

CITY OF ROY
Water System Plan

G&O #15610
October 2018

Gray & Osborne, Inc.

CITY OF ROY

PIERCE COUNTY **WASHINGTON**

WATER SYSTEM PLAN

G&O #15610
OCTOBER 2018

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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EXECUTIVE SUMMARY

This Water System Plan provides a long-term planning strategy for the City of Roy's water system over 6-, 10- and 20-year planning periods. The objectives of this Plan are to evaluate the performance and adequacy of Roy's existing water system, to determine what will be necessary to meet the infrastructure demands over the next 20 years, and to identify compliance issues that may affect operation of the water system. The Plan was prepared in accordance with the Washington State Department of Health (DOH) requirements specified in Washington Administrative Code (WAC) 246-290.

The following elements are required by DOH to be addressed in a Plan:

- Chapter 1: Water system history, inventory of facilities, policies and the relationship of this plan to other planning documents.
- Chapter 2: Basic planning data including existing and future estimates of population, water production, and water consumption.
- Chapter 3: Water system analysis including water quality and analysis of distribution system hydraulic capacity to meet existing and future peak hour demand and fire flow demand.
- Chapter 4: Water use efficiency program.
- Chapter 5: Wellhead protection plan for Wells 1 and 2.
- Chapter 6: Water system operation and maintenance including system operation and control, preventative maintenance, emergency response program, and cross-connection control program.
- Chapter 7: Analysis of existing operation and maintenance procedures, cross-connection control program, and recommendations for improvements to the operation and maintenance of the water system.
- Chapter 8: Discussion of proposed capital improvements to address system deficiencies.
- Chapter 9: A 6-year financial plan for improvements identified in Chapter 8 and identification of potential funding sources.
- Appendices: Additional required planning elements, including a coliform monitoring plan, a cross connection control program, and construction standards.

At this time, Roy's most significant facilities needs are:

- Maintenance and recoating of the existing water reservoir.
- Reservoir seismic retrofit.
- Improvements to Wells 1 and 2.
- Replacement of water meters with radio read meters.

In the future, Roy will need the following facilities:

- Acquisition of land and construction of a second reservoir.
- Treatment for iron and manganese at Well 2.

This plan indicates that Roy has adequate source, and distribution capacity to meet predicted year 2036 demands. Distribution system leakage is low, indicating that the water distribution system is in good condition.

Operations and maintenance are discussed in Chapter 7. Included are maintenance schedules, monitoring schedules, checklists and emergency response guidance. Discussion includes analysis of the need for a full-time public works employee responsible for the water system operations and maintenance and are part-time employee for water system administration and this need is included in projected water system operation budgets in Chapter 9.

Capital improvements are recommended in Chapter 8. The majority of capital improvements recommended in the 6-year planning horizon consist of increasing system reliability through improvements to Wells 1 and 2 and the construction of a second reservoir.

Chapter 9 contains a financial analysis of the Plan. Projected operating and capital improvement budgets show the water system to be financially viable and the proposed capital improvements to be feasible with the utilization of funding sources available to the City.

SEWER SYSTEM

A sewer feasibility study has been previously completed; however, the preliminary study of alternatives for providing sewer service was evaluated by the City and it was determined that providing sewer service was not economically feasible at the time. Further development within the City of Roy UGA will require the construction of a sewer system. Approval for a sewer system will be dependent on the City's demonstrated

ability to sustainably manage the water system, either by City personnel, or an outside agency. The current management of the water system is not to the necessary standards.

CITY OWNERSHIP AND MANAGEMENT OF THE WATER SYSTEM

This water system plan is also intended to be a tool for better understanding the required financial and staff resources for owning and managing a water system in a sustainable manner. The City is currently not allocating enough resources to the water system and is considering the option of having an outside entity to assume ownership and management of the water system. Throughout this water system plan recommendations are made assist the City in understanding what would be required to bring the City's management of the water system up to a sustainable level.

The City recently increased water rates to improve the water system's financial health. In the future, the necessary water rate increases should occur regardless of the City decision to either maintain ownership and management of the water system or to have an outside agency assume ownership and management of the water system.

The City does not currently have adequate staff to run the water system from both an operations and maintenance and administration perspective. Based on the historical required hours, other systems, and the amount of maintenance work currently not being performed, it is recommended that the City have one dedicated Full Time Employee (FTE) for water system operations and maintenance. Additionally, the City does not have the necessary administrative capacity to manage the water system. It is recommended that the City have one part-time manager dedicated to the water system for planning, asset management, funding applications, finances, and billing. The City does not currently have the staff or necessary experience for project management should future capital improvement projects be undertaken. It is recommended that the City hire a part-time manager that has the necessary experience or retain an outside consultant for project management purposes.

The current rates charged by the City for connection to the water system are based on the previous water system plan. Because this water system plan contains an updated capital improvement plan, it is recommended that the general facility charges be revised following the approval of this plan in order to account for the planned projects and maintain financial feasibility of the plan.

Beyond hiring a full-time employee for water system operations and maintenance and a part time employee for water system administration, elected representative on the City Council must attend drinking water conferences and regional water meetings to gain the knowledge necessary to supervise the water system and understand the effort and resources required by a water system. Furthermore, water system business must be included in meeting agendas on a regular basis to ensure the water system is properly run

and to demonstrate to DOH that the water system is being run like a business enterprise. Including water system business in meeting agendas will contribute to the transparency of the water system management and contribute to the education of consumers on the full cost of tap water and responsibilities of water system ownership.

CHAPTER 1

WATER SYSTEM DESCRIPTION

INTRODUCTION

This Water System Plan Update has been prepared in fulfillment of the planning requirements set by the Washington State Department of Health (DOH) in accordance with Washington Administrative Code (WAC) 246-290-100. These regulations require analysis of system capacity over 6-, 10- and 20-year planning periods. System capacity is defined in WAC 246-290-010 as, "the system's technical, managerial and financial capacity to achieve and remain in compliance with all applicable local, state and federal regulations." The regulations require water system plan updates every 6 years, or 10 years with adequate planning. The previous water system plan update was completed in June 2005.

Chapter 1 of this Water System Plan Update describes the existing water system. System ownership, management, local ordinances and policies affecting the water system are discussed. Existing facilities are described both in terms of their history and their present configuration. The local setting is also described in terms of geography, geology, and demography. Later chapters will address the following:

- History and future projections of water system growth, water production and water consumption.
- Ability of existing facilities to meet the projected demands.
- Water quality issues related to existing and anticipated regulations.
- Source protection measures necessary to assure a safe and reliable supply of water into the foreseeable future.
- Operations requirements.
- Capital improvements necessary to meet future requirements.
- A financial strategy to meet the capital and operational requirements of the water system.

SYSTEM OWNERSHIP AND MANAGEMENT

The City of Roy (City) owns and operates the City of Roy Public Water System that serves residents and businesses within their corporate limits and in nearby unincorporated areas. The DOH water system identification number is 45027K and the name for the water system in DOH records is "Roy, City of." The City is governed by six elected officials: five Council members and a Mayor. Administrative staff involved in water system management include the public works staff and the City clerk.

The City's current elected representatives are:

Mayor:	Rawlin "Anthony" McDaniel
Council Member:	Jessie Ashman
Council Member:	Yvonne Starks
Council Member:	Elton Poole
Council Member:	Harvey Gilchrist
Council Member:	Leon Garrison
City Clerk-Treasurer	Debbie Dearinger

The City has terminated its contract with Clearwater Utility Services, LLC effective May 4, 2017, and terminated its contract with Thurston County PUD effective October 1. 2018. The City now employs qualified staff to operate and maintain the water system.

Representatives of the City of Roy can be contacted by calling the Roy City Hall at (253) 843-1113. City Hall is located at 216 McNaught Street. The mailing address for the City of Roy is:

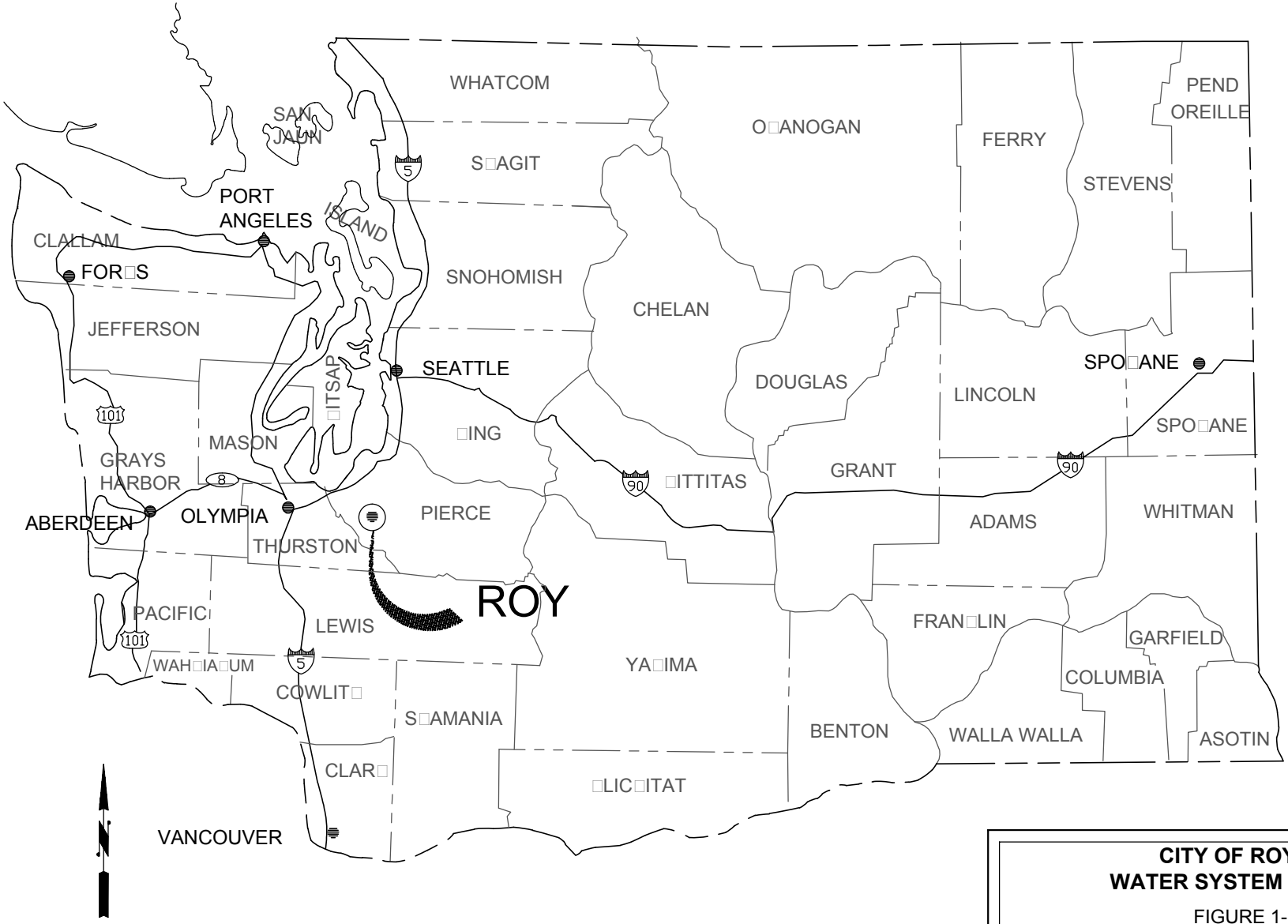
City of Roy
P.O. Box 700
Roy, Washington 98580

A copy of Roy's current Water Facilities Inventory Report (WFI) is included in Appendix A. Figure 1-1 is a vicinity map, showing Roy's location within the State of Washington. The water system map, Figure 1-2, shows the locations of Roy's major water facilities. Figure 1-3 shows local zoning and identifies historical and public properties.

SYSTEM BACKGROUND

WATER SYSTEM HISTORY

The City of Roy was incorporated in 1908, but did not have its own water supply system until 1987. Table 1-1 below shows an abbreviated history of the Roy water system.



CITY OF ROY
WATER SYSTEM PLAN

FIGURE 1-1
VICINITY MAP

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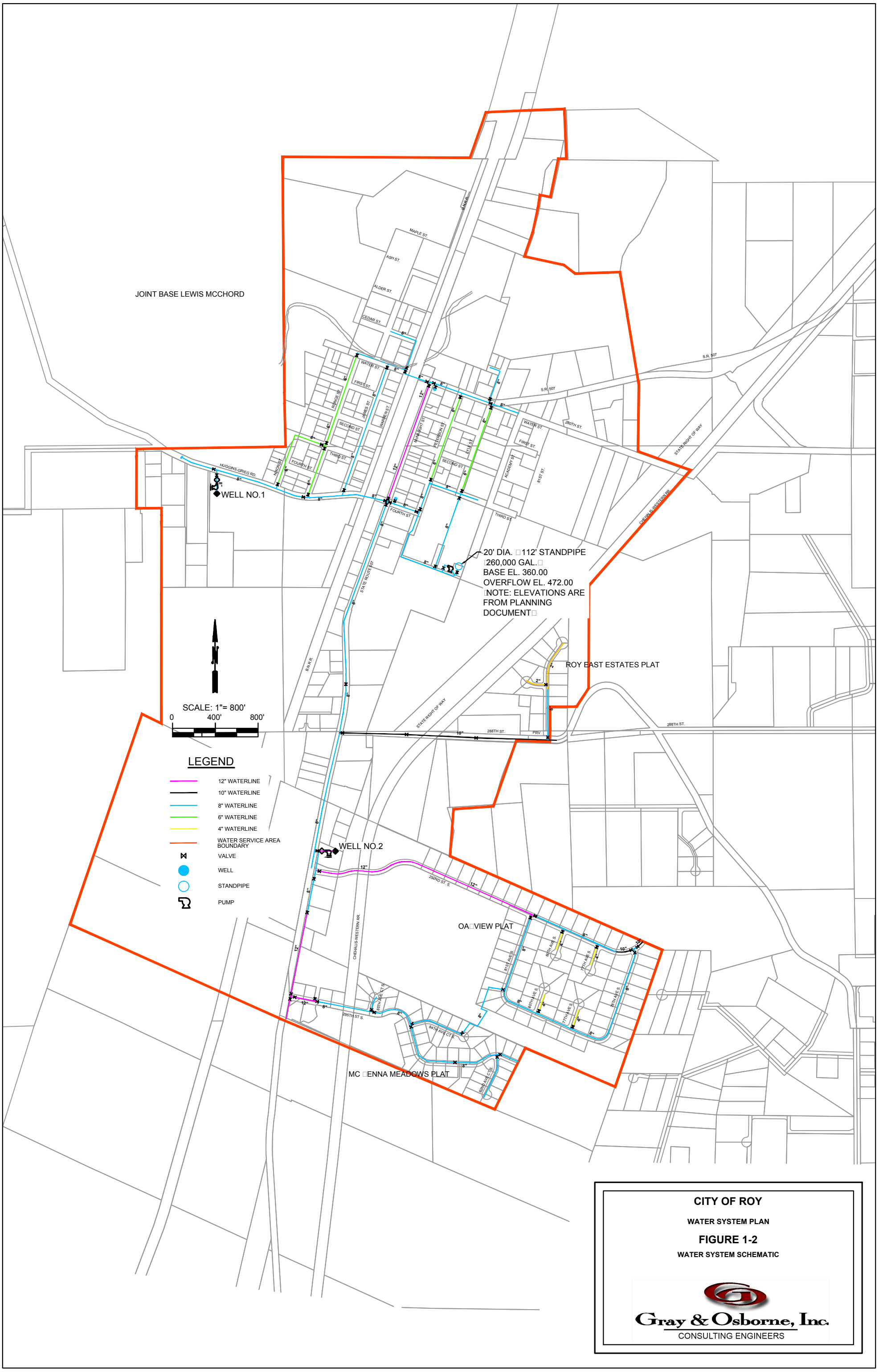
JOINT BASE LEWIS MCCHORD
MAPLE ST.
ASH ST.
ALDER ST.
CEDAR ST.
BNRR
WATER ST.
FIRST ST.
LYNGE ST.
JAMES ST.
WARREN ST.
SECOND ST.
THIRD ST.
FOURTH ST.
NIXON ST.
HUGGINS-GRIEG RD.
WELL NO.1
S.R. 507
280TH ST.
STATE RIGHT OF WAY
MCKNIGHT ST.
PETERSON ST.
KYLE ST.
ACADEMY ST.
81ST ST.
CHEHALIS-WESTERN RR.
20' DIA. 112' STANDPIPE
260,000 GAL.
BASE EL. 360.00
OVERFLOW EL. 472.00
NOTE: ELEVATIONS ARE FROM PLANNING DOCUMENT
STATE ROUTE 507
ROY EAST ESTATES PLAT
288TH ST.
PRV
SCALE: 1"= 800'
0
400'
800'
LEGEND
12" WATERLINE
10" WATERLINE
8" WATERLINE
6" WATERLINE
4" WATERLINE
WATER SERVICE AREA BOUNDARY
VALVE
WELL
STANDPIPE
PUMP
WELL NO.2
292ND ST. S.
OA VIEW PLAT
81ST AVE S.
85TH AVE CT S.
85TH AVE S.
86TH AVE S.
87TH AVE S.
77TH AVE S.
78TH AVE S.
295TH ST S.
84TH AVE CT S.
MC ENNA MEADOWS PLAT
CITY OF ROY
WATER SYSTEM PLAN
FIGURE 1-2
WATER SYSTEM SCHEMATIC
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JOINT BASE LEWIS MCCHORD

