: 6/30/2020
WFI Printed For: On-Demand
Submission Reason: Contact Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
05184 K	PRAXAIR WATER SYSTEM	WHATCOM	B	

6. PRIMARY CONTACT NAME & MAILING ADDRESS

FRED M. DISCH [OPERATIONS MANAGER]
PUD # 1 OF WHATCOM COUNTY
1705 TRIGG RD
FERNDALE, WA 98248

7. OWNER NAME & MAILING ADDRESS

PUD #1 OF WHATCOM COUNTY
DEVIN B. CRABTREE
1705 TRIGG RD
FERNDALE, WA 98248

WATER SYSTEM

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone: (360) 384-4288 x18		Owner Daytime Phone: (360) 384-4288 x24	
Primary Contact Mobile/Cell Phone: (360) 739-0676		Owner Mobile/Cell Phone: (360) 296-3260	
Primary Contact Evening Phone:		Owner Evening Phone: (xxx)-xxx-xxxx	
Fax: (360) 384-4849	E-mail: xxxxxxxxxxxxxxxxxxxx	Fax: (360) 384-4849	E-mail: xxxxxxxxxxxxxxxxxxxx

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

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
- [x] 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
- [x] Special District
- [ ] State

14. STORAGE CAPACITY (gallons)

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 TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	PUD LC WELL #1		X										X			Y	X						127	10	SW SW	08	39N	01E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
05184 K	PRAXAIR WATER SYSTEM	WHATCOM	B	

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		0	1
A. Full Time Single Family Residences (Occupied 180 days or more per year)	0		
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		1	1

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 0

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?	12	12	12	12	12	12	12	12	12	12	12	12
B. How many days per month are they present?	20	20	20	20	20	20	20	20	20	20	20	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

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: _____

WS ID	WS Name
05184	PRAXAIR WATER SYSTEM

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	6/30/2020		
Water System Id(s):	05184K		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	To	ALL
Water System Update Date	ALL	To	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	To:	ALL
Approved Connection Count	ALL	To:	ALL
Full-Time Population From:	ALL	To:	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

PACIFIC SURVEYING &
ENGINEERING SERVICES, INC.
ENGINEERING
SURVEYING
PLANNING
CONSULTING

1812 CORNWALL AVENUE
BELLINGHAM, WA 98225
360/671-7387
FAX: 360/671-4685
E-MAIL: pse@psesurvey.com

December 29, 1999

Attn: Doug Lisser
Project Manager
Whatcom County PUD No. 1
1705 Trigg Road
Ferndale, WA 98248

Re: Proposed Waterline Easement through Intalco property

Dear Doug,

I have enclosed the latest sketch map of the proposed utility easement through Intalco property that now includes the transmission tower area, recently surveyed by our field crews. The legal description for the proposed 20' wide easement, which is shown on the map, has changed to reflect the additional encompassed area and the true alignment of the existing 24" AC watermain as shot in the field during Pottle construction. Please review the map and legal and let me know when a recordable version needs to be prepared. We would be happy to provide an exhibit map for the subject easement if and when it becomes necessary.

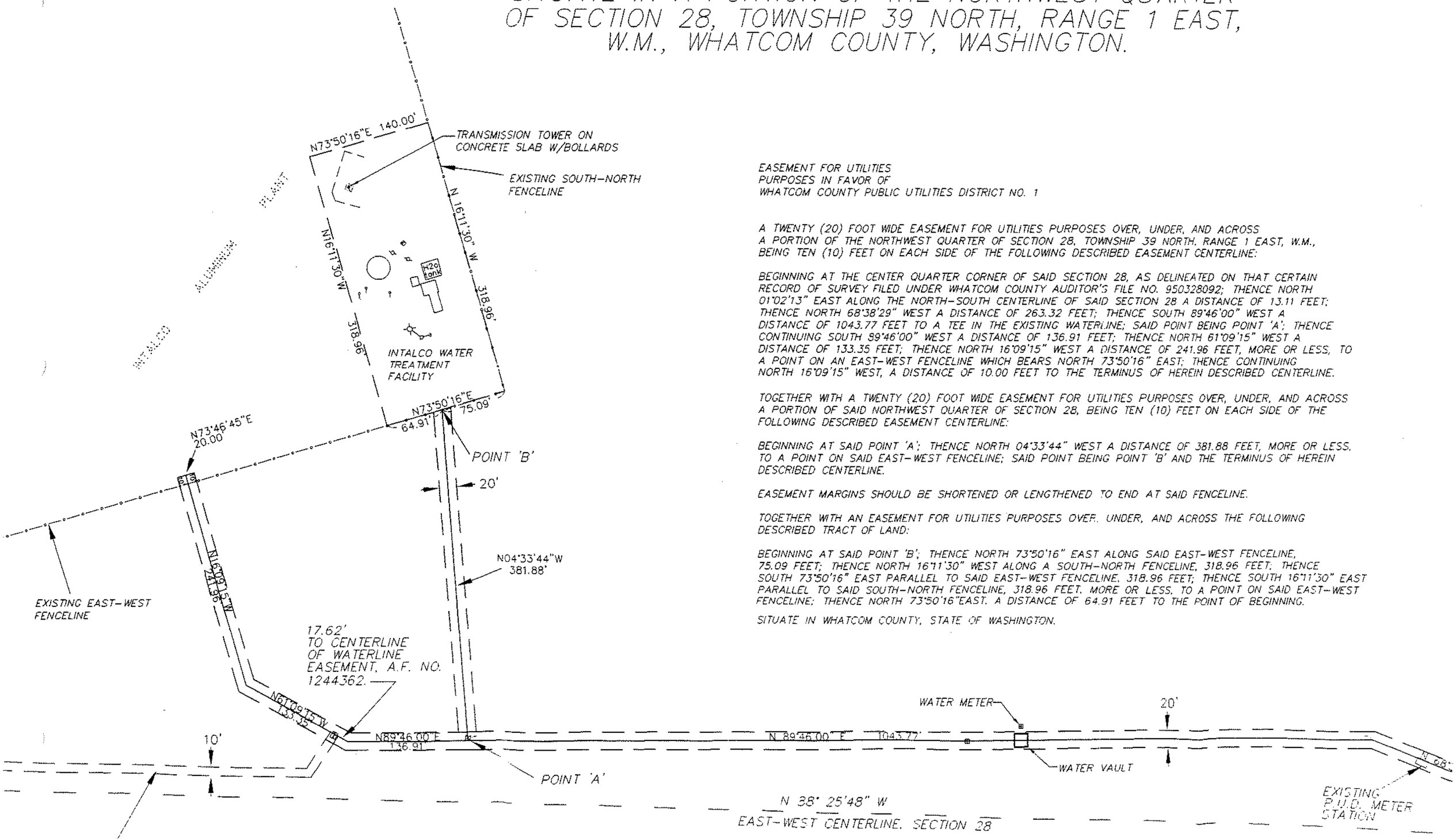
If there are any questions you have regarding the alignment of the proposed easement or features shown on the map, please let me know right away. We stand ready to complete the easement documents upon your authorization.

Sincerely,
Pacific Surveying and Engineering Services, Inc.

Adam Morrow
Private Development Manager
Principal

PROPOSED UTILITIES EASEMENT MAP

SITUATE IN A PORTION OF THE NORTHWEST QUARTER OF SECTION 28, TOWNSHIP 39 NORTH, RANGE 1 EAST, W.M., WHATCOM COUNTY, WASHINGTON.



EASEMENT FOR UTILITIES
PURPOSES IN FAVOR OF
WHATCOM COUNTY PUBLIC UTILITIES DISTRICT NO. 1

A TWENTY (20) FOOT WIDE EASEMENT FOR UTILITIES PURPOSES OVER, UNDER, AND ACROSS A PORTION OF THE NORTHWEST QUARTER OF SECTION 28, TOWNSHIP 39 NORTH, RANGE 1 EAST, W.M., BEING TEN (10) FEET ON EACH SIDE OF THE FOLLOWING DESCRIBED EASEMENT CENTERLINE:

BEGINNING AT THE CENTER QUARTER CORNER OF SAID SECTION 28, AS DELINEATED ON THAT CERTAIN RECORD OF SURVEY FILED UNDER WHATCOM COUNTY AUDITOR'S FILE NO. 950328092; THENCE NORTH 01°02'13" EAST ALONG THE NORTH-SOUTH CENTERLINE OF SAID SECTION 28 A DISTANCE OF 13.11 FEET; THENCE NORTH 68°38'29" WEST A DISTANCE OF 263.32 FEET; THENCE SOUTH 89°46'00" WEST A DISTANCE OF 1043.77 FEET TO A TEE IN THE EXISTING WATERLINE; SAID POINT BEING POINT 'A'; THENCE CONTINUING SOUTH 89°46'00" WEST A DISTANCE OF 136.91 FEET; THENCE NORTH 61°09'15" WEST A DISTANCE OF 133.35 FEET; THENCE NORTH 16°09'15" WEST A DISTANCE OF 241.96 FEET, MORE OR LESS, TO A POINT ON AN EAST-WEST FENCELINE WHICH BEARS NORTH 73°50'16" EAST; THENCE CONTINUING NORTH 16°09'15" WEST, A DISTANCE OF 10.00 FEET TO THE TERMINUS OF HEREIN DESCRIBED CENTERLINE.

TOGETHER WITH A TWENTY (20) FOOT WIDE EASEMENT FOR UTILITIES PURPOSES OVER, UNDER, AND ACROSS A PORTION OF SAID NORTHWEST QUARTER OF SECTION 28, BEING TEN (10) FEET ON EACH SIDE OF THE FOLLOWING DESCRIBED EASEMENT CENTERLINE:

BEGINNING AT SAID POINT 'A'; THENCE NORTH 04°33'44" WEST A DISTANCE OF 381.88 FEET, MORE OR LESS, TO A POINT ON SAID EAST-WEST FENCELINE; SAID POINT BEING POINT 'B' AND THE TERMINUS OF HEREIN DESCRIBED CENTERLINE.

EASEMENT MARGINS SHOULD BE SHORTENED OR LENGTHENED TO END AT SAID FENCELINE.

TOGETHER WITH AN EASEMENT FOR UTILITIES PURPOSES OVER, UNDER, AND ACROSS THE FOLLOWING DESCRIBED TRACT OF LAND:

BEGINNING AT SAID POINT 'B'; THENCE NORTH 73°50'16" EAST ALONG SAID EAST-WEST FENCELINE, 75.09 FEET; THENCE NORTH 16°11'30" WEST ALONG A SOUTH-NORTH FENCELINE, 318.96 FEET; THENCE SOUTH 73°50'16" EAST PARALLEL TO SAID EAST-WEST FENCELINE, 318.96 FEET; THENCE SOUTH 16°11'30" EAST PARALLEL TO SAID SOUTH-NORTH FENCELINE, 318.96 FEET, MORE OR LESS, TO A POINT ON SAID EAST-WEST FENCELINE; THENCE NORTH 73°50'16"EAST, A DISTANCE OF 64.91 FEET TO THE POINT OF BEGINNING.

SITUATE IN WHATCOM COUNTY, STATE OF WASHINGTON.

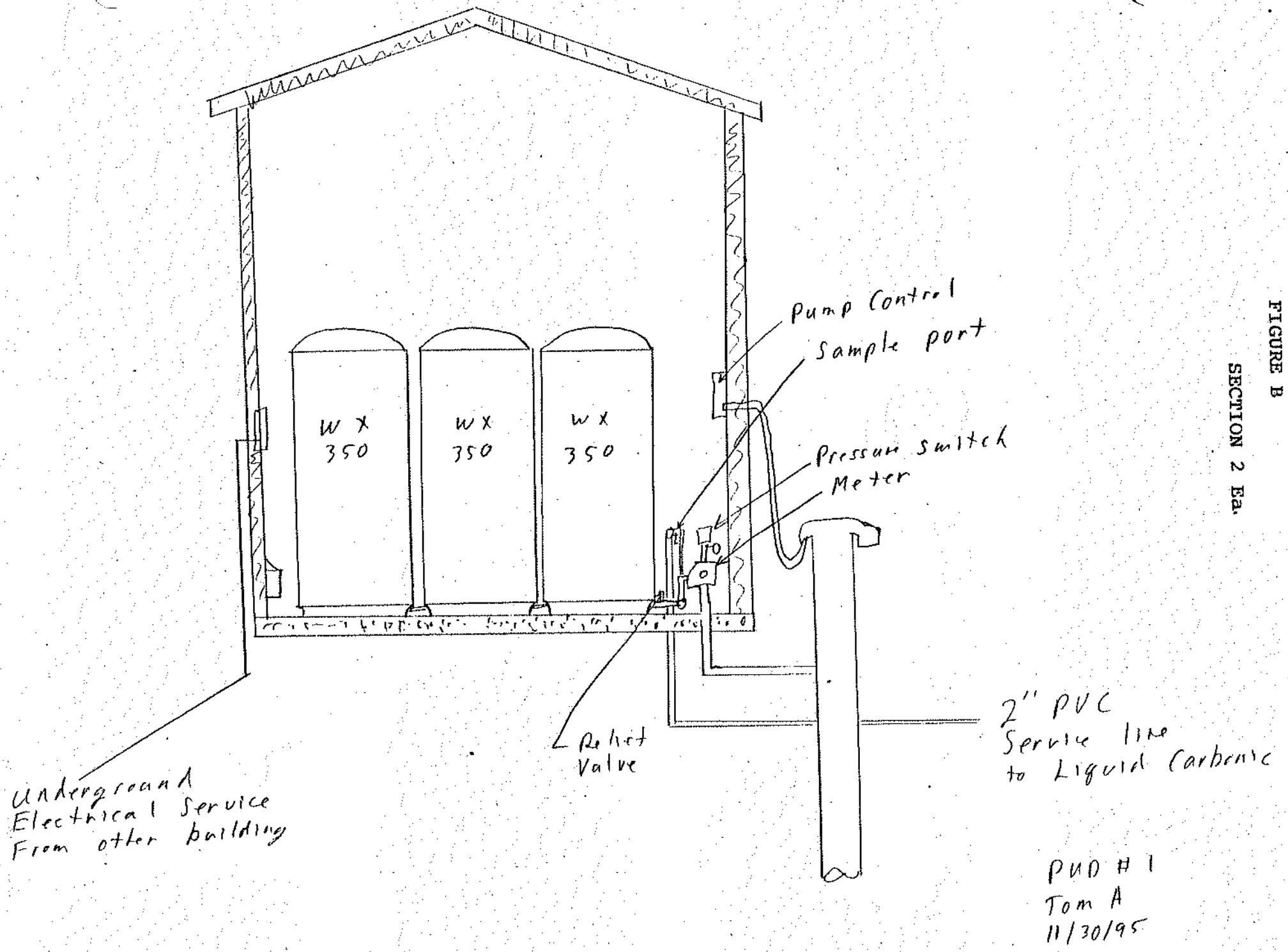


FIGURE B

SECTION 2 Ea.

HEALTH DEPARTMENT
509 Girard Street
Bellingham, WA 98225
Phone 676-6724 or 384-1565

☐ Mail to: email 4/2/96 AA

☐ Call when ready: _____

PUBLIC WATER AVAILABILITY NOTIFICATION FORM

SECTION ONE — APPLICABILITY:

Health Department approval of this form is NOT required if your building project:

- does not include plumbing for potable water, or;
- is a residential remodel or addition, or;
- is replacing a permitted building which has been demolished or removed. You must take evidence of the existence of the previous building to Planning & Development Services for review.

SECTION TWO — INSTRUCTIONS:

Please take this form to your water system manager or authorized representative for completion of Section Four below. You must complete Section Three. Return this form to the Health Department for review of water system status. The Health Department will not approve new building connections on public water systems that are substantially out of compliance with State laws. After the Health Department has approved this form, submit it to Planning & Development Services with your building plans.

SECTION THREE — APPLICATION:

Plat/Building Permit Applicant's Name: Liquid Carbonic

Current Mailing Address: 4466 Aldergrove Rd.

City Ferndale State WA Zip code 98248 Phone 371-2900

Project Type: ☐ Single Family Residence ☒ Commercial (AA) **Tax Parcel No.** 390 108 059 042 000

SECTION FOUR

Name of Subdivision NA Div NA Block NA Lot NA

Water System Name PUD LC Well State I.D. # Pending, Water Right Permit or Certificate # Exempt. This water system is capable of and will supply water to the residence, project, or plat for 1 connection(s) located at 4300 Aldergrove Rd.

The above Public Water System is approved by the State Department of Health or Whatcom County Health Department for Pending service connections and currently serves -0- connections. The water system facilities necessary to adequately provide service to this site have been designed, approved, and installed per WAC 246-290 or WAC 246-291. The final plat approval or building permit must be applied for within one year of the purveyor's signature date which is when this Water Availability Notification Form expires.

Signature and Title Tom Anderson Manager Date 4/3/96

Audress 220 W. Champion, Suite 290 Bellingham, WA 98225 Phone 360 733-5810

Approved by Whatcom County Health Department [illegible] Date [illegible]

B. & C. WELL DRILLING CO.
888 Kelly Road
Bellingham, Washington 98226
(206) 734-2730 • (206) 398-7081

SECTION 2D.i.d

TO: JAN - WHATCOM PUD #1

FAX: 733-5811

FROM: MIKE

FAX: 398-1660

PAGES: 3 INC.

NOTE: 120 FT OF PIPE DOWN WELL

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W053101
ABP 576
Water Right Permit No.

(1) OWNER: Name Whatcom PUD Address 4300 Aldergrove

LOCATION OF WELL: County Whatcom SE ¼ SW ¼ Sec. 9 T. 39 N., R. 1 W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) Above

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 258 feet. Depth of completed well 127 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from +2.0 ft. to 122 ft.
Welded [X] " Diam. from ft. to ft.
Liner installed [ ] " Diam. from ft. to ft.
Threaded [ ]
Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
Screens: Yes [X] No [ ]
Manufacturer's Name Cook
Type SS Model No.
Diam. 6 Slot size 018 from 122 ft. to 128 ft.
Diam. Slot size from ft. to ft.
Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.
Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level
Static level 44 ft. below top of well Date 8/20/84
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level
Date of test
Bailer test 8 gal./min. with 126 ft. drawdown after 1 hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Topsoil	0	2
Sand	2	9
Clay Brown	9	20
Clay Gray	20	45
Gray Clay Gravel	45	60
Gravel Gray Clay	60	110
Gravel Sand H2O	110	128
Gray Clay	128	158
Silt Sand	158	195
Gray Clay	195	204
Sand Silt H2O ½ GPM	204	218
Silt Gravel	218	232
Gray Clay Silt	232	255

Work started 7/20, 19. Completed 8/28, 19 84

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME S+C Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 999 Kelly Bellingham
(Signed) [signature] (WELL DRILLER) License No. 0095
Contractor's Registration No. WELDPOS972 Date 9/7, 19 84

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) 1329

GOULDS PUMPS, INC.
WATER TECHNOLOGIES GROUP
SENECA FALLS, NEW YORK 13148

Goulds Model GS 60 Hz 4" Submersible Pumps

Models: 5GS, 7GS, 10GS, 13GS, 18GS, 25GS

SPECIFICATIONS

Model	Flow Range GPM	Horsepower Range	Best Eff. GPM	Discharge Connection	Minimum Well Size	Rotation①
5GS	1.2 – 7.5	½ – 1½	5	1¼	4"	CCW
7GS	1.5 – 10	½ – 3	7	1¼	4"	CCW
10GS	3 – 16	½ – 3	10	1¼	4"	CCW
13GS	4 – 20	½ – 3	13	1¼	4"	CCW
18GS	6 – 28	¾ – 5	18	1¼	4"	CCW
25GS	8 - 33	1 – 5	25	1¼	4"	CCW

① Rotation is counterclockwise when observed from pump discharge end.

"GS" SERIES MATERIALS OF CONSTRUCTION

Part Name	Material
Discharge Head	AISI 303 SS
Check Valve Poppet	AISI 304 SS
Check Valve Seal	BUNA, FDA compliant
Check Valve Seat	AISI 304 SS
Check Valve Retaining Ring	AISI 302 SS
Bearing Spider – Upper	Glass Filled Polycarbonate, FDA compliant
Bearing	Urethane, FDA compliant
Kilpring	AISI 301 SS
Diffuser	Glass Filled Polycarbonate, FDA compliant
Impeller	
Bowl	AISI 304 SS
Intermediate Sleeve①	AISI 304 SS, Powder Metal
Intermediate Shaft Coupling②	AISI 304 SS, Powder Metal
Intermediate Bearing Spider①	Glass Filled Poycarbonate, FDA compliant
Intermediate Bearing Spider②	AISI 303 SS
Bearing	Urethane, FDA compliant
Shim	AISI 304 SS
Spacer	AISI 304 SS, Powder Metal
Inlet Strainer	AISI 304 SS
Screws – Cable Guard	
Motor Adapter	AISI 303 SS
Casing	AISI 304 SS
Shaft	
Coupling	AISI 304 SS, Powder Metal
Cable Guard	AISI 304 SS

① Used on pumps over 24 stages.
② Used on 34 stage model 7GS30.

FEATURES

Powered for Continuous Operation: All ratings are within the working limits of the motor as recommended by the motor manufacturer. Pump can be operated continuously without damage to the motor.

Field Serviceable: Pump can be rebuilt in the field to like new condition with common tools and readily available spare parts. **NOTE: The Model GS has left hand casing threads.**

Sand Resistant Construction: Field proven over almost four decades, face clearance design and floating impellers for an extremely abrasion resistant configuration.

Stainless Steel Metal Parts: AISI types 302, 303 and 304 are corrosion resistant, non-toxic and non-leaching.

FDA Compliant Non-Metallic Parts: Impellers, diffusers and bearing spiders constructed of glass filled polycarbonate, an engineered composite. This material is corrosion resistant and non-toxic.

Discharge Head: Precision cast 303 stainless steel for superior strength and durability. Cast in loop for safety line.

Motor Adapter: Precision cast 303 stainless steel is extremely rigid for accurate alignment of liquid end to motor. Generous space for removal of motor mounting nuts with regular open-end wrench.

Bowls: Stainless steel for strength and abrasive resistance.

Check Valve: Built in check valve constructed of stainless steel and low compression, FDA compliant, BUNA rubber for excellent abrasive resistance and quiet, efficient operation.

Stainless Steel Casing: Polished stainless steel is attractive and durable in the most corrosive water.

Hex Shaft Design: Six sided shafts for positive impeller drive.

Shaft Coupling: Exposed for ease of field alignment to motor shaft and to check pump rotation.

Inlet Strainer: Stamped stainless steel for rigidity.

Urethane Upper and Middle Bearings: Fluted design for free passage of abrasives and excellent resistance to sand damage.

Franklin Electric Motor:
- Corrosion resistant stainless steel construction through 2 HP, stainless steel casing with nickel plated gray iron end bells on motors over 2 HP.
- Built-in surge arrestor is provided on single phase motors through 3 HP.
- Stainless steel splined shaft.
- Hermetically sealed windings.
- Replaceable motor lead assembly.
- UL 778 recognized.
- NEMA mounting dimensions.
- Control box is required with 3 wire single phase units.
- Three phase units require a magnetic starter with three leg protection. Magnetic starter and heaters must be ordered separately.

Agency Listings: All complete pump/motor assemblies are UL778 and CSA listed. All 4" Franklin Electric Motors are UL778 recognized.

ORDER NUMBER CODE

5 GS 05 4 1 2 (R)

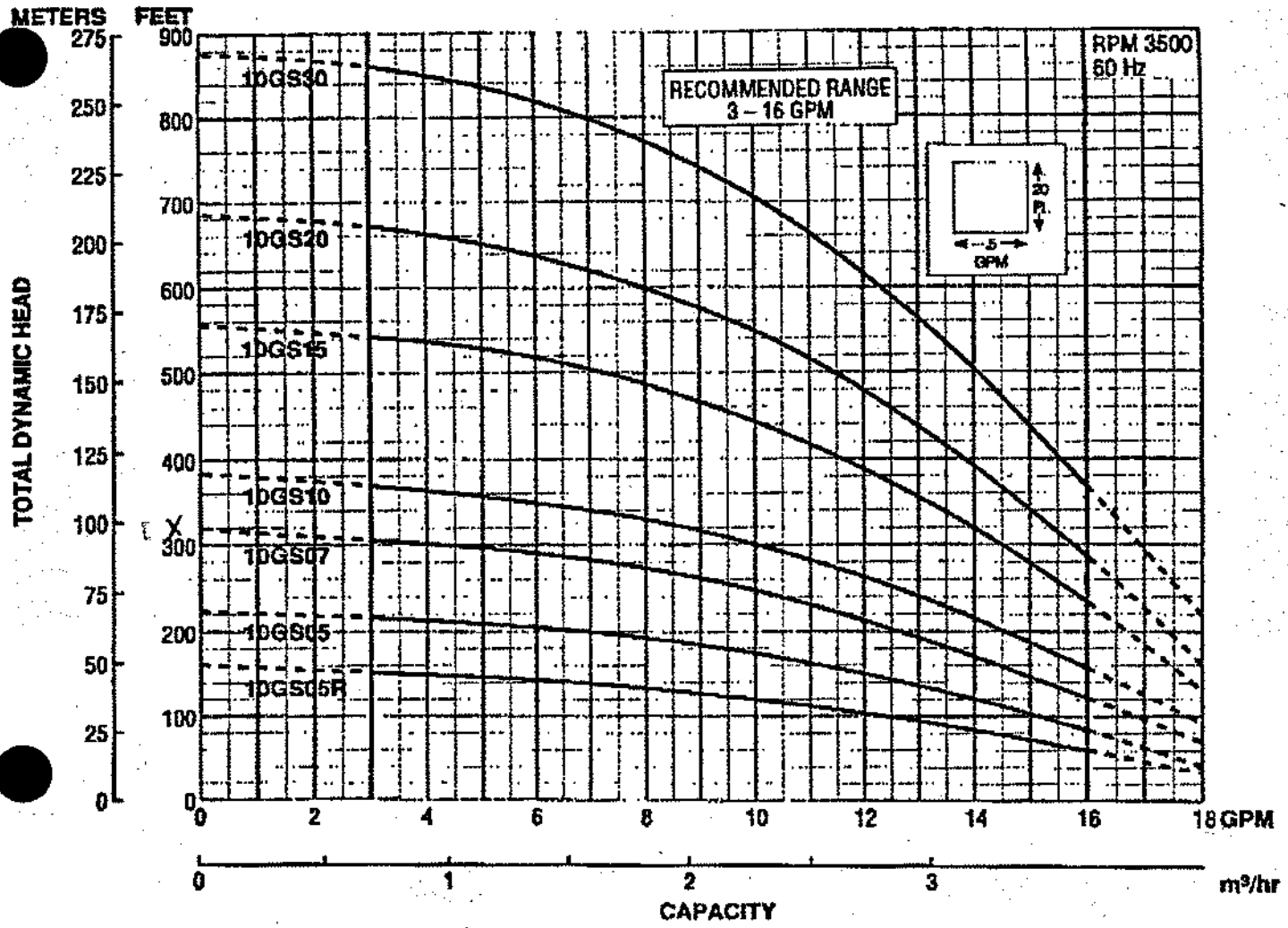
- GPM at Best Efficiency — 5, 7, 10, 13, 18, 25
- GS Pump Series
- Horsepower Code: 05 = ½, 07 = ¾, 10 = 1, 15 = 1½, 20 = 2, 30 = 3, 50 = 5
- 4 = 4" Franklin Motor
- Phase: 1 = 1 Phase 3 Wire, 2 = 1 Phase 2 Wire, 3 = 3 Phase 3 Wire
- Voltage: 1 = 115 V, 2 = 230 V, 3 = 380 V, 4 = 460 V, 7 = 575 V
- Reduced Stage ½ HP Water End ("R" model replaces the ½ HP model.)

Canadian Standards Association

Underwriters Laboratories

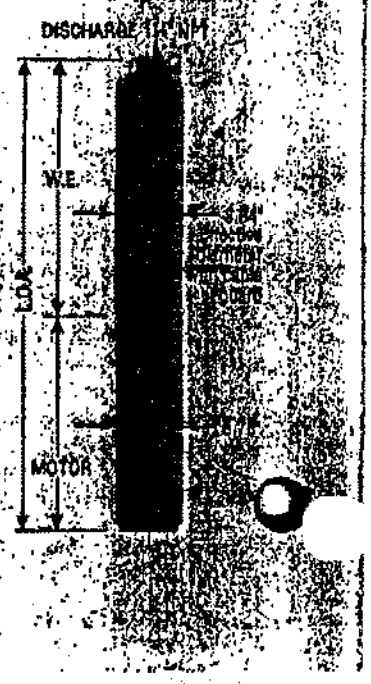
Model 10GS

GOULDS PUMPS, INC.



DIMENSIONS AND WEIGHTS

Model	HP	Phase	Stages	Length (inches) W.E.①	Length (inches) Motor	Length (inches) L.O.A.②	Weight (lbs.) W.E.	Weight (lbs.) Motor	Weight (lbs.) Total
10GS05412R,22,11,21③	½R③	1	5	9.1	9.5	18.6	6	18	24
10GS05412,22,11,21	½	1	7	10.5	9.5	20.0	7	18	25
10GS07412,22	¾	1	10	12.6	10.7	23.3	8	20	28
10GS10412,22	1	1	12	13.9	11.8	25.7	9	23	32
10GS15412	1½	1	17	17.4	13.6	31.0	11	28	39
10GS15422	1½	1	17	17.4	15.1	32.5	11	31	42
10GS15432	1½	3	17	17.4	11.8	29.2	11	23	34
10GS20412	2	1	20	19.4	15.1	34.5	12	30	42
10GS20432,34	2	3	20	19.4	13.6	33.0	12	28	40
10GS30412	3	1	27	25.5	23.5	49.0	15	52	67
10GS30432,34	3	3	27	25.5	20.6	46.1	15	43	58



① Reduced trim ½ HP pump/water end for low head applications. This model replaces the ½ HP water end.
② W.E. = water end or pump without motor.
③ L.O.A. = length of assembly – complete pump – water end and motor.

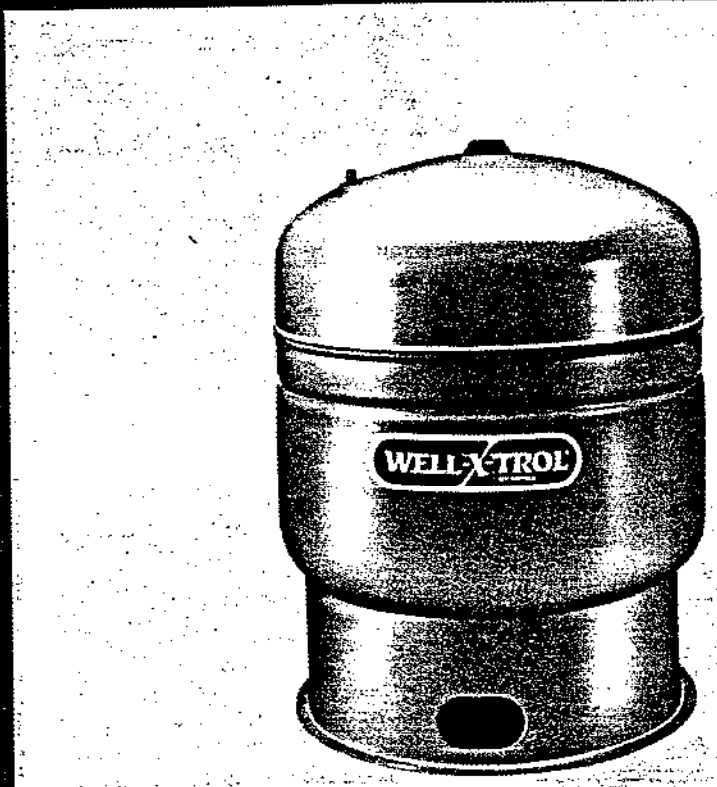
AMTROL

WELL-X-TROL

PRE-PRESSURIZED HYDRO-PNEUMATIC TANKS Series 100, 200, 250 and 300

SECTION 5 b

Application, selection, sizing and installation procedures

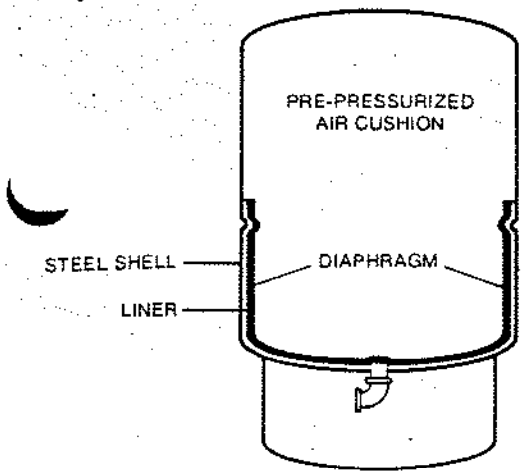


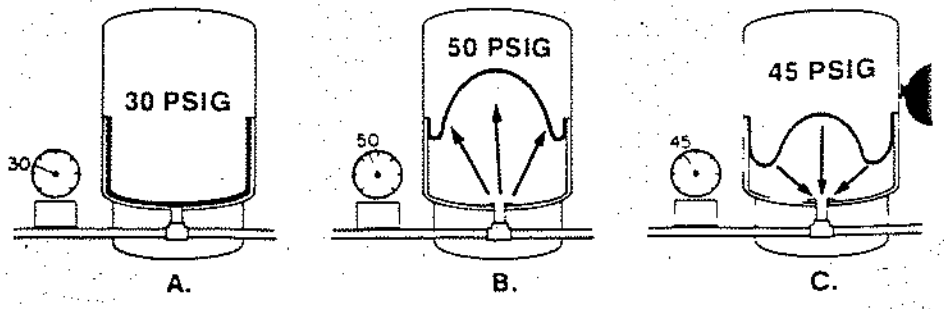
FUNCTION OF THE WELL-X-TROL IN RESIDENTIAL AND LIGHT COMMERCIAL WELL SYSTEMS

Contrary to traditional belief, the primary function of the pressure tank in a well system is not to store useable water. It is a pressure control . . . providing the means of operating a domestic water system to meet system demand at a desirable operating pressure range. Specifically, the pressure tank:

1. Delivers adequate water under pressure between pump cycles to meet demand.
2. Provides economical system operation by minimizing pump starts, extending pump motor life, and saving energy.
3. Assists the pump in meeting peak demand.

MARK OF THE ORIGINATOR





A. Factory installed precharged air cushion. Pump off.

B. When pump starts, water enters the reservoir. At 50 psig, system is filled. Pump shuts off.

C. When water is demanded, pressure in the air chamber forces water into the system. Pump stays off.

EFFECTIVE SYSTEM PROTECTION

This key function can best be expressed as one of providing effective system protection . . . or ESP.

The properly sized WELL-X-TROL will protect the pump and operating controls by insuring that pump operation conforms to the manufacturer's specified minimum running time.

And since the WELL-X-TROL is designed to hold its sealed-in air cushion, and separate it from system water, the level of effective system protection will be maintained.

SIZE TO PUMP RUNNING TIME . . . NOT TO DEMAND

Since the primary function of the WELL-X-TROL is to protect the pump and pressure switch against short cycling . . . it is advisable to size it directly to the desired running time. It is *not recommended* to size a WELL-X-TROL to supply a theoretical demand volume (except on special applications).

OPERATING CHARACTERISTICS

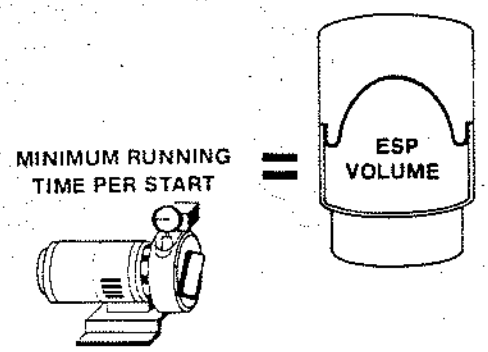
The WELL-X-TROL principle employs a mechanical sealed-in heavy duty diaphragm to allow an air cushion to be pre-pressurized before leaving the factory.

Water is contained in a separate molded rigid polypropylene liner that is supported by the outside steel shell and covered by a flexing diaphragm. This provides a completely non-corrosive water reservoir, eliminating any contact of system water with ferrous metal.

The WELL-X-TROL is shipped with its total volume filled with air pressured to a standard precharge.

As water enters the WELL-X-TROL, the diaphragm is flexed, compressing the air cushion, reducing its volume by the same volume of water that enters. As the volume of air decreases, the pressure in the WELL-X-TROL increases . . . so that it always equals the pressure exerted by the water. Since air pressure and water pressure are always equal, the diaphragm is never under any strain. It merely flexes or floats between the water and air.

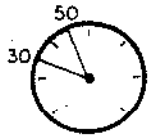
When properly sized, the air cushion in the WELL-X-TROL will be of sufficient volume at minimum pressure (pump cut-in) to allow a desired volume of water to enter the WELL-X-TROL with the subsequent pressure increase within the specified operating pressure range (20/40, 30/50, 40/60, etc.) as set by the pressure switch.



This volume of water (ESP volume) is equal to the average capacity of the pump during its minimum running time per start as specified by the manufacturer.

The operation of the WELL-X-TROL, then, will insure that once the pump starts, it will run at least the specified minimum time before the pressure in the WELL-X-TROL's air cushion reaches the pump switch cut-out level.

When this pressure is reached, the pump stops and the system is fully pressurized. Further demand is supplied by water in the WELL-X-TROL. As water leaves the WELL-X-TROL, the air volume increases in the air cushion and the pressure decreases, always equalizing the dropping system pressure. When pressure in the WELL-X-TROL reaches the minimum point of the operating range (pump cut-in), the pump switch actuates the pump and the operating cycle begins again.



RECOMMENDED PRESSURE RANGE FOR RESIDENTIAL SYSTEM

RECOMMENDED OPERATING PRESSURE RANGES

The WELL-X-TROL will operate at any pressure range (pump cut-in to pump cut-out) when properly sized. Standard pump usage traditionally has centered on the use of three ranges . . . 20/40, 30/50, 40/60.

The recommended pressure range for today's average residential system is 30/50. While, traditionally, many smaller systems have used a 20/40 range, increased water usage in the home, as well as more sophisticated water use appliances and fixtures require adequate flow and pressure that is not available when running at the 20/40 range.

Every WELL-X-TROL is air tested to 100 psig . . . the maximum working pressure for the WELL-X-TROL line.

Should pressures exceed 100 psig, proper selection and sizing of an A.S.M.E. constructed WELL-X-TROL should be made.

RELIEF VALVE RECOMMENDED

It is recommended that a relief valve be installed which is set to open at excessive pressures (75 psig or more). This will protect the WELL-X-TROL and other system components should the pressure switch malfunction and fail to shut the pump WELL-X-TROL to the system piping and have a discharge equal to the pump's capacity at 75 psig.

STANDARD PRECHARGE PRESSURES

WELL-X-TROL Models WX-101 and 102 are precharged to 20 psig. Other models in the Series 100, 200, and LTD Series are precharged to 30 psig. Model WX-205 and WX-250 Series precharged t 40 psig, and WX-300 Series precharged to 38 psig.

All precharges should be checked and adjusted, if necessary, to conform to specific job conditions. (See Sizing and Installation.)

SIZING AND SELECTION

USE OF THE SIZING METHODS

All selection and sizing methods explained in the following two procedures are based on the same physical law, first developed by Robert Boyle in 1662. Boyle's Law ($P_1V_1 = P_2V_2$) states that the pressure of an air cushion, in a pressure tank, multiplied by the volume of the air cushion at one system pressure condition, will always equal the pressure of the air cushion multiplied by its volume at any other pressure condition.

This law, which has held true for over three hundred years, insures that your sizing will be based on factual physical law, not an arbitrary performance standard set by the tank manufacturer.

SIZING TABLE

PUMP DISCHARGE RATE GPM (Approx.)	OPERATING PRESSURE – PSIG					
	20/40		30/50		40/60	
	ESP I	ESP II	ESP I	ESP II	ESP I	ESP II
2.5 5	WX-104 WX-201	WX-201 WX-203	WX-104 WX-202	WX-202 WX-203	WX-104 WX-202	WX-202 WX-250
7 10 12	WX-202 WX-203 WX-250	WX-250 WX-251 WX-302	WX-203 WX-203 WX-250	WX-251 WX-302 WX-302	WX-203 WX-250 WX-251	WX-251 WX-302 WX-350
15 20 25	WX-250 WX-251 WX-302	WX-302 WX-350 (2)WX-302	WX-251 WX-302 WX-302	WX-350 (2)WX-251 (2)WX-302	WX-251 WX-302 WX-350	WX-350 (2)WX-302 (3)WX-251
30	WX-302	(2)WX-302	WX-350	(1)WX-302 (1)WX-350	WX-350	(2)WX-350
35	WX-350	(1)WX-302 (1)WX-350	WX-350	(2)WX-350	(2)WX-251	(3)WX-302
40	WX-350	(2)WX-350	(2)WX-251	(3)WX-302	(2)WX-302	(1)WX-302 (2)WX-350

Site work 6

I. ESP I AND ESP II TABLES

These tables will size correct WELL-X-TROL model numbers directly to the running time of the pump or flow rate of the system at three standard operating pressure ranges.*

ESP I will insure that the pump will run *at least* one minute each time it starts. This is the usual minimum run time recommended by most pump and pump motor manufacturers.

ESP II will insure *at least* two minutes run time. This is usually recommended for pumps greater than ¾ H.P. and/or when pump starts and operating energy consumption are to be reduced.

The tables can be used for most normal job conditions, i.e., WELL-X-TROL and pressure switch installed in same location and adequate piping size from system main to WELL-X-TROL.

EXAMPLE:

1. **A minimum running time of *at least* one minute is desired for a submersible pump system with a flow rate of 10 GPM and operating at 30/50. ESP I will be provided with a WELL-X-TROL WX-203.**
2. **If two minutes running time were desired for the above system in order to reduce pump starts, ESP II would be used resulting in the selection of a WX-302.**

*Time may vary due to system conditions.

II. ESP VOLUME/PRESSURE FACTOR SIZING METHOD

This method should be used when run times other than one or two minutes are desired, and/or when operating pressures are other than 20/40, 30/50, or 40/60.

It is a simple procedure that helps you quickly calculate the volume of water that the pump will deliver during any desired running time and determine the correct WELL-X-TROL size to insure that running time at any operating pressure range.

The volume of water delivered by the pump during the specified run time is referred to as "ESP Volume." It is the exact volume of water that is to be accepted by the WELL-X-TROL to provide effective system protection.

Using AMTROL's pre-calculated pressure factor table (based on Boyle's Law), a simple division of the ESP volume by the correct pressure factor will give you the size WELL-X-TROL for the job.

To make it easier, the following quick sizing form breaks down the sizing procedure into eight simple steps.

(We suggest you make an extra copy of this page [illegible] to calculate.)

For selecting WELL-X-TROLs for a different running time than ESP I or ESP II, and/or at pressure ranges the same or different than 20/40, 30/50, 40/60:

THINGS YOU MUST KNOW

1. System flow rate (pump capacity or discharge) ..... 10 GPM
2. Desired running time, in minutes and fractions of minutes (1.5 min. = 1 min. 30 sec.) ..... 6 Min.
3. Pump cut-in, in gauge pressure ..... 30 Psig
4. Pump cut-out, in gauge pressure ..... 60 Psig

CALCULATING TANK SIZE

5. Multiply Line 1 by Line 2 and enter ESP Volume ..... 60 ESP Vol.
6. Refer to Table 1. Find pressure factor for Line 3 and Line 4 and enter ..... .40 P.F.
7. Divide Line 5 by Line 6 and enter minimum total WELL-X-TROL Volume ..... 150 Gals.
8. Refer to Table 2 and select WELL-X-TROL model that is greater than Line 7 for "Total Volume" and Line 5 is less than "Maximum ESP Volume" ..... Yes 350 WX No.
9. Select precharge pressure ..... 30 Psig

NOTE: The precharge pressure *must* be adjusted to the pump cut-in pressure. For the following example reduce from 40 to 25 psig.

***EXAMPLE:* A system flow will be delivered by a pump at a rate of 12.5 GPM. The pump switch is to be installed at the WELL-X-TROLL and has been determined to cut-in the pump at 25 psig. Its differential, or operating range, is 20 psi. It is desired to have the pump run *at least* one minute and 30 seconds every time it starts. Which WELL-X-TROL will provide "ESP"?**

THINGS YOU MUST KNOW

1. System flow rate (pump delivery) ..... 12.5 GPM
2. Desired running time, in minutes and fractions of minutes (1.5 min. = 1 min. 30 sec.) ..... 1.5 Min.
3. Pump cut-in, in gauge pressure ..... 25 Psig
4. Pump cut-out, in gauge pressure ..... 45 Psig

CALCULATING TANK SIZE

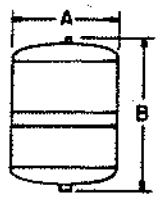
5. Multiply Line 1 by Line 2 and enter ESP Volume ..... 18.8 ESP Vol.
6. Find Pressure factor for Line 3 and Line 4 in Table 1, and enter ..... .34 P.F.
7. Divide Line 5 by Line 6 and enter minimum total WELL-X-TROL volume ..... 55.2 Gals.
8. Refer to Table 2 and select WELL-X-TROL model that is greater than Line 7 for "Total Volume" and Line 5 is less than "Maximum ESP Volume" WX-251

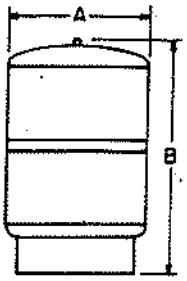
A WX-251 has a total volume of 62 gallons and a maximum ESP volume of 34 gallons.

TABLE 1 — ACCEPTANCE FACTORS

PUMP CUT-OUT PRESSURE — PSIG	PUMP CUT-IN PRESSURE — PSIG														
	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
30	.22														
35	.30	.20													
40	.37	.27	.18												
45	.42	.34	.25	.17											
50	.46	.39	.31	.23	.15										
55	.50	.43	.36	.29	.22	.14									
60	.54	.47	.40	.33	.27	.20	.13								
65		.50	.44	.38	.31	.25	.19	.13							
70		.53	.47	.41	.35	.30	.24	.18	.12						
75			.50	.45	.39	.33	.28	.22	.17	.11					
80			.53	.48	.42	.37	.32	.26	.21	.16	.11				
85				.50	.45	.40	.35	.30	.25	.20	.15	.10			
90				.53	.48	.43	.38	.33	.29	.24	.19	.14	.10		
95					.50	.46	.41	.36	.32	.27	.23	.18	.14	.09	
100					.52	.48	.44	.39	.35	.31	.26	.22	.17	.13	.09

TABLE 2

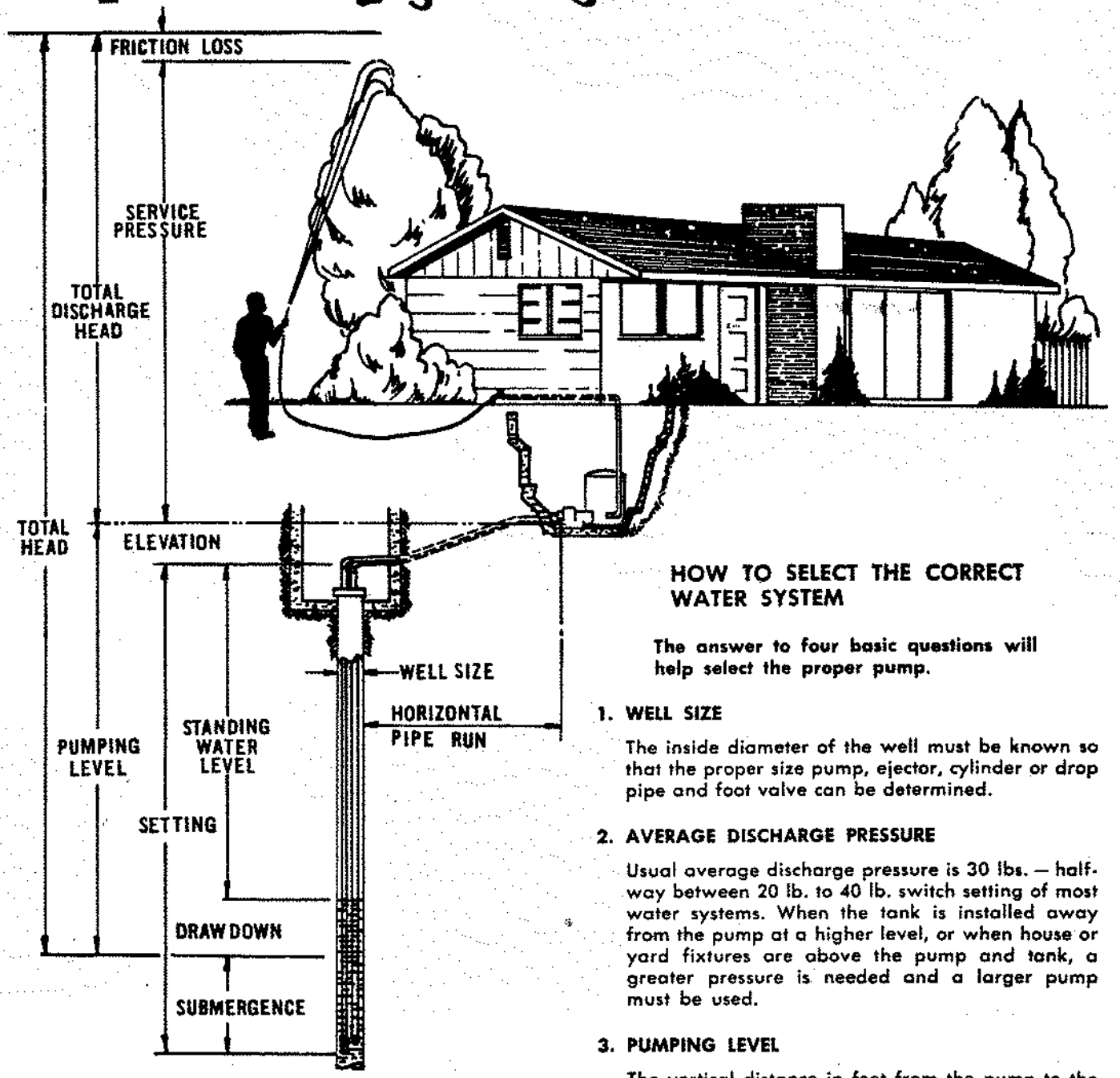




MODEL NO.	DIMENSIONS — IN. A	DIMENSIONS — IN. B	TOTAL WELL-X-TROL VOL. (Gals.)	MAXIMUM ESP VOLUME ACCEPTANCE VOLUME (GALS.)	SYSTEM CONNECTION	SHIPPING WEIGHT (LBS.)
WX-101	8"	12⅝"	2.0	0.9	¾" NPTM	5
WX-102	11"	15"	4.4	2.4	¾" NPTM	9
WX-104	15⅜"	17¾"	10.3	10.3	1" NPTF	20
WX-104S	15⅜"	19¼"	10.3	10.3	1" NPTF	23
WX-200	15⅜"	22"	14.0	11.3	1" NPTF	24
WX-200-UG	15⅜"	22"	14.0	11.3	1" NPTF	23
WX-201	15⅜"	24"	14.0	11.3	1" NPTF	25
WX-201-IN	16½"	24⅝"	14.0	11.3	1" NPTF	27
WX-202	15⅜"	31¾"	20.0	11.3	1" NPTF	33
WX-202-IN	16½"	32"	20.0	11.3	1" NPTF	35
WX-202-UG	15⅜"	29¾"	20.0	11.3	1" NPTF	31
WX-203	15⅜"	46⅝"	32.0	11.3	1" NPTF	43
WX-205	22"	29½"	34.0	34.0	1¼" NPTF	61
WX-250	22"	36"	44.0	34.0	1¼" NPTF	69
WX-250-UG	22"	33½"	44.0	34.0	1¼" NPTF	60
WX-251	22"	46¾"	62.0	34.0	1¼" NPTF	92
WX-251-UG	22"	44¼"	62.0	34.0	1¼" NPTF	83
WX-302	26"	47 3/16"	86.0	46.0	1¼"-NPTF	123
WX-350	26"	61⅞"	119.0	46.0	1¼"-NPTF	166
LTD SERIES						
WX-104 LTD	15⅜"	19¼"	10.3	10.3	1"-NPTF	23
WX-201 LTD	15⅜"	24"	14.0	11.3	1"-NPTF	25
WX-202 LTD	15⅜"	31¾"	20.0	11.3	1"-NPTF	33
WX-203 LTD	15⅜"	46⅝"	32.0	11.3	1"-NPTF	43

Maximum Working Pressure — Models WX-101, WX-102, WX-104, WX-104S and WX-104-LTD, 150 psig — all other models — 100 psig.
Maximum Operating Temperature — 200°F.

Myers® Engineering Data



HOW TO SELECT THE CORRECT WATER SYSTEM

The answer to four basic questions will help select the proper pump.

1. WELL SIZE

The inside diameter of the well must be known so that the proper size pump, ejector, cylinder or drop pipe and foot valve can be determined.

2. AVERAGE DISCHARGE PRESSURE

Usual average discharge pressure is 30 lbs. — halfway between 20 lb. to 40 lb. switch setting of most water systems. When the tank is installed away from the pump at a higher level, or when house or yard fixtures are above the pump and tank, a greater pressure is needed and a larger pump must be used.

3. PUMPING LEVEL

The vertical distance in feet from the pump to the water level while the pump is operating. If the pump is installed away from the well and is on higher ground, this elevation must also be included. Most wells draw down while being pumped so this must not be confused with the standing water level.