ASH ST
ALDER ST
CEDAR ST
WATER ST.
FIRST ST
SECOND
THIRD ST.
FOURTH ST.
HUGGINS GRIEG CITY ROAD
JAMES ST.
WARREN ST.
RONGE ST.
JAMES ST.
MCNAUGHT ST.
PETERSON ST.
LYLE ST.
ACADEMY ST.
81ST ST
288TH ST S
STATE ROUTE 507
292 ND ST S
295TH ST S
LYONS DR
MURRAY CR

SINGLE FAMILY
MULTI-FAMILY
COMMERCIAL-C
INDUSTRIAL PAR□
MIXED USE
URBAN GROWTH

SCALE: 1"=600'

0 300' 600'

CITY OF ROY

WATER SYSTEM PLAN

FIGURE 1-3

ZONING MAP

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TABLE 1-1

City of Roy Abbreviated Water System History

Date	Item	Description
1977	Report of Preliminary Groundwater Study, Dames and Moore, Inc.	Provided basic geotechnical information necessary for development of wells within the City. Identified favorable well sites.
1978	Comprehensive Water Plan, Harstad Associates, Inc.	Identified location of wells and reservoir, and developed a capital improvement plan.
1982	Revised Comprehensive Water System Plan, Giaudrone & Associates	Updated Harstad report and provided revised schedule for water system capital improvement plan.
1986	Wells Drilled	Wells 1 and 2 were drilled between September 1985 and January 1986.
1987	Water system constructed	Original system consisted of Well 1, a 260,000-gallon welded steel standpipe reservoir, and 12,200 LF of 6-inch and 8-inch PVC pipe.
1990	Water System Improvements	Well 2 equipped and placed in service, 3,450 LF 8-inch PVC installed along SR 507 between Well 2 and Fourth Street.
1993	Water System Expansion	Water mains extended to serve Oakview Subdivision (83 single-family connections).
1995	Water System Expansion	Water mains extended to serve McKenna Meadows Subdivision (originally called Petticoat Junction) (50 single-family connections).
1996	Water System Plan Update, Gray & Osborne, Inc.	Projected growth rates for existing and expanded Urban Growth Area (UGA) boundaries. Recommended improvements including water main extensions to serve proposed developments, a pumping system to increase effectiveness of existing storage capacity, an additional storage reservoir and telemetry improvements.
1998	Water System Expansion	Water Main Extensions to serve Zenker Subdivision on 80th Avenue Court South and 286th Street Court South off 288th Street South (15 single-family connections).
2001	Water Distribution Improvements	Approximately 1,100 feet of 12-inch PVC water main was installed on McNaught Street between Fourth Street and Water Street, and approximately 310 feet of 12-inch PVC water main was installed on Huggins-Greig Road from the Well 1 pump house to Fielder Street.

TABLE 1-1 – (continued)

City of Roy Abbreviated Water System History

Date	Item	Description
2003	Diesel Booster Pump Station	Diesel powered booster pump station at reservoir site makes entire volume of reservoir useable for standby and fire storage.
2003	Corrosion Control Treatment	An aeration system was installed at Well 1 to strip CO_2 from water, thereby raising pH of water, reducing corrosivity and reducing levels of lead and copper at the consumers' taps. Construction started in May 2003 and was completed in December 2003.
2005	Water System Plan Update	Recommended improvements including increased storage and developing a second pressure zone for upper elevations.

GEOGRAPHY

The City of Roy is located in west Pierce County, Washington, approximately 18 miles south-southwest of Downtown Tacoma. The City is bordered to the north and west by the Joint Base McChord Military Reservation. The Nisqually River passes approximately 2 miles SW of The City and the Town of McKenna is approximately 4 miles to the South. To the east and southeast are rural and agricultural lands. The terrain is mostly flat to rolling with elevations in the City of Roy water service area ranging from 310 to 438 feet. The highest elevation service at this time is at 412 feet in the Oakview Subdivision. The highest ground elevation in the vicinity of the City's service area is 438 feet on a hilltop north of the Oakview Subdivision, although this location is outside the service area.

SOILS AND GEOLOGY

Deposits in the area were laid down by a series of glacial advances and retreats, as well as airborne volcanic ash deposits and Nisqually River alluvium. The soils in the area are classified by the Soil Conservation Service (SCS) as the Spanaway Association, consisting of nearly level, somewhat excessively drained soils that formed in glacial outwash. The most common soil types in the area, as classified by SCS are Everett gravely sandy loam, Spanaway gravely sandy loam, Alderwood gravely sandy loam and Nisqually loamy sand. The underlying geology of the area includes volcanic ash, alluvium and soil over a thick (40 to 50 feet) gravely, glacial-retreat outwash known as Steilacoom Gravel. A layer of very low permeability glacial till underlies the Steilacoom gravel and restricts vertical movement of groundwater from the Steilacoom Gravel to the lower sand and gravel aquifer.

The Steilacoom Gravel has a direct connection with land surface and is therefore very vulnerable to contamination. A study conducted by the Washington State Department of Health in 1980 documented groundwater contamination in the shallow aquifer that was attributed to a combination of highly permeable soils and high density of septic tank-drainfields in the area. The City wells tap into the lower gravel aquifer, below the glacial till layer, and as such are less susceptible to contamination originating from nearby surface activities.

CLIMATE

The climate of the area is typical of Western Washington. The summers are warm and comparatively dry. Winters are cool and wet. There are no official weather stations in the City. Climate data has been estimated based on climate data available from nearby weather stations in Olympia, Tacoma, Puyallup, Yelm, Joint Base Lewis McChord. The average temperature is 51 degrees F and an average rainfall is 45 inches, which have been estimated using an average of data available from these locations weighted based on distance of the data location from the City.

ADJACENT PURVEYORS

There are four known, privately owned, water systems in the vicinity of the City. These systems are listed in Table 1-2. None of these systems have expressed any interest in obtaining water service from the City, nor do they have capacity to provide service to the City. The City water system currently has no interties with other water purveyors. The City is not likely to construct interties with any other water system in the next 20 years due to lack of any neighboring utilities. Expansion of the water system to the north and west is limited by the presence of Joint Base Lewis McChord.

TABLE 1-2

Nearby Water Systems

Name	WSDOH ID No.	Connections	Location
Travis Jack Estates	33924	56	Approx. 1 mile SE of Roy on 72nd Avenue South
Campo Verde Street and Water Association	10994	22	Approx. 2 miles SSE of Roy on 72nd Avenue South
Lake Serene Water Association	03451	34	Approx. 2 miles SE of Roy on Hinkelman Road
Wilderness Glen	31226	23	Approx. 2 miles SE of Roy on Hinkelman Road

INVENTORY OF EXISTING FACILITIES

A description of the facilities currently owned and operated by the City is provided in the following sections.

SOURCE OF SUPPLY – WELLS

The City utilizes two wells. Well 1 is located west of town on Huggins-Grieg Road, in NE 1/4 SE 1/4 Section 33, T18N R 2E. Well 2 is located south of town on SR 507 in NW 1/4 NW 1/4 Section 3 T17 N R 2E. Both wells were drilled between September 1985 and January 1986. Well 1 has had the unique well identification number, AEF 351, and Well 2 has had the unique well identification number, ABR 133, assigned by the Department of Ecology (DOE). Well 1 was equipped when the water system was first constructed in 1987 and was the system's only active well until 1990, when Well 2 was equipped and put into service. The installed pumping capacities of the wells are 490 gpm and 450 gpm, respectively. Well 2 is equipped with a standby generator.

Well 2 has levels of iron and manganese in excess of the secondary drinking water standard, making the water from Well 2 less desirable. Iron and manganese in a public water supply can cause staining of clothes and water fixtures. Also deposits of iron and manganese in water mains can occasionally break loose causing dirty water complaints. However, the presence of iron and manganese in water from Well 2 is not a public health concern. On the other hand, Well 2 is less susceptible to contamination from surface activities due to its much greater depth. To date there has been no indication of contamination of either well except for the naturally occurring iron and manganese in Well 2. Well logs are included in Appendix B. Basic data about the wells is included in Table 1-3. The control system is set to call lead and lag wells based on reservoir levels, and to automatically alternate the lead and lag positions of the wells.

The City leases the land that Well 1 is located on, the northwest 200-foot by 200-foot portion of parcel 0218334032 at the 8700 block of Huggins Greig Road South, from the Roy Pioneer Rodeo Association. The term of the lease began September 1, 1983 and continues until August 31, 2033. The City currently pays $2,800 a year until 2019 and the rental agreement is reviewed by the Lessor and Lessee every 5 years.

TABLE 1-3

Well Data

Parameter	Well 1	Well 2
DOE ID Number	none	ABR 133
Location	West of town on Huggins-Grieg Road, in NE 1/4 SE 1/4 Section 33, T18N R2E	South of town on SR 507 in NW 1/4 NW 1/4 Section 3 T17 N R 2E
Date Drilled	September 1985 to January 1986	September 1985 to January 1986
Date Placed in Service	1987	1990
Casing Size, inches	12	12
Depth, feet	154	500
Static Water Level, feet	8	60
Screens	Johnson SS 100-slot, 79.8 to 90.2 feet, and 94.8 to 100.2 feet	Johnson SS 20, 25, and 30 slot, 443.9 to 469.4 feet, and 478.2 to 488.5 feet
Pump	Hays, 10KK bowl, type H impeller, 7-inch cone strainer	Hays, 10KK bowl, type H impeller, 7-inch cone strainer
Motor Horsepower	40	50
Production Capacity, gpm	490	450

TREATMENT

The City provides treatment of their water supply including disinfection with liquid chlorine at each well. The pH at Well 1 is adjusted for corrosion control purposes by a packed tower aeration system.

WATER RIGHTS

The Washington Stated Department of Ecology Water Rights Application System (WRATS) lists two water rights certificates, two water rights applications and a water right claim for the City of Roy. These water rights are summarized in Table 1-4. The City has certificated rights with priority dates of 1983 and 1984 for a total of 600 gpm and 137.5 Acre-Feet per Year (AF/Y) of primary right. These rights are evenly split between Wells 1 and 2. In 1995 the City applied for additional instantaneous and annual water rights on both wells to cover the installed pumping capacity and projected usage of the wells. The City also has a water right claim for 10 gpm and 2 AF/Y from a well located in the NW 1/4 of Section 34, Township 18N Range 2E with a priority date of 1932.

TABLE 1-4

City of Roy Water Rights

Water Right Number	Status	Point of Withdrawal	Priority Date	Instantaneous Right, gpm	Annual Right, AF/Y
G2-26452C	Certificate	Well 1	12/14/83	300	137.5
G2-26633C	Certificate	Well 2	12/27/84	300	137.5(1)
Total Certificated Rights				600	137.5(1)
G2-29313A	Application	Well 1	10/30/95	490(2)	148
G2-29312A	Application	Well 2	10/30/95	500(2)	148
Total Additional Rights Applied For				990(2)	296
G2-00933CL	Claim	Well(3)	1932	10	2

(1) The annual right of 137.5 AF/Y on Groundwater Certificate G2-26633 is entirely supplemental to the annual right of 137.5 AF/Y on Groundwater Certificate G2-26452.

(2) Applications G2-29313A and G2-29312A were intended to allow for higher withdrawal rates from Wells 1 and 2. The 490 and 500 gpm requested, respectively, would replace the existing 300 gpm instantaneous right at each well.

(3) No well currently developed.

STORAGE

The City operates a 260,000-gallon welded steel standpipe reservoir that was constructed in 1986. The reservoir is located southeast of downtown as shown in Figure 1-2. The reservoir is 20 feet in diameter and 112 feet from base to overflow, with a base elevation of 376 feet and an overflow elevation of 488 feet. The reservoir is equipped with a screened vent, an overflow and drain. The water level in the reservoir regularly oscillates between 487.5 feet (the well pumps-off level) and 486 feet (the lead well pump-on level). One well is normally able to meet system demand. However, if demand exceeds the output of the lead well for a long enough period of time, the lag well will automatically turn on when the water level in the reservoir reaches 484.5 feet (the lag well pump-on level). The control system alternates lead and lag wells each time the water level reaches the well pumps-off level.

With the completion of the new, emergency water booster pumping system at the reservoir, a greater volume of the reservoir is usable for standby and fire storage purposes. Table 1-5 summarizes reservoir dimensions and capacities.

TABLE 1-5

Reservoir Dimensions and Capacities

Parameter	Value
Year constructed	1986
Type	Welded Steel
Diameter, feet	20
Overflow Elevation, feet	488
Well Pumps Off Level, feet	487.5
Lead Well Pump On Level, feet	486
Lag Well Pump On Level, feet	484.5
Diesel Booster Pump on Level, feet	482
Minimum Operating Level, feet	378
Base of Reservoir, feet	376
Volume per Foot of Reservoir Depth, gallons	2,350
Gross Volume, Base to Overflow, gallons	263,200

DIESEL BOOSTER PUMP SYSTEM

A diesel powered booster pump system has been installed at the reservoir site to sustain water system pressure when the reservoir level is below 482 feet elevation, as determined by a pressure transducer located in the reservoir. The booster pump station consists of one 1,600-gpm diesel powered pump, sized to meet maximum day demand plus fire flow with the water system wells operating. The pump system includes a pressure relief valve, which allows water to pass by the booster pump and back to the reservoir, thus allowing the booster pump to maintain system pressure at lower flows and allowing the wells to refill the reservoir while maintaining adequate system pressure. The emergency booster pump system makes most of the water stored in the reservoir available for use at the minimum required system pressure.

PRESSURE ZONES

The water system operates on a single pressure zone. The elevations of water services, based on ground elevations shown on topographic maps, range from 310 feet in downtown to 412 feet at the highest elevation in the Oakview subdivision. Based on these elevations, at the well pumps-off level of 487.5 feet the static pressure in the distribution system ranges from 33 psi to 77 psi. At the lag well pump-on level of 484.5 feet, the static pressure ranges from 31 psi, to 76 psi. As described above, if the reservoir level drops below 482.5 feet the diesel booster pump will turn on until the reservoir level increases. The pressure relief valve will sustain the pressure on the system until as the wells refill the reservoir above 482.5 feet elevation. The City occasionally receives complaints about low pressure in the Oakview subdivision.

DISTRIBUTION SYSTEM

The City's distribution system consists of approximately 36,200 linear feet of pipe, ranging in size from 6-inch to 12-inch diameter. Service lines are not included in this total. A breakdown of the pipe sizes and materials is provided in Table 1-6.

TABLE 1-6

Summary of Water Distribution Mains

Pipe Diameter (inches)	Material	Approximate Length of Pipe in System (linear feet)(1)	Percent of Total
12 inch	PVC	5,718	15%
10 inch	PVC	1,238	3%
8 inch	PVC	21,989	58%
6 inch	PVC	3,795	10%
4 inch	PVC	4,650	12%
2 inch	PVC	450	1%
Total		**37,840**	**100%**

(1) Pipe lengths and materials estimated from water system record drawings.

SERVICE CONNECTIONS

The City had a total of 324 service connections in December of 2015, with 300 residential and 24 commercial service connections. Water system connections history has been estimated based on records of active water service accounts. Services may be inactivated temporarily when a house or business is vacated then reactivated when the house or business is reoccupied. All residential connections are 5/8-inch meters. Non-residential meters are mostly 1-inch meters, with three 1-1/2-inch meters, and four 2-inch meters. Also, one of the accounts classified as non-residential by the City is a mobile home park that serves up to 28 mobile homes.

SYSTEM INVENTORY AND ANTICIPATED REPLACEMENTS

An inventory of the City's water system based on City records is provided in Table 1-7, along with years of installation and anticipated years of replacement based on assumed service lives.

TABLE 1-7

System Inventory

System Component	Quantity	Service Life	Year of Installation	Year to Replace	Estimated Project Cost ENR:11443
Well 1 Hays, 10KK Bowl, Type H Impeller, 7-Inch Cone Strainer, 40 hp, 490 gpm Pump	1	25	1986	2011	$152,000
Well 2 Hays, 10KK Bowl, Type H Impeller, 7-Inch Cone Strainer, 50 hp, 450 gpm Pump	1	25	2017	2042	$132,840
20' X 112' Welded Steel Standpipe (260,000 gallons)	1	75	1986	2061	$880,000
2" PVC	450	75	2003	2078	$13,000
4" PVC	1,650	75	1994	2069	$323,000
6" PVC	3,795	100	1987	2087	$414,000
8" PVC	16,006	100	1987	2087	$2,273,000
8" PVC	2,225	100	1994	2094	$316,000
8" PVC	3,758	100	1994	2094	$534,000
10" PVC	200	100	1994	2094	$31,000
10" PVC	1,038	100	1998	2098	$160,000
12" PVC	2,200	100	1993	2093	$373,000
12" PVC	1,410	100	2001	2101	$239,000
12" PVC	2,108	100	1987	2087	$358,000
12" GV	1	100	1993	2093	$5,000
12" GV	10	100	1987	2087	$43,000
10" GV	2	100	1994	2094	$8,000
10" GV	3	100	1998	2098	$11,000
8" GV	4	100	1994	2094	$11,000
8" GV	37	100	1987	2087	$97,000
6" GV	3	100	1987	2087	$6,000
4" GV	4	100	1994	2094	$7,000
2" GV	1	100	2003	2103	$1,000
Booster Station Pump, Diesel 1,600 gpm	1	25	2003	2028	$190,000
Aeration Tower, 60 Inches in Diameter, 40 Feet Tall, Skid Mounted Booster Station	1	50	2003	2053	$352,000
Aeration Tower Blower: 1,635 scfm	1	25	2003	2028	$23,000
Prominent Dosing Pump No. BT5B1008NPT2000UD010000	1	25	2014	2039	$4,000
IWAKI Dosing Pump No. EWN-C16VCURA	1	25	2014	2039	$4,000

The system was developed beginning in the 1980s and most water system components are relatively new. The Well 2 pump was replaced in 2017 and the Well 1 pump was installed in 1986; however, the City has not had issues with the pump at this time. The Well 1 pump is anticipated to require replacement in 2020 and is included in the capital improvement plan in Chapter 9. Based on the system inventory, assumed service lives, and a history of no recent water main breaks, an annual pipe replacement capital improvement project is not recommended at this time. The City conducted a leak detection survey of the entire system in 2013 and no leaks were found.

SYSTEM CONTROL

Float switches in the reservoir send signals to the programmable controller located in the Public Works Office at City Hall. The programmable controller uses the input signals from the reservoir float switches to generate output signals turning on lead and lag well and high and low reservoir alarms. There is also a separate control system for the diesel booster pump. A pressure transducer in the bottom of the reservoir generates a 4-20 mA signal that tells the booster pump station when the reservoir level is low enough to require the booster pump station to start.

RELATED PLANNING DOCUMENTS

The DOH Water System Design Manual, December 2009 was a guiding document in the preparation of this Plan.

The following documents were also consulted:

City of Roy Corrosion Control Study, March 2001, Gray & Osborne, Inc.
The purpose of this report was to document results of lead and copper sampling from 1996 through 1999 and to evaluate and recommend options for complying with the lead and copper rule. The preferred options were to either find a new well that does not require corrosion control treatment or to provide pH adjustment at Well 1 using aeration.

Pierce County Coordinated Water System Plan, October 2001, Pierce County Public Works
This document addresses coordination of the development of public water supply systems throughout the Critical Water Supply Service Area, which encompasses the entirety of Pierce County. Designated service areas for individual water system are assigned and regional water system standards are defined, including fire flow and minimum water main sizes. Procedures are also specified for amending designated water system service areas.

City of Roy Comprehensive Water System Plan, 2005, Gray & Osborne, Inc.
This document includes a detailed description of the water system, hydraulic analysis and recommended improvements. These recommended improvements included ground

storage and a booster station to meet fire flow duration and improve pressure in the south end of the system, iron and manganese treatment for Well 2, backup power supply for Well 1, and the creation of a high pressure zone for the Oakview subdivision.

City of Roy Comprehensive Plan, 2015

The Comprehensive Plan is a broad statement of the Community's vision for the future and contains policies primary to guide the physical development of the City, as well as certain aspects of its social and economic character. The Plan steers regulations, implementation actions and services in a direction that supports the vision.

SERVICE AREA CHARACTERISTICS

The City of Roy water system serves properties inside the city limits and portions of the Roy Urban Growth Area (UGA) boundary, with the exception of service provided to Roy East Estates, which is outside the city limits and UGA. Per the Municipal Water Law, the City has a duty to provide retail water service within its retail service area, and if appropriate, also designate a future service area and wholesale service area.

The 1996 Water System Plan designated a future water system service area that extended well beyond City limits in the expectation that the City would eventually develop a UGA boundary of approximately the same dimensions. Pierce County, however, has resisted expansion of the City's UGA boundary because the City does not provide sewer service, which the County has contended is an essential urban level of service. In 1998 the County allowed expansion of the City's UGA boundary to include the McKenna Meadows and Oakview subdivisions, because the areas were already platted to a typical urban density, and the City was pursuing a sewer feasibility study. Again, in 1999, Pierce County approved an expansion of the City's UGA boundary to take in approximately 23.7 acres south of 288th Street because the City was in the process of developing a sewer plan. When the sewer plan was completed, however, the preliminary study of alternatives for providing sewer service was evaluated by the City and it was determined that providing sewer service was not economically feasible. Until the City finds that a sewer system is economically feasible it is anticipated that the County will not allow the City's UGA boundary to expand any further.

The water supply service area has not changed since the 2005 Water System Plan. The water system service area was submitted to and approved by the Pierce County Water Utility Coordinating Committee prior to the 2005 Water System Plan. The Water System Service Area boundary, City Limits and UGA boundary are shown in Figure 1-4. The City is under the jurisdiction of the Tacoma-Pierce County Health Department and the Pierce County CWSP which has intent, ordinances, and policies to not allow the proliferation of wells in the service area of a Group A water system.

POLICIES AND CONDITIONS OF SERVICE

DOH has established a list of policies that should be addressed in a water system comprehensive plan. Table 1-8 provides a list of these DOH policies and definitions. The City's current policies are also included in this table. While the City has a duty to serve new connections, there are four threshold factors that the circumstances must meet. These are:

1. The municipal water supplier has sufficient capacity to serve water in a safe and reliable manner.

2. The service request is consistent with adopted local plans and development regulations.

3. The municipal water supplier has sufficient water rights to provide service.

4. Service can be provided in a timely and reasonable manner.

BRANDENBURG LA□E

MUC□ LA□E

JOINT BASE LEWIS MCCHORD

JOINT BASE LEWIS MCCHORD

MUC□ CREE□

MAPLE ST

ASH ST

ALDER ST

CEDAR ST

WATER ST.

FIRST ST

SECOND

THIRD ST.

FOURTH ST.

RONGE ST.

JAMES ST.

MCNAUGHT ST.

WARREN ST.

PETERSON ST.

LYLE ST.

ACADEMY ST.

81ST ST

HUGGINS GRIEG CITY ROAD

LACAMAS CRE

73RD AVE S.

LEGEND

CITY LIIMITS

UGA BOUNDARIES

WATER SERVICE AREA BOUNDARIES

288TH ST S.

STATE ROUTE 507

292ND ST S.

LYONS DR. SW

295TH ST S.

ROAD

SCALE: 1"=800'

0 400' 800'

CITY OF ROY

WATER SYSTEM PLAN

FIGURE 1-4

SERVICE AREA

Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE 1-8

City of Roy Service Area Policies

DOH Policy Name	Policy Description	Current Policy
Annexation Policy	How annexation relates to the provision of water service.	The City of Roy has required property owners to sign an agreement not to oppose annexation as a condition of obtaining water service. 2005 Water System Plan.
Direct Connection and Remote System Policy	The conditions under which new developments may connect to existing water system, and whether satellite systems will be allowed.	The City of Roy would prefer to provide water utility service only by direct connection to the Roy water system. However, the City would consider taking control of a satellite system if it is in the City's best interest to do so. 2005 Water System Plan.
Design and Performance Standards Policy	Minimum design and performance standards for new development.	State minimum design recommendations apply. A copy of Developer Standards is included as Appendix C.
Surcharge for Outside Customers	Purveyor's surcharge for customers outside corporate limits.	City Ordinance No. 778 and 784 set a 50 percent surcharge on water rates for water customers outside city limits.
Oversizing Policy	Purveyor provides funds to install larger facilities to allow for future development.	The developer will cover the cost of oversizing unless special provisions are made in the plat approval process. City Code 11-47.
Cross-Connection Control Program	Policy on regulations of cross connections, including steps taken if a cross-connection is discovered.	The City has adopted a cross connection control ordinance. A copy of the ordinance in included in Appendix D.
Extension Policy	Policy regarding extension of the system, including identity of responsible party. Design standards and payment included in conditions of service.	The costs of water main extensions are to be borne by the benefited parties. Unless specific prior arrangements are made with the City, the developer is to bear the cost of water main extensions and other facilities directly required to provide water service to the developer's properties. City Ordinance 921 allows latecomer agreements, prorated repayment of water main costs for properties that connect at a later date to water mains installed by the developer.

Signed Local Government Consistency Review Checklists are required from Pierce County and the City of Roy. These forms are included in Appendix A. A copy of the Nisqually Watershed Detailed Implementation Plan has been included in Appendix O.

Pierce County Planning and Land Services has established a policy concerning building permits and subdivision applications which propose using new permit exempt wells as their potable water source. It shall be determined if a building permit or subdivision has legal water based on findings of a required hydrogeological study and Pierce County Planning and Land Services shall issue a building permit or subdivision if it is demonstrated that the new permit exempt well will not impact or impair established instream flows and closures as identified by the State.

APPLICATION FOR NEW SERVICE

A certificate of capacity, guaranteeing the availability of public facility is issued upon approval of a development permit. A certificate of capacity expires if the accompanying development permit expires or is revoked. A certificate of capacity may be extended according to the same terms and conditions as the accompanying development permit. If the development permit is granted an extension, the certificate of capacity is extended as well. If the accompanying development permit does not expire, the certificate of capacity shall be valid for 5 years.

All applications for permits for the use of water shall be made to the clerk-treasurer. The applicant is required to pay a nonrefundable permit fee and the permit expires if connection to the water system is not made within 90 days of final inspection or expiration of the related building permit. No permit shall be issued until a building permit or use permit is issued for the structure or use that will be served by the connection. Each new water service connection requires payment of the system development charge or the latecomer reimbursement fees. A new customer at an existing connection shall apply for service on a form available from the city clerk-treasurer and shall pay a new account fee.

CHAPTER 2

BASIC PLANNING DATA

INTRODUCTION

Basic water system planning data such as historical growth, water production and consumption records, and population projections are presented in this chapter. This information is used in the calculation of water demand forecasts at the end of the chapter. In addition, this information is used in later chapters to evaluate the capability of the existing system to meet existing and future needs.