4. CAPACITY REQUIRED

The discharge capacity of the pump in gallons per hour that is needed for satisfactory service. The pump should have enough capacity so that it does not need to work more than the equivalent in intermittent service of 2 hours per day. See table of water requirements.

SELECT A WATER SYSTEM WITH ENOUGH CAPACITY TO MEET BOTH PRESENT AND FUTURE REQUIREMENTS.

AVERAGE WATER REQUIREMENTS FOR GENERAL SERVICE AROUND THE HOME AND FARM

Each person per day, for all purposes	50 gal.
Each horse, dry cow or beef animal	12 gal.
Each milking cow	35 gal.
Each hog per day	4 gal.
Each sheep per day	2 gal.
Each 100 chickens per day	4 gal.

AVERAGE AMOUNT OF WATER REQUIRED BY VARIOUS HOME AND YARD FIXTURES

Drinking fountain, continuously flowing	50 to 100 gal. per day
Each shower bath	Up to 60 gal.
To fill bathtub	30 gal.
To flush toilet	6 gal.
To fill lavatory	2 gal.
Dish Washing Machine — per load	3 gal.
Automatic Washer — per load	Up to 50 gal.
Regeneration of Domestic Water Softener	50-100 gal.
Shower	4 to 6 g.p.m.
Bathtub	4 to 8 g.p.m.
Toilet	4 to 5 g.p.m.
Lavatory	1 to 3 g.p.m.
Kitchen sink	2 to 3 g.p.m.
½" hose and nozzle	200 g.p.h
¾" hose and nozzle	300 g.p.h
Lawn sprinkler	120 g.p.h

1101 Myers Parkway, Ashland, Ohio 44805-1923 • 419/289-1144 • FAX: 419/289-6658 • TLX: 98-7443 Printed in U. S. A.

INSTALLATION PROCEDURES

UNPACKING AND ATTACHING ACCEPTANCE FITTINGS

SKIRTED MODELS WX-205, 250, 251, and 302

1. Lay carton on its side.
2. Open at bottom and slide WELL-X-TROL out until acceptance opening in skirt is accessible.
3. Install system fittings to acceptance elbow, located on bottom of WELL-X-TROL.
4. Stand tank upright and slip off carton and protective plastic bag.

SKIRTLESS MODELS WX-101, 102, 104 AND 200

In-line Models WX-101 and 102, are conventionally installed in the main water supply line with a ¾" connection. For Models WX-104 and WX-200, 1" fitting.

PROPER WELL-X-TROL LOCATION

The WELL-X-TROL should be installed as close as possible to the pressure switch. This will reduce the adverse effects of added friction loss and differences in elevation between WELL-X-TROL and/or water main and switch. (See compensation for adverse job conditions).

ADJUSTING WELL-X-TROL PRECHARGE TO SYSTEM REQUIREMENTS

All WELL-X-TROLs are shipped with a standard precharge. This precharge should be the same as the pump cut-in setting of the pressure switch. The following steps should be taken:

1. Using a suitable pressure gauge, check precharge pressure prior to assembling in system.
2. Release or add air as necessary to make precharge pressure equal to pressure switch pump cut-in setting.

   NOTE: Pressure switch setting may be out-of-adjustment, i.e., if labelled "30/50", it may be actually 28 or 29 to 48 or 49. See "Tuning System" for correcting this situation. *Do not adjust WELL-X-TROL precharge for this variation.*

3. Replace protective air valve cap and seal with the air valve label provided. This will enable you to determine if valve has been tampered with on possible future service calls.

SYSTEM CONNECTION

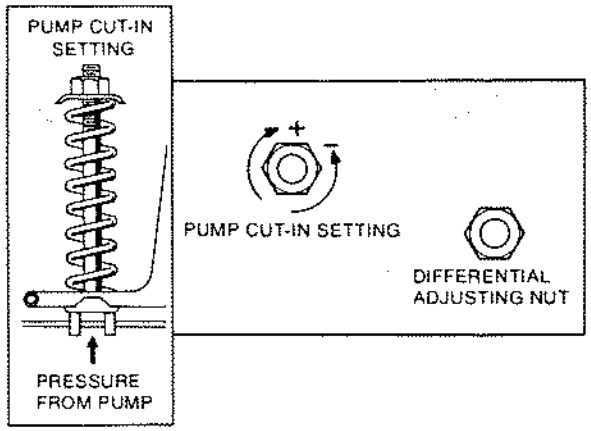
1. Locate WELL-X-TROL in final desired location.
2. Level as necessary.
3. Connect to pump supply line with same size pipe as from pump. Eliminate unnecessary friction loss.
4. All piping should be in accordance with prevailing local codes and standards.

FINE TUNING PROCEDURE

Many times actual pressure switch settings will vary from the standard pressure range indicated. These variations could cause a momentary lag of water delivery as the pressure switch is not "tuned" to the WELL-X-TROL's precharge pressure.

TO "FINE TUNE", FOLLOW THESE STEPS:

1. Fill the system and WELL-X-TROL until pump cuts-off.
2. Open one or more fixtures to drain WELL-X-TROL.
3. If there is a momentary pause in the water flow from the time the WELL-X-TROL is emptied and the pump starts, adjust pump switch cut-in setting upward (clockwise) slightly. (Refer to Adjustment Instructions by switch manufacturer.)



4. Close fixtures and refill WELL-X-TROL to pump cut-off.
5. Open fixtures and see if pause is eliminated. If not, continue adjusting pressure switch until there is no pause in water flow between the draining of the WELL-X-TROL and pump cut-in.

REPLACING PLAIN STEEL TANKS WITH WELL-X-TROL

Many times a defective plain steel tank must be replaced with a WELL-X-TROL to provide ESP for the system.

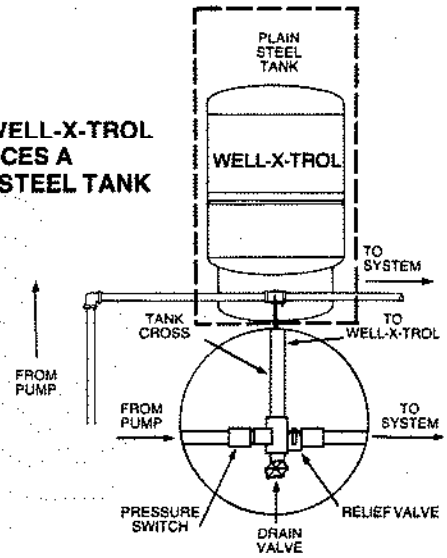
It is a simple procedure and the line drawing below should be followed for correct connection to the system.

The WELL-X-TROL will replace a 16" or larger diameter plain steel tank without requiring additional floor space.

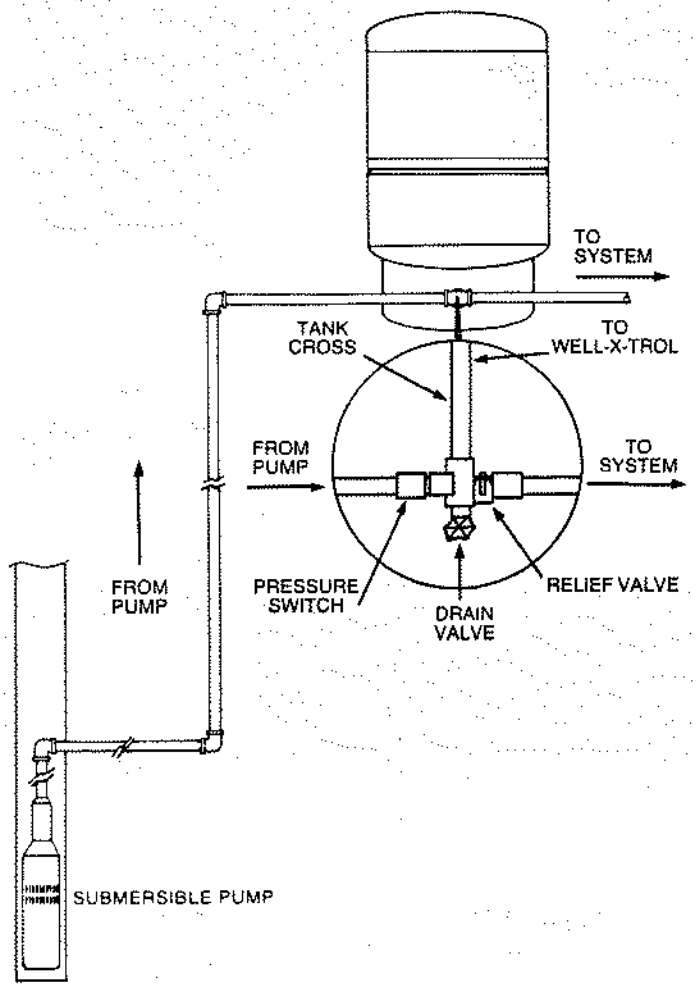
It is recommended that a relief valve be installed at the WELL-X-TROL connection.

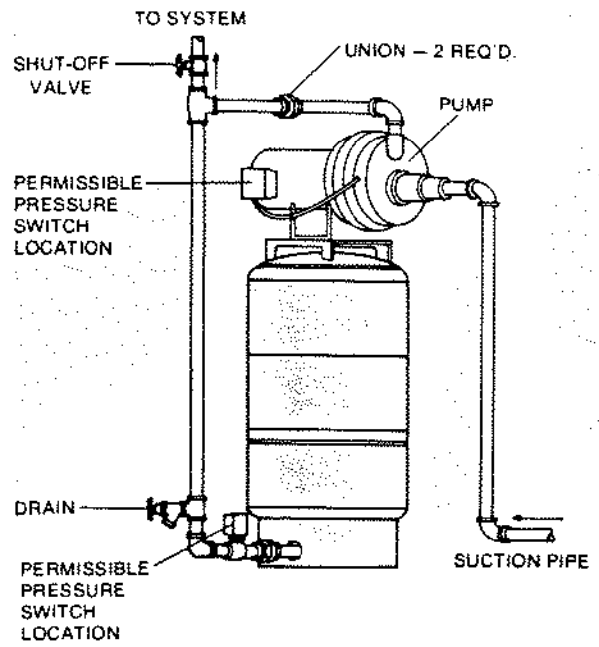
Also be sure to plug the air port on a jet pump, as air is no longer required to be supplied to the tank.

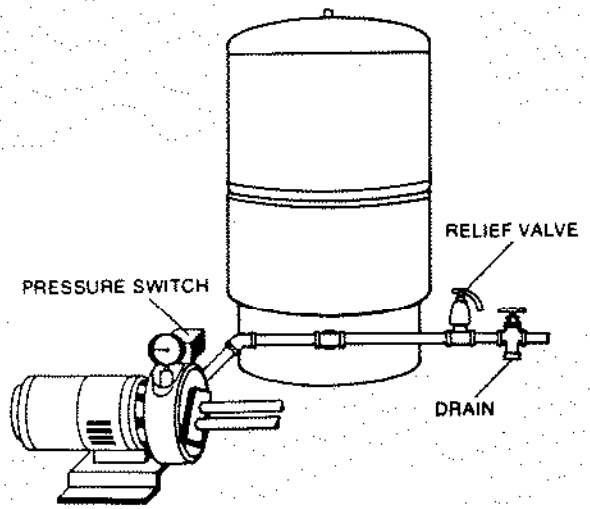
HOW WELL-X-TROL REPLACES A PLAIN STEEL TANK

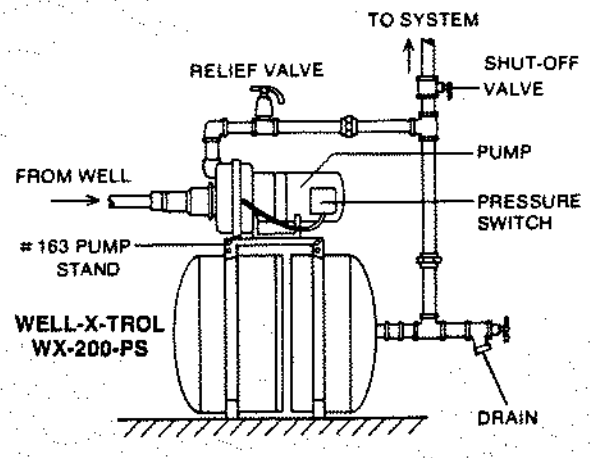


INSTALLATION

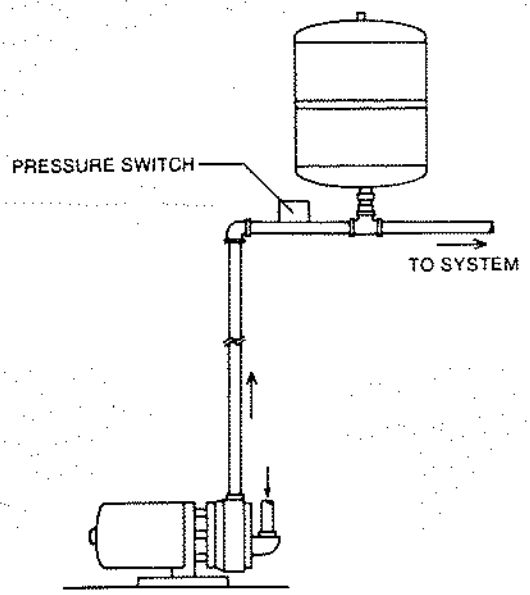


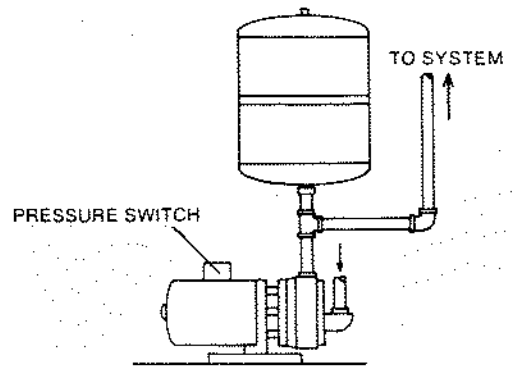




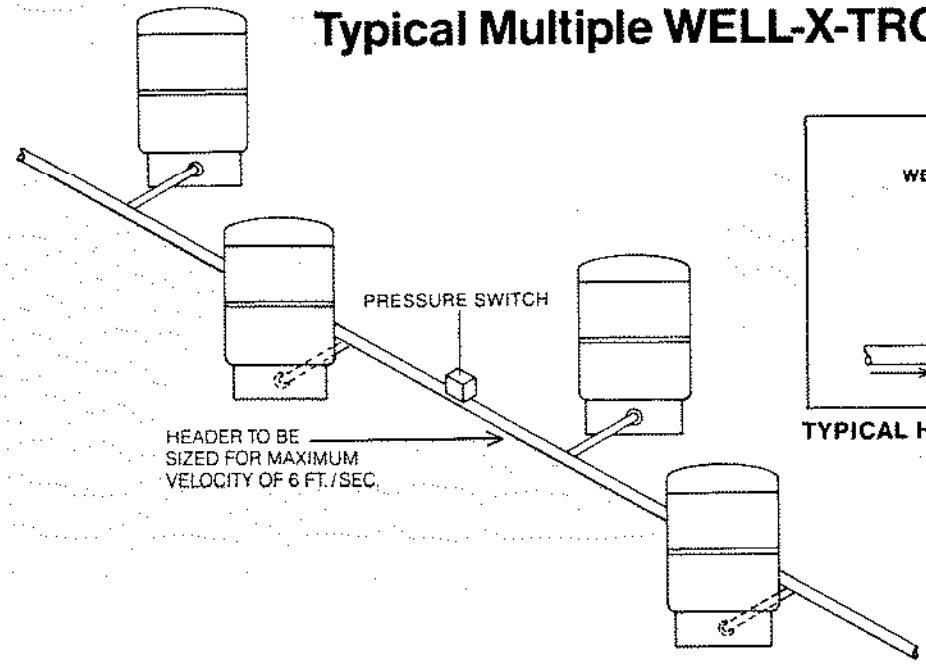


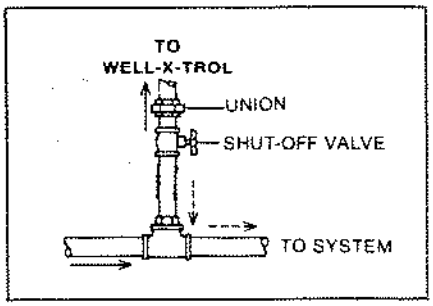
INSTALLATION



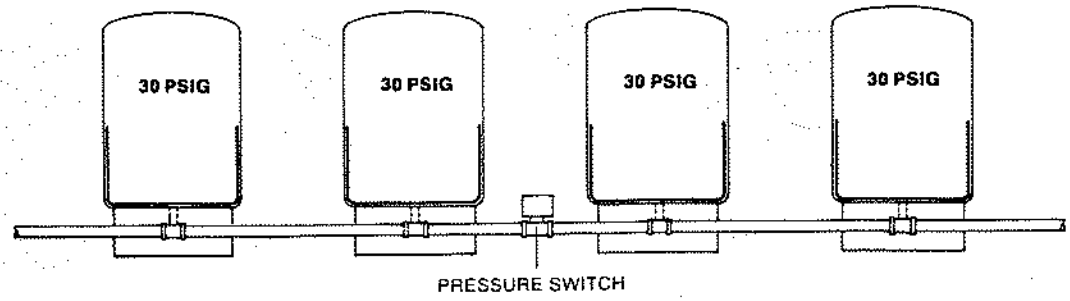


Typical Multiple WELL-X-TROL Installations





TYPICAL HEADER TO TANK PIPING



INSTALLATION PROCEDURES

UNPACKING AND ATTACHING ACCEPTANCE FITTINGS

SKIRTED MODEL WX-350

UNCARTONING AND POSITIONING

1. Position WX-350 in carton as near to installation site as possible.
2. Lay carton down in horizontal position with side panel "CUT ALONG DOTTED LINE AND FOLD DOWN FOR EASY REMOVAL OF WELL-X-TROL" facing up.
3. Cut along dotted lines and fold panel back.
4. Remove protective plastic bag and discard shipping platform.
5. Connect nipples for straight-through or off-line connections as desired. If off-line, use outlet fitting as is. If straight-through, remove plug in tee.

CAUTION: In both cases, the tee fitting must be held with a pipe wrench to prevent permanent tank damage.

6. Removing carton, stand WX-350 upright.
7. Maneuver WX-350 into final, stable position.
8. Make final connections to pump and system piping.

PROPER WELL-X-TROL LOCATION

The WELL-X-TROL should be installed, on a stable and level surface, as close as possible to the pressure switch. This will reduce the adverse effects of added friction loss and differences in elevation between WELL-X-TROL and/or water supply main and switch.

PIPING CONNECTIONS

REPLACING PLAIN STEEL TANKS WITH WELL-X-TROL

Many times a defective plain steel tank must be replaced with a WELL-X-TROL to provide (ESP) Effective System Protection.

It is a simple procedure and the line drawing should be followed for correct connection to the system.

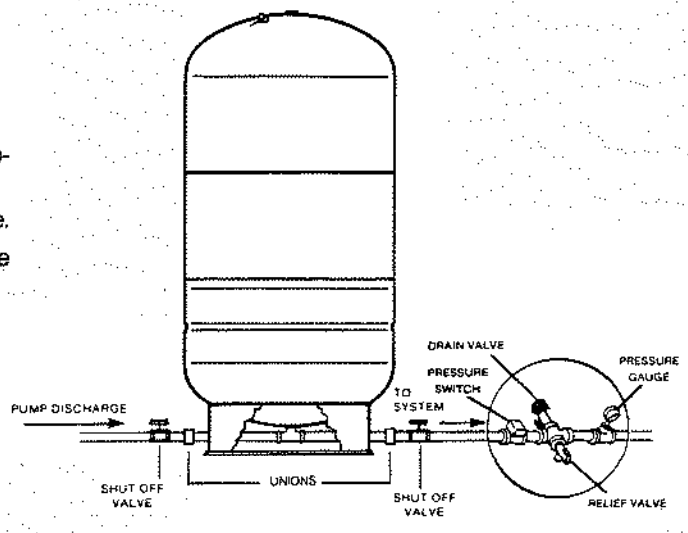
Because the WELL-X-TROL is precharged with air, it will always occupy less space for similar amounts of pressurized water than a plain steel tank.

It is recommended that a relief valve be installed at the WELL-X-TROL connection to ensure system protection.

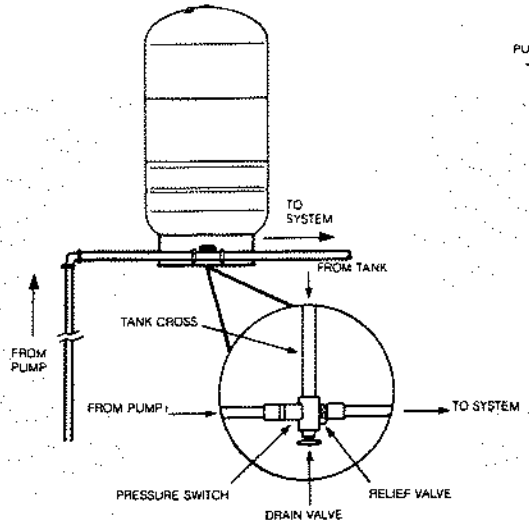
Also BE SURE to plug the air port on a jet pump, as air is no longer required to be supplied to the tank.

STRAIGHT-THROUGH CONNECTION

- Install union and shut-off valves on nipple protruding from each side of skirt.
- Connect to system piping and pump discharge.
- Install manifold with pressure gauge, pressure switch and relief valve as shown.

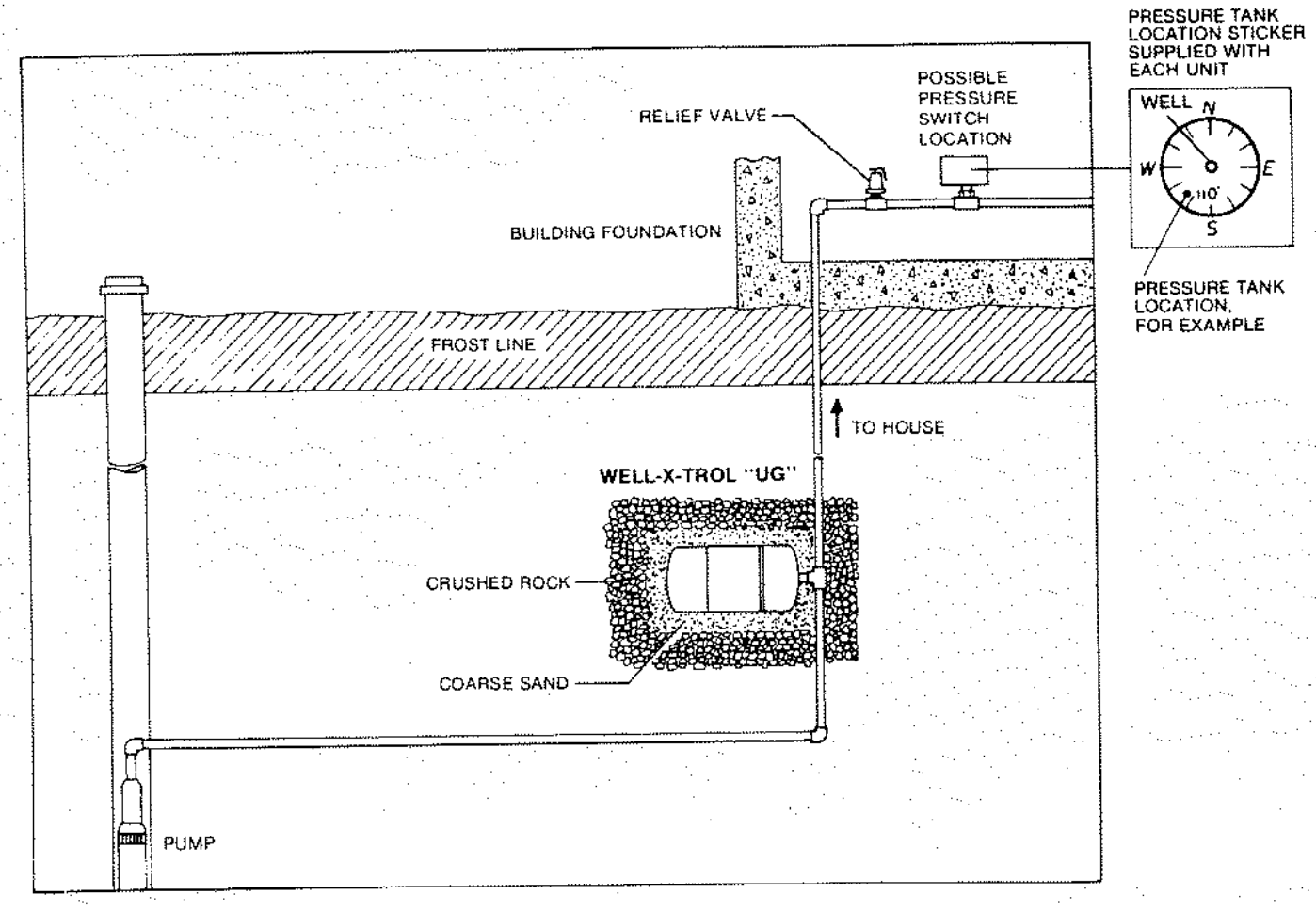


NOTE: When replacing galvanized tanks use straight-through connection.



OFF-LINE SYSTEM CONNECTION

- Use either left or right access opening. Using long cross tee connection to system, install pressure switch and relief valve as shown. Or, use straight-through connections. . . off-line system connection on one side . . . control manifold on the other as shown above.



INSTALLATION INSTRUCTIONS

WELL-X-TROL UNDERGROUND PRESSURE TANKS

All WELL-X-TROL 'UG' tanks are designed for direct burial and can be installed in the horizontal or vertical position. To eliminate danger of freezing, tank should be buried below frost line.

The following steps should be taken when installing a WELL-X-TROL 'UG' tank.

1. Make sure that tank will be buried below frost line and above water table.
2. Remove plastic bag and check tank pre-charge. Factory pre-charge is 30 psig on 200 Series; 40 psig on 250 Series. Replace red cap securely.
3. Install tank on firm rock-free earth.
4. Water line from the pump to the tank and to the switch location should be the same size to prevent switch cycling.
5. Check system for performance and inspect for leaks.
6. Backfill hole with sand or rock-free dirt. Firmly tamp fill to prevent settling.
7. Fill out pressure tank location sticker and affix to power panel or other visible surface so tank can be easily located at a later time.

SIZING FOR JOB VARIATIONS

When sizing and selecting WELL-X-TROLs, it is important to consider job variations that may alter the sizing results, i.e., less run time than calculated will result.

Under normal job situations, the first two sizing methods will give you the correct WELL-X-TROL model. Such "normal" conditions include:

1. WELL-X-TROL and pump switch installed at same location.
2. Adequate pipe size from system main to WELL-X-TROL. (For details, see installation procedures.)

However, many times job conditions will vary from the above. In these cases, it is recommended that the following be incorporated to provide proper compensation in sizing.

Here are two common variations:

I. Differences in elevation between WELL-X-TROL and pump switch.

Since each component is at a different elevation, static pressure will be different. To correct for this, divide height, in feet, by 2.31 to arrive at difference in static pressure.

Example: **Height difference is 9.5'**
9.5 ÷ 2.31 = 4.11 psi difference

HOW TO COMPENSATE

Adjust pressure switch settings (cut-in and cut-out) to pressure range at WELL-X-TROL:

1. If switch is below WELL-X-TROL, ADD difference.

   Example:

   Switch is 9.5' below WELL-X-TROL. Setting on switch is 30/50. Adjust switch setting to 34/54. Size WELL-X-TROL to 30/50.

2. If switch is above WELL-X-TROL (as in underground installations), SUBTRACT difference.

   Example:

   WELL-X-TROL is installed 9.5' below switch. Pressure range is 30/50. Adjust switch setting to 26/46. Size WELL-X-TROL to 30/50.

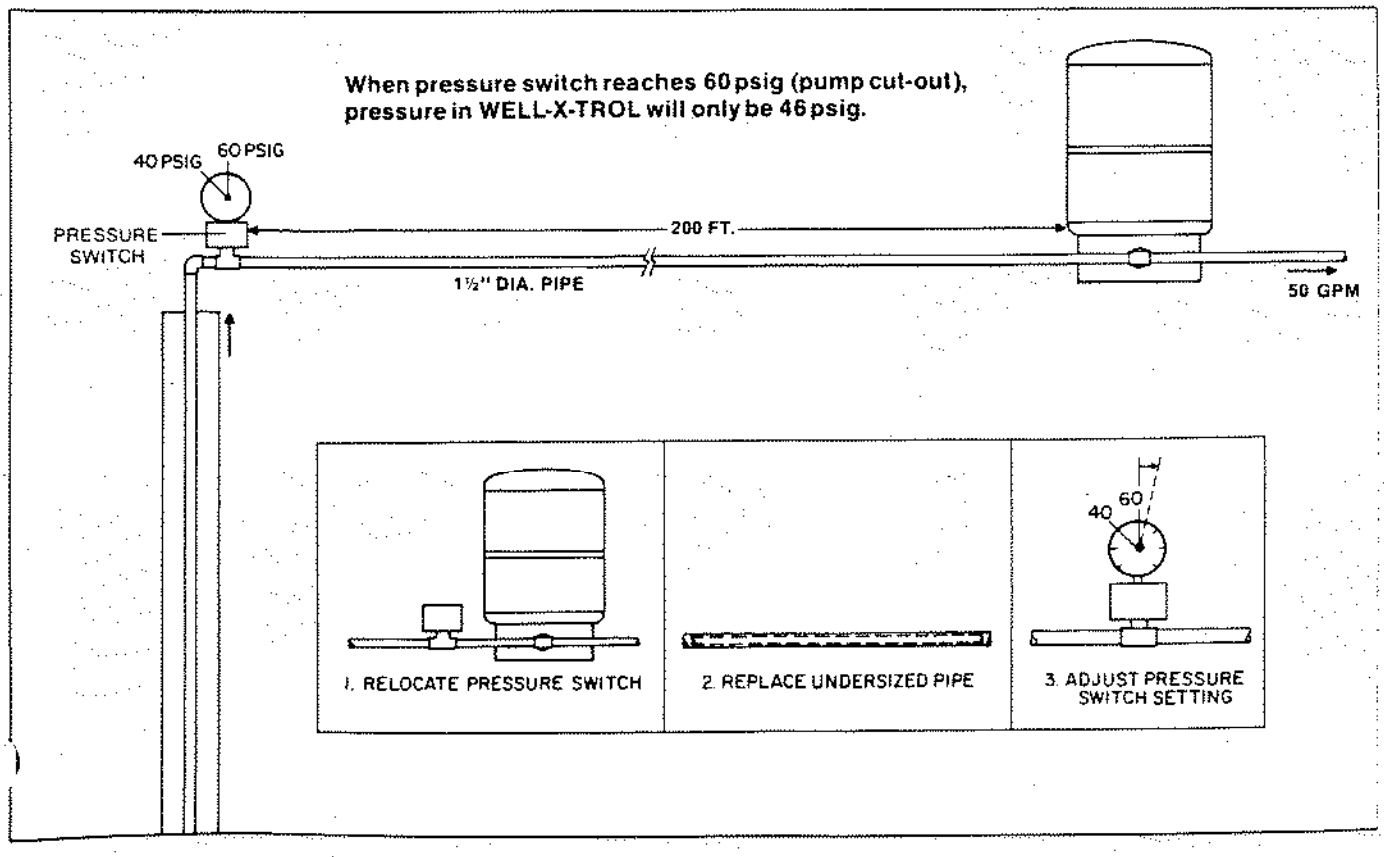
II. Excessive lengths of piping not properly sized.

Excessive lengths of piping (50' and longer) not properly sized that separate the pump switch from the WELL-X-TROL will cause excessive friction and a pressure difference between the switch and tank location.

Example:
Pressure switch and WELL-X-TROL are separated by 200' of 1½" steel pipe. Pump flow is 50 gpm. Switch setting is 40/60. Standard friction loss table shows that the friction loss for 50 gpm thru 200' of 1½" steel pipe will total 14.2 psig. Under these conditions, the switch will reach 60 psig and shut the pump off while the WELL-X-TROL has reached only 46 psig. In this case, our WELL-X-TROL tank is precharged to 40 psig for a 40/60 switch setting, but we are only using approximately 12% of its acceptance capability (40/46).

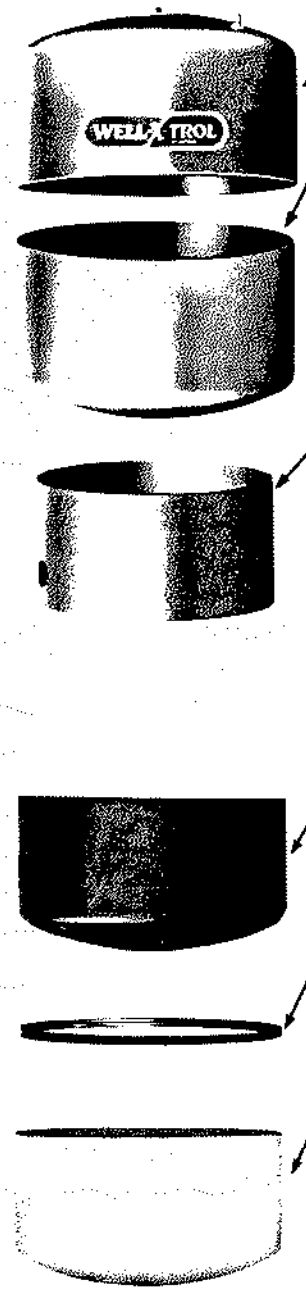
Solution: (Select one of three)

1. Relocate pressure switch near WELL-X-TROL tank.
2. Replace undersized pipe to reduce excessive friction loss.
3. Adjust the pressure switch setting upward to compensate for the friction loss.



The Well-X-Trol label means you get these

...Well-X-Trol Hallmark* features:



- **Top quality deep-drawn steel domes.**
  The manufacturing process developed over 40 years of pioneering expertise...the only brand that carries the hallmark of the originator.

- **Inner bulkhead dome (not shown).**
  Integral, unique 3-dome construction provides solid, long-lasting reinforcement. Featured on large models WX-202, WX-203, WX-251 and WX-350.

- **Time-proven durable steel support stand.**
  Rugged, rigid suspension with ample ventilation to eliminate under tank moisture.

- **Appliance-like weatherproof finish.**
  Lab tested, two-coat urethane finish is superior to baked-on enamel or conventional paint. Resistant to sunlight and corrosive atmospheres for outdoor installations.

- **Exclusive butyl diaphragm meets FDA requirements.**
  Diaphragm material complies with Food and Drug Administration requirements for use with potable water.

- **Mechanical seals.**
  Exclusive mechanical 360° clamping ring bonds diaphragm and liner to shell groove.

- **The only separate rigid polypropylene liner.**
  Only Well-X-Trol uses a separate rigid non-metallic liner to provide long-lasting non-corrosive handling of fresh water. Listed by National Sanitation Foundation for use with potable water.

- **The only silver brazed, copper sleeved acceptance fitting (not shown).**
  Double sealed . . . inside and out to provide high integrity in a 100% non-ferrous system connection. Swaged "O" ring seal on water side of acceptance fitting.

***Hallmark - The mark of the originator.**

AMTROL INC.
WEST WARWICK, R.I. 02893

PRINTED IN U.S.A.

perc[illegible]tion tests are completed, the quantity of sewage to be treated must be estimated to determine the size and capacities of the disposal units.

ESTIMATES OF SEWAGE QUANTITIES

Where there are water meters in existing buildings, the quantity of sewage may best be estimated from the recorded meter readings.

In using water meter readings for estimating the quantity of sewage to be contributed, some allowance should also be made for maximum conditions that may not be readily apparent from the readings. For example, water consumption by an ordinary family of four in an apartment building may average 48 gallons of water per person per day over a period of 3 months, but actually range from perhaps 30 gallons per person on certain days to something in excess of 80 gallons per person on days when water consumption is heaviest, as on washdays. Besides these peak loads, some allowance should be made for the sewage contributed by occasional guests. Therefore, when computing sewage flows from *average* meter readings, a minimum factor of safety of about 25 percent should be allowed to cover the range of variations. Accordingly, the design of a disposal system for the apartment house referred to, where the average usage is 48 gallons per person per day, should be based upon a computed maximum usage of at least 60 gallons per person per day.

Conversely, unusually high meter readings may be caused by lawn sprinkling or by leakage of water that does not enter the disposal system. Due allowances should be made for abnormalities of this kind.

Where measurements of water consumption are not possible, as where water meter records are not available, or where disposal facilities are being planned for a new building, it is necessary to use other methods of estimating the amount of sewage to be discharged. One way is to base the estimated flow on the number of bedrooms, as in Part I. Another way is to compute the flow on the basis of the number and kinds of plumbing fixtures. If the building is used as a restaurant, the number of patrons or the number of meals served may be the best criterion. The competent designer will base his estimates upon a combination of the various influencing factors. He will consider each case on its own merits, especially when disposal facilities are being designed for a large institution where the cost of construction will amount to a considerable sum. If definite information and accurate water measurements are not available, the quantity of sewage may be estimated from experiences at establishments similar to that for which the new sewage disposal facilities are intended. Table 7 (page 43) may be helpful in such cases.

The quantities listed in the table are merely the best averages available at this time, and they should be modified in localities or establishments where experience indicates a need for so doing.

It is sometimes economical and advisable to construc[illegible]arate disposal systems for different types of wastes at a given estab[illegible]ent. The decision as to the number of disposal systems may be influenced by conditions of terrain, topography, and locations of the buildings contributing to the wastes. At large camps, for example, and at some resorts, kitchens and central dining facilities may be located at appreciable distances from the barracks or cottages and cabins. Under such circumstances, the kitchens may be provided with separate disposal systems, including facilities for the removal of grease ahead of the septic tank.

Table 7.—*Quantities of sewage flows*

Type of Establishment	Gallons Per Person Per Day (Unless Otherwise Noted)
Airports (per passenger)	5
Apartments—multiple family (per resident)	60
Bathhouses and swimming pools	10
Camps:	
Campground with central comfort stations	35
With flush toilets, no showers	25
Construction camps (semi-permanent)	50
Day camps (no meals served)	15
Resort camps (night and day) with limited plumbing	50
Luxury camps	100
Cottages and small dwellings with seasonal occupancy	50
Country clubs (per resident member)	100
Country clubs (per non-resident member present)	25
Dwellings:	
Boarding houses	50
additional for non-resident boarders	10
Luxury residences and estates	150
Multiple family dwellings (apartments)	60
Rooming houses	40
Single family dwellings	75
Factories (gallons per person, per shift, exclusive of industrial wastes)	35
Hospitals (per bed space)	250+
Hotels with private baths (2 persons per room)	60
Hotels without private baths	50
Institutions other than hospitals (per bed space)	125
Laundries, self-service (gallons per wash, i.e., per customer)	50
Mobile home parks (per space)	250
Motels with bath, toilet, and kitchen wastes (per bed space)	50
Motels (per bed space)	40
Picnic Parks (toilet wastes only) (per picknicker)	5
Picnic parks with bathhouses, showers, and flush toilets	10
Restaurants (toilet and kitchen wastes per patron)	10

Table 7.—Continued

Type of Establishment	Gallons Per Person Per Day (Unless Otherwise Noted)
Restaurants (kitchen wastes per meal served)	3
Restaurants additional for bars and cocktail lounges	2
Schools:	
Boarding	100
Day, without gyms, cafeterias, or showers	15
Day, with gyms, cafeteria, and showers	25
Day, with cafeteria, but without gyms, or showers	20
Service stations (per vehicle served)	10
Swimming pools and bathhouses	10
Theaters:	
Movie (per auditorium seat)	5
Drive-in (per car space)	5
Travel trailer parks without individual water and sewer hook-ups (per space)	50
Travel trailer parks with individual water and sewer hook-ups (per space)	100
Workers:	
Construction (at semi-permanent camps)	50
Day, at schools and offices (per shift)	15

Separate systems may also be used for community bathhouses. When this is done, the total per capita flow must be broken down into its component parts, and some allowance should be made for the amount of sewage tributary to the different disposal systems. Table 8 (below) illustrates how this may be done where there are no definite data as to the exact distribution of flow.

Table 8.—*Estimated distribution of sewage flows, in gallons per day per person*

Type of Waste	Volume, gallons per day per person				
Total Flow (gallons)	30	40	50	75	100
Kitchen wastes	[1] 0	7	10	10	15
Toilet wastes	15	15	20	25	30
Showers, washbasins, etc.	15	18	20	25	35
Laundry wastes	[1] 0	[1] 0	[1] 0	15	20

[1] No wastes from these uses.

Example: In a household contributing 75 gallons of sewage per day per person, as shown in column 4, an average breakdown for each of the four types of wastes listed might be about 10 gallons per day per person for kitchen wastes; 25 gallons

per day per person for toilet wastes; 25 gallons per day per person for sho— wastes, bathtubs, and washbasins; and about 15 gallons per day per person ndry wastes.

For certain types of new establishments, the designing engineer may be unable to obtain from his clients accurate estimates as to the number of patrons to be served by the disposal facilities. This is particularly true in the case of restaurants and at recreational places, such as picnic areas, country clubs, and the like. In such cases, computations and estimates may best be made from the number of plumbing fixtures installed. Table 9 indicates average values for quantities of sanitary wastes per fixture at country clubs with modern plumbing.

Table 9.—*Sewage flow from country clubs*

Type of fixture	Gallons per day per fixture	Type of fixture	Gallons per day per fixture
Showers	500	Toilets	150
Baths	300	Urinals	100
Lavatories	100	Sinks	50

Estimates of sewage quantities from golf clubs should be checked and calculations based on the weekend population. Allowances of 10 gallons per person for showers and 7 gallons per person for toilet and kitchen wastes, both for the average weekend population, have been found reasonable.

Table 10 shows one method used in estimating the amount of sewage discharged hourly during the hours when public parks are open. Similar figures may be used for fairgrounds, carnivals, ball parks, etc.

Table 10.—*Sewage flow at public parks*

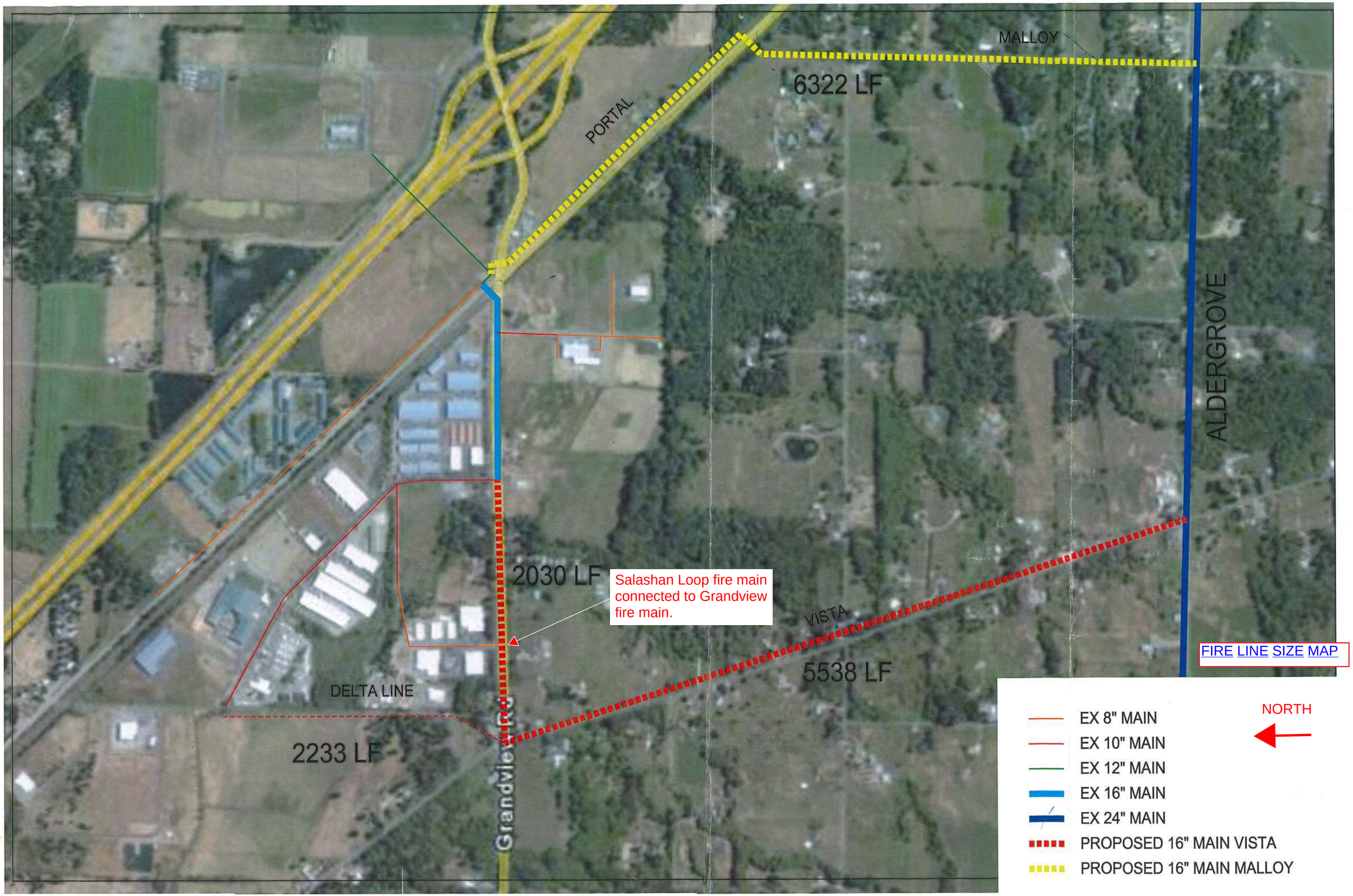
[During hours when park is open]

Type of fixture	Gallons per hour per fixture	Type of fixture	Gallons per hour per fixture
Flush toilets	36	Showers	100
Urinals	10	Faucets	15

ESTIMATES OF SOIL ABSORPTION AREAS

With information from percolation tests and with due consideration to the results of test borings or subsurface explorations, as explained in

Appendix G
Fire System Documents


MALLOY
6322 LF
PORTAL
ALDERGROVE
2030 LF
Salashan Loop fire main connected to Grandview fire main.
VISTA
5538 LF
DELTA LINE
2233 LF
Grandview Rd
FIRE LINE SIZE MAP
NORTH
EX 8" MAIN
EX 10" MAIN
EX 12" MAIN
EX 16" MAIN
EX 24" MAIN
PROPOSED 16" MAIN VISTA
PROPOSED 16" MAIN MALLOY