HISTORICAL POPULATION AND SERVICE CONNECTIONS

There are various methods that can be used to estimate the population served by the City of Roy water system. Two methods commonly used are records and projections of the Washington State Office of Financial Management (OFM) population estimates, and estimates based on water system connection records. When a water system serves strictly within city limits and serves all residents within city limits, then OFM estimates and projections are useful to estimate the population served by the water system. However, if a water system serves outside the city limits, or if there are other water systems serving inside city limits, then OFM population estimates and projection do not directly apply. In the latter case, service area population can be estimated based on water system residential services and OFM reported average numbers of persons per household.

OFM POPULATION ESTIMATES

OFM population estimates and projections were evaluated for the City of Roy and determined to be accurate for estimating the City's water system service area population history. The City maintains records of connection which include information on connections outside of the City. In addition, the City is aware of 28 residences in the mobile home park that are served by commercial meter and of the existence of residences within the City that are not connected to the City water system. Because of the availability of City connection records the number of residential connections actively served by the City is well known.

The OFM population estimates allow for the calculation of the residential occupancy rate in persons per household within the City of Roy. The impact of connections served outside of the City limits and residences within the City that are not served on the calculated people per household can be considered de minimis because of their small number compared to the total population. Using the City records of the number of connections served by the City and the calculated residential occupancy rate, an

estimated service area population may be calculated. Population estimates are discussed further in this chapter.

SERVICE CONNECTIONS

The water system's total number of active service connections for December 2015, as stated in Chapter 1, was 324, including 300 residential and 24 commercial service connections. Table 2-1 shows the record of water system connections for each year since 2010. Table 2-1 shows no growth in active water system connections.

TABLE 2-1

Water System Connections History

Year	Residential Connections	Commercial Connections[(1)]	Total Connections	% Change
2010	299	25	324	-
2011	299	25	324	0%
2012	299	25	324	0%
2013	299	25	324	0%
2014	299	25	324	0%
2015	300	24	324	0%

(1) One commercial connection is a master meter to a mobile home park that serves 28 mobile homes.

Note: Table 2-1 shows active connections. These are connections that are actually using water. Existing service connections to vacant houses and commercial occupancies are not counted in this table.

The City of Roy currently has a total of 481 committed water connections based on current records (2017).

SERVICE AREA POPULATION ESTIMATES

In the 2005 Water System Plan, a residential occupancy rate of 3.02 persons per household was used based on a 2001 census conducted by the City. This number was not used in this plan because the City of Roy has not produced an updated census, the occupancy rate is unusually high when compared to other systems, and the impact of variation between City limits and service area boundaries on the residential occupancy rate has been deemed de minimis. **The calculated residential occupancy rate based on the 2010 US Census average of 2.62 will be used for this plan.** The City's service area population is estimated using connections records from Table 2-1, adding 28 mobile homes, and using a 2.62 persons per household occupancy rate. Service area population estimates are presented in Table 2-2.

TABLE 2-2

Estimated Service Area Population

Year	Residences Served[(1)]	Estimated Service Area Population[(2)]
2010	327	856
2011	327	856
2012	327	856
2013	327	856
2014	327	856
2015	328	858

(1) Residences served include residential connections from Table 2-1 plus 28 mobile homes served on a commercial meter.

(2) Population estimates based on 2010 Census, which found 2.62 persons per household. Note that this population estimate does not agree with estimates of City limits population due to water services outside City limits and residences in City limits that are not on City water.

WATER USE

Water production and consumption records are reviewed in this section. Based on City records, average and maximum day water system production requirements, and distribution system leakage are estimated. These values are used later, together with population growth projections, to project future water system requirements.

WATER PRODUCTION HISTORY

Water production data is collected from source meters and reported on a monthly log. Table 2-3 summarizes the water system's annual source production history for the years 2010 through 2015. These values were calculated from monthly source meter logs provided by the City of Roy. Table 2-4 contains production by month for both Well 1 and Well 2 for 2015.

TABLE 2-3

Water Production Records

Year	Well 1, MG	Well 2, MG	Total, MG	Total, gpd
2010	13.46	8.50	21.96	60,200
2011	11.08	10.57	21.65	59,300
2012	11.68	7.75	19.43	53,100
2013	9.09	10.43	19.52	53,500
2014	10.00	9.17	19.16	52,500
2015	17.16	3.54	20.70	56,700

TABLE 2-4

2015 Monthly Water Production

Month	Well 1, MG	Well 2, MG	Total, MG	Total, gpd
January	658,390	638,510	1,296,900	41,800
February	834,690	-	834,690	29,800
March	1,115,470	-	1,115,470	36,000
April	1,438,520	-	1,438,520	48,000
May	1,071,450	457,600	1,529,050	49,300
June	1,348,010	1,637,080	2,985,090	99,500
July	2,642,010	726,060	3,368,070	108,600
August	2,713,910	-	2,713,910	87,500
September	1,565,130	38,560	1,603,690	53,500
October	1,123,630	-	1,123,630	36,200
November	1,196,270	-	1,196,270	39,900
December	1,453,600	44,880	1,498,480	48,300
Total	**17,161,080**	**3,542,690**	**20,703,770**	**56,700**

Water Production Per Capita

Annual water demand per capita for the City from 2010 through 2015 is shown in Table 2-5. This table shows that estimated per capita production has ranged from 61 to 71 gallons per capita per day (gpcd), with an average of 66 gpcd, during this 6-year period. For design purposes, to assure that an adequate supply of water is planned, average day per-capita water consumption of **70 gpcd** will be used.

TABLE 2-5

Water Production per Capita (2010-2015)

Year	Estimated Service Area Population[(1)]	Average Daily Demand, gpd[(2)]	Estimated Daily Per Capita Production, gpcd
2010	856	60,169	70
2011	856	59,314	69
2012	856	53,086	62
2013	856	53,484	62
2014	856	52,503	61
2015	858	56,723	66
Average			**65**

(1) Estimated Service Area Population is from Table 2-2.

(2) Average Daily Production is the Total Annual Production from Table 2-3 divided by the number of days per year (365 or 366 for leap year).

Maximum Day Demand

Monthly demand records 2012 to 2015 have been reviewed. Using a Maximum Day to Maximum Month Average Day Demand (MMADD) ratio of 1.7 per the DOH Design Manual, a Maximum Day Demand (MDD) was calculated. Dividing the MDD by the Average Day Demand (ADD) yields a maximum day to average day ratio. An Average MDD to ADD ratio of 3.12 was calculated. The MDD to ADD ratio for 2015 was the highest and this ratio will be used for maximum day estimation purposes in the remainder of this report. The maximum day to average day ratio is shown in Table 2-6.

TABLE 2-6

Maximum Day to Average Day Ratio, 2012 to 2015

Year	Average Day Demand, gpd	Maximum Month Average Day Demand, gpd	Maximum Day Demand, gpd(1)	MDD to ADD Ratio
2012	53,086	104,449	177,562	3.23
2013	53,484	91,677	155,852	2.84
2014	52,503	95,520	162,385	2.96
2015	56,723	111,488	189,530	3.45

(1) Based on MMADD multiplied by 1.7 per DOH Design Manual.

WATER USE HISTORY

Average Water Use

The City's total residential and commercial water consumption for 2010 through 2015 is presented in Table 2-7. This information was derived from monthly billing records.

TABLE 2-7

Water Consumption Records

Year	Residential Sales, gpd[(1)]	Commercial Sales, gpd	Total Use Records, gpd
2010	54,930	5,695	60,625
2011	50,306	5,467	55,773
2012	48,959	6,208	55,167
2013	44,688	5,304	49,993
2014	46,161	5,358	51,519
2015	47,298	7,163	54,461

(1) Residential water use in Table 2-7 does not include water use by the 28-connection mobile home park, since that water is sold as commercial under the City's billing system.

Figure 2-1 shows monthly water use since 2010. Clear patterns of winter and summer water use can be seen. The figure demonstrates that the majority of water use is residential.

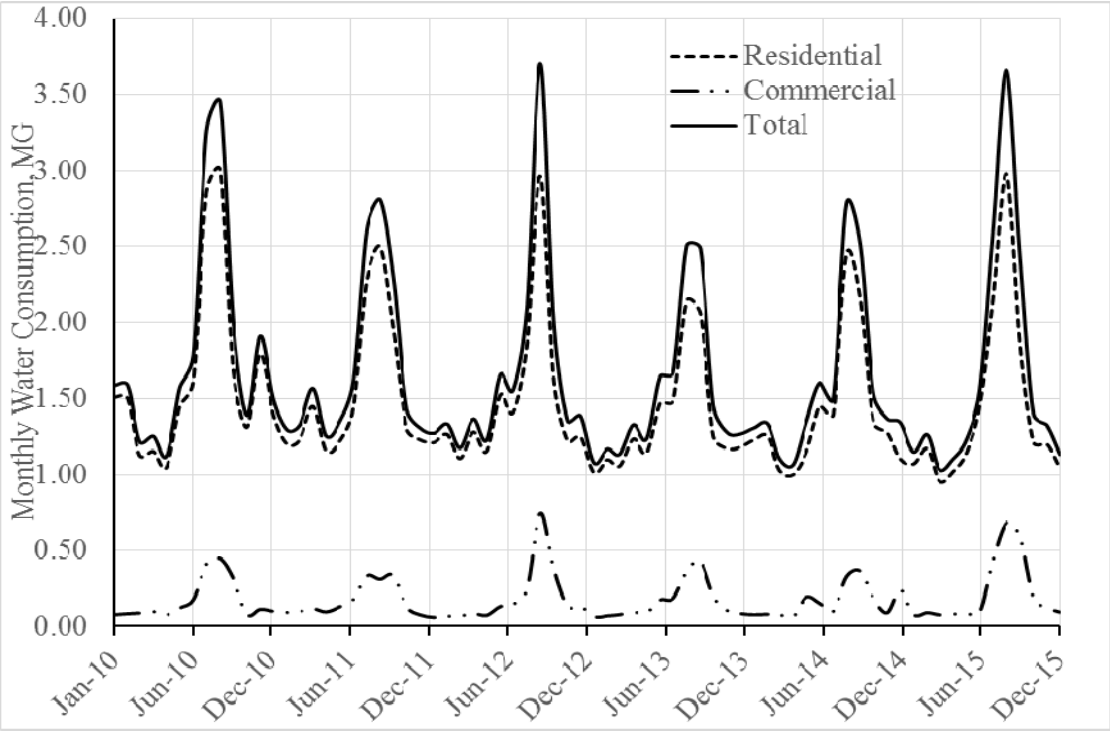


FIGURE 2-1

Monthly Water Consumption

DISTRIBUTION SYSTEM LEAKAGE

Distribution System Leakage (DSL) is defined as the difference between metered source production and metered and credibly estimated authorized consumption. DSL includes water loss due to leaks or unauthorized uses such as illegal service connections, accounting errors, meter inaccuracies, and water leaving the system for unmetered uses. The Municipal Water Law and Water Use Efficiency Rule set a limit of 10 percent DSL based on a 3-year rolling average.

Table 2-8 lists the annual water production and water sales records for the years 2010 through 2015 and calculates DSL for this time period. The results indicate a net positive DSL. There are instances of negative DSL in 2010 and 2012 and this was due to source meters under reporting. The meters were replaced in 2012 and the City thinks meter reading errors or discrepancies between the time periods analyzed contributed to this error. The water system DSL ranged from –3.64 percent to +6.53 percent, and averaged +2.33 percent.

TABLE 2-8

Distribution System Leakage

Year	Production, gpd[(1)]	Total Water Use, gpd[(2)]	DSL		
			gpd	Percent of Production	3-Year Rolling Average
2010	60,169	60,625	(457)	-1%	-
2011	59,314	55,773	3,542	6%	-
2012	53,086	55,017	(1,930)	-4%	1%
2013	53,484	49,993	3,491	7%	3%
2014	52,503	51,519	984	2%	2%
2015	56,723	54,461	2,262	4%	4%
Average				**2%**	

(1) Water Production is from Table 2-3.
(2) Consumption is from Table 2-7.

EQUIVALENT RESIDENTIAL UNITS

Use of Equivalent Residential Units (ERUs) is a way to express water use by non-residential customers as an equivalent number of residential customers. ERUs are calculated by dividing the volume of water utilized in the single-family customer class by the number of single-family residential connections. This number defines the average single-family residential water use or one ERU. Table 2-9 shows the daily water usage per residential connection ranging from as 137 to 168 gpd since 2010 with an average of 149 gpd. For planning purposes, **one ERU will be estimated as 150 gpd**.

TABLE 2-9

Average Day Consumption per Residential Connection

Year	Residential Sales, gpd	Residences Served	Average Per Connection Residential Sales, gpd
2010	54,930	327	168
2011	50,300	327	154
2012	48,830	327	150
2013	44,680	327	137
2014	46,160	327	141
2015	47,290	328	144
Average			**149**

The volume of water used by commercial customer class can be divided by the average single-family residential water use to determine the number of equivalent residential units utilized by the other customer classes. It should be noted that the number of ERUs represented by non-residential users will change from year to year because commercial users do not use the same amount of water every year. It should also be noted that the definition of an ERU will change from year to year because residential users also do not use the same amount of water every year. The numbers of ERUs for all customer classes are shown in Table 2-10.

TABLE 2-10

Equivalent Residential Units for 2015

Service Type	Average Day Consumption in 2015, gpd	Number of Connections at the End of 2015	ERUs(1)
Residential	47,298	328	328
Commercial	7,163	24	50
DSL	2,262	-	16
Total	56,723	352	394

(1) Based on 2015 ERU value of 144gpd.

FUTURE POPULATION AND WATER DEMANDS

Water production records and historic growth rates derived in the previous section are used in this section to project future water system demands.

PROJECTED POPULATION

Because the water service area is partly in the City of Roy Urban Growth Area (UGA) and partly outside the UGA, and also because some residences in the City of Roy water service area are currently not on city water, growth estimates for the water service area will be different from growth estimates for the City of Roy UGA in the City of Roy Growth Management Plan. Growth within the UGA will be based on the projections from the Growth Management Plan, corrected by estimated residences not on city water. Growth outside the UGA will be based on an estimated buildout population and an estimated rate at which the area will approach buildout saturation.

Projected Water Service Population Within the UGA

Projected population within the UGA has been obtained from the City of Roy Growth Management Plan. The projected population is for all persons living within the city limits and the UGA. Currently there are 11 residences in city limits not on City water. For water system population projection purposes it will be assumed that these residents will gradually connect to City water, one per year until they are all connected. Table 2-11 shows the projected UGA population and the projected water service population within the UGA.