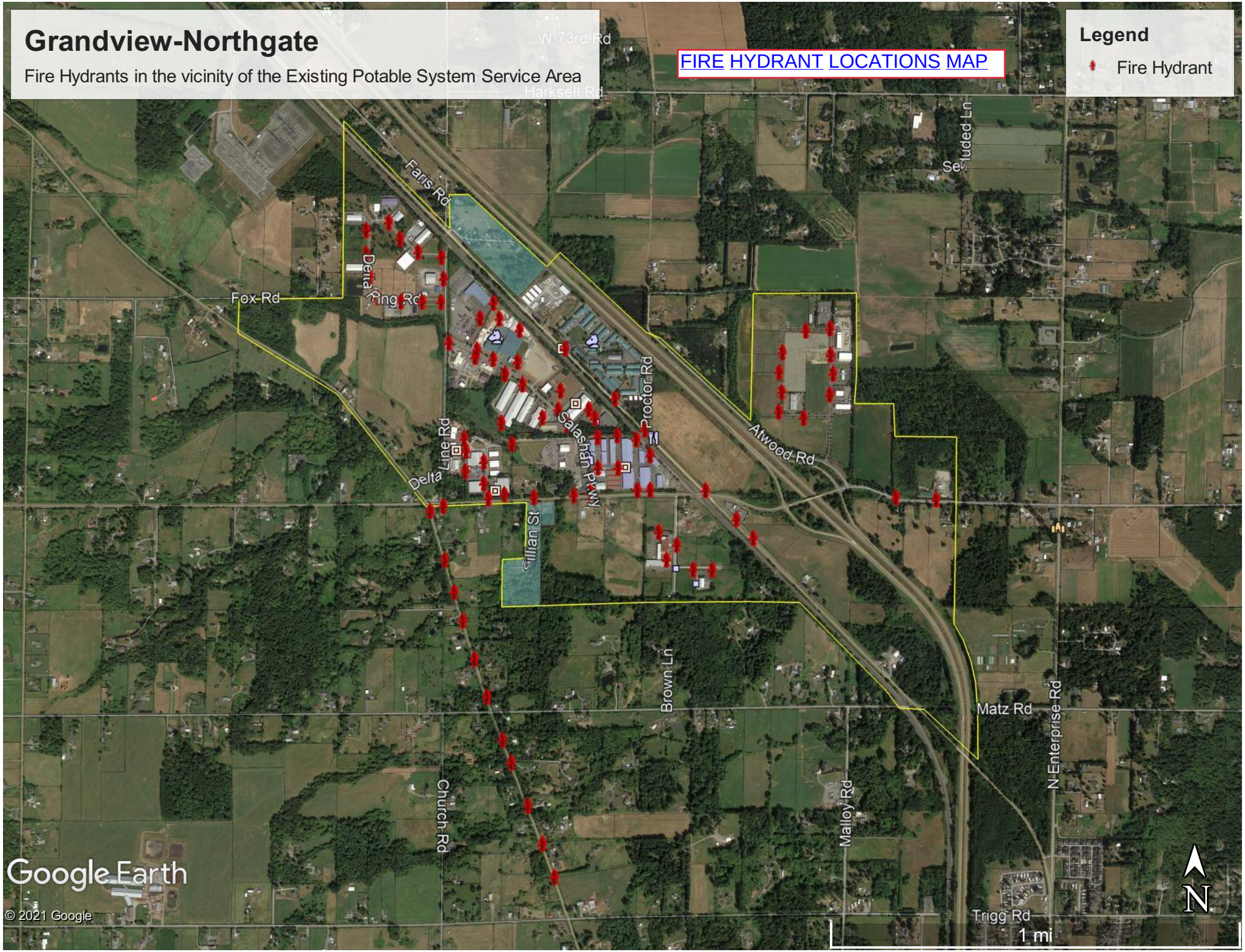
Grandview-Northgate

Fire Hydrants in the vicinity of the Existing Potable System Service Area

FIRE HYDRANT LOCATIONS MAP

Legend

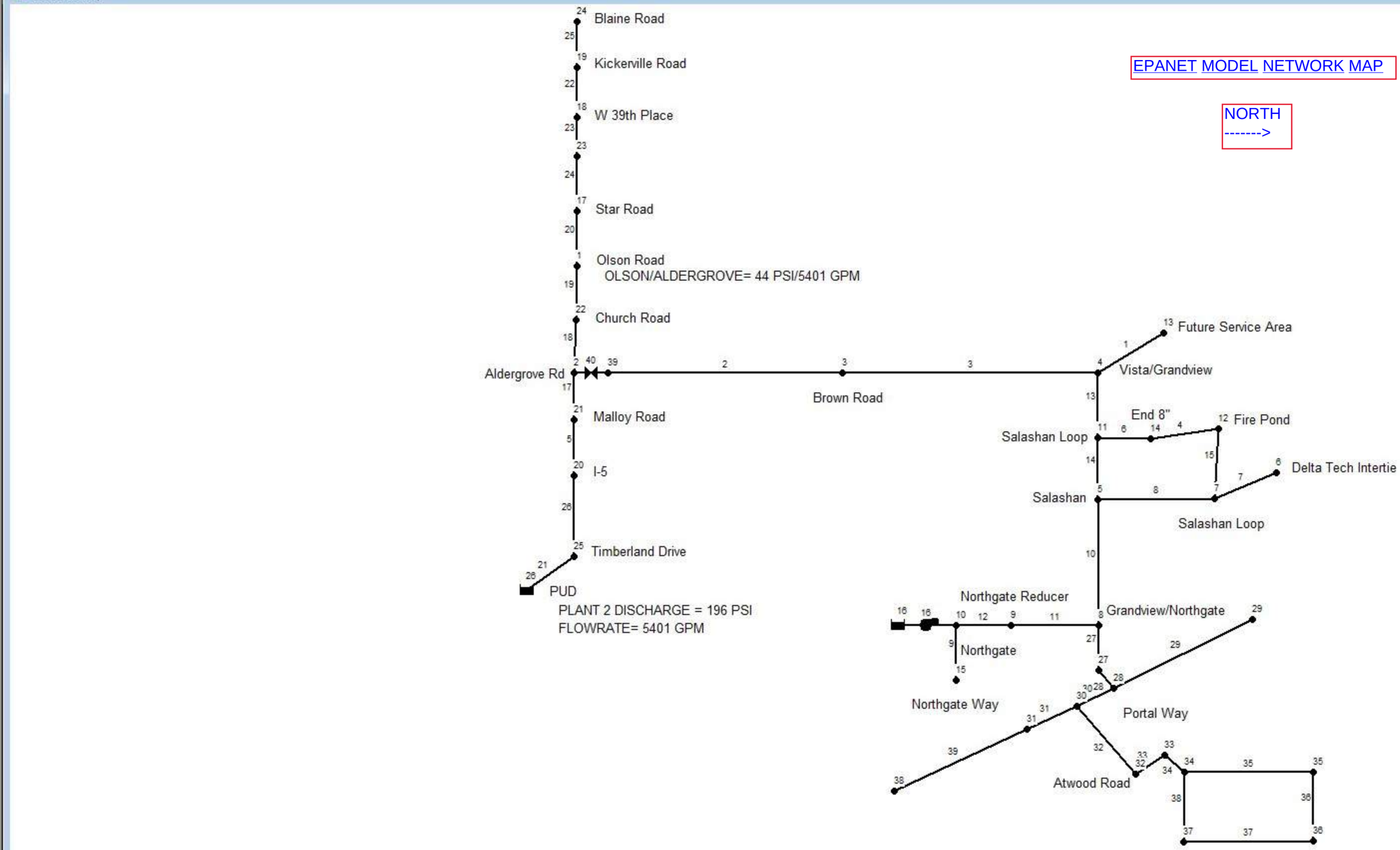
Fire Hydrant



EPANET 2 - Vista_expanded.net

File Edit View Project Report Window Help

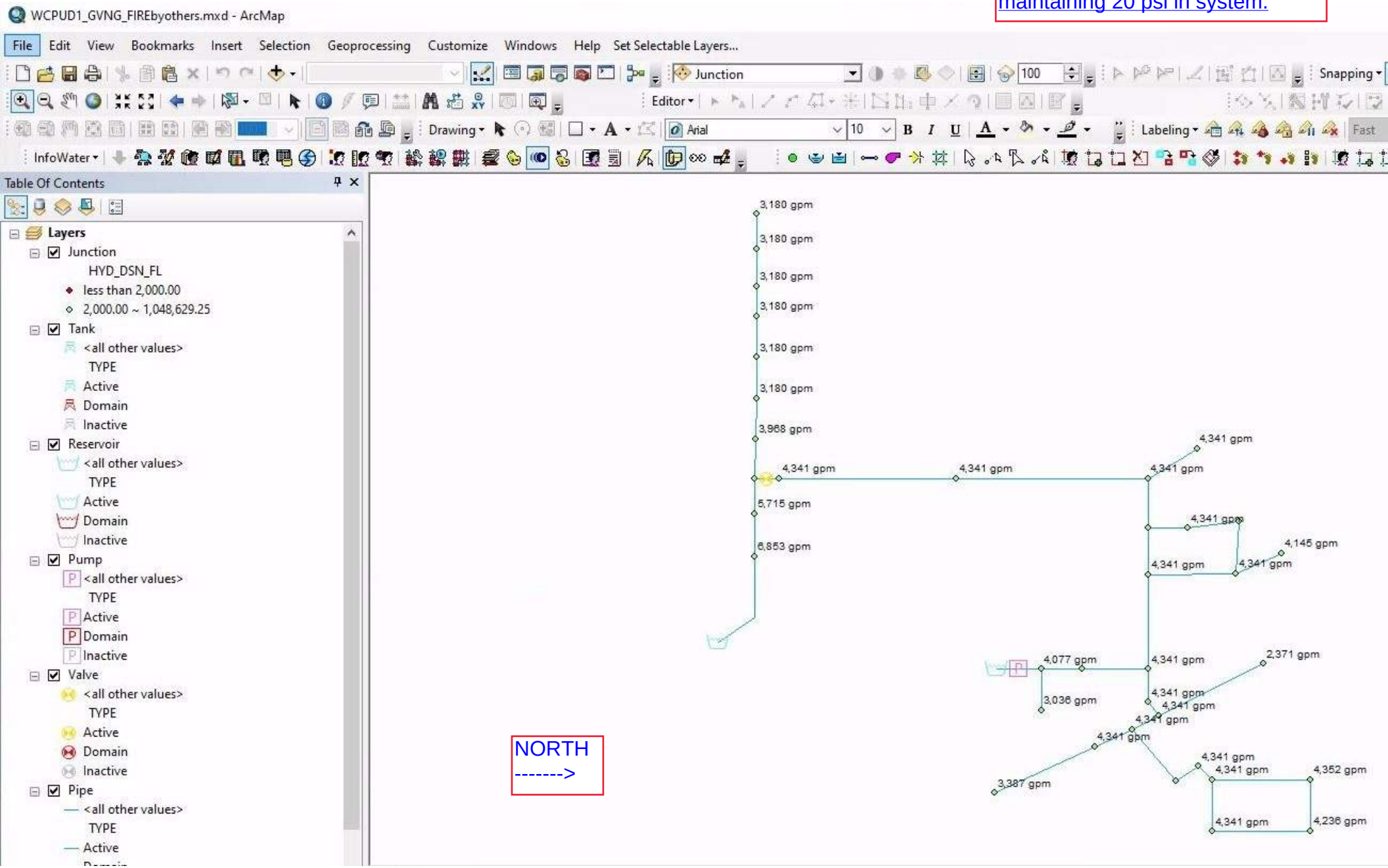
Network Map



Auto-Length Off | GPM | 100% | X,Y: 62860.44, 35986.16

FIRE FLOW ANALYSIS MAP

Available fire flows while maintaining 20 psi in system.



FIRE FLOW ANALYSIS REPORT

Available fire flows while maintaining 20 psi in system.

Grandview Fire

		ID	Total Demand (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
1	☐	1	2,000	1	24	20	3,180	20
2	☐	10	2,000	10	95	20	4,077	20
3	☐	11	2,000	1	25	20	4,341	100
4	☐	12	2,000	1	25	20	4,341	87
5	☐	13	2,000	1	25	20	4,341	100
6	☐	14	2,000	1	25	20	4,341	105
7	☐	15	2,000	15	75	20	3,036	20
8	☐	17	2,000	1	24	20	3,180	39
9	☐	18	2,000	1	24	20	3,180	64
10	☐	19	2,000	1	24	20	3,180	79
11	☐	2	2,000	1	25	20	4,341	79
12	☐	20	2,000	1	26	20	6,853	142
13	☐	21	2,000	1	26	20	5,715	121
14	☐	22	2,000	1	25	20	3,968	58
15	☐	23	2,000	1	24	20	3,180	62
16	☐	24	2,000	1	24	20	3,180	114
17	☐	27	2,000	1	25	20	4,341	96
18	☐	28	2,000	1	25	20	4,341	98
19	☐	29	2,000	29	51	20	2,371	20
20	☐	3	2,000	1	25	20	4,341	75
21	☐	30	2,000	1	25	20	4,341	95
22	☐	31	2,000	1	25	20	4,341	84
23	☐	32	2,000	1	25	20	4,341	78
24	☐	33	2,000	1	25	20	4,341	76
25	☐	34	2,000	1	25	20	4,341	73
26	☐	35	2,000	35	108	20	4,352	20
27	☐	36	2,000	36	107	20	4,236	20
28	☐	37	2,000	1	25	20	4,341	33
29	☐	38	2,000	38	91	20	3,387	20
30	☐	39	2,000	1	25	20	4,341	70
31	☐	4	2,000	1	25	20	4,341	102
32	☐	5	2,000	1	25	20	4,341	100
33	☐	6	2,000	6	109	20	4,145	20
34	☐	7	2,000	1	25	20	4,341	91
35	☐	8	2,000	1	25	20	4,341	97
36	☐	9	2,000	1	25	20	4,341	72

Appendix H
Cross-Connection Control Program

Cross-Connection Control Program Plan
for Grandview-Northgate Industrial Park Water System

A. Requirement for Program

Grandview-Northgate Industrial Park, ID No. 00638N, hereinafter referred to as "the Purveyor", has the responsibility to protect the public water system from contamination due to cross connections. A cross connection may be defined as *"any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid, such that it is possible for a non-potable gas or liquid to enter the potable water system by backflow."*

All public water systems are required to develop and implement cross-connection control (CCC) programs. The CCC requirements are contained in Washington Administrative Code (WAC) 246-290-490 of the Group A Drinking Water Regulations. The minimum required elements of a CCC program are:

1. Establishment of legal authority and program policies;
2. Evaluation of premises for cross-connection hazards;
3. Elimination and/or control of cross connections;
4. Provision of qualified personnel;
5. Inspection and testing of backflow preventers;
6. Quality control of testing process;
7. Response to backflow incidents;
8. Public education for consumers;
9. Record keeping for CCC program; and
10. Special requirements for reclaimed water use.

Other CCC program requirements include:

1. Coordination with the Local Administrative Authority (LAA), i.e., the local building or plumbing official regarding CCC activities;
2. Prohibition of the return of used water into the public water system (PWS) distribution system; and
3. Inclusion of a written CCC program in a Water System Plan (WSP) or a Small Water System Management Program (SWSMP).

Note: Throughout the example CCC program plan the term *customer* is used. *Customer* as used herein means the property owner and/or occupant of the premises served by the PWS (i.e., whoever interfaces with the PWS regarding water service). Also, unless otherwise defined, all CCC-related terms used in this example program have the same definitions as those contained in WAC 246-290-010 of the Washington State Drinking Water Regulations.

B. Program Objectives

The objectives of the CCC program are to:

1. Reasonably reduce the risk of contamination of the public water distribution system; and
2. Reasonably reduce the Purveyor's exposure to legal liability arising from the backflow of any contaminant originating from the customer's plumbing system and then supplied to other customers; and

C. Summary of Program Decisions

The following table summarizes the major policy and program decisions adopted for the Grandview-Northgate Industrial Park water system. The items in the table represent CCC program areas that have more than one acceptable approach or option.

CCC Program Decision Summary Table for the Grandview-Northgate Industrial Park

Decision Item	Decision
1. Type of Program [General, WAC 246-290-490(2)(e)]	
a. Premises isolation only	
b. Premises isolation and in-premises protection (combination program)	X
2. Extent of Coordination with LAA [WAC 246-290-490(2)(d)]	
a. Information exchange	X
b. Interaction	X
c. Joint program	
3. Relationship with Customer [Element 1]	
a. Signed service agreement or contract	
b. Ordinance/resolution; implied service agreement	X
4. Enforcement of Corrective Action [Element 1]	
a. Rely upon shut-off of water service	X
b. Rely upon purveyor-installed premises isolation	
5. Assessment and Re-assessment of Hazard [Element 2]	
a. By purveyor's staff or equivalent	X
b. By cross-connection control specialist (CCS) employed by customer; report reviewed by purveyor's CCS	X
6. Location and Ownership of Premises Isolation Assembly [Element 3]	
a. On purveyor's service line	
b. On customer's service line	X
7. CCS Option – Purveyor's Program Management [Element 4]	
a. Purveyor's staff member certified	X
a. Contract with consultant CCS	
8. Testing of Assemblies [Element 5]	
a. By purveyor's staff or purveyor-employed backflow assembly tester (BAT)	
b. By customer-employed (contractor) BAT	X
9. Cost Recovery [WAC 246-290-100(4)(h) and –105(4)(p)]	
a. Borne by all customers (general water rates)	
b. Each customer directly bears cost	X

D. Required Elements of Program

The drinking water regulations for Group A public water systems in Washington, WAC 246-290, require CCC programs to include certain minimum elements. The elements are listed in WAC 246-290-490(3). This section describes how the water system intends to comply with each of the required program elements. Elements are numbered the same as they appear in the WAC.

Element 1: *Adoption of a written legal instrument authorizing the establishment and implementation of a CCC program.*

The Grandview-Northgate Industrial Park water system has adopted a resolution (Resolution No. 800), reproduced as Appendix E, which authorizes the Purveyor to implement a CCC program. The resolution also authorizes the system to terminate water service to consumers who do not comply with the resolution. However, the primary method for protection of the distribution system will be the installation of a backflow preventer by the customer, at the customer's expense.

For customers supplied prior to the adoption of the attached resolution, an implied service contract allows the Purveyor to protect the distribution system from contamination through a Purveyor-installed backflow preventer on a customer's service. *The written and implied contract terms are discussed further under Element 3.*

Element 2: *Development and implementation of procedures and schedules for evaluating new and existing service connections to assess the degree of hazard.*

Initial Cross-Connection Hazard Surveys

The procedures for evaluating the backflow prevention requirements for new and existing customers are as follows:

1. For all ***new non-residential services***, the Purveyor will require that the customer submit with the application for water service an evaluation (performed at customer's expense) by a DOH-certified cross-connection control specialist (CCS) of the hazard posed by the proposed plumbing system, with recommendations for the installation at the meter of either a double-check valve assembly (DCVA) or a reduced-pressure principle backflow assembly (RPBA) or commensurate in-premises backflow protection. The Purveyor may accept the recommendations or submit the recommendations to a CCS employed by the PWS for peer review and concurrence, before acceptance.

   As an alternative to the above requirement for a survey by a CCS, the customer may agree to install an approved air gap (AG) or RPBA for premises isolation as a condition of service.

2. For all ***new residential services***, the Purveyor will require that the customer submit with the application for water service a completed "Water Use Questionnaire" (sample shown on

page 33). If the customer's questionnaire indicates special plumbing, such as a lawn sprinkler system, or hazardous water use on the premises, the customer shall submit to the Purveyor an evaluation by a DOH-certified CCS of the hazard posed by the proposed special plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

As an alternative to the above requirement for a survey by a DOH-certified CCS, the Purveyor, at his/her discretion, may specify the backflow preventer required to be installed as a condition of service.

3. For all ***existing non-residential services***, the Purveyor will require the customer to submit to the Purveyor, within nine months of notification, an evaluation by a DOH-certified CCS, of the hazard posed by the plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA "or commensurate in-premises backflow preventers. The Purveyor may accept the recommendations or submit the recommendations to a CCS employed by the Purveyor for peer review and concurrence, before acceptance.

   As an alternative to the above requirement for a survey by a DOH-certified CCS, the customer may agree to install an AG or RPBA for premises isolation within 90 days of notification by the Purveyor or an alternate time period acceptable to the Purveyor.

4. For all ***existing residential services***, the Purveyor will require the customer to submit to the Purveyor, within four months of notification, a completed "Water Use Questionnaire." If the customer's reply indicates special plumbing or water use on the premises, the customer shall submit an evaluation by a DOH-certified CCS of the hazard posed to the water system by the customer's plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

   As an alternative to the above requirement for a survey by a CCS, the Purveyor may specify the backflow preventer required to be installed as a condition of service. The Purveyor's CCS will provide guidance on the type of backflow preventer to be installed.

5. For all existing services, should the customer fail to supply the required information for a hazard assessment or fail to submit a completed "Water Use Questionnaire," the Purveyor may have the assessment made by a CCS employed by the Purveyor, require the installation of an RPBA for premises isolation, or take other such actions consistent with the previously stated policies and bill the customer for the associated costs.

Cross-Connection Hazard Survey Schedule for Initial Hazard Assessments

The schedule for initial hazard assessment is outlined in the following table. The schedule starts from the date the CCC program is established.

Initial Assessment Task	Schedule
Assessment of all new connections	At time of application for water service
Identification and assessment of high-hazard premises which are listed on Table 9 of Washington Administrative Code (WAC) 246-290-490	12 months after program is established
Identification and assessment of hazardous premises supplemental to Table 9 of WAC 246-290-490	12 months after program is established
Identification of residential connections with special plumbing facilities and/or water use on the premises	12 months after program is established

Cross-Connection Hazard Survey Schedule for Subsequent Hazard Re-Assessments

For subsequent cross-connection hazard surveys, procedures for evaluating the backflow prevention requirements are:

1. For **residential services,** the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a completed "Water Use Questionnaire." The procedure used for evaluating the hazard re-assessment and the potential change in the required backflow prevention will be the same as used for the initial hazard assessment.
2. For all **non-residential services**, the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a hazard re-assessment (at the customer's expense) by a DOH-certified CCS.

The frequency of hazard re-assessments will be as shown in the table below:

Type of Service	Frequency of Re-Evaluation
Any services with reduced-pressure principle backflow assembly (RPBA) installed for premises isolation	None required as long as the RPBA passes annual tests and inspections
Commercial services with double-check valve assembly (DCVA) installed for premises isolation	Every 2-3 years and upon change in use or ownership Next Re-Evaluation 2025
Residential services with special plumbing where the purveyor relies upon compliance with Uniform Plumbing Code (UPC)	Every 2-3 years Next Re-Evaluation 2025
Residential services with DCVA installed for premises isolation	Every 4-5 years Next Re-Evaluation 2027
Residential services with no known special plumbing or water use on the premises	Every 4-5 years and upon change in use, ownership, or plumbing system Next Re-evaluation 2027

The Purveyor will inform the customer that the Purveyor's survey of a customer's premises (whether by a representative of the Purveyor or through the evaluation of a questionnaire completed by the customer) is for the sole purpose of establishing the Purveyor's minimum requirements for the protection of the public water supply system, and that the required backflow protection will be commensurate with the Purveyor's assessment of the degree of hazard.

The Purveyor will also inform the customer or any regulatory agencies that the Purveyor's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the purveyor's personnel or agent do not constitute an approval of the customer's plumbing system or an assurance to the customer or any regulatory agency of the absence of cross connections.

Element 3: *Development and implementation of procedures and schedules for elimination and/or control of cross-connections.*

Backflow Preventer Requirements

The following service policy shall apply to all new and existing customers:

1. The Purveyor will require that water service to all **non-residential customers** be isolated at the meter by a DOH-approved DCVA or RPBA acceptable to the Purveyor. All high-hazard connections of the type described in Table 9 of WAC 246-290-490 shall be isolated with an RPBA. All other non-residential customers shall be isolated with a DCVA.

   In lieu of isolation with a DCVA, other non-residential customers, with the concurrence of the Purveyor's CCS, may install in-premises protection commensurate with the degree of hazard, as determined by the Purveyor's CCS.

2. The Purveyor will require all **residential customers** with facilities of the type described in Table 9 of WAC 246-290-490 to be isolated with an RPBA. All other residential customers with special plumbing or water use on the premises will be isolated with a DCVA. "Special plumbing" includes, but is not limited to, the following:

   a. A lawn irrigation system;
   b. A solar heating system;
   c. An auxiliary source of supply, e.g., a well or creek;
   d. Piping for livestock watering, hobby farming, etc.;
   e. Residential fire sprinkler system; and
   f. Property containing a small boat moorage.

3. The Purveyor has chosen to supplement Table 9 of WAC 246-290-490(4) by identifying additional premises or premises types for which premises isolation is mandated. Such premises will include but not be limited to premises with complex plumbing, premises with plumbing subject to frequent changes and plumbing with a repeat history of cross-connections being established or reestablished.

4. All Backflow Preventer's shall be:

   - Purchased and installed by the customer (at the customer's expense) immediately downstream of the water meter in accordance with the Purveyor's standards described hereinafter; and
   - Maintained, tested, and inspected in accordance with the Purveyor's standards described hereinafter.

   For new customers, the Purveyor will not turn on water (except for testing purposes) at the meter until the customer complies with the above requirements.

   The failure of the customer to comply with the Purveyor's installation and maintenance requirements shall constitute a breach of contract by the customer, and the Purveyor will proceed with the established compliance procedures.

5. **Approved Backflow Preventers and Installation**

   All backflow preventers relied upon by the Purveyor to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. The Purveyor will direct the customer to a current list of assemblies approved for installation in Washington State from the DOH Office of Drinking Water.

   All backflow preventers will be installed in:

   - The orientation for which they are approved;
   - A manner and location that facilitates their proper operation, maintenance, and testing or inspection;
   - A manner that will protect them from weather-related conditions such as flooding and freezing; and
   - Compliance with applicable safety regulations.

Installation shall conform to standard construction drawings and specifications of the Purveyor. Where the purveyor does not have applicable standard construction drawings and specifications, installation standards contained in the most recently published edition of the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) *CCC Manual* or the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR) *CCC Manual* shall be followed unless the manufacturer's requirements are more stringent.

The Purveyor has no regulatory responsibility or authority over the installation and operation of the customer's plumbing system. The customer is solely responsible for compliance with all applicable regulations and for prevention of contamination of his plumbing system from sources within his/her premises. Any action taken by the Purveyor to survey plumbing, inspect or test backflow prevention assemblies, or to require premises isolation (installation of DCVA or RPBA on service) is solely for the purposes of reducing the risk of contamination of the Purveyor's distribution system.

The Purveyor will inform the customer that any action taken by the Purveyor shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. The Purveyor will not provide advice to the customer on the design and installation of plumbing other than through the general public education program discussed in Element 8.

Except for easements containing the Purveyor's distribution system, the Purveyor will not undertake work on the customer's premises.

8. Schedule for Installation of Backflow Preventers

The following table shows the schedule that the Purveyor will follow for customer installation of backflow preventers when they are required (based on the hazard evaluation).

Type of Service	Schedule
New connections with cross-connection hazards	Before service is initiated
Existing connections with Table 9-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than Table 9 of WAC 246-290-490 or high cross-connection hazards	Within 180 days after notification
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by purveyor's water	Within 1 year after notification

The Purveyor may consider granting an extension of time for installation of backflow preventer for an existing connection if requested by the premises owner.

Element 4: *Provision of qualified personnel, including at least one person certified as a CCS, to develop and implement the CCC program.*

1. The responsibility for administration of the CCC Program rests with the Purveyor. General policy direction and risk management decisions are established by the commissioners.

2. The Purveyor will employ or have on staff at least one person certified by DOH as a CCS to develop and implement the CCC program. As an alternative, or when no staff or employees are properly qualified, the Purveyor may retain a DOH-certified CCS on contract to provide the necessary expertise and services.

3. The following cross-connection related tasks will be performed by or under the direction of the Purveyor's certified CCS (on staff or under contract):

   - Preparation of and recommendations regarding changes to the CCC program;
   - Performance of and/or reviews of CCC hazard evaluations;
   - Recommendations on the type of backflow preventer to be installed;
   - Recommendations on schedules for retrofitting of backflow preventers;
   - Inspections of backflow preventers for proper application and installation;
   - Reviews of backflow preventer inspection and test reports;
   - Reviews of backflow testing quality control information;
   - Recommendations and/or the granting of exceptions to mandatory premises isolation;
   - Participation in or cooperation with other water utility staff in the investigation of backflow incidents and other water quality problems;
   - Completion of Backflow Incident Reports; and
   - Completion of CCC Activity and Program Summary Reports.

4. The Purveyor may delegate other CCC program activities to other personnel who are not certified CCSs, including clerical support staff. These activities include:

   - Administration of paperwork associated with service agreements;
   - Mailing, collecting, and initial screening of hazard evaluation/water use questionnaires;
   - Mailing of assembly testing notices;
   - Receiving and screening of assembly testing reports;
   - CCC program database administration and record keeping;
   - Dissemination of public education material; and
   - Assisting tasks associated with coordination with the LAA.

5. The following table identifies the current CCS employed or retained on contract by the Purveyor to manage the Purveyor's CCC program and/or act as the CCC technical resource for the Purveyor:

Name of CCS	Devin Crabtree, David LaPlaunt, Ron Hacker, Guy Gleason
Address	1705 Trigg Rd.
City, State, Zip	Ferndale, WA 98248
Telephone Number	360-384-4288
CCS Certification Number	12224, 10849, 11862, 06845

Element 5: *Development and implementation of procedures to ensure that approved backflow preventers are inspected and/or tested (as applicable).*

1. Inspection and Testing of Backflow Preventers

All backflow preventers that the Purveyor relies upon for protection of the water system will be subject to inspection and, if applicable, testing. This includes backflow preventers installed for in-premises protection that the Purveyor relies upon for protection of the water systems.

Inspection and testing of backflow preventers will be as follows:

- The Purveyor's DOH-certified CCS will inspect backflow preventers for proper application (i.e., to ensure that the preventer installed is commensurate with the assessed degree of hazard).
- Either a DOH-certified CCS or backflow assembly tester (BAT) will perform inspections of backflow preventers for correct installation.
- A DOH-certified backflow assembly tester will test all assemblies relied upon by the Purveyor to protect the public water system.

2. Frequency of Inspection and Testing

Inspection and testing of backflow preventers will be conducted:

- At the time of installation;
- Annually after installation;
- After a backflow incident; and
- After repair, reinstallation, relocation, or re-plumbing.

The Purveyor may require a backflow preventer to be inspected and/or tested more frequently than once a year, when it protects against a high-health hazard or when it repeatedly fails tests or inspections.

3. Responsibility for Inspection and Testing

The Purveyor will be responsible for inspection and testing of all purveyor-owned backflow preventers.

The Purveyor will require the customer to be responsible for inspection and testing of backflow preventers owned by the customer. The customer shall employ, at customer expense, a DOH-certified BAT to conduct the inspection and test within the time period specified in the testing notice sent by the Purveyor. The test report shall be completed and signed by the BAT, then countersigned and returned by the customer to the Purveyor, before the due date specified by the Purveyor. The customer may request an extension of the due date for returning a test report by submitting a written request to the Purveyor. The Purveyor may grant one extension up to 90 days.

4. Approved Test Procedures

The Purveyor will require that all assemblies relied upon to protect the public water system be tested in accordance with DOH-approved test procedures as specified in WAC 246-290-490(7)(d). Any proposal to use alternate test procedures must be approved by the Purveyor's CCS.

5. Notification of Inspection and/or Testing

The Purveyor will notify in writing all customers who own backflow preventers that are relied upon to protect the public water system to have their backflow preventer(s) inspected and/or tested. Notices will be sent out not less than 30 days before the due date of the inspection and/or test. The notice will also specify the date (up to 30 days after the due date of the inspection and/or test date) by which the inspection/test report must be received by the Purveyor.

6. Enforcement

When a customer fails to send in the inspection/test report within 15 days after the due date specified, and the Purveyor has not approved an extension to the due date, the Purveyor will take the following enforcement action:

- The Purveyor will send a second notice giving the customer an additional 15 days to send in the inspection/test report.
- If the customer has not sent in the inspection/test report within 10 days of the due date given in the second notice, the Purveyor will send a third notice, by certified mail, or by hand delivery giving the customer an additional 15 days to send in the report. The

notice will also inform the customer that failure to satisfactorily respond to this notice will result in water service shut-off.

- The Purveyor will send copies of the third notice to the owner and occupants of the premises if different from the customer and to the LAA.
- If the owner and/or occupants have not responded satisfactorily to the Purveyor within 10 days of the due date specified in the third notice, the Purveyor will implement water service shut-off procedures.

Element 6: *Development and implementation of a backflow prevention assembly testing quality assurance/quality control program.*

1. DOH-Certified Backflow Assembly Tester (BAT) Required - The Purveyor will ensure that a DOH-certified BAT tests all backflow assemblies that protect the public water system from contamination.

2. BAT Documentation Requirements - Prior to engaging a BAT to test assemblies within the water system, the Purveyor will require the tester to document that he/she:

   a. Is currently certified by DOH as a BAT;
   b. Has appropriate assembly testing equipment (make, model and serial number); and
   c. Has had the testing equipment verified for accuracy and/or calibrated within the past 12 months.

3. Quality Assurance – The Purveyor's CCS will review within 30 days of receipt inspection/test report forms submitted by the BAT and follow-up on any reports that are found to be deficient in any way. The Purveyor's CCS will report incidences of fraud or gross incompetence on the part of any BAT or CCS to DOH Operator Certification program staff.

Element 7: *Development and implementation (when appropriate) of procedures for responding to backflow incidents.*

1. Backflow Incident Response Plan

The Purveyor's CCS will participate in developing a backflow incident response plan that will be part of the water system's emergency response program as required by WAC 246-290-415(2). The incident response plan will include, but will not be limited to:

- Notification of affected population;
- Notification and coordination with other agencies, such as DOH, the LAA, and the local health jurisdiction;
- Identification of the source of contamination;
- Isolation of the source of contamination and the affected area(s);

- Cleaning, flushing, and other measures to mitigate and correct the problem; and
- Apply corrective action to prevent future backflow occurrences.