TABLE 2-11

Projected Water Service Population within UGA

Year	Projected UGA Population[(1)]	Connections in UGA Not on City Water[(2)]	Population in UGA Not on City Water[(3)]	Projected UGA Population on City Water
2016	948	11	29	919
2017	957	10	30	927
2018	966	9	27	939
2019	976	8	24	951
2020	985	7	21	963
2021	994	6	18	976
2026	1,039	1	3	1,036
2031	1,085	-	-	1,085
2036	1,129	-	-	1,129
Buildout	1,129	-	-	1,129

(1) From City of Roy Comprehensive Plan, 2015.
(2) Estimated that one existing residence not currently on City water will hook up to City water each year until all are hooked up.
(3) Based on 2.62 persons per household.

Projected Water Service Population Outside UGA

Projected water service population outside the UGA will be based on total buildable lots in the water service area outside the UGA, the average household occupancy of 2.62 persons per household for the City of Roy, and an estimated rate at which these properties may connect to the City of Roy water system.

Buildable Lots Outside the UGA

The water system service area outside the UGA consists of approximately 389 acres subdivided into 107 identified tax parcels. Existing lots are considered buildable if they are of sufficient size for a residence and septic system, or if they have a neighboring lot of sufficient size such that a lot line adjustment could make both lots buildable, and if they do not have an existing use incompatible with development. Current Pierce County On-site Waste Regulations require a minimum lot size of 12,500 square feet (0.287 acre) for a single family residence on an on-site wastewater (septic) system if it is served by an approved public water supply. Of the existing 107 parcels, there are 16 parcels that are unbuildable; 14 because of insufficient size and no way to accomplish a lot line adjustment, one because it is an existing cemetery and one because it is a long narrow strip that belongs to Bethel School District. That leaves a total of 91 buildable existing lots.

The entire area outside the UGA is zoned by Pierce County as R-10 or ARL (Parcel No. 0218334006), with a maximum overall density of one residence per 10 acres. There are five existing parcels that are larger than 20 acres each, and therefore represent more than one potential future residence. These lots comprise a total of 182.57 acres and could be divided into a total of 18 lots, or 13 additional lots. There are significant wetlands within the areas encompassed by the larger lots, but since the minimum lot size is 1 acre and the overall density would include wetland areas, it is estimated that the wetlands would not affect the ability to develop these lots at the zoned density of 1 unit per 10 acres. Therefore, it is estimated that the maximum number of future water services outside the UGA is 104. Table 2-12 summarizes the estimated buildable lots in the water service area outside the UGA.

TABLE 2-12

Estimated Buildable Lots Outside the UGA

Existing Lots	107
Unbuildable Lots	16
Buildable Lots	91
Lots Greater than 20 Acres	5
Potential Lots from Existing Lots Greater Than 10 Acres	13
Total Potential Buildable Lots	104

Buildout Population Projection and Growth Rate Outside the UGA

At 2.62 persons per household, the buildout population for the water service area outside the UGA is estimated at 272 persons. There are currently 23 water services outside the UGA, representing 60 persons, so the potential additional water service population is 212 persons. Half of buildout will be estimated to occur within 20 years. This type of growth rate is modeled mathematically as follows:

$$y = P_0 + \frac{ax}{x+b}$$

where:

y	=	the population after x years	
P_0	=	Initial Population	= 60
a	=	Additional Population Potential	= 212
x	=	Years of Growth Elapsed	
b	=	Years until half of Projected Growth Occurs	= 20

Total Projected Service Area Population

Using the formula above for projected population outside the UGA and the projected populations from the Table 2-11 for inside the UGA, the estimated water service area population is presented in Table 2-13 and Figure 2-2.

TABLE 2-13

Projected Service Area Population

Year	Projected In-UGA Water Service Population[(1)]	Projected Outside-UGA Water Service Population[(2)]	Projected Total Water Service Population
2016	919	60	980
2017	927	70	997
2018	939	80	1,019
2019	951	88	1,039
2020	963	96	1,059
2021	976	103	1,078
2026	1,036	131	1,167
2031	1,085	151	1,236
2036	1,129	166	1,295
Buildout	1,129	212	1,341

(1) From Table 2-11.

(2) From above formula based on estimated buildout under current zoning, existing 11 connections outside UGA, estimated 2.62 persons per household, estimated 20 years to half buildout.

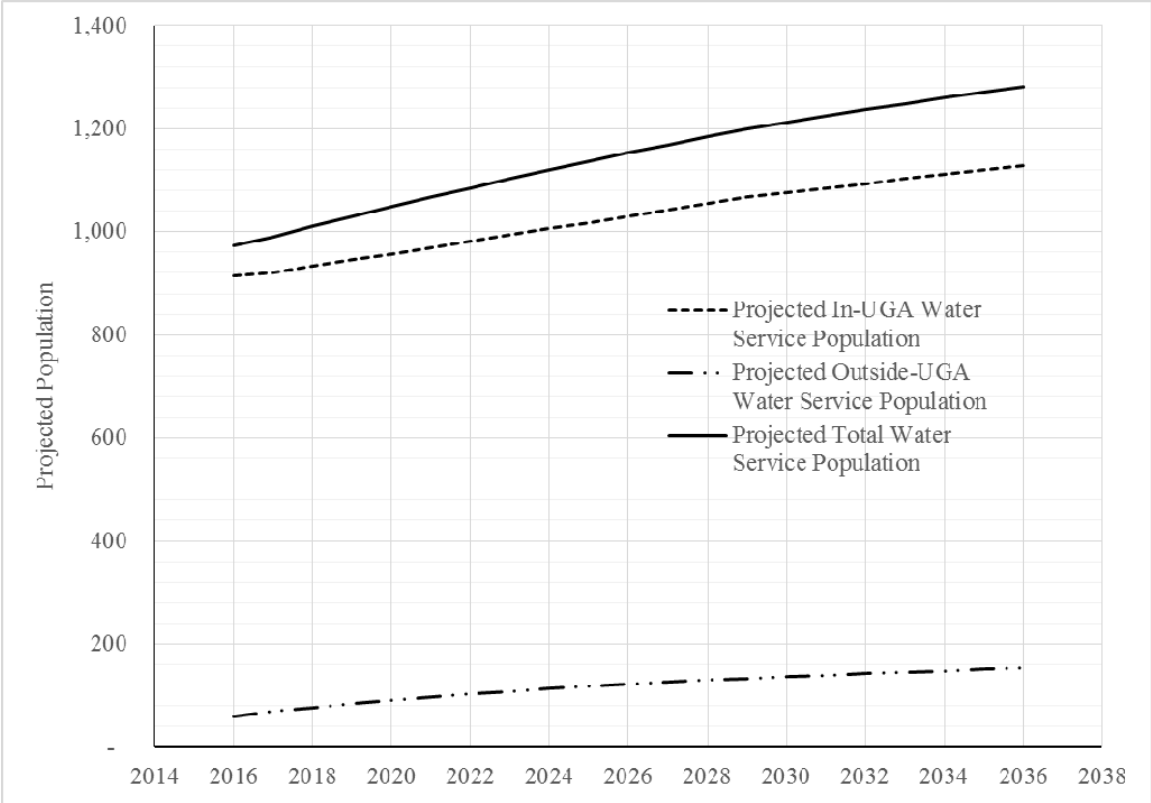


FIGURE 2-2

Projected Service Area Population

WATER DEMAND PROJECTIONS

It is estimated that water demand will increase at the same rate as the projected population growth rate as shown in Table 2-11. The average daily per capita production of 70 gpcd, which includes DSL, is used to project future water demand based on the population projections in Table 2-13.

Projected maximum day production is estimated from average day production by applying the maximum day to average day peak factor of 3.45. Peak hour demands are calculated using the peak hour demand formula (Equation 5-1) from the Washington State Department of Health *Water System Design Manual*.

$$PHD = (MDD / 1440) [(C) * (N) + F] +18$$

Where PHD = Peak Hourly Demand, (gallons per minute)
C = Coefficient Associated with Ranges of ERUs
N = Number of ERUs
F = Factor Associated with Ranges of ERUs
MDD = Maximum Day Demand, (gpd/ERU)

ERUs are determined by dividing the estimated average day production by 150 gpd per ERU. Table 2-14 summarizes projected water demand.

TABLE 2-14

Projected Water Demand

Year	Average Day Demand, gpd[(1)]	Maximum Day Demand, gpd[(2)]	Peak Hour Demand, gpm[(3)]	ERUs[(4)]
2016	68,567	236,589	361	439
2017	69,818	240,903	370	447
2018	71,312	246,058	376	457
2019	72,750	251,021	381	466
2020	74,139	255,814	386	475
2021	75,485	260,459	392	483
2026	81,720	281,974	416	523
2031	86,521	298,537	434	554
2036	90,662	312,826	450	580
Buildout	93,871	323,901	462	601

(1) Average Day Production Requirement is Projected Population from Table 2-13 times Average Estimated Daily Per Capita Production of 70 gpcd
(2) Maximum Day Production Requirement is Average Day Production Requirement times the Maximum Day to Average Day Ratio of 3.45 from Table 2-6.
(3) Peak Hour Demand is calculated from Equation 5-1 from the Washington State Department of Health *Water System Design Manual*.
(4) Number of ERUs is Average Day Production divided by 150 gpd per ERU plus 6.2 gpd/ERU for DSL representing 4 percent (3-year rolling average).

CHAPTER 3

SYSTEM ANALYSIS

INTRODUCTION

Water system planning is based on careful analysis of a water utility's ability to meet level of service standards for existing and future customers. The City has adopted design standards which identify criteria and standards for the water system. These standards can be used to evaluate and analyze the existing water system facilities within the City's system by comparing the existing and projected system demands developed in Chapter 2 to the standards. Based on this comparison, water system deficiencies can be identified and recommendations for improvements to meet standards can be developed.

SYSTEM DESIGN STANDARDS

Performance and design criteria typically address the sizing and reliability requirements for source, storage, distribution, and fire flow. WAC 246-290 contains general criteria and standards that must be followed in development of public water systems. These standards can be used to evaluate and analyze the existing water system facilities and water quality within the City's system. Based on these analyses, a summary of deficiencies and options to improve compliance with the required standards are identified. The design standards for the following subjects are discussed in this chapter:

WATER QUALITY STANDARDS

1. Applicable Drinking Water Quality Regulations
2. Existing Drinking Water Quality Standards
3. Anticipated Future Drinking Water Quality Regulations
4. Water Quality Monitoring Schedule

GENERAL FACILITY STANDARDS

1. Average and Maximum Day Demand
2. Peak Hour Demand
3. Storage Requirements
4. Fire Flow Rate and Duration

5. Minimum System Pressure
6. Minimum Pipe Sizes
7. Backup Power Requirements
8. Valve and Hydrant Spacing
9. Other System Policies

CITY OF ROY STANDARDS

Table 3-1 lists the DOH Water System Design Manual guidance and Roy's policies with regards to each standard for general facility requirements.

TABLE 3-1

General Facility Requirements

Standard	DOH Requirement	Roy's Standard
Average Day Demand (ADD) and Maximum day Demand (MDD) (Water System Design Manual)	Average day and maximum day demand are estimated on a per-capita and a per-connection basis. These should be estimated from actual water use data. If metered data is not available average day demand may be estimated based on average annual rainfall and lot size, and maximum day demand may be estimated at 2 times the average day demand. Average day water sales per residential water connection is used to estimate the value of an equivalent residential unit (ERU) and to estimate how many ERUs are used by non-residential users.	Average day production requirement is estimated at 65 gallons per capita per day based on recent water production records and population estimates from 2010 through 2015. Maximum day production requirement is estimated at 3.12 times average day production requirement based on daily production logs from 2010 through 2015. Average day water sales per residential customer is estimated at 150 gallons per connection per day based on water sales records from 2010 through 2015.

TABLE 3-1 – (continued)

General Facility Requirements

Standard	DOH Requirement	Roy's Standard
Peak Hour Demand (PHD) (Water System Design Manual)	Peak hour demand is determined using Equation 5-3 from the Water System Design Manual: PHD = (MDD/1440)[(C)(N)+F] +18 where C = Coefficient from Water System Design Manual Table 5-1 N = Number of ERUs served F = Factor from Water System Design Manual Table 5-1 MDD = Maximum Day Demand per connection	C and F are: 1.8 and 125, respectively.
Storage (Water System Design Manual)	Total required storage volume is the sum of: • Operational Storage • Equalizing Storage • Standby Storage * • Fire Suppression Storage (if required) * • Dead Storage *Where "nesting" of standby and fire suppression storage are allowed by the local fire authority, only the greater of Standby or Fire Suppression Storage are required.	DOH Water System Design Manual. Nesting of Standby and Fire Storage is allowed.
Minimum System Pressure (Group A Public Water System Regulations)	WAC 246-290-230 states that systems must maintain a minimum of 30 psi throughout the distribution system during peak hour demand and a minimum 20 psi during maximum day demand plus fire flow.	DOH Water System Regulations. Minimum pressure goal of 40 psi.
Minimum Water Main Sizes (Group A Public Water System Regulations)	The minimum water main size shall not be less than 6 inches in diameter unless justified by hydraulic analysis. The minimum water main size for mains that must meet fire flow is 6 inches if the water main is looped and 8 inches if the water main is not looped.	DOH Water System Design Manual.

TABLE 3-1 – (continued)

General Facility Requirements

Standard	DOH Requirement	Roy's Standard
Reliability Recommendations (Water System Design Manual)	• Two or more sources capable of replenishing fire suppression storage within a 72-hour period while supplying MDD. • Sources capable of supplying MDD within an 18-hour period. • Sources should meet ADD with largest source out of service. • Back-up power equipment for pump stations unless there are two independent public power sources. • Provision of multiple storage tanks. • Standby storage equivalent to ADD x 2 - {Total Source – Largest Source} x 1440 minutes/day, with a minimum of 200 gpd/ERU. • Low and high level storage alarms. • Looping of distribution mains when feasible. • Pipeline velocities not > 8 fps at PHD. • Flushing velocities of 2.5 fps for all pipelines.	DOH Water System Design Manual.
Valve and Hydrant Spacing	Sufficient valving should be placed to keep a minimum of customers out of service when water is turned off for maintenance or repair. Fire hydrants on laterals should be provided with their own auxiliary gate valve.	In-line valves every 600 feet in the distribution system, every 1,300 feet in transmission mains, and generally 2 at every tee and 3 at every cross. Fire hydrants are required every 500 feet where the fire flow requirement is 1,750 gpm or less, and every 450 feet where more than 1,750 gpm is required.

WATER QUALITY STANDARDS

Table 3-2 lists drinking water regulations, the affected contaminants, and indicates which regulations require the City to conduct monitoring or take other action. Existing state law contains regulations for bacteriological contaminants, inorganic chemicals and inorganic physical parameters (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs), radionuclides, and total trihalomethanes (TTHMs).

The implementation schedules for the proposed new regulations are subject to revision and the City should continue to stay informed regarding regulatory deadlines.

TABLE 3-2

Drinking Water Regulations(1)

Drinking Water Regulations(1)	Contaminants Affected(2)	City Action
Bacteriological	Coliform	Monitoring
Residual Disinfectant	Total Free Chlorine	Monitoring
Consumer Confidence Report	Reporting Only	Reporting
Inorganic Chemicals and Physical Parameters	IOCs	Monitoring
Arsenic Rule	Arsenic	Monitoring
Volatile and Synthetic Organic Compounds	VOCs, SOCs	Monitoring
Asbestos	Asbestos	Monitoring
Lead and Copper Rule	Lead, Copper	Monitoring
Radionuclide Rule	Radionuclides	Monitoring
Stage 1 and 2 Disinfectants/ Disinfection Byproducts Rule	TTHMs, HAA5, Chlorite, Bromate	Monitoring and Planning
Groundwater Rule w/Triggered Source Monitoring	Bacteriological	Monitoring and Planning
Surface Water Treatment Rule	Microbial Contaminants	Not Applicable
Information Collection Rule	Bacteriological	Not Applicable
Filter Backwash Recycling Rule	Bacteriological	Not Applicable
Interim Enhanced Surface Water Treatment Rule	Bacteriological	Not Applicable
Long Term 1 Enhanced Surface Water Treatment Rule	Bacteriological	Not Applicable

(1) Drinking water regulations as of July 2016.
(2) TTHM = Total Trihalomethanes; HAA5 = Five Haloacetic Acids; IOCs = Inorganic Chemical and Physical Characteristics; VOCs = Volatile Organic Chemicals; SOCs = Synthetic Organic Compounds.

EXISTING DRINKING WATER QUALITY STANDARDS

Minimal standards for water quality are specified in terms of maximum contaminant levels (MCLs). Primary MCLs are based on chronic and/or acute human health effects. Secondary MCLs are based on factors other than health effects, including aesthetics. MCLs are specified in WAC 246-290 and described further in the following pages and tables. The following sections discuss the applicable water quality regulations, analysis of the City's compliance with these regulations, and a summary of anticipated future regulations. A water quality monitoring schedule is presented at the end of this chapter.

COLIFORM MONITORING

Many serious diseases are caused by bacteria, which are a classification of single-celled organisms. To test for contamination in drinking water, specific bacteria generally known as indicator organisms are measured. Indicator organisms are used because they are easy to test for and their presence is generally indicative of biological contamination. Total coliform, fecal coliform, and *E. coli* are typical indicator organisms.

WAC 246-290 establishes bacteriological testing requirements for public water systems. Compliance with this rule is based on the presence/absence of total coliforms. The number of routine samples required depends on the system size.

Monitoring requirements and schedules for the City are found in the City's Coliform Monitoring Plan. A copy of the Coliform Monitoring Plan is provided in Appendix H.

Washington State bacteriological standards require a minimum number of 1 sample per month for a population of 1 to 1,000. The City's current (2017) population is now estimated to be approximately 805; however, the City's required to take two samples per month, in exception to WAC 246-290.

The Revised Total Coliform Monitoring Rule specifies that each total coliform positive routine sample must be tested for the presence of E. coli. and if any total coliform positive sample is also E. coli. positive, then the sample must be reported to the state by the end of the day. If a routine sample is positive for total coliform, repeat samples are required.

Within 24 hours of learning of the total coliform positive sample result, at least three repeat samples must be collected and analyzed for total coliform. One repeat sample must be collected from the same tap as the original sample, one repeat sample must be collected within five service connections upstream, and one repeat sample must be collected within five service connections downstream. If one or more repeat sample is positive for total coliform, the sample must be analyzed for E. coli. If the total coliform positive sample is positive for E. coli, the sample must be reported to the state. Another set of repeat samples must then be collected unless an assessment has been triggered and the state has been notified.

A Treatment Technique Trigger (TTT) occurs when one or more repeat samples are positive for total coliform with a total coliform positive routine sample. A TTT requires a Level 1 or Level 2 Assessment. Violations occur if an E. coli MCL violation is incurred, a required Level 1 or Level 2 Assessment is not completed, or sanitary defects identified during the assessment are not corrected.

The City is in compliance with monitoring requirements for coliform.

Public notifications requirements for violations are included in Chapter 6. Sample letters and notifications are included in Appendix F.

The City completes triggered source monitoring per the Groundwater Rule when necessary.

Monitoring Requirements and Analysis

The City monitors for bacteriological contaminants in accordance with its Water Quality Monitoring Plan, which is included in Appendix F. The number of required monthly samples is provided annually from DOH on the Water Quality Monitoring Report.

RESIDUAL DISINFECTANT

Monitoring Requirements and Analysis

According to WAC 246-290-300, systems providing disinfection treatment shall measure residual disinfectant concentration within the distribution system when taking routine or repeat coliform samples. The City complies with this requirement and records chlorine residuals along with coliform sampling results. The City's chlorination goal is to maintain a detectable residual chlorine concentration within the distribution system. Chlorine residual concentrations are monitored during the bacteriological sampling and if no chlorine is detected, City staff flush the local distribution mains.

CONSUMER CONFIDENCE REPORT

Description and Requirements

This new rule was finalized on August 19, 1998. The Consumer Confidence Report Rule requires community water system purveyors to prepare and distribute an annual report of water quality analyses to their customers. The City is required to submit the report to its customers by July 1 each year. A copy of the City's 2015 report (year 2014 data) is included in Appendix F.

INORGANIC PHYSICAL AND CHEMICAL CHARACTERISTICS

Description

This category includes several inorganic elements and compounds. Many of the inorganic chemicals include elemental metals such as mercury, arsenic, and iron. Some non-metallic constituents such as chloride, fluoride, and sulfate are also included. Physical properties that affect water quality in this category include turbidity, specific conductivity, total dissolved solids, and color.

WAC 249-290-310 specifies primary and secondary MCLs for inorganic physical and chemical characteristics. Primary MCLs are based on health effects and secondary MCLs are based on factors other than health effects, such as aesthetics. Three chemicals, lead, copper, and sodium, do not have primary or secondary MCLs, but are required to be monitored along with other IOCs. Lead and copper are regulated under the Lead and Copper Rule, described in detail later in this chapter. Primary and secondary MCLs for inorganic chemical and physical characteristics are summarized in Tables 3-3 and 3-4, respectively.

TABLE 3-3

Primary Water Quality Standards Inorganic Chemical Characteristics

Chemical	Primary MCL
Antimony (Sb)	0.006 mg/L
Arsenic (As)	0.01 mg/L
Asbestos	7 million fibers/liter (length >10 microns)
Barium (Ba)	2.0 mg/L
Beryllium (Be)	0.004 mg/L
Cadmium (Cd)	0.005 mg/L
Chromium (Cr)	0.1 mg/L
Copper (Cu)	1.3 mg/L (Action Level)
Cyanide (HCN)	0.2 mg/L
Fluoride (F)	4.0 mg/L
Lead (Pb)	0.015 mg/L (Action Level)
Mercury (Hg)	0.002 mg/L
Nickel (Ni)	0.1 mg/L
Nitrate (as N)	10.0 mg/L
Nitrite (as N)	1.0 mg/L
Selenium (Se)	0.05 mg/L
Sodium (Na)	None, 20 mg/L recommended by EPA
Thallium (Tl)	0.002 mg/L

Source: WAC 246-290-310.

TABLE 3-4

Secondary Water Quality Standards Inorganic Chemical and Physical Characteristics

Chemical/Characteristics	Secondary MCL
Chloride (Cl)	250.0 mg/L
Fluoride (F)	2.0 mg/L
Iron (Fe)	0.3 mg/L
Manganese (Mn)	0.05 mg/L
Silver (Ag)	0.1 mg/L
Sulfate (SO4)	250.0 mg/L
Zinc (Zn)	5.0 mg/L
Color	15 Color Units
Specific Conductivity	700 µmhos/cm
Total Dissolved Solids (TDS)	500 mg/L

Source: WAC 246-290-310.

Monitoring Requirements and Analysis

Groundwater sources must be sampled for inorganics once every 3 years, unless a monitoring waiver is granted by DOH. Nitrate samples are required annually and nitrite samples are required once every 3 years. Because nitrates and nitrites are included in IOC sampling, additional individual samples are not required in years when an IOC is taken from the source.

The City has a monitoring waiver for IOCs, except for lead, copper, and nitrates. The City's most recent IOC samples (except lead, copper, and nitrates) were taken in June 2010. Table 3-5 provides results only for parameters that were detected. Sample parameters that were listed as "not detected" or "less than" by the laboratory are omitted from the table. No samples exceeded the primary EPA standards.

TABLE 3-5

Inorganic Source Water Quality

Parameter	MCL	Inorganic Testing Results	
		Well 1	Well 2
Antimony (mg/L)	0.006	0.005	0.005
Arsenic (mg/L)	0.01	0.002	0.002
Barium (mg/L)	2.0	0.1	0.1
Beryllium (mg/L)	0.004	0.003	0.003
Cadmium (mg/L)	0.005	0.002	0.002
Chromium (mg/L)	0.1	0.01	0.01
Cyanide (mg/L)	0.2	0.05	0.05
Fluoride (mg/L)	4.0	0.2	0.2
Mercury (mg/L)	0.002	0.0005	0.0005
Nickel (mg/L)	0.1	0.04	0.04
Nitrate (mg/L as N)	10.0	3.2	0.2
Nitrite (mg/L as N)	1.0	0.2	0.2
Selenium (mg/L)	0.05	0.005	0.005
Sodium (mg/L)(1)	None	7	8
Thallium (mg/L)	0.002	0.002	0.002
Total Nitrate/Nitrite (mg/L as N)	0.5	3.2	0.4
Chloride (mg/L)	250	8	2
Color (color units)	15	5	5
Conductivity (µmhos/cm)	700	121	99
Iron (mg/L)	0.3	0.1	0.39
Manganese (mg/L)	0.05	0.01	0.11
Silver (mg/L)	0.1	0.01	0.01
Sulfate (mg/L)	250	6	2
Turbidity (NTU)	1	0.1	0.5
Zinc (mg/L)	5	0.2	0.2

(1) EPA has established a recommended limit of 20 mg/L for those consumers that may have diet restriction related to sodium intake.

ARSENIC

Description

Arsenic is an inorganic chemical that has received significant attention due to proposed rule revisions. Long-term exposure to low concentrations of arsenic in drinking water can lead to skin, bladder, lung, and prostate cancer. Non-cancer effects of ingesting arsenic at low levels include cardiovascular disease, diabetes, and anemia, as well as reproductive, developmental, immunological, and neurological effects.

A new arsenic standard was adopted by the EPA on January 22, 2001, and became effective on February 22, 2002. The new standard MCL of 0.01 mg/L replaced the old standard of 0.05 mg/L. Compliance with the new MCL standard was required for all systems by January 23, 2006.

Monitoring Requirements and Analysis

The Arsenic Rule makes monitoring requirements consistent with monitoring for other IOCs. Groundwater sampling for arsenic is required once every 3 years. Any system that has a sampling point monitoring result exceed the MCL must increase the frequency of monitoring at that sampling point to quarterly sampling. Compliance with the MCL would be based on the running annual average of the samples. Systems triggered into increased monitoring would not be considered in violation of the MCL until they have completed 1 year of quarterly sampling. However, if any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

IOC sample analyses from 2010 indicate the City is below the new MCL standard of 0.01 mg/L.

VOLATILE ORGANIC COMPOUNDS AND SYNTHETIC ORGANIC COMPOUNDS

Description

Volatile organic chemicals (VOCs) are manufactured, carbon-based chemicals that vaporize quickly at normal temperatures and pressures. VOC include many hydrocarbons associated with fuels, paint thinners, and solvents. This group does not include organic pesticides, which are regulated separately as synthetic organic chemicals (SOCs). VOCs are divided into the two following groups.

1. Regulated VOCs that have been determined to post a significant risk to human health.

2. Unregulated VOCs for which the level of risk to human health has not been established.

There are currently 21 regulated VOCs and 33 regulated SOCs. Lists of these compounds and their MCLs are included in Tables 3-6 and 3-7.

Monitoring Requirements and Analysis

Per the DOH requirements, SOCs and VOCs must be sampled once every 3 years, unless a waiver is in place. VOC sampling was most recently completed in June 2015. No VOCs or SOCs were detected for all samples taken.

TABLE 3-6

Regulated Synthetic Organic Chemicals

Organic Chemical	Primary MCL (mg/L)	Organic Chemical	Primary MCL (mg/L)
Vinyl Chloride	0.002	Chlordane	0.002
Benzene	0.005	Dibromochloro-propane	0.0002
Carbon Tetrachloride	0.005	2,4-D	0.07
1,2-Dichloroethane	0.005	Ethylene dibromide	0.00005
Trichloroethylene	0.005	Heptachlor	0.0004
Para-Dichlorobenzene	0.075	Heptachlor epoxide	0.0002
1,1-dichloroethylene	0.007	Lindane	0.0002
1,1,1-Trichloroethane	0.2	Methoxychlor	0.04
Cis-1,2-Dichloroethylene	0.07	Polychlorinated biphenyls (PCBs)	0.0005
1,2-Dichloropropane	0.005	Pentachlorophenol	0.001
Ethylbenzene	0.7	Toxaphene	0.003
Monochlorobenzene	0.1	2,4,5-TP	0.05
Ortho-Dichlorobenzene	0.6	Benzo(a)pyrene	0.0002
Styrene	0.1	Dalapon	0.2
Tetrachloroethylene	0.005	Di(2-ethylhexyl) adipate	0.4
Toluene	1	Di(2-ethylhexyl) phthalate	0.006
Trans-1,2-Dichloroethylene	0.1	Dinoseb	0.007
Xylenes (total)	10	Diquat	0.02
Dichloromethane	0.005	Endothal	0.1
1,2,4-Trichloro-benzene	0.07	Endrin	0.002
1,1,2-Trichloro-ethane	0.005	Glyphosate	0.7
Arochlor	0.002	Hexachlorobenzene	0.001
Aldicarb	0.003	Hexachlorocyclopentadiene	0.05
Aldicarb sulfone	0.003	Oxamyl (vydate)	0.2
Aldicarb sulfoxide	0.004	Picloram	0.5
Atrazine	0.003	Simazine	0.004
Carbofuran	0.04	2,3,7,8-TCDD (dioxin)	0.00000003

ASBESTOS

Description

Asbestos is listed as a primary inorganic contaminant; however, it is not routinely included in IOC samples for public water systems. Asbestos monitoring is to be conducted every 9 years unless a waiver is applied for and granted by DOH. The City water system does not have asbestos-cement water main and therefore qualifies for an asbestos monitoring waiver.

LEAD AND COPPER

Description

In 1991, the EPA promulgated the Federal Lead and Copper Rule. The State of Washington adopted this rule in 1995, with minimal changes. The Lead and Copper Rule is intended to reduce the tap water concentrations of lead and copper that can occur when corrosive source water causes lead and copper to leach from water meters and other plumbing fixtures. Possible treatment techniques to reduce lead and copper leaching include addition of caustic soda or soda ash to the source water prior to distribution.