2. **Technical Resources**

   The Purveyor will use the most recently published edition of the manual, *Backflow Incident Investigation Procedures*, published by the PNWS-AWWA as a supplement to the Backflow Incident Response Plan for the Grandview-Northgate Industrial Park.

Element 8: *Development and implementation of a cross-connection control public education program.*

1. **Customer Education**

   The Purveyor will distribute with water bills or some other means, periodically, public education brochures to system customers. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply. The Purveyor will source public education brochures from:

   - PNWS-AWWA;
   - Spokane Regional Cross-Connection Control Committee (SRC4);
   - Western Washington Cross-Connection Prevention Professionals Group (The Group);
   - USC FCCCHR;
   - Other national backflow prevention associations, such as the American Backflow Prevention Association (ABPA); and/or
   - Other water utilities or sources.

   The information distributed by the Purveyor may include, but not be limited to, the following subjects:

   - Cross-connection hazards in general;
   - Irrigation system hazards and corrective actions;
   - Fire sprinkler cross-connection hazards;
   - Importance of annual inspection and/or testing of backflow preventers; and
   - Thermal expansion in hot water systems when backflow preventers are installed for premises isolation.

Element 9: *Development and maintenance of cross-connection control records.*

1. **Types of Records and Data to be Maintained**

   The Purveyor will maintain records of the following types of information required by WAC 246-290-490:

- Service connections/customer premises information including:

    - Assessed degree of hazard; and
    - Required backflow preventer to protect the public water system.

- Backflow preventer inventory and information including:

    - Air gap (AG) location, installation and inspection dates, inspection results and person conducting inspection;
    - Backflow assembly location, assembly description (type, manufacturer, make, model, size, and serial number), installation, inspection and test dates, test results and data, and person performing test; and
    - Information on atmospheric vacuum breakers used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and person performing inspections.

The Purveyor will maintain records on all assemblies that protect the public water system from contamination. At a minimum, the Purveyor will maintain records on all premises isolation assemblies required to protect the public water system. Where applicable, the above information will also be maintained for backflow preventers installed for in-premises protection that are relied upon by the Purveyor to protect the public water system.

2. Reports to be Prepared and Submitted to DOH

The Purveyor will prepare the following reports required by WAC 246-290-490 including:

- Cross-connection control program activities report for the calendar year, to be sent to DOH when requested;
- Cross-connection control program summary information, when required, or when there are significant policy changes;
- Backflow incident reports to DOH (and voluntarily to the PNWS-AWWA CCC Committee); and
- Documentation when exceptions to mandatory premises isolation are granted.

At a minimum, the Purveyor's CCS will prepare and sign the exceptions reports.

The Purveyor's CCS will prepare and sign all CCC-related reports required by WAC 246-290-490.

Element 10: *Additional cross-connection control requirements for reclaimed water.*

At this time the Grandview-Northgate Industrial Park does not receive or distribute reclaimed water.

In the event that reclaimed water use is proposed within the PWS's service area, the Purveyor will make all cross-connection control requirements mandated by the Permitting Authority in accordance with Chapter 90.46 RCW part of the written CCC program plan and comply with such additional requirements.

E. Other Provisions

1. Coordination with Local Administrative Authority

Both WAC 246-290-490 and the Uniform Plumbing Code amended for Washington require coordination between the water purveyor and the Local Administrative Authority (LAA) in all matters pertaining to cross-connection control.

The Purveyor will provide a copy of this CCC program to the LLA via a copy of the Purveyor's water system plan or in a separate document. The Purveyor will inform the LAA of any changes in policy or procedure that may impact the LAA.

The Purveyor will provide information to the LAA in a timely manner regarding any:

- Requirement imposed on a residential customer for the installation of a DCVA or an RPBA on the service, with a description of the cross-connection hazard identified;
- Upgrade of the premises isolation backflow preventer, i.e., from a DCVA to an RPBA;
- Action taken to discontinue water service to a customer; and
- Backflow incident known by the Purveyor to have contaminated the public water system or a customer's plumbing system.

2. Prohibition of Return of Used Water.

The PWS must prohibit the intentional return of used water to the Purveyor's distribution system per WAC 246-290-490 (2)(l).

Used water is defined as water that has left the control of the Purveyor. This includes water used for heating and cooling purposes and water that may flow back into the distribution system from customers with multiple connections.

It is the policy of the Grandview-Northgate Industrial Park water system to:

- Prohibit the intentional return of used water to the distribution system by any customer served by the public water system; and
- Require that all customers with multiple connections, where the hydraulics permit the potential return of used water, to install a backflow preventer (DCVA or RPBA) commensurate with the degree of hazard at <u>each</u> point of connection.

3. Unapproved Auxiliary Supplies.

All water supplies other than those owned by the Purveyor are considered unapproved auxiliary supplies as defined in WAC 246-290-010. The Purveyor will require backflow protection for customers with auxiliary supplies on their premises as follows:

- Per Table 9 of WAC 246-290-490, the Purveyor will require the installation of an RPBA for premises isolation at the service connection to any customer having an unapproved auxiliary supply on the premises that is interconnected with the Purveyor's water system.
- The Purveyor will require the installation of a DCVA for premises isolation at the service connection to any customer with an unapproved auxiliary water supply not interconnected with the Purveyor's water system.

4. Tanker Trucks

The Purveyor may allow tanker trucks to obtain water from the Purveyor's water system under the following conditions:

- The tanker truck is equipped with an approved AG or an approved RPBA with a current satisfactory inspection or test report.
- The tanker truck will obtain water from purveyor-designated watering points only. These watering points are equipped with purveyor-installed backflow preventers.

5. Temporary Water Connections

The Purveyor will not supply water through temporary connections, such as those used for construction projects or main disinfection, except through a backflow preventer arrangement approved by the Purveyor. The applicant for the temporary connection shall document that the backflow preventer is a DOH-approved model and has passed an inspection and/or test within the past 12 months and/or upon relocation, whichever is more recent.

6. Interties and Wholesale Water Customers

The Purveyor will require that interties with other public water systems or wholesale customers (such as mobile home parks) be isolated at the point of delivery by:

- A minimum of a DCVA; and
- A minimum of an RPBA if the Purveyor considers the purchasing system or wholesale customer to pose a high-health hazard to the Purveyor's system.

F. Relationship to Other Planning and Operations Program Requirements

The Purveyor will consider the requirements and consequences of the CCC program on the utility's planning and operations requirements. Such considerations include, but are not limited to ensuring:

- And promoting adequate communication between CCC program personnel and other water utility staff;
- That adequate training is provided to all staff to recognize potential cross-connection control problems;
- That cross-connection issues be considered in water quality investigations;
- That the design of the water distribution system makes adequate provisions for expected head losses incurred through the installation of experienced by backflow assemblies;
- That CCC program personnel be consulted in the design of water and wastewater treatment facilities and when proposals are made to receive or distribute reclaimed water;
- That operations under normal and abnormal conditions do not result in excessive pressure losses; and
- That adequate financial and administrative resources are available to carry out the CCC program.

Appendix A
Backflow Incident Response Plan

A. General

This Backflow Incident Response Plan should be considered a supplement to the Purveyor's Emergency Plan.

Purveyors should immediately begin a backflow incident investigation whenever the initial evaluation of a water quality complaint indicates that:

1. A backflow incident has occurred (i.e., drinking water supply has been contaminated) or may have occurred; or

2. The complaint can't be explained as a "normal" aesthetic problem.

Also, whenever a water main break (or power outage for pumped systems) causes a widespread loss of water pressure in the system (creating backsiphonage conditions), purveyors should initiate a check of distribution system water quality as a precursor to the need for a backflow incident investigation.

WAC 246-290-490 requires purveyors to notify DOH, the Local Administrative Authority and local health jurisdiction as soon as possible, but no later than the end of the next business day when a backflow incident contaminates the potable water supply (in the distribution system and/or in the customer's plumbing system). Purveyors should include a list of emergency contact telephone numbers at the beginning of the water system's O & M Manual, so that the information is readily available when an incident occurs.

A backflow incident investigation is often a team effort. The investigation should be made by or initially led by the DOH-certified Cross-Connection Control Specialist employed by the Purveyor. The investigation team may include state health (regional) staff, local health personnel and/or local plumbing inspectors.

Purveyors can get more detailed guidance on how to respond to a backflow incident from the manual, *Backflow Incident Investigation Procedures*, published by the Pacific Northwest Section, American Water Works Association (PNWS-AWWA). Contact information for the PNWS-AWWA is provided in Appendix D.

B. Short List of Tasks

Small water system purveyors can use the following short list of tasks as initial guidance for dealing with backflow incidents. Purveyors should consult the most recently published edition of the PNWS-AWWA *Backflow Incident Investigation Procedures Manual* referenced above for greater

detail as soon as possible after learning of a possible or confirmed backflow incident. Note: the water system is referred to as the Purveyor in the short task list.

1. **Customer Notification**

    a. As soon as possible, the Purveyor will notify customers not to consume or use water.

    b. The Purveyor will start the notification with the customers nearest in location to the assumed source of contamination (usually the customer(s) making the water quality complaint).

    c. The Purveyor will inform the customer about the reason for the backflow incident investigation and the Purveyor's efforts to restore water quality as soon as possible. The Purveyor will let the customer know that customers will be informed when they may use water, the need to boil water used for consumption until a satisfactory bacteriological test result is obtained from the lab, etc.

    d. Where a customer cannot be contacted immediately, the Purveyor will place a written notice on the front door handle, and a follow-up visit will be made to confirm that the customer received notice about the possible contamination of the water supply.

    e. When dealing with a backflow incident, the Purveyor will let customers know that it could take several days to identify the source and type of contaminant(s) and to clean and disinfect the distribution system.

2. **Identification of Source of Contamination**

    a. The Purveyor will give consideration to the distribution system as a potential source of the contaminant (e.g., air valve inlet below ground).

    b. The Purveyor will not start flushing the distribution system until the source of contamination is identified (flushing may aggravate the backflow situation, and will likely remove the contaminant before a water sample can be collected to fully identify the contaminant).

    c. The Purveyor will conduct a house-to-house survey to search for the source of contamination and the extent that the contaminant has spread through the distribution system. Note: a check of water meters may show a return of water (meter running backward) to the distribution system.

    d. When the cross connection responsible for the system contamination is located, the Purveyor should discontinue water service to that customer, until the customer completes the corrective action ordered by the Purveyor.

3. **Isolation of Contaminated Portion of System**

   a. The Purveyor will isolate the portions of the system that are suspected of being contaminated by closing isolating valves; leave one valve open to ensure that positive water pressure is maintained throughout the isolated system.

   b. The Purveyor will be sure to notify all affected customers in the isolated area first and then notify other customers served by the system.

4. **Public Health Impacts**

   a. The Purveyor will seek immediate input from and work with state and local health agencies to accurately communicate and properly mitigate potential health effects resulting from the backflow incident.

   b. If appropriate, the Purveyor will refer customers that may have consumed the contaminant or had their household (or commercial) plumbing systems contaminated to public health personnel and Local Administrative Authorities (plumbing inspectors).

5. **Cleaning/Disinfecting the Distribution System**

   a. The Purveyor will develop and implement a program for cleaning the contaminated distribution system consistent with the contaminant(s) identified.

   b. Where both chemical and bacteriological contamination has occurred, the Purveyor will disinfect the system after the removal of the chemical contaminant.

   c. Where any bacteriological contamination is suspected, the Purveyor will provide field disinfection.

C. Additional Information on Cleaning/Disinfecting the Distribution System

Most chemical or physical contaminants can be flushed from the water distribution system or customer's plumbing system with adequate flushing velocity. However, this may not be the case in systems where scale and corrosion deposits (e.g., tuberculation on old cast iron mains) provide a restriction to obtaining adequate flushing velocity, or where chemical deposits or bacteriological slimes (biofilm) are present (on which the chemical contaminant may adhere).

To remove a chemical or physical contaminant from the distribution system, purveyors may need to:

1. Physically clean the affected area using foam swabs (pigs); and/or

2. Alter the form of the chemical contaminant (e.g., through oxidation using chlorination or addition of detergents).

When adding any chemical (including chlorine) to remove a contaminant from the distribution system, it is essential that the Purveyor fully understand the chemistry of the contaminant. **Adding the wrong chemical could make the contaminant more toxic to customers and/or more difficult to remove from the distribution system.**

To disinfect water mains using the "slug" or "continuous flow" method, a field unit should be used for chlorine injection, such as a chemical feed - metering or proportioning pump for sodium hypochlorite. Purveyors should contact the appropriate DOH regional office to discuss proposed approaches to contaminant removal and disinfection prior to taking corrective action.

Appendix B
Program Administration Documents

Appendix B contains sample forms, letters and standard installation drawings. Purveyors may use any or all of these documents as they administer their cross-connection control programs. The content of these forms and letters may be adjusted where appropriate to meet system-specific needs or program requirements.

Sample Forms

The first section of Appendix B contains the following forms:

- Application for Water Service (service agreement);
- Backflow Assembly Test/AG Inspection Report;
- Backflow Assembly Test/AG Inspection Report - File Record;
- Backflow Assembly Testers - Pre-Approved for Submitting Test Reports;
- Preliminary Hazard Assessment Form – Non-Residential Customers;
- Cross-Connection Control Survey Report – Non-Residential Customers;
- Water Use Questionnaire - Residential Customers; and
- Backflow Incident Report Form.

Sample Letters

The second section of Appendix B contains sample letters from the Purveyor to the customer relating to the administration of a cross-connection control program. These letters include:

- Request to Complete Water Use Questionnaire;
- Notice of Survey of Premises;
- Request to Install Backflow Prevention Assembly;
- Request to Submit Test of Backflow Prevention Assembly; and
- Second Notice to Test Backflow Prevention Assembly.

Sample Standard Installation Drawings

The last section of Appendix B contains the following sample installation drawings:

- Standard Details - Single Family Residential Service Connection Options; and
- Backflow Prevention Assemblies - Recommended Premises Isolation Installations.

Application for Water Service (Service Agreement)

Owner's Name: _____**Phone:** _____

Mailing Address: _____

Location Address: _____

Legal Description: _____

1. The undersigned applicant hereby applies for a water connection to the above-described property.

2. The applicant is the owner of the described property or the authorized agent of the owner.

3. As a condition of the Grandview-Northgate Industrial Park, hereinafter referred to as the Purveyor, providing and continuing service to the above described property, the property owner, by signing this application, agrees to comply with:

   a. All provisions of the attached current Ordinance, Resolution and/or By-laws of the Purveyor, or latest revision thereof; and

   b. Other such current (attached) and future rules and regulations that govern the Purveyor's water system.

4. The property owner specifically agrees:

   a. To install and maintain at all times his plumbing system in compliance with the most current edition of the Whatcom County Plumbing Code as it pertains to the prevention of potable water system contamination and prevention of pressure surges and thermal expansion in his water piping (for thermal expansion, it shall be assumed that a check valve is installed by the Purveyor on the water service pipe);

   b. Within 30 days of the Purveyor's request (or alternate schedule acceptable to the Purveyor):

      i) To install, maintain, test and repair in accordance with the Purveyor's cross-connection control standards all premises isolation backflow prevention assemblies required by the Purveyor to be installed to protect the public water system from contamination; and
      ii) To report to the Purveyor the results of all assembly tests and/or repairs to the premises isolation backflow prevention assemblies.

   c. As a condition of the Purveyor waiving the requirement for premises isolation by a reduced pressure backflow assembly on the property owner's service pipe:

      i) To authorize the Purveyor to make periodic water use surveys of the premises;
      ii) Within 30 days of the Purveyor's request, to install, test, maintain, and repair in accordance with the Purveyor's cross connection control standards (copy received with this application) all in-premises backflow prevention assemblies that provide equivalent protection for the Purveyor's distribution system;
      iii) To report to the Purveyor within 30 days of obtaining the results of all tests and repairs to the aforementioned backflow prevention assemblies; and
      iv) To report to the Purveyor any change to the plumbing system.

d. Not to make a claim against the Purveyor or its agents or employees for damages and/or loss of production, sales or service, in case of water pressure variations, or the disruption of the water supply for water system repair, routine maintenance, power outages, and other conditions normally expected in the operation of a water system.

e. To pay his water bill within 30 days from the date of billing.

After 30 days of the Purveyor mailing a written notice to the property owner of his breach of this agreement, the Purveyor may terminate water service.

In the event legal action is required and commenced between the parties to this agreement to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all its costs and expenses including but not limited to reasonable attorney's fees as determined by the Court.

Applicant's Signature _____Date _____

Attachments received (have customer initial):

Water Rates/Charges _____
Service Connection Information _____
Water Service Policy _____

For Purveyor Use Only

_____/_____/____ Date connection fee received

_____/_____/____ Date Water Use Survey questionnaire received

_____/_____/____ Date risk assessment completed; by _____
{Insert Name of CCS}

_____/_____/____ Date customer notified of requirement for BPA

_____/_____/____ Date BPA installation approved

_____/_____/____ Date BPA test report accepted

_____/_____/____ Date BPA information entered into database

Backflow Prevention Assembly Test/Air Gap Inspection Report

PWS ID _____ **WATER SYSTEM NAME** _____ **COUNTY** _____

ACCOUNT #_____**BACKFLOW PREVENTER ID** _____ **TEST REPORT ID** _____

NAME OF PREMISES _____**Commercial** ☐ **Residential** ☐

SERVICE ADDRESS _____ **CITY** _____**ZIP** _____

CONTACT PERSON _____ **PHONE ( )** _____ **FAX ( )** _____

LOCATION OF ASSEMBLY _____

DOWNSTREAM PROCESS _____ **DCVA** ☐ **RPBA** ☐ **PVBA** ☐ **OTHER** _____

NEW INSTALL☐ **EXISTING**☐ **REPLACEMENT**☐ **OLD SER. #** _____ **PROPER INSTALLATION? YES** ☐ **NO** ☐

MAKE OF ASSEMBLY_____**MODEL** _____**SERIAL NO.** _____**SIZE** _____

INITIAL TEST **PASSED** ☐ **FAILED** ☐	**DCVA / RPBA CHECK VALVE NO.1** LEAKED ☐ _____ PSID	**DCVA / RPBA CHECK VALVE NO.2** LEAKED ☐ _____PSID	**RPBA** OPENED AT _____ PSID #1 CHECK _____PSID AIR GAP OK? _____	**PVBA/SVBA** AIR INLET OPENED AT_____PSID DID NOT OPEN ☐
NEW PARTS AND REPAIRS	CLEAN REPLACE PART ☐ ☐_____ ☐ ☐_____ ☐ ☐_____ ☐ ☐_____	CLEAN REPLACE PART ☐ ☐_____ ☐ ☐_____ ☐ ☐_____ ☐ ☐_____	CLEAN REPLACE PART ☐ ☐_____ ☐ ☐_____ ☐ ☐_____ ☐ ☐_____	CHECK VALVE HELD AT _____PSID LEAKED ☐ _____ CLEANED ☐ REPAIRED ☐
TEST AFTER REPAIRS **PASSED** ☐ **FAILED** ☐	LEAKED ☐ _____PSID	LEAKED ☐ _____PSID	OPENED AT _____PSID #1 CHECK_____PSID	AIR INLET _____ PSID CHK VALVE _____PSID

AIR GAP INSPECTION: Required minimum air gap separation provided? Yes ☐ No☐ **Detector Meter Reading** _____

REMARKS: _____ **LINE PRESSURE** _____**PSI**

_____**CONFINED SPACE?** _____

I certify that this report is accurate, and I have used WAC 246-290-490 approved test methods and test equipment.

TESTERS SIGNATURE: _____ **CERT. NO.** _____**DATE** _____ /_____/_____

TESTERS NAME PRINTED: _____ **TESTERS PHONE # ( )** _____

REPAIRED BY: _____**DATE** ____/_____/_____

FINAL TEST BY:_____ **CERT. NO.** _____**DATE** _____/_____/_____

CALIB/VERIF DATE __ /__ /___ **GAUGE #** _____ **MODEL**_____ **SERVICE RESTORED? YES** ☐ **NO** ☐

(SPECIALTY) PLUMBER CERT. NO. _____ **CONTRACTOR LICENSE NO.** _____

Backflow Prevention Assembly Test/Air Gap Inspection Report File Record

PWS Assigned Inventory Number: _____

Name of Premises:		
Premises Address:		
Location of Assembly:		
Type of Hazard Isolated:		
Assembly Type:		**Assembly Size (inches):**
Make:	**Model:**	**Serial No.:**
Date Installed:		**DOH-Approved? Y N**

Date Test Notice Issued	Date of Test Report	Name of Certified Tester (BAT)	BAT Certification Number	Results Satisfactory? Y/N+	Repairs Made? Y/N*

+Attach all ***Backflow Assembly Test/AG Inspection Report*** forms.
*Include retest after repairs as a separate line.

Comments/Notes (attach additional sheets if necessary):

_____

_____

_____

Backflow Assembly Testers Pre-Approved for Submitting Test Reports to the _____
{Insert date here}

The following table lists Backflow Assembly Testers (BATs) that are pre-approved to test backflow assemblies in our water system's service area. We compiled the list by identifying individual testers who requested to work in this area or who previously submitted properly completed test reports to our system. *{**Optional language:** An asterisk (*) denotes BATs that are also DOH-certified Cross-Connection Control Specialists (CCSs).}* ***Note: listing does not constitute an endorsement of these BATs by our system or a certification of the quality of services they provide.***

To appear on our pre-approved BAT list, the tester must:

- Show proof of current BAT certification from DOH;
- Submit documentation that his/her assembly test equipment has been verified for accuracy within the last 12 months and calibrated if needed; and
- *{**Optional** language: Meet other criteria established by our system including_____ {**insert additional requirements here such as business licenses, etc.**}*

As an alternative to the above, pre-approved testers must document that they appear on the approved BAT list of another nearby water system that has a testing QA/QC program acceptable to our system.

WAC 246-290-490 requires a DOH-certified BAT to test all assemblies (RPBA, RPDA, DCVA, etc.) that protect the distribution system. Assemblies that protect the public water system must be tested in accordance with DOH-approved field test procedures:

- Upon installation, and annually thereafter;
- After repair, reinstallation, or relocation; and
- After a backflow incident.

Note: the DOH BAT certification is a special certification separate from other waterworks operator certification categories, plumbing licenses, contractor registration, etc. Other licenses, certifications and/or registrations may be required to install backflow prevention assemblies and/or perform maintenance work on assemblies within buildings. **However, only a currently DOH-certified BAT may test the assemblies that protect the public water system from contamination.**

Name of Tester Company Name and Address	Phone Number	BAT Certificate Number

Preliminary Cross-Connection Control Hazard Assessment Form

Non-Residential Customers

Name of Customer or Business: _____
Address: _____
Phone Number: _____
Description of Business: _____

Is your business or premises of a type included in the table below (check all that apply)?

Agricultural (farm or dairy)		Metal plating industry	
Beverage bottling plant		Mortuary	
Car wash		Petroleum processing or storage plant	
Chemical plant		Pier or dock	
Commercial laundry or dry-cleaners		Radioactive material processing plant or nuclear reactor	
Having both reclaimed water and potable water provided		Survey access denied or restricted	
Film processing facility		Wastewater lift station or pumping station	
Food processing plant		Wastewater treatment plant	
Hospital, medical center, nursing home, veterinary, medical, or dental clinic, or blood plasma center		Having an unapproved auxiliary water supply interconnected with the potable water supply	
Having separate irrigation system using purveyor's water and adding chemicals*		Other (describe) *[Purveyor to add other types of premises considered to be high-hazard]*	
Laboratory		Other (describe) *[See above]*	

*e.g., parks, playgrounds, golf courses, cemeteries, estates, etc.

Other potential cross-connection concerns:

☐ Irrigation system

☐ Fire sprinkler system, using ☐ not using ☐ chemicals or anti-freeze

☐ Swimming pool

☐ Other (describe): _____

Note to Customer: *This form is used for preliminary assessment only. The water purveyor may require a more thorough assessment at a later date.*

This form was completed by (print name): _____ Date: _____

Please return completed form by {<u>insert date</u>} and send to: {<u>insert name/address</u>}.

Cross-Connection Control Hazard Survey Report
Non-Residential Customers

Survey date: _____

Customer Information

Premises name: _____Telephone: _____

Address: _____ZIP: _____

Contact person: _____Title: _____

Description of premises: _____

Description of water use: _____

Water Service and Backflow Prevention Assembly (BPA) Size/Type

Service Type	Service Size	Meter Size	BPA Size	BPA Type
Domestic				
Fire				
Irrigation				
Other				

Cross-Connection Control Specialist (CCS) Information

Name: _____ Telephone: _____

Company name: _____

Address: _____ZIP: _____

DOH CCS Certification #: _____ Year certified: _____

Survey Results

Note: The CCS's survey shall include an inspection of the premises isolation assembly to verify that it is installed correctly and is a currently listed DOH-approved assembly.

Item	Location & Description of Cross Connection	Backflow Prevention Provided/Required

Attach additional sheets if needed.

Surveyor's Comments

Surveyor's Recommendations

I certify that this cross-connection hazard survey accurately reflects the overall risk posed by the customer's plumbing system to the Purveyor's distribution system. Based on the above survey, I certify that:

1. I found the following type(s) of premises isolation backflow preventer(s):

   Air Gap ____ RPBA/RPDA ____ DCVA/DCDA _____ None ____.

2. The existing backflow preventer(s) is/are properly installed.

   Yes ____ No ____ N/A ____.

3. The existing backflow preventer(s) is/are commensurate with the degree of hazard:.

   Yes ____ No ____ N/A ____.

4. Since no backflow preventer was installed for premises isolation, the premises owner should install a premises isolation backflow preventer of the following type:

   Air Gap ____ RPBA/RPDA ____ DCVA/DCDA ____ N/A ____.

5. The premises owner should replace the existing premises isolation backflow preventer(s) with the following:

   Air Gap ____ RPBA/RPDA ____ DCVA/DCDA ____ N/A ____.

The completed survey report shall be first signed by the CCS conducting the survey, and then counter-signed by the owner of the premises or the owner's authorized agent.

CCS Signature: _____Date: _____

As the Owner of the Premises (or Owner's authorized agent), I certify that I have received a copy of this completed Cross-Connection Control Hazard Survey Report.

Signature: _____**Date**: _____

Note: Customers and regulatory agencies should be aware that the Purveyor's requirement for this cross-connection hazard survey and/or for the installation of a specific backflow prevention assembly on a service pipe ***do not*** constitute an approval of the customer's plumbing system, compliance of the customer's plumbing system with the Uniform Plumbing Code or an assurance of the absence of cross connections in the customer's plumbing system.