Monitoring Requirements and Analysis

Based on the requirements of the EPA Lead and Copper Rule (40 CFR 141), lead and copper monitoring must be completed for two consecutive 6-month monitoring periods. If lead and copper action levels are not exceeded, then the number of samples may be reduced to one-half the original number for three consecutive annual periods. Assuming compliance with the action level is maintained, reduced sampling may continue once every 3 years thereafter.

Ninety percent of the distribution system lead samples collected according to the procedures outlined in WAC 246-290 must have concentrations below the "Action Level" of 0.015 mg/L. Similarly, 90 percent of the copper samples must have concentrations of less than 1.3 mg/L. Systems exceeding the action levels are required to provide public notification and implement a program for reducing lead and copper levels.

The City last collected lead and copper samples on September 26, 2014. Distribution system samples were taken at 10 locations in 2014. The results of the lead and copper testing conducted are shown in Table 3-7. As shown, all of the lead and copper sample results indicate concentrations below the action levels.

TABLE 3-7

Lead and Copper Testing Results

Parameter	2014
Lead	
Action Level (mg/L)	0.015
Maximum Concentration (mg/L)	0.003
Number of Samples Taken	10
Number of Samples Exceeding Action Level	0
Copper	
Action Level (mg/L)	1.3
Maximum Concentration (mg/L)	0.15
Number of Samples Taken	10
Number of Samples Exceeding Action Level	0

RADIONUCLIDES AND RADON

Description

Radionuclides include radioactive substances occurring naturally in subsurface waters. Regulated substances include radium-226, radium-228, uranium, and gross alpha and beta particles. Table 3-8 summarizes radionuclide MCLs as defined by EPA's Radionuclide Rule, WAC 246-290-310(7), and 40 CFR 141.66.

TABLE 3-8

Radionuclide MCLs

Radionuclide	MCL
Combined Radium-226 and -228	5 pCi/L
Uranium	30 µg/L
Gross Alpha (excluding uranium and radon)	15 pCi/L
Gross Beta	4 millirem/year

Monitoring Requirements and Analysis

WAC 246-290-300(10) and 40 CFR 141.26 require radionuclide samples once every 6 years. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis, provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 percent. The City collected radionuclide samples for radium and gross alpha in 2016. The samples had no detectable level of gross alpha or radium-228

DISINFECTANTS AND DISINFECTION BYPRODUCTS RULE

Description

WAC 246-290-300(7) requires purveyors of public water systems that provide water treated with chemical disinfectants to monitor for disinfectants and disinfection byproducts. The Disinfection/Disinfectants Byproduct Rule (D/DBP Rule) establishes residual disinfectant concentrations and maximum contaminant levels for disinfection byproducts.

Trihalomethanes (THMs) and five haloacetic acids (HAA5) are a group of organic compounds that can be formed as a result of drinking water disinfection by chlorine and are therefore often referred to as disinfection byproducts. Total trihalomethanes (TTHMs) include the sum of the concentrations of four disinfection byproducts: chloroform, bromoform, bromodichloromethane, and dibromochloromethane.

Monitoring Requirements and Analysis

Stage 1 of the D/DBP Rule was published in November 1998 and became effective in 2002. Under Stage 1 of the D/DBP Rule, the MCLs for the TTHM and HAA5 are 80 micrograms per liter (µg/L) and 60 µg/L, respectively, and is based on the running annual average of two annual samples. Systems are required to prepare and implement a disinfection byproducts monitoring plan. A copy of the City's plan is included in Appendix H. The Stage 1 D/DBP Rule remained in effect for compliance until October 1, 2013.

TTHM and HAA5 samples were taken at two locations in August of 2014 and all test results are below the respective MCLs. TTHM results ranged from 1.3 to 1.5 µg/L and HAA5 results were 1.4 µg/L.

Stage 2 of the D/DBP Rule was published in January 2006 and compliance with the new regulations began on October 1, 2013. Under Stage 2 of the D/DBP Rule, the MCLs for TTHM and HAA5 remain 80 µg/l and 60 µg/l, respectively; however, compliance with the MCL is based on the running annual average of each individual sample instead of the running annual average of all samples combined. The number of samples taken is dependent on the population served. Systems serving between 500 and 9,999 people must collect two samples per year. In 2015, the City served an estimated 950 people.

GROUNDWATER RULE

The Groundwater Rule (GWR) became effective November 1, 2010. The goal of the GWR is to set disinfection requirements for groundwater not under the influence of surface water. Under the 1986 SDWA, the U.S. EPA was required to set disinfection requirements for all public water systems. The SWTR did this for surface water and GUI. The GWR contains four regulatory elements.

- Sanitary Surveys
- Hydrologic Sensitivity Assessments
- Source Water Monitoring
- Corrective Action or Disinfection

Each groundwater source will be evaluated by DOH to determine if it should be disinfected. If disinfection is required, the system must provide either: (1) a continuous free chlorine residual of 0.2 mg/L at the entry to the distribution system and detectable free chlorine residual throughout the distribution system; or (2) an alternate treatment strategy that ensures at least 4-logs (99.99 percent) of viral inactivation as determined by DOH.

Roy currently chlorinates all wells and maintains a residual throughout the water distribution system.

WATER QUALITY MONITORING SCHEDULE

Water quality monitoring is required for regulatory compliance and to monitor water system conditions. DOH prepares a Water Quality Monitoring Report each year that is distributed to each water purveyor. This report defines a monitoring schedule and provides sample locations. Table 3-9 provides a monitoring schedule for the City. A copy of the report is included in Appendix G.

TABLE 3-9

Water Quality Monitoring

Parameter	Sample Location	City of Roy Minimum Required Sampling Frequency	Notes	Consequence of Failing to Meet Standard
Routine Coliform	Distribution System	One sample per month, June, July and August, two samples per month all other months.	See Coliform Monitoring Plan. The City takes two samples every month.	Repeat sampling, public notification and possible treatment.
Chlorine Residual	Distribution System	Daily and when Coliform samples are taken.	Monthly Reporting to DOH Required.	Need to increase chlorine dose.
Disinfection Byproducts	Distribution System	One sample each for TTHM and HAA5 annually.	Sampling frequency may reduce due to low levels.	Public notification and treatment.
Inorganic Chemicals	Source (S01 & S02)	One collected for each source.	Waiver – 9 year. Next samples due 6/2019	Public notification, and treatment or source replacement.
Nitrates	Source (S01 & S02)	One collected annually from each source.	No waiver option	Public notification, and treatment or source replacement.
VOCs	Source (S01 & S02)	One collected for each source.	Waiver - 6 year. Next samples due 6/2019	Public notification, and treatment or source replacement.
SOCs	Source (S01 & S02)	One every 3 years at each source for Herbicides, Pesticides, Insecticides, and Soil Fumigants including EDB. See exception in Notes.	Last SOC monitoring was in 2015. SOC monitoring waived through 2022. Next monitoring per waiver conditions.	Public notification, and treatment or source replacement.
Lead and Copper	Distribution System	Ten samples after corrosion control treatment has had to adject to water quality conditions.	Reduced monitoring option if monitoring shows compliance. Currently standard 3 – year frequency.	Possible Treatment Modifications.
Radio-nuclides	Source (S01 & S02)	Standard 6 – year monitoring frequency.	With state approval, historic monitoring may be used in lieu of initial quarterly monitoring. Reduced monitoring frequency depends on results of initial quarterly monitoring. Compositing of quarterly samples is allowed.	Public notification, and treatment or source replacement.

SYSTEM CAPACITY ANALYSIS

SYSTEM DESIGN STANDARDS

Performance and design criteria typically address the sizing and reliability requirements for source, storage, distribution, and fire flow. WAC 246-290 contains general criteria and standards that must be followed in development of public water systems.

WATER RIGHTS ANALYSIS

The City of Roy water rights are discussed in Chapter 1 and summarized in Table 1-5. The following compares those rights to existing installed pumping capacity, historic water use, and projected water demands to determine if there are any deficiencies in the City's water rights. Installed pumping capacities are compared to instantaneous water rights in Table 3-10.

The City has certificated rights with priority dates of 1983 and 1984 for a total of 600 gpm and 137.5 Acre-Feet per Year (AF/Y) of primary right. These rights are evenly split between Wells 1 and 2.

TABLE 3-10

Instantaneous Water Rights Comparison

Source	Installed Capacity, gpm	Instantaneous Right, gpm(1)	Applied-for Water Right, gpm
Well 1	490	300	490
Well 2	450	300	500

(1) The City of Roy has applied for additional water rights as shown in Table 1-5.

Installed pumping capacity exceeds existing instantaneous water rights at both wells. As shown in Table 1-5, the City has applied for additional instantaneous water rights to cover the existing installed pumping capacity.

Table 3-11 compares permitted annual withdrawal with the maximum annual production records. In 2010, the City withdrew 49 percent of its permitted annual withdrawal.

TABLE 3-11

Annual Water Rights Comparison

Source	Annual Water Right, AF/Y	Maximum Historic Annual Production, AF/Y[(1)]
Well 1	137.5[(2)]	52.66
Well 2	137.5[(2)]	32.44
Total	**137.5[(2)]**	**67.39[(3)]**

(1) Maximum annual withdrawals are listed from Table 2-3, converted to acre-feet. The maximum year for Well 1 was 2015, and the maximum year for Well 2 was 2011.

(2) The annual withdrawal allowed for Well 1 is entirely supplemental to that allowed for Well 2.

(3) The maximum total production is not the sum of the maximum annual production of Wells 1 and 2 because the maximum production of Wells 1 and 2 were not in the same year. Maximum total production occurred in 2010.

SOURCE OF SUPPLY ANALYSIS

A description of Roy's source of supply was given in Chapter 1. According to the DOH Design Manual, source production capacity must be sufficient to supply maximum day production requirements. Installed pumping capacity and average day production requirements must also comply with the maximum instantaneous and maximum annual withdrawal limitations of associated water rights.

Water Rights Analysis

Table 3-12 compares instantaneous water right limits and annual water right limits to projected demands. The 2005 Water System Plan projected that the City would exceed their existing water rights; however, as shown, the City will not require any additional water rights to meet the year 2036 projections or estimated buildout demands.

TABLE 3-12

Projected Water Rights Requirement

Year	Combined Certified Instantaneous Water Right, gpm	Projected Source Capacity Requirement, gpm[(1)]	Instantaneous Water Right Surplus/(Deficit), gpm[(2)]	Certified Annual Water Right (acre-ft)	Projected Annual Withdrawal Requirement (acre-ft)[(3)]	Annual Water Right Surplus (acre-ft)
2016	600	170	430	137.5	77	60
2017	600	170	430	137.5	78	59
2018	600	180	420	137.5	80	58
2019	600	180	420	137.5	81	56
2020	600	180	420	137.5	83	54
2021	600	190	410	137.5	85	53
2026	600	200	400	137.5	92	46
2031	600	210	390	137.5	97	41
2036	600	220	380	137.5	102	36
Buildout	600	230	370	137.5	105	32

(1) Projected source capacity requirement is the pumping capacity required to meet Maximum Day Production Requirement from Table 2-14 in 24 hours per day, rounded to the nearest 10 gpm.

(2) Instantaneous Water Right Surplus/(Deficit) is sum of the City's existing instantaneous water rights, 600 gpm, less Projected Source Capacity Requirement.

(3) Projected Annual Water Right Requirement is Average Day Production Requirement from Table 2-14 converted to AF/Y.

(4) Annual Water Right Surplus/(Deficit) is the City's existing annual water rights, 137.5 AF/Y, less Projected Annual Water Right Requirement.

Source Production Capacity Analysis

Details of Roy's Wells 1 and 2 are summarized in Table 1-4. Table 3-13 compares the installed pumping capacity of the wells with projected maximum day production requirements through the year 2036. As shown, the City of Roy will not require any additional source capacity to meet the year 2036 projections or estimated buildout demands if the applied for water rights are received.

TABLE 3-13

Projected Source Production Capacity Requirements

Year	Existing Combined Source Capacity (gpm)[(1)]	Projected Source Capacity Requirement, gpm[(2)]	Projected Production Capacity Surplus/(deficit), gpm
2016	940	220	720
2017	940	230	710
2018	940	230	710
2019	940	240	700
2020	940	240	700
2021	940	250	690
2026	940	270	670
2031	940	280	660
2036	940	290	650
Buildout	940	300	640

(1) Combined source capacity is the total of Wells Nos. 1 and 2 as shown in Table 1-5.
(2) Projected source capacity requirement is the pumping capacity required to meet Maximum Day Production Requirement, from Table 2-14, in 18 hours per day, rounded up to the nearest 10 gpm.

STORAGE ANALYSIS

Storage requirements for the City of Roy are determined according to the Department of Health Water System Design Manual. The effective storage requirement is based on the sum of the following:

- Operational Storage
- Equalizing Storage
- Standby Storage
- Fire Suppression Storage
- Dead Storage

Operational Storage

Operational storage is typically defined as the volume of the reservoir devoted to supplying the water system while, under normal conditions, the sources are in "off" status. The City operates its sources based on reservoir level and a difference in high and low levels of 3.5 feet. The calculated operational storage is 8,200 gallons.

Equalizing Storage

Equalizing storage is used to meet peak hour demands that exceed the installed system source capacity. The volume of equalizing storage required depends on peak hour system demands, the length of time the peak hour demands persist, the source production rate,

and the mode of system operation. Sufficient equalizing storage must be provided in combination with available water sources and pumping facilities such that peak system demands can be satisfied.

The Water System Design Manual recommends that equalizing storage be calculated using the following equation, but in no case should it be less than zero:

$$V_{ES} = (Q_{PH} - Q_S)\ 150 \text{ minutes}$$

Where

V_{ES} = Equalizing storage component (gallons)
Q_{PH} = Peak hourly demand (gpm)
Q_S = Total source of supply capacity, excluding emergency sources (gpm)

The equalizing storage requirements according to the above formula are summarized in Tables 3-15, 3-16 and 3-17. The projected equalizing storage requirement is based on a capacity of 300 gpm for each well based on the 300 gpm water right limit.

Standby Storage

Standby storage is provided in order to meet demands in the event of a system failure such as a power outage, an interruption of supply, or break in a major transmission line. The amount of emergency storage should be based on the reliability of supply and pumping equipment, standby power sources, and the anticipated length of time the system could be out of service.

The Water System Design Manual recommends that standby storage be calculated using the following equation:

$$V_{SB} = 200 \text{ gallons} \times N$$

Where

V_{SB} = Total standby storage component (gallons)
N = Number of ERUs for the design year

The Standby Storage requirement is presented in Tables 3-14, 3-15, and 3-16. Calculations are based on the water right limit of 300 gpm for each well. In all cases the standby storage requirement is 200 gallons times the number of ERUs, because the City of Roy water system has substantial backup source capacity for the size of the system.

Fire Suppression Storage

Fire suppression storage is provided to ensure that the volume of water required for fighting fires is available when necessary. Fire suppression storage also reduces the impact of firefighting on distribution system water pressure. The amount of water required for firefighting purposes is specified in terms of rate of flow in gallons per minute (gpm) and an associated duration. Fire flows must be provided at a residual water system pressure of at least 20 pounds per square inch (psi) at all points in the system.

Fire suppression storage is calculated using the following equation:

$$V_{FSS} = FF * t_m$$

Where

V_{FSS} = Required fire suppression storage component (gallons)
FF = Fire flow rate (gpm)
T_m = Fire flow duration (minutes)

The City's maximum interim fire flow requirement is 2,000 gpm for 1 hour. The associated fire suppression storage requirement for this interim fire flow standard is 120,000 gallons. If the City decides to rescind the interim fire flow standard and enforce the IFC standard then the fire flow requirement will become 2,000 gpm for 2 hours, or 240,000 gallons. Table 3-14 shows storage requirements with the interim fire protection standard and Table 3-15 shows storage requirements with the International Fire Code standard.

Dead Storage

Dead storage is the volume of stored water not available at a minimum design pressure. The minimum operating level of the reservoir is 378 feet, 2 feet above the base of the reservoir. This represents 4,700 gallons.

STORAGE SUMMARY

Calculated storage components are combined to determine the total required system storage. By comparing available storage to the calculated required storage it may be determined if the system has adequate storage to provide a proper level of service.

TABLE 3-14

Projected Storage Capacity Requirements at Interim Fire Code Standard

Year	Required Storage (gallons)						Available Storage (gallons)	Storage Surplus/ (Deficit), gallons
	Operational Storage	Equalizing	Standby	Fire Suppression[(1)]	Dead Storage	Total[(2)]		
2016	8,200	0	87,800	120,000	4,700	220,700	263,200	42,500
2017	8,200	0	89,400	120,000	4,700	222,300	263,200	40,900
2018	8,200	0	91,400	120,000	4,700	224,300	263,200	38,900
2019	8,200	0	93,200	120,000	4,700	226,100	263,200	37,100
2020	8,200	0	95,000	120,000	4,700	227,900	263,200	35,300
2021	8,200	0	96,700	120,000	4,700	229,600	263,200	33,600
2026	8,200	0	104,700	120,000	4,700	237,600	263,200	25,600
2031	8,200	0	110,800	120,000	4,700	243,700	263,200	19,500
2036	8,200	0	116,100	120,000	4,700	249,000	263,200	14,200
Buildout	8,200	0	120,200	120,000	4,700	253,100	263,200	10,100

(1) Fire Suppression storage requirements are based on Roy's interim fire flow standard of 2,000 gpm for 1 hour.

(2) Total storage is the sum of operational equalizing, standby, fire suppression, and dead storage.

As shown in Table 3-13, at the projected growth rate, the City of Roy will have adequate effective storage capacity to meet storage capacity requirements through buildout, *provided the City retains the interim fire flow standard*. However, if the City plans to develop their commercial area or accommodate industry or multi-family housing, the interim fire flow standard will have to be revoked and additional storage will be required for fire protection.

TABLE 3-15

Projected Storage Capacity Requirements at International Fire Code Standard

Year	Required Storage (gallons)						Available Storage (gallons)	Storage Surplus/ (Deficit), gallons
	Operational Storage	Equalizing	Standby	Fire Suppression[(1)]	Dead Storage	Total[(2)]		
2016	8,200	0	87,800	240,000	4,700	340,700	263,200	(77,500)
2017	8,200	0	89,400	240,000	4,700	342,300	263,200	(79,100)
2018	8,200	0	91,400	240,000	4,700	344,300	263,200	(81,100)
2019	8,200	0	93,200	240,000	4,700	346,100	263,200	(82,900)
2020	8,200	0	95,000	240,000	4,700	347,900	263,200	(84,700)
2021	8,200	0	96,700	240,000	4,700	349,600	263,200	(86,400)
2026	8,200	0	104,700	240,000	4,700	357,600	263,200	(94,400)
2031	8,200	0	110,800	240,000	4,700	363,700	263,200	(100,500)
2036	8,200	0	116,100	240,000	4,700	369,000	263,200	(105,800)
Buildout	8,200	0	120,200	240,000	4,700	373,100	263,200	(109,900)

(1) Fire Suppression storage requirements are based on International Fire Code standard of 2,000 gpm for 2 hours.

(2) Total storage is the sum of operational equalizing, standby, fire suppression, and dead storage.

Table 3-15 shows that, if the City were to provide the International Fire Code standard of 2,000 gpm for 2 hours, the City would need 71,300 gallons of additional effective storage now, 97,500 gallons of additional effective storage by 2036 at the projected growth rate and 101,400 gallons of additional effective storage at estimated buildout.

There may be other reasons to install additional storage besides a need for equalizing, standby or fire storage capacity. Such reasons include pressure control in outlying areas, storage for additional pressure zones and pressure control in additional pressure zones. When the City considers constructing additional water storage capacity, either due to storage deficits as outlined in Table 3-15 or for other reasons, it would be appropriate to consider rescinding the interim fire flow standard and enforcing the IFC fire flow standards at that time.

Storage Requirements with Nesting

The Water System Design Manual allows for the exclusion of the standby storage or fire suppression storage component, whichever is smaller, from the calculated required storage unless it is prohibited by a locally developed and adopted coordinated water system plan, local ordinance, of the local fire protection authority or county fire marshal. Table 3-16 summarizes storage requirements when standby storage and for suppression storage are nested and the International Fire Code standard is met.

TABLE 3-16

Projected Storage Capacity Requirements at International Fire Code Standard with Nesting

Year	Required Storage (gallons)						Available Storage (gallons)	Storage Surplus/ (Deficit), gallons
	Operational Storage	Equalizing	Standby	Fire Suppression[(1)]	Dead Storage	Total[(2)]		
2016	8,200	0	87,800	240,000	4,700	252,900	263,200	10,300
2017	8,200	0	89,400	240,000	4,700	252,900	263,200	10,300
2018	8,200	0	91,400	240,000	4,700	252,900	263,200	10,300
2019	8,200	0	93,200	240,000	4,700	252,900	263,200	10,300
2020	8,200	0	95,000	240,000	4,700	252,900	263,200	10,300
2021	8,200	0	96,700	240,000	4,700	252,900	263,200	10,300
2026	8,200	0	104,700	240,000	4,700	252,900	263,200	10,300
2031	8,200	0	110,800	240,000	4,700	252,900	263,200	10,300
2036	8,200	0	116,100	240,000	4,700	252,900	263,200	10,300
Buildout	8,200	0	120,200	240,000	4,700	252,900	263,200	10,300

(1) Fire Suppression storage requirements are based on International Fire Code standard of 2,000 gpm for 2 hours.

(2) Total storage is the sum of operational equalizing, fire suppression, and dead storage.

As shown in Table 3-16, at the projected growth rate, the City of Roy will have adequate effective storage capacity to meet storage capacity requirements through buildout while meeting the IFC standard if nesting of standby and fire suppression storage is factored in to the analysis.

HYDRAULIC MODELING

The development of a computer hydraulic model, which can accurately and realistically simulate the performance of a water system in response to a variety of conditions and scenarios, has become an increasingly important element in the planning, design, and analysis of municipal water systems. The Washington State Department of Health's WAC 246-290 requires hydraulic modeling as a component of water system plans.

The hydraulic analysis included in this Water System Plan has not been changed from that included in the 2005 Water System Plan. The system infrastructure has not changed since the 2005 Water System Plan. The demands used in the 2005 WSP model are also still valid for the updated 6-, 10-, and 20-year projections. In the 2005 WSP, the 20-year demands for 2024 were projected to be 518,000 gpd for maximum day and 726 gpm PHD, which are higher than the updated projections for 2036 in this plan. The 2009 demands were projected to be 372,000 gpd for maximum day and 557 gpm PHD, which are also higher than the updated projections for 2036 in this plan.

HYDRAULIC MODELING SOFTWARE

The City's water system was analyzed using MWHSoft's H_2ONet hydraulic modeling software, which operates in an AutoCAD computer-aided design and drafting environment. The H_2ONet model was created using the City's water system base map. Reservoir elevations, well capacities, and booster station settings were determined from construction documents and City records. The model consists of water system pipes and nodes to represent the actual physical water system facilities. Nodes are used to represent intersections of pipes, points of water demand, water sources and water reservoirs. Figure 3-1 shows the pipes and nodes of the City of Roy water system hydraulic model.

The H_2ONet model is configured with a graphical user interface. Each water system element, including pipes, valves, and reservoirs is assigned a unique graphical representation within the model. Each element is assigned a number of attributes specific to its function in the actual water system. Typical element attributes include spatial coordinates, elevation, water demand, pipe lengths and diameters, and critical water levels for reservoirs. With attributes of each system element as the model input, the H_2ONet software produces the model output in the form of flows and pressures throughout the simulated water system.

MODEL ASSUMPTIONS

Prior to the calibration of the hydraulic model, the basic layout of the water system is recreated within the model. The lengths, diameters, and connection points of system piping are assigned using an updated base map of the water system. The locations of normally closed valves, check valves, and pressure reducing valves (PRVs) are found on water system base maps, while the critical elevations of the City's reservoirs are taken from the City's records. The assumptions regarding the modeling of the City's water sources and system demands are included in the following sections.

SYSTEM FACILITIES

The City water system consists of two supply wells, one reservoir, and one booster pump station. Well 1 is located along Huggins-Grieg Road and Well 2 is located along SR 507 near 292nd Street South. The reservoir is a standpipe measuring 20-feet diameter by 112 feet high with a base elevation of 376 feet. A single-pump booster station pumps from the reservoir to the distribution system when the reservoir outlet pressure drops below a level of 482 feet. This pump allows the reservoir to be operated at its full range and continue to maintain adequate system pressures. Chapter 1 provides a complete description of each system facility.

SYSTEM DEMANDS

A key element in the hydraulic modeling process is the distribution of demands throughout the water system. Total demand on the system is based on the existing and projected demands from Chapter 2.

Three demand sets were used in the hydraulic analysis.

- 2003 Average Daily Demands: These demands were used while calibrating the model because fire flow tests were performed in 2003. Demands were distributed throughout the system in proportion to the number of existing service connections in each area.

- 2009 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi. 2009 Maximum Day Demands projected in the 2005 Plan are greater than the buildout maximum day demands projected in this Plan. Demands were distributed throughout the system using the same proportions as described under 2024 Peak Hour Demands.

- 2024 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi within the 20-year planning period.

FORT LEWIS

MAPLE ST.
ASH ST.
ALDER ST.
CEDAR ST.
B.N.R.R.
S.R. 507
WATER ST.
FIRST ST.
SECOND ST.
THIRD ST.
FOURTH ST.
RONGE ST.
JAMES ST.
WARREN ST.
NIXON ST.
McNAUGHT ST.
PETERSON ST.
LYLE ST.
ACADEMY ST.
81ST ST.
280TH ST.
STATE RIGHT OF WAY
CHEHALIS-WESTERN RR.
HUGGINS-GRIEG RD.

J-1 J-3 J-5 J-7 J-8 J-11 J-12 J-13 J-14 J-16 J-19 J-20 J-21 J-23 J-24 J-25 J-28 J-29

WELL NO.1

20' DIA. □112' STANDPIPE
□260,000 GAL.□
BASE EL. 376.00

J-33 J-34 J-35 J-38 J-39 J-40

ROY EAST ESTATES PLAT
288TH ST.

WELL NO.2

292ND ST. S.
OA□VIEW PLAT
81ST AVE S.
80TH AVE S.
77TH AVE S.
78TH AVE S.

J-43 J-44 J-45 J-46 J-47 J-48 J-51 J-52 J-53 J-54 J-56 J-57 J-58 J-59 J-60 J-62 J-63

MC □ENNA MEADOWS PLAT

SCALE: 1"= 600'

0 300' 600'

LEGEND

- VALVE
- FIRE HYDRANT
- WELL
- STANDPIPE
- PUMP
- J-63 MODEL NODE □ NUMBER

CITY OF ROY

WATER SYSTEM PLAN

FIGURE 3-1

WATER SYSTEM HYDRAULIC MODEL MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Demands were distributed throughout the system in proportion to the number of projected water system connections in each area. Projected connections include a proposed 50-lot subdivision between Oakview and McKenna Meadows as well as other potentially developable land in proportion to the estimated development potential of the land based on existing lots, current zoning, and land areas.

MODEL CALIBRATION

The calibration of a hydraulic model provides a measure of assurance that the model is an accurate and realistic representation of the actual system. For the City's model, field measurements from February 2004 are used for the calibration process.

FIRE HYDRANT TESTS

The H_2ONet hydraulic model of the City's water system was calibrated using data obtained from fire hydrant tests at various locations throughout the water system. Four fire hydrant tests were conducted, with the assistance of City personnel, on February 4, 2004. During these tests, static and residual pressures were recorded as City staff opened hydrants and recorded flow rates. Field results were used to calibrate the hydraulic model through verification of pipe type, size, and elevations and adjustment of pipe friction coefficients.

The testing locations include multiple points within the various pressure zones. A description of each testing location is presented in Table 3-17.

TABLE 3-17

Hydrant Testing Locations

Test Number	Testing Location
1	McKenna Meadows Plat
2	Oakview Plat
3	Water Street and Lyle Street
4	Ronge Street and 3rd Street

The system conditions were recorded at the time of each test. Reservoir water levels, booster station status, and well status were all recorded during the testing time period. A summary of the recorded reservoir levels and booster station flow rates is presented in Table 3-18. System demand during the hydrant testing was determined based on the flow meter at the booster pump station, which shows flow from the reservoir to the distribution system. Both wells were off so the flow meter represented overall system demand at the time. The flow meter read approximately 60 gpm.

TABLE 3-18

System Conditions During Hydrant Testing

Test No.	Reservoir Level	Booster Station Status	Well 1 Status	Well 2 Status	System Domestic Demand(1)
1	112 feet	Off	Off	Off	60 gpm
2	111 feet	Off	Off	Off	60 gpm
3	110 feet	Off	Off	Off	60 gpm
4	109 feet	Off	Off	Off	60 gpm

(1) System demand was estimated to be 60 gpm based flow meter readings at the new booster pump station.

CALIBRATION PROCEDURES

The hydraulic model was used to generate static pressures and residual pressures at the measured hydrant flow rates, using the system conditions for each hydrant test. Model output was generated at points in the model equivalent to the locations of the hydrant tests. Model output for static pressure was generated by running the model at 2003 average day demands. Model output for residual pressure was generated at each hydrant test location by placing an added demand equal to the measured hydrant flow rate and recording the resulting pressure.

The system pressures and pipe flow rates determined in the hydraulic analysis are dependent on the friction loss characteristics established for each pipe. The friction losses occurring in lengths of pipe and various valves