Water Use Questionnaire
Residential Customers

Customer Account Number (optional)
Customer Name
Address Line 1
Address Line 2

Please indicate whether the special plumbing or activities listed below apply to your premises:

Yes	No	Plumbing or Activity Present on Customer's Premises*
		Underground sprinkler system
		Water treatment system (e.g., water softener)
		Solar heating system
		Residential fire sprinkler system
		Other water supply (whether or not connected to plumbing system)
		Sewage pumping facilities or grey water system
		Boat moorage with water supply
		Hobby farm
		Animal watering troughs
		Swimming pool or spa
		Greenhouse
		Decorative pond
		Photo lab or dark room
		Home-based business. If Yes, list type/describe (e.g., beauty salon, machine shop, etc.): _____ _____ _____

* Based on their knowledge of residential connections served, public water systems may "customize" this list by adding or deleting plumbing categories or activities

Completed by (print name): _____ Date: _____

Resident's Signature: _____

Backflow Incident Report Form

Many backflow incidents occur that are not reported. This is usually because:

- The incidents are of short duration;
- The incidents are not detected;
- Neither the customer nor the Purveyor realizes that a contamination was caused by a backflow incident;
- The customer is not aware the incident should be reported;
- Customers do not know who to report the incidents to; and/or
- Liability concerns on the part of either the customer or purveyor or both.

DOH and the PNWS-AWWA Cross-Connection Control Committee are making an effort to bring backflow incidents to the attention of water purveyors, Local Administrative Authorities, legislators, and the general public. If you have any knowledge of a backflow incident, please fill out a copy of the Backflow Incident Report Form and return it to DOH and the PNWS-AWWA CCC committee.

Backflow Incident Report Form

Reporting Agency: _____ Report Date: _____

Reported By: _____ Title: _____

Mail Address: _____ City: _____

State: _____ Zip Code: _____ Telephone: _____

Date of Incident: _____ Time of Occurrence: _____

General Location (Street, etc.): _____

Backflow Originated From:

Name of Premises: _____

Street Address: _____ City: _____

Contact Person: _____ Telephone: _____

Type of Business: _____

Description of Contaminants:
(Attach Chemical Analysis or MSDS if available)

_____

_____

Distribution of Contaminants:

Contained within customer's premises: Yes: _____ No: _____

Number of persons affected: _____

Effect of Contamination:

Illness Reported: _____

Physical irritation reported: _____

Cross-Connection Source of Contaminant (boiler, chemical pump, irrigation system, etc.):

_____

_____

Cause of Backflow (main break, fire flow, etc.):

_____

_____

Corrective Action Taken to Restore Water Quality (main flushing, disinfection, etc.):

_____

_____

Corrective Action Ordered to Eliminate or Protect from Cross Connection (type of backflow preventer, location, etc.)

_____

_____

Previous Cross-Connection Survey of Premises:

Date: _____ By: _____

Types of Backflow Preventer Isolating Premises:

RPBA: _____ RPDA: _____ DCVA: _____ DCDA: _____ PVBA: _____ SVBA: _____

AVB: _____ Air Gap: _____ None: _____ Other Type: _____

Date of Latest Test of Assembly: _____

Notification of Washington State Health Department:

Date: _____ Time: _____ Person Notified: _____

Attach sheets with additional information, sketches, and/or media information, and mail to:

Letter Requesting Customer to Complete Water Use Questionnaire

Date

Customer Account Number (optional)
Customer
Customer Address Line 1
Customer Address Line 2

Dear _____ Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs help protect public health by preventing contamination of the drinking water as it is delivered to water system customers. The attached brochure explains what a cross connection is, describes typical household cross connections and what you can do to help protect your drinking water.

As part of our efforts to keep your drinking water safe, we are conducting a cross-connection control hazard survey of residential customers served by our system. The purpose of the survey is to help us determine if any of our residential customers have special plumbing or activities on their premises that could increase the risk of contamination to our water system.

For most residential customers, the cross-connection control hazard posed to the public water system is minimal. This is because your household plumbing was installed in compliance with the Uniform Plumbing Code. The Uniform Plumbing Code generally provides adequate protection of your water potable water piping and our public water distribution system from cross connections. However, a few customers with special plumbing or activities on their premises may pose an increased health risk to other customers served by our system. These customers may need to have a backflow preventer installed on their service lines or provide alternate protection to prevent contamination of the public water system.

Please complete the attached questionnaire by checking the applicable boxes on the table; and return the completed, signed questionnaire by {insert date} to the address shown on the letterhead {or insert address if different}.

Thanks in advance for filling out the questionnaire. We appreciate your cooperation in helping us to protect the drinking water we deliver to our customers. If you have any questions about the survey or how to fill out the questionnaire, please contact me at {**insert phone number**}. We will review your questionnaire and determine whether we need to contact your for further information.

Sincerely,

Name
CCC Program Manager

Enclosures: CCC Brochure
Water Use Questionnaire

Notice of Survey of Premises (Non-Residential/Multi-Family Residential) Customer-Employed Cross-Connection Control Specialist

Date

Customer Account Number (optional)
Customer Name
Customer Address Line 1
Customer Address Line 2

Dear _____ Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs protect public health by preventing contamination of the drinking water supply. The attached brochure explains what a cross connection is and what you can do to help protect your drinking water.

As part of the cross-connection control program, our system must assess the degree of hazard posed by each of our customer's plumbing systems upon the public water system. Non-residential customers and multi-family residential customers pose a special concern, because of the greater scope and complexity of their plumbing systems, special uses of water on the premises (e.g., manufacturing), fire protection systems, etc. Depending on the hazard assessment results, you may need to have a backflow preventer installed on your service line or provide alternate protection.

A cross-connection survey needs to be conducted for us to make the hazard assessment for your premises. The drinking water regulations require a person with special training, i.e., a Department of Health certified Cross-Connection Specialist (CCS), to conduct the surveys. Our system's policy is to have surveys of all non-residential premises and multi-family residential premises conducted by a CCS *employed by the customer*. Survey results must be submitted to our system for review.

Please arrange for the attached survey form to be completed and returned to this office by {insert date}. A list of local CCSs who provide this type of service is attached.

We appreciate your cooperation in meeting this hazard survey requirement. If you have any questions, please contact me at **{insert phone number}**.

Sincerely,

Name
CCC Program Manager

Enclosures: CCC Brochure
Water Use Questionnaire
CCS List

Request to Install Backflow Prevention Assembly

Date

Customer Account Number (optional)
Customer Name
Customer Address Line 1
Customer Address Line 2

Dear _____ Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs protect public health by preventing contamination of the drinking water as it is delivered to people served by the water system. **The purpose of this letter is to inform you of a requirement to install a backflow assembly.**

Our water system's policy considers each of our customer's plumbing systems, starting from the termination of the service pipe downstream of the water meter, to pose a potential cross-connection hazard to the public water system. Our policy requires a backflow prevention assembly commensurate with the degree of hazard to be installed on the service line. The purpose of this backflow prevention assembly is to isolate your plumbing system from the water distribution system. We've attached a copy of Resolution {**insert number**} describing our cross-connection control policy.

We have received the cross-connection control survey report submitted by your Cross-Connection Control Specialist (CCS). The survey assessed the overall public health hazard posed by your plumbing system (and water use) to the public water system. We agree with the assessment made by the CCS. **Based on the assessment, a Department of Health-approved {insert type of assembly} is required to be installed on your service line (at a location downstream of the water meter).**

Please make arrangements for the assembly to be installed by **{insert date}** or when your plumbing system is modified, whichever comes sooner. {***Optional language***: We realize that this expense was not anticipated, so if you are unable to comply with this deadline, please contact us to discuss an alternative date}. We've enclosed a copy of our standard installation drawings for this type of assembly. Your CCS should oversee the installation of the assembly to ensure compliance with these standards.

We appreciate your cooperation in this matter. If you have any questions, please contact me at {**insert phone number**}.

Sincerely,

Name
CCC Program Manager

cc: {City/County Plumbing Inspector}

Enclosures: Standard Installation Drawings

Request To Submit Test of Backflow Prevention Assembly

Date

Customer Account Number (optional)
Customer Name
Customer Address Line 1
Customer Address Line 2

Dear _____ Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs to protect the drinking water supply from contamination. As part of this program, backflow prevention assemblies have been installed on your water service(s) and/or within your plumbing system to protect our water distribution system. Annual testing is required to ensure that the backflow prevention assemblies properly function.

The purpose of this letter is to request that you now arrange for the annual testing of the reduced pressure principle (RPBA), double check valve (DCVA), and/or pressure vacuum breaker (PVBA or SVBA) assembly/assemblies described on the attached list. A Washington State Department of Health certified backflow assembly tester (BAT) must conduct the testing. **Testing results should be sent to the address above and submitted by {insert date}.**

For your convenience, we are enclosing a list of backflow assembly testers pre-approved to test assemblies that protect our water system. Test report forms are also enclosed. The test report forms need to be properly completed by the BAT, signed by the customer/assembly owner, and returned to us.

Note: the Uniform Plumbing Code in effect in Washington also requires annual assembly testing. In addition to the testing required for the assemblies that protect the public water system (i.e., identified on the attached list), you may wish to have all of the remaining assemblies within your premises tested at this time.

If you have any questions, please feel free to contact me at {**insert phone number**}.

Sincerely,

Name
CCC Program Manager

Enclosures: Assembly List
Pre-Approved BAT List
Assembly Test Report Forms

Second Notice to Test Backflow Prevention Assembly

Date

Customer Account Number (optional)
Customer Name
Customer Address Line 1
Customer Address Line 2

Subject: Testing of Backflow Prevention Assembly - Second Notice
First Notice Date: _____ Second Notice Date: _____

Dear _____ Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to implement cross-connection control programs to protect the drinking water supply from contamination. As part of this program, backflow prevention assemblies were installed on your service or within your premises to protect our water distribution system from contamination. The WAC requires these assemblies to be tested annually to verify that they are in good working condition.

The assembly/assemblies identified in our letter of {**insert date**} (copy attached) must be tested by a Department of Health certified Backflow Assembly Tester (BAT) upon installation and annually thereafter. This requirement is a condition of our system continuing to supply potable water to your premises. **According to our records, as of today's date, you have not submitted the requested Assembly Test Report(s).** If you believe this is in error, please contact me as soon as possible at the number below.

If you have not submitted the Assembly Test Reports as requested, please:

- Immediately employ a DOH-certified BAT to test the listed assembly/assemblies; and
- Submit a signed copy of the completed Assembly Test Report(s) to me at the address above **within 15 days of the date of this letter**.

Your cooperation in this matter is essential for protecting your drinking water supply and the public water supply from contamination. Failure to comply with the annual assembly testing requirement will trigger an enforcement action by our system. Enforcement could include a shut-off of your water service.

If you have any questions, please contact me at {**insert phone number**}.

Sincerely,

Name
CCC Program Manager

Enclosure: First Test Notice Letter

Standard Installation Drawings

The following pages show typical premises isolation installations of backflow assemblies (Illustrations 5 and 6).

Illustration 5
Standard Details - Service Connection Options
Single Family Residential

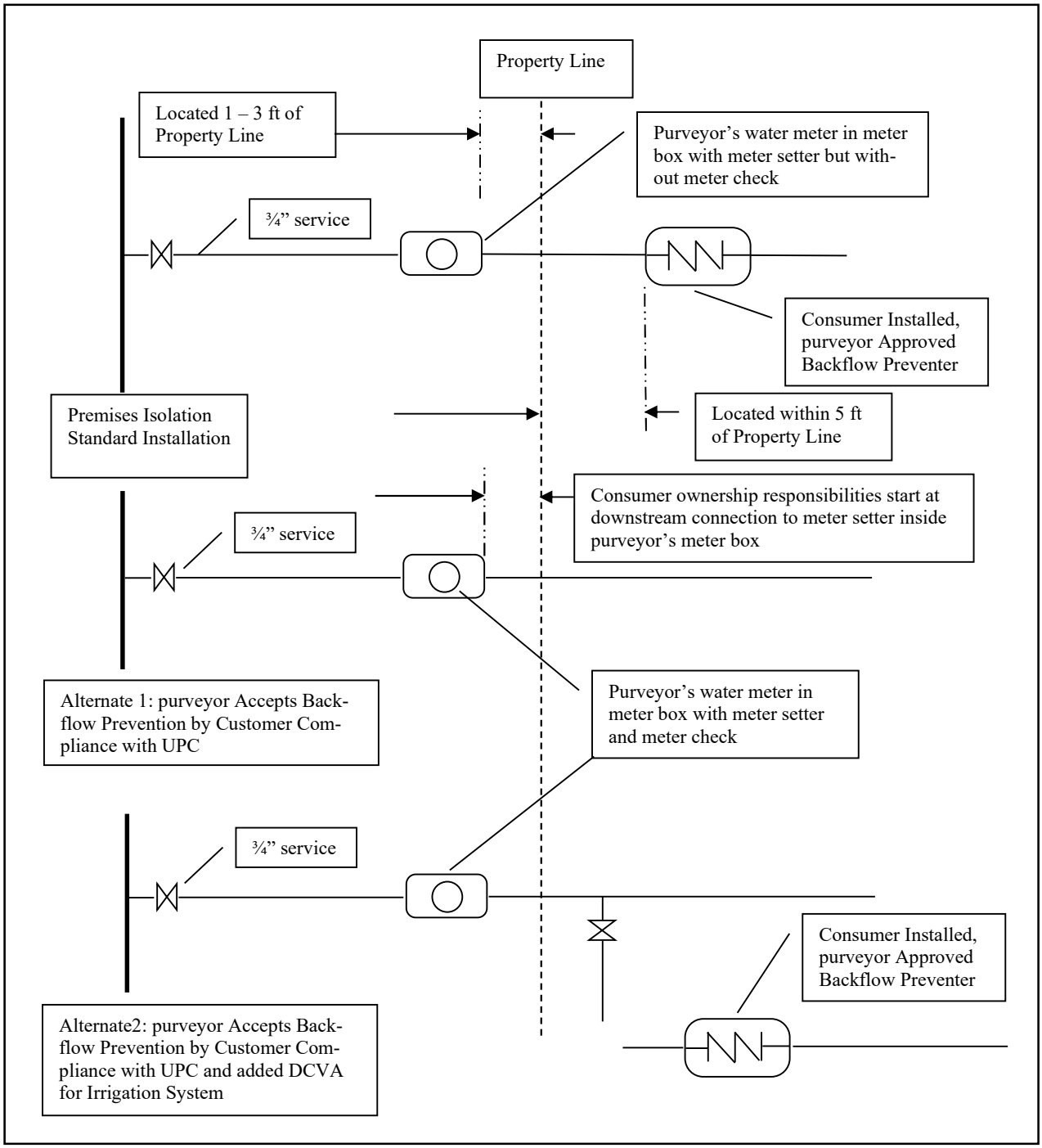
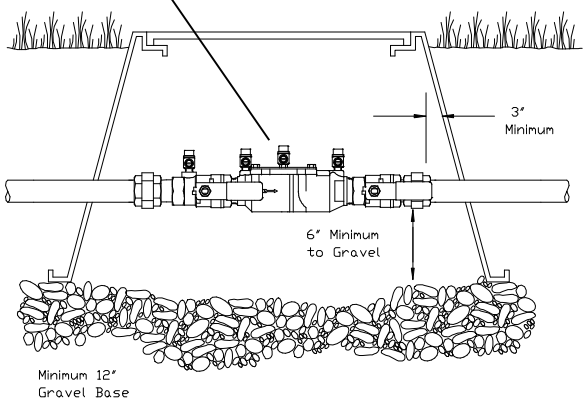


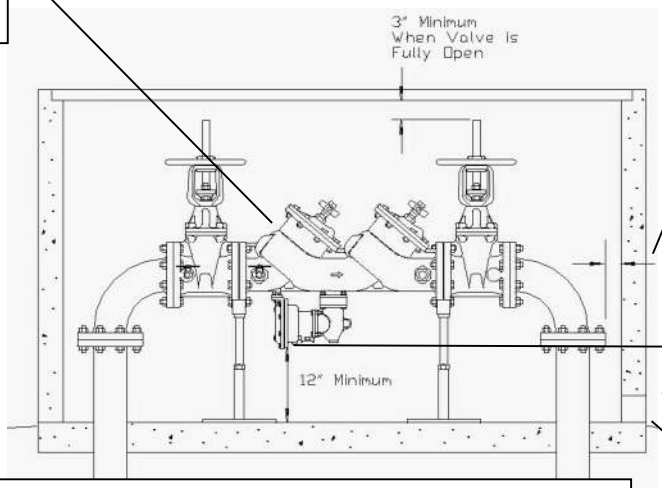
Illustration 6
Backflow Prevention Assemblies
Recommended Premises Isolation Installations

Purveyor Approved DCVA with test cocks pointed upwards with plastic plugs



Vault Installation – DCVA only

Purveyor Approved RPBA or DCVA



3" Minimum

Approved Air Gap - Required for RPBA

Lockable Insulated Enclosure Installation – RPBA and DCVA

Drain to daylight- Required for RPBA

All installations comply with manufacturer's recommendation and USCFCCCHR CCC Manual and PNWS-AWWA Manual standards

Appendix C
Annual Summary Report Forms

Appendix C contains sample cross-connection control (CCC) Annual Summary Report forms. Per WAC 246-290-490, purveyors are required to complete these forms to report information on the status of a public water system's CCC program and implementation activities. When the Department of Health sends out hard copies or electronic copies of the forms, they are color-coded. Purveyors often refer to the forms by color instead of name. The respective color of each form is noted below.

The three forms are:

1. **Cross-Connection Control Activities Annual Summary Report**

   Purveyors use this form to report (for a calendar year) their CCC implementation activities, such as status of high-hazard premises protection, backflow preventer inventory/testing information, and hazard evaluations. This is the "blue form."

2. **Cross-Connection Control Program Summary Report**

   This form is use to report the type, policies, and provisions of a public water system's CCC written program. This is the "cream form."

3. **Exceptions to High Health Hazard Premises Isolation Requirements**

   Purveyors use this form to document and report exceptions to mandatory premises isolation requirements allowed under WAC 246-290-490(4)(b)(iii). Only purveyors granting exceptions need to complete and submit this form. This is the "green form."

The forms provided are those used for the reporting year indicated on the forms. For copies of forms for later years, or for versions suitable for completion on screen using MS Word, contact the DOH Office of Drinking Water (see Appendix D)

Public Water System Cross-Connection Control Activities
Annual Summary Report for Year _____

Part 1: Public Water System (PWS) and Cross-Connection Control Specialist (CCS) Information

PWS ID:	PWS Name:	County:
Provide name and Certification Number of CCS who develops and implements your CCC program.		
CCS Name (Last, First & MI): ,		CCS Phone: (___) ___-____
CCS Cert. No.:	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

PWS has: A written CCC program 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.)

Please provide information regarding PWS's specific CCC Program Elements. Check one box in each column.

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 2003

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)	
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)	
Total Number of Connections	

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 4.

- Complete all cells. Count only premises PWS serves water to. 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 2003			
	Being Served Water by PWS[1]	With Premises Isolation by AG/RP[2]	With Premises Isolation AG/RP Inspected or Tested[3]	Granted Exception from Mandatory Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)				
Car washes				
Chemical plants				
Commercial laundries and dry cleaners				
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire protection systems with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers				
Separate irrigation systems using purveyor's water supply and chemical addition[4]				
Laboratories				
Metal plating industries				
Mortuaries				
Petroleum processing or storage plants				
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift stations and pumping stations				
Wastewater treatment plants				
Unapproved auxiliary water supply interconnected with potable water supply				
Other high-hazard premises (list)[5]				
Totals				

[1] Count multiple connections or parallel installations as separate connections.

[2] Count only those connections with AG or RP installed for premises isolation. Do not include connections with only in-premises protection, or those with DCVA/DCDAs installed for premises isolation.

[3] Count only those connections ***whose premises isolation preventers*** were tested or inspected during year 2003

[4] For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), 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 by table.***

Part 4A: Backflow Preventer Inventory and Testing Data During Year 2003

- Complete all cells. Enter zero (0) if there are no backflow preventers in the 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, check box above the "AVB" column.**
- Count multiple tests or failures for any particular backflow preventers 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 2003									
1	In service at beginning of 2003								
2	Inspected and/or tested in 2003[1]								
3	Failed Inspection or test in 2003								
Rows 4 – 6 pertain ONLY to NEW Premises Isolation preventers installed during 2003									
4	New preventers installed in 2003[2]								
5	Inspected and/or Tested in 2003[1]								
6	Failed inspection or test in 2003								
Premises Isolation Total at end of 2003[3]									
Installed for In-Premises Protection (Fixture Protection or Area Isolation), including preventers within PWS-owned facilities.									
Rows 7 – 9 pertain ONLY to In-Premises Protection preventers in service at beginning of 2003									
7	In service at beginning of 2003								
8	Inspected and/or Tested in 2003[1]								
9	Failed Inspection or Test in 2003								
Rows 10 – 12 pertain ONLY to NEW In-Premises Protection preventers installed during 2003									
10	New preventers installed in 2003[2]								
11	Inspected and/or Tested in 2003[1]								
12	Failed inspection or test in 2003								
In-Premises Protection Total at end of 2003[3]									
Grand Total at end of 2003									

[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).
[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced preventers those in service at beginning of 2003. Replacement preventers may be of a different type than the original.
[3] Total installed at end of 2003 can't be more than preventers in service at beginning of 2003 plus those installed during 2003. May be less due to changes in preventer type and preventers taken out of service during 2003.

Part 4B: Other Implementation Activities in 2003

Complete all cells. Enter zero (0) if not applicable.

Activity or Condition	Number
New services connections evaluated for cross-connection hazards to PWS in 2003.	
New services connections requiring backflow protection to protect PWS.[1]	
Existing services connections evaluated for cross-connection hazards to PWS in 2003.	
Existing services connections requiring backflow protection to protect PWS.[1, 2]	
Exceptions granted to high-hazard premises per WAC 246-290-490(4)(b) in 2003.[3]	
CCC Corrective enforcement actions taken by PWS during 2003.[4]	

[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 Exception 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, Risk Factors and Indicators during 2003

	Backflow Incidents, Risk Factors and Indicators during 2003	***Number*** (Enter 0 if none)	**Check if Data Not Available**
Backflow Incidents during 2003			
1	Backflow incidents that contaminated the PWS.[5]		☐
2	Backflow incidents that contaminated the customer's drinking water system ***only***.[5]		☐
Risk Factors for Backflow during 2003			
3	Distribution main breaks per 100 miles of pipe.		☐
4	Low pressure events (<20 psi in PWS distribution system).		☐
5	Water outage events.		☐
Indicators of Possible Backflow during 2003			
6	Total health-related complaints received by PWS.[6]		☐
7	Received during BWA or PN events.[7]		☐
8	Received during low pressure or water outage events.		☐
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).		☐
10	Received during BWA or PN events.[7]		☐
11	Received during low pressure or water outage events.		☐

[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 "wordwrap" from one line to the next. Press <Enter> to continue on new line. Maximum length of each comment is 255 characters, including spaces.

Part No.	Comment

Part 7: Report Completion Information

Enter dates in MM/DD/YYYY format.

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 (Print)[1]:		Title:
Signature:		Date:
Phone: (___) ___-____	E-mail: _____@_____	
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 (Print)[2]:		Title:
Signature:	Op. Cert. No.:	Date:

[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.

Cross-Connection Control Program Summary
For 2003

Describe the characteristics of the PWS's CCC Program at the end of the 2003 reporting year.

Part 1: Public Water System (PWS) Identification

PWS ID:	PWS Name:	County:

Part 2: Cross-Connection Control (CCC) Program Characteristics

A. Type of Program Currently Implemented

Type of Program	Check One
Premises isolation only.	☐
Combination program: reliance on both premises isolation and in-premises protection.	☐
In transition from a combination program to a premises isolation only program.	☐

B. Coordination with Local Administrative Authority (LAA) on Cross-Connection Issues

Indicate the status of coordination with LAAs in your service area. The LAA is the entity that enforces the Uniform Plumbing Code. ***Check one box in each of last 3 columns for each LAA in your service area***.

LAA No.	Name of LAA[1] (e.g., the City or County Building Department)	PWS currently:		If not coordinating, did LAA Decline to Coordinate?
		Coordinates with LAA	Has Written Agreement with LAA	
1		Y ☐ N ☐	Y ☐ N ☐	Y ☐ N ☐
2		Y ☐ N ☐	Y ☐ N ☐	Y ☐ N ☐
3		Y ☐ N ☐	Y ☐ N ☐	Y ☐ N ☐
4		Y ☐ N ☐	Y ☐ N ☐	Y ☐ N ☐
5		Y ☐ N ☐	Y ☐ N ☐	Y ☐ N ☐

[1] If more than 5 LAAs, attach separate sheet giving the above information.

C. Corrective or Enforcement Actions Available to the Purveyor

Type of Corrective Action	Indicate Whether Available	Most Often Used (Check one)
Denial or discontinuance of water service.	Y ☐ N ☐	☐
purveyor installs backflow preventer and bills customer.	Y ☐ N ☐	☐
Assessment of fines (in addition to elimination or control of cross-connection).	Y ☐ N ☐	☐
Other corrective actions (describe below):	Y ☐ N ☐	☐

D. CCC Program Typical Responsibilities

Typical responsibilities *do not* include enforcement action related procedures or circumstances.

CCC Program Activity	Responsible Party (Check one per row)	
	Customer	Purveyor
Hazard Evaluation by DOH-certified CCS.	☐	☐
Backflow preventer (BP) ownership.	☐	☐
BP installation.	☐	☐
BP ***initial*** inspection (for proper installation – all BPs).	☐	☐
BP ***initial*** test (for testable assemblies).	☐	☐
BP ***annual*** inspection (Air Gaps and AVBs).	☐	☐
BP ***annual*** test (for testable assemblies).	☐	☐
BP maintenance and repair.	☐	☐

E. Backflow Protection for Fire Protection Systems

Please remember to enter number of days allowed if you require retrofitting.

PWS coordinates with ***LAA*** on CCC issues for fire protection systems (FPS).	Y ☐	N ☐	N/A ☐
PWS coordinates with ***local Fire Marshal*** on CCC issues for FPS.	Y ☐	N ☐	N/A ☐
PWS ensures backflow prevention is installed before serving ***new*** connections with FPS.	Y ☐	N ☐	
PWS requires retrofits to ***high***-hazard FPS.	Y ☐ (No. of days allowed: _____)	N ☐	N/A ☐
PWS requires retrofits to ***low***-hazard FPS.	Y ☐ (No. of days allowed: _____)	N ☐	N/A ☐

F. Backflow Protection for Irrigation Systems

Minimum level of backflow prevention required on irrigation systems ***without*** chemical addition.	Not Addressed ☐ PV/SVBA ☐	AVB ☐ DCVA ☐	RPBA ☐
PWS currently inspects AVBs upon ***initial*** installation.	Y ☐	N ☐	N/A ☐
PWS currently inspects AVBs upon repair, reinstallation or relocation.	Y ☐	N ☐	N/A ☐

G. Used Water

PWS prohibits, by ordinance, rules, policy or agreement, the intentional return of used water (e.g., for heating or cooling) into the distribution system.	Y ☐	N ☐
If not prohibited at present, date plan to prohibit.	Date (mm/dd/yyyy):	N/A ☐
Current number of service connections returning used water to distribution system.		

H. Backflow Protection for Unapproved Auxiliary Water Supplies[1] NOT Interconnected with PWS

Indicate the **minimum** backflow preventer and type of protection required for service connections having unapproved auxiliary water supplies *when they are NOT interconnected to the PWS.* Check only one per row.

Existing service connections.	None ☐	DCVA ☐	RPBA ☐	AG ☐
Type of protection required.	None ☐	In-premises protection ☐		Premises isolation ☐
New service connections.	None ☐	DCVA ☐	RPBA ☐	AG ☐
Type of protection required.	None ☐	In-premises protection ☐		Premises isolation ☐

[1] An auxiliary water supply is any water supply on or available to the customer's premises in addition to the Purveyor's potable water supply.

I. Backflow Protection for Tanker Trucks and Temporary Water Connections

Minimum level of backflow protection (installed on or associated with the truck) required for tanker trucks taking water from PWS.	AG ☐ DCVA ☐ RPBA ☐ Not specified ☐ Tanker trucks not allowed ☐
PWS requires tanker trucks to obtain water at designated filling sites each equipped with permanently installed backflow preventer(s).	Y ☐ (Min. site protection: DCVA ☐ RPBA ☐) N ☐ N/A ☐ No sites provided ☐
PWS currently accepts tanker trucks approved by other PWSs without further inspection or testing.	Y ☐ N ☐ N/A ☐
Minimum level of backflow protection required for temporary water connections (e.g., for construction sites).	AG ☐ DCVA ☐ RPBA ☐ Not specified ☐ Temp. connections not allowed ☐
PWS requires testing each time the temporary connection backflow preventer is relocated.	Y ☐ N ☐ N/A ☐ (Temp. connections not allowed)
PWS provides approved backflow preventer for temporary connections.	Y ☐ N ☐ N/A ☐ (Temp. connections not allowed)

J. Backflow Protection for Non-Residential Connections

For each category shown, indicate whether PWS has non-residential connections of that type and the **minimum** level of ***premises isolation*** backflow protection required (whether or not PWS currently has that type of customer).

Type of Connection	PWS has Customers of this Type	Minimum Premises Isolation Backflow Protection Required
Commercial	Y ☐ N ☐	Not required ☐ DCVA ☐ RPBA ☐
Industrial	Y ☐ N ☐	Not required ☐ DCVA ☐ RPBA ☐
Institutional	Y ☐ N ☐	Not required ☐ DCVA ☐ RPBA ☐
Other (specify): _____	Y ☐ N ☐	Not required ☐ DCVA ☐ RPBA ☐
Other (specify): _____	Y ☐ N ☐	Not required ☐ DCVA ☐ RPBA ☐

K. Backflow Protection for Wholesale Customers

Indicate whether the PWS requires backflow protection at interties with wholesale customers (other PWSs).

Type of Intertie	PWS has (plans to have) Customers of this Type	Backflow Protection Required (If protection is required, indicate minimum level)
Existing	Y ☐ N ☐	Not specified/Not required ☐ Always required ☐ Required only if purchaser's CCC program is inadequate ☐ Minimum required (if applicable): DCVA ☐ RPBA ☐
New	Y ☐ N ☐	Not specified/Not required ☐ Always required ☐ Required only if purchaser's CCC program is inadequate ☐ Minimum required (if applicable): DCVA ☐ RPBA ☐

Part 3: CCC Program Record-Keeping and Inventory

Indicate the type or name of computer software used by the PWS to track CCC records.

BMI ☐	BPMS ☐	Engsoft ☐	Tokay ☐	Other commercial CCC software ☐ (specify): _____	
Custom developed for or by PWS[1] ☐		Other non-CCC software (e.g., Excel) ☐			None Used ☐

[1] Do not include commercial CCC software customized for PWS. Indicate these on line above.

Part 4: 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 <Enter> to continue on new line. Maximum length of each comment is 255 characters, including spaces.

Part No.	Comment

Part 5: CCC Program Summary Completion Information

Enter dates in MM/DD/YYYY format.

I certify that the information provided in this CCC Program Summary is complete and accurate to the best of my knowledge.		
CCC Program Mgr Name (Print)[2]:		Title:
Signature:		Date:
Phone: (___) ___-____	E-mail: _____@_____	
I certify that the information provided in this report accurately represents the status and description of this water system's CCC Program.		
PWS Mgr Name (Print)[3]:		Title:
Signature:	Op. Cert No:	Date:

[2] The CCC Program Manager is generally the CCS who is responsible for development and implementation of the CCC program.

[3] The person that the CCC Program Manager reports to or other manager having direct responsibility and/or oversight of CCC program.

Exceptions to High Health Hazard Premises Isolation Requirements For _____ 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 one form for **each** exception that was granted:

- During 2003; or
- Prior to 2003, **if** you didn't submit an Exceptions form to DOH previously (i.e., don't duplicate previously submitted Exception forms).

If your system didn't grant any exceptions in 2003, and you have already submitted forms for exceptions granted prior to 2003, don't complete any Exception forms for 2003.

Part 1: Public Water System (PWS) Information

PWS ID:	PWS Name:	County:

Part 2: Premises Information

Name of Premises	
Service Address	
Premises Type or Category – Refer to Table 9 of WAC 246-290-490(4)(b)	
Additional Information or Description of Premises to help explain why exception is appropriate:	

Part 3: Information Regarding Exception to Premises Isolation

Enter dates in MM/DD/YYYY format.

Date of Hazard Evaluation	
Date Exception Granted	
Expiration Date of Exception (if any)	
Date of Next Hazard Evaluation	

Name of Premises: _____

Part 4: Justification for not Requiring Premises Isolation Using AG, RPBA or RPDA

- The reasons for not requiring mandatory premises isolation shown in the table are typical examples. *purveyors are not required to follow or apply any of these reasons.*
- 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 PWS	**Check if Applicable**
Medical/Health Services Facility not having laboratory or similar facilities, e.g., Psychiatric or Counseling Office.	☐
Dental Office having independent water supplies for dental work (no interconnection with purveyor's water system).	☐
"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.	☐
Other (please describe):_____	☐
	☐
	☐
	☐

Part 5: Form Completion Information

Enter dates in MM/DD/YYYY format.

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 (Print)**:**		CCS Cert. No:
Signature:		Date:
Phone: (___) ___-____	E-mail: _____@_____	
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 (Print)**:**		Title:
Signature :	Op. Cert. No:	Date:

* The person that the CCS reports to or other manager having direct responsibility for and/or oversight of the CCC program. It is not required that this person be in charge of the entire water system.

Appendix D
Cross-Connection Control Resource Information

Guide to Cross-Connection Control Publications

Title	Publisher	Contact Information
Cross Connection Control Manual, Accepted Procedure And Practice 6th Edition, 1995 ("Yellow Manual")	Pacific Northwest Section, American Water Works Association	PO Box 2050 Clackamas, OR 97015-2050 (877) 767-2992 (toll-free)
Summary of Backflow Incidents 4th Edition, 1995	Pacific Northwest Section, American Water Works Association	PO Box 2050 Clackamas, OR 97015-2050 (877) 767-2992 (toll-free)
Backflow Incident Investigation Procedures 1st Edition, 1996	Pacific Northwest Section, American Water Works Association	PO Box 2050 Clackamas, OR 97015-2050 (877) 767-2992 (toll-free)
Note: the above three manuals along with two additional manuals are available on one CD-ROM (pdf format). The cost of the CD is much lower than the cost to purchase the three manuals separately in printed form.		
Manual of Cross-Connection Control 9th Edition, 1993	University of Southern California, Foundation for Cross-Connection Control & Hydraulic Research	KAP-200 University Park MC-2531 Los Angeles, CA 98089-2531 (213) 740-2032

Local, Regional and National Cross-Connection Control Organizations

Organization Information	Description	Resources Available (*Publications in Italics)*
Within Washington		
Washington State Department of Health Office of Drinking Water P. O. Box 47822 Olympia, WA 98504-7822 1-800-521-0323 (toll-free) www.doh.wa.gov/ehp/dw	Administers the State Drinking Water Regulations (Chapter 246-290 WAC), including Cross-Connection Control (CCC) Requirements for Public Water Systems (WAC 246-290-490).	• Regulation interpretation and general technical assistance on starting and implementing a CCC program • *Cross-Connection Control Guidance Manual for Small Water Systems* • *Backflow Assemblies Approved for Installation in Washington State* (available from Training and Outreach Section)
Western Washington Cross-Connection Prevention Professionals Group ("The Group") P. O. Box 94551 Seattle, WA 98124 www.backflowgroup.org	An organization of CCC professionals (including Cross-Connection Specialists [CCSs], Backflow Assembly Testers [BATs], and others interested in CCC) in Western Washington who meet monthly to discuss CCC-related topics and exchange information on program development and implementation. Annual dues are $10.00.	• *Brochures on assembly installation requirements* • Annual seminar in October each year • BAT forum in the spring • Special CCC seminars • Internet access to USC List of Approved Assemblies
Spokane Regional Cross-Connection Control Committee (SRC4) P. O. Box 13086 Spokane, WA 99213 www.src4.org	An organization of CCC professionals (CCSs, BATs, and others) in Eastern Washington who meet monthly to discuss CCC-related topics and exchange information on program development and implementation. Annual dues are $20.00.	• *Brochures for consumers on common CCC subjects* • Annual seminar in February each year • Special CCC seminars and exam review sessions • Comprehensive CCC Newsletter periodically • Internet access to USC List of Approved Assemblies

Organization Information	Description	Resources Available (*Publications in Italics)*
Washington Environmental Training and Resource Center (WETRC) 2401 SE 320th Street, M/S WW Auburn, WA 98029 1-800-562-0858 (toll-free) http://www.green-river.edu/WETRC/	Part of Green River Community College, WETRC is the principal training center in Washington for drinking water related subjects, including CCC. WETRC offers various CCC courses including those designed to prepare individuals for the CCS and BAT certification exams. WETRC also currently administers the BAT program for DOH.	• *Backflow Assembly Field Test Procedures Approved for Use in Washington State (DOH publication provided as part of BAT classes)* • General CCC classes • CCS classes • BAT classes and exams
Evergreen Rural Water of Washington (ERWOW) P. O. Box 2300 Shelton, WA 98584 1-800-272-5981 (toll-free) www.erwow.org	An organization that represents small public water systems in Washington. It provides training in various subjects of interest to small systems, including CCC program development and implementation.	• CCC program review course • CCS exam review course
Regional		
British Columbia Institute of Technology (Piping Department) 3700 Willingdon Ave Burnaby, British Columbia Canada V5G 3H2 (604) 434-5734 www.bcit.ca	An educational institution, founded by the British Columbia Provincial government, that specializes in technical and technology subjects. The Institute grants Bachelor degrees in several areas. Cross-Connection Management and Backflow Assembly Tester certificates are offered through the British Columbia Water and Wastewater Association (BCWWA).	• CCC Program Management (CCS) • Backflow Assembly Testing (BAT)

Organization Information	Description	Resources Available (*Publications in Italics)*
CCC Committee **Pacific Northwest Section** **American Water Works Association** (PNWS-AWWA) P. O. Box 2050 Clackamas, OR 97015-2050 1-877-767-2992 (toll-free) www.pnws-awwa.org	An official committee of the PNWS-AWWA that has a well-defined membership representing the Pacific Northwest states. The Committee publishes numerous CCC-related manuals, provides CCC training and offers CCS scholarships for systems with ≤ 2500 connections. The Committee holds quarterly meetings that are open to all interested parties.	• *Cross-Connection Control Manual, Accepted Procedure and Practice – 6th Edition* • *Summary of Backflow Incidents – 4th Edition* • *Backflow Incident Investigation Procedures** • *Numerous CCC public education brochures* *First 3 publications available on CD-ROM for $25.
Clackamas Community College 19600 South Molalla Ave Oregon City OR 97045 (503) 675-6958 www.clackamas.cc.or.us	Clackamas Community College is one of the principal training centers in Oregon for drinking water related subjects, including CCC. The Water and Environmental Technology Program offers Certificate and Associate of Applied Science Degree Programs.	Clackamas offers various CCC courses including those designed to prepare individuals for the CCS and BAT certification exams, such as: • General CCC classes • Inspector (CCS) classes • BAT classes and exams
National		
American Backflow Prevention Association (ABPA) P. O. Box 3051 Bryan, TX 77805-3051 (979) 846-7606 www.abpa.org	An international organization whose members are from all aspects of the backflow prevention industry including, building officials, standards organizations, CCC professionals, assembly testers, plumbers, public health officials and backflow preventer manufacturers. Annual dues are $30.00.	• *ABPA News* (bimonthly publication with news and technical articles on the CCC industry) • *The Dangers of Cross-Connections* (video for public water systems on the need for CCC programs and how to develop them) • Website has a forum for discussion of CCC topics

Organization Information	Description	Resources Available (*Publications in Italics)*
University of Southern California **Foundation for Cross-Connection Control and Hydraulic Research** Kaprielian Hall - 200 Los Angeles, CA 90089-2531 (213) 740-2032 www.usc.edu/dept/fccchr	The Foundation, associated with the University of Southern California, conducts research and has products and services (technical assistance) to help public water systems and others with their CCC programs. The Foundation has a comprehensive backflow assembly evaluation program, publishes a list of approved backflow prevention assemblies, and publishes a CCC manual. Annual membership costs vary depending on system size and/or type of organization.	• *Manual of Cross-Connection Control, 9th Edition* (10th Edition currently under development) • *List of Approved Backflow Prevention Assemblies* (for Foundation members only) • Website has useful introduction to CCC and prevention of backflow
Drinking Water and Backflow Prevention S.F.A. Enterprises, Inc. P.O. Box 33209 Northglenn, CO 80233-9951 1-888-367-3927 (toll-free) www.dwbp-online.com	A private company whose emphasis is to provide information and assist in the awareness of the potential hazards associated with the quality of drinking water supply.	• *Drinking Water and Backflow Prevention.* (a monthly magazine with news and technical articles about CCC and backflow prevention industry)

Cross-Connection Control Software

The following list identifies some of the companies that supply PC software database management programs for cross-connection control. The average price is in excess of $1,000. However, prices often depend upon the maximum number of assemblies being tracked. Many companies have free demo CDs available. ***Note: appearance on this list does not constitute an endorsement by DOH.***

Software Program Title	Company Name and Address	Contact Information
BPMS	**BPMS Software** 4060 Irmin St Burnaby, British Columbia Canada V5J 1X4	**www.bpms.net** 1-877-250-2698 (toll-free) Email: bpms@bpms.net
C4-Complete Cross Connection Control Software	**Hydro Designs, Inc.** 2222 Franklin Road, #200 Bloomfield Hills, MI 48302	**www.hydrodesignsinc.com** (248) 335-3122 Email: Jhudak@hydrodesignsinc.com
CHS MMIS7 for Water	**CHS Software & Consulting, Inc.** 12507 Bel-Red Rd., Ste 101 Bellevue, WA 98005	**www.chssoftware.com** (425) 637-3693 Email: chs@seanet.com
Cross-Track	**BMI** 17752 NE San Rafael St Portland, OR 97230	**www.bmi-backflow.com** 1-800-841-7689 (toll-free) Email: support@bmi-backflow.com
Smart Water Systems	**Smart Water Systems** P O Box 481 Manchester, WA 98353-0481	**(No website at present)** (360) 871-4987 Email: gherbison@netscape.net
Specialized Systems Software	**Specialized Systems Software** 356 NE Kingwood Place College Place, WA 99324	**www.specsys.us** (509) 629-0877 Email: info@specsys.us

Software Program Title	Company Name and Address	Contact Information
Tokay Backflow Prevention Management Software	**Tokay Software** P O Box 2439 Framingham, MA 01703	**www.tokay.com** 1-800-865-2965 (Toll-free) Email: tokay@tokay.com
XC^2	**Engsoft Solutions** 9 Mono Avenue Fairfax, CA 94930	**www.engsoft.com** 1-800-761-4999 (Toll-free) Email: XC2@engsoft.com

Appendix E
Cross-Connection Control Policy Resolution No. 800_____

RESOLUTION NO. 800

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY ("DISTRICT") ADOPTING CROSS-CONNECTION CONTROL POLICY

WHEREAS, where applicable in its adopted Drinking Water Supply Plan, it is the responsibility of Public Utility District No. 1 of Whatcom County, (hereinafter referred to as the "District") to provide water that meets Washington State drinking water quality standards, to the customer at the meter, and

WHEREAS, where applicable in its adopted Drinking Water Supply Plan, it is the District's responsibility to prevent the contamination of the public water system from the source of supply (i.e., to the customer's connection to the service pipe or meter), and

WHEREAS, it is a requirement of the Washington State Department of Health (DOH) for the District to establish a cross connection-control program satisfactory to DOH and consistent with the regulations provided in Chapter 246-290 WAC (the "Cross-Connection Control Program"), and

WHEREAS, cross-connections within the customer's plumbing system pose a potential source for the contamination of the public water supply system;

WHEREAS, in order to continue to provide for the public health and safety of its customers, the Board of Commissioners of the District shall authorize the District's General Manager to establish and implement the Cross-Connection Control Policy to protect the District-owned water system from the risk of contamination that shall apply to all new and existing customers.

NOW, THEREFORE, BE IT RESOLVED that the District establishes the cross connection control set forth in Exhibit A, attached hereto.

ADOPTED by the Commission of the Public Utility District No. 1 of Whatcom County at its regular meeting held on the 14th day of September 2021.

Public Utility District No. 1
of Whatcom County

_____
Atul Deshmane, President/Commissioner

_____
Christine Grant, Secretary/Commissioner

_____
Mike Murphy, Commissioner

APPROVED: SEPTEMBER 14, 2021

EXHIBIT A
PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY
CROSS CONNECTION CONTROL POLICY
(September 2021)

I. Definitions

Unless otherwise defined, all terms used in this resolution pertaining to cross connection control have the same definitions as those contained in WAC 246-290-010 of the Washington State Drinking Water Regulations.

II. Prevention of Contamination

The customer's plumbing system, starting from the termination of the District's water service pipe, shall be considered a potential high-health hazard requiring the isolation of the customer's premises by a DOH-approved, customer-installed and maintained reduced-pressure principle backflow assembly (RPBA) or reduced-pressure detector assembly (RPDA). The RPBA or RPDA shall be located at the end of the District's water service pipe (i.e., immediately downstream of the meter). Water shall only be supplied to the customer through a DOH-approved, customer-installed and maintained RPBA or RPDA.

Notwithstanding the aforesaid, the District, upon an assessment of the risk of contamination posed by the customer's plumbing system and use of water, may allow:

- A single-family or duplex residential customer to connect directly to the water service pipe, i.e., without a DOH-approved double-check valve assembly (DCVA) or RPBA.
- Any customer other than a single-family or duplex residential customer, as a minimum, to be supplied through a DOH-approved, customer-installed and maintained double-check valve assembly (DCVA) or double-check detector assembly (DCDA).
- Any customer, other than a single-family or duplex residential customer to connect directly to the water service pipe (i.e., without a District-approved DCVA or RPBA), PROVIDED THAT the customer installs and maintains backflow preventers, at the point of hazard, that are commensurate with the degree of hazard assessed by the District.

III. Conditions for Providing Service

Water service is provided based on the following terms, conditions, requirements and limitations:

1. The customer shall take all measures necessary to prevent the contamination of the plumbing system within his/her premises and the District's distribution system that may occur from backflow through a cross connection. These measures shall include the prevention of backflow under any backpressure or backsiphonage condition, including the disruption of the water supply from the District's system that may occur during routine system maintenance or during emergency conditions, such as a water main break.

2. The customer shall install, operate, and maintain at all times the customers plumbing system in compliance with the current edition of the Uniform Plumbing Code having jurisdiction as it pertains to the prevention of contamination and protection from thermal expansion, due to a closed system that could occur with the present or future installation of backflow preventers on

the customer's service and/or at plumbing fixtures.

3. For cross-connection control or other public health-related surveys, the customer agrees to provide for the District's employees or agents free access to all parts of the premises during reasonable working hours of the day for routine surveys and at all times during emergencies.

   Where agreement for free access for the District's survey is denied, the District may supply water service provided that premises isolation is provided through a DOH- approved reduced-pressure principle backflow assembly (RPBA).

4. The customer agrees to install all backflow prevention assemblies requested by the District and to maintain those assemblies in good working order. The assemblies shall be of a type, size, and make approved by DOH and acceptable to the District. The assemblies shall be installed in accordance with the recommendations given in the most recently published edition of the Cross Connection Control Manual, Accepted Procedures and Practice, published by the Pacific Northwest Section, American Water Works Association, or latest edition thereof.

5. The customer shall:
   a. Have all assemblies (e.g., RPBAs and/or DCVAs) that the District relies upon to protect the public water distribution system tested upon installation, annually thereafter and/or more frequently if requested by the District, after repair, and after relocation;
   b. Have all testing done by a District-approved and currently DOH-certified Backflow Assembly Tester (BAT);
   c. Have the RPBA or DCVA tested in accordance with DOH-approved test procedures; and
   d. Submit to the District the results of the test(s) on test report forms acceptable to the District within the time period specified by the District.

6. The customer shall bear all costs for the aforementioned installation, testing, repair, maintenance and replacement of the RPBA, RPDA, DCVA or DCDA installed to protect the District's distribution system.

7. At the time of application for service, if required by the District, the customer shall submit to the District plumbing plans and/or a cross-connection control survey of the premises conducted by a District-approved and DOH-certified Cross-Connection Control Specialist (CCS). The cross-connection control survey shall assess the cross-connection hazards and list the backflow preventers provided within the premises. The results of the survey shall be submitted prior to the District turning on water service to a new customer. The cost of the survey shall be borne by the customer.

8. For classes of customers other than single-family residential, when required by the District, the customer agrees to periodically submit a cross-connection control re-survey of the premises by a DOH-certified CCS acceptable to the District. The District may require the re-survey to be performed in response to changes in the customer's plumbing or water use, or performed periodically (annually or less frequently) where the District considers the customer's plumbing system to be complex or subject to frequent changes in water use. The cost of the re-survey shall be borne by the customer.

9. Within 30 days of a request by the District, a residential customer shall agree to complete and submit to the District a "Water Use Questionnaire" for the purpose of surveying the health hazard posed by the customer's plumbing system on the District's distribution system. Further, the residential customer agrees to provide within 30 days of a request by the District a cross-

connection control survey of the premises by a DOH-certified CCS acceptable to the District.

10. The customer shall obtain the prior approval from the District for all changes in water use, and alterations and additions to the plumbing system, and shall comply with any additional requirements imposed by the District for cross-connection control.

11. The customer shall immediately notify the District and the local health jurisdiction of any backflow incident occurring within the customer's premises (i.e., entry of any contaminant/pollutant into the drinking water) and shall cooperate fully with the District to determine the reason for the backflow incident.

12. The customer acknowledges the right of the District to discontinue the water supply within 72 hours of giving notice to the customer, or a lesser period of time if required to protect public health, if the customer fails to cooperate with the District in the survey of premises, in the installation, maintenance, repair, inspection, or testing of backflow prevention assemblies or air gaps required by the District, or in the District's effort to contain a contaminant or pollutant that is detected in the customer's system.

    Without limiting the generality of the foregoing, in lieu of discontinuing water service, the District may install an RPBA on the service pipe to provide premises isolation, and recover all costs for the installation and subsequent maintenance and repair of the assembly, appurtenances, and enclosure from the customer as fees and charges for water. The failure of the customer to pay these fees and charges may result in termination of water service in accordance with the District's water billing policies.

13. The District will require premises isolation for a customer that is of the high-hazard type or category requiring "Mandatory Premises Isolation" established by the DOH regulations (Table 9, WAC 246-290-490).

14. Where the District imposes mandatory premises isolation in compliance with DOH regulations, or agrees to the customer's voluntary premises isolation through the installation of a RPBA immediately downstream of the District's water meter, the customer acknowledges his obligation to comply with the other cross-connection control regulations having jurisdiction (i.e., Uniform Plumbing Code). Although the District's requirements for installation, testing, and repair of backflow assemblies may be limited to the RPBAs used for premises isolation, the customer shall comply with the other terms herein as a condition of allowing a direct connection to the District's service pipe.

15. The customer shall indemnify and hold harmless the District for all contamination of the customer's plumbing system or the District's distribution system that results from an unprotected or inadequately protected cross connection within the customer's premises. This indemnification shall pertain to all backflow conditions that may arise from the District's suspension of water supply or reduction of water pressure, recognizing that the air gap separation otherwise required would require the customer to provide adequate facilities to collect, store, and pump water for his/her premises.

16. The customer shall, in the event legal action is required and commenced between the District and the customer to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all incurred costs and expenses including, but not limited to, reasonable attorney's fees as determined by the Court.

17. The customer acknowledges that the District's survey of a customer's premises is for the sole purpose of establishing the District's minimum requirements for the protection of the public water supply system, commensurate with the District's assessment of the degree of hazard.

    It shall not be assumed by the customer or any regulatory agency that the District's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the District's personnel constitute an approval of the customer's plumbing system or an assurance to the customer of the absence of cross connections therein.

18. The customer acknowledges the right of the District, in keeping with changes to Washington State regulations, industry standards, or the District's risk management policies, to impose retroactive requirements for additional cross-connection control measures.

The District will record the customer's agreement to the above terms for service on an "Application for Water Service," "Application for Change of Water Service," or other such form prepared by the District and signed by the customer.

IV. Implementation of the Cross-Connection Control Policy

The District will employ or otherwise engage the services of a DOH-certified CCS to develop, implement and be in responsible charge of the District's cross-connection control program.

The District, under the direction of the aforementioned CCS, will prepare a written cross-connection control program plan to implement the requirements of this resolution. The written program shall be consistent with this resolution and shall comply with the requirements of Chapter 246-290 WAC (Group A Drinking Water Regulations).

The District will use the most recently published editions of the following publications as references and technical aids:

1. Cross-Connection Control Manual, Accepted Procedures and Practice, published by the Pacific Northwest Section, American Water Works Association, or latest edition thereof.

2. Manual of Cross-Connection Control, published by the Foundation for Cross- Connection Control and Hydraulic Research, University of Southern California, or latest edition thereof.

3. Cross-Connection Control Guidance Manual for Small Water Systems, published by the DOH Office of Drinking Water.

The District will incorporate the written program plan into all Drinking Water System Plans and will submit the plan to DOH for approval when requested.

The District, in consultation with the aforementioned CCS, shall have the authority to make reasonable decisions related to cross connections in cases and situations not provided for in the resolution or written program.

If any provision in this resolution, or in the written cross-connection control program is found to be less stringent than or inconsistent with the Drinking Water Regulations (Chapter 246-290 WAC), or other Washington state statutes or rules, the more stringent state statute, rule, or regulation shall apply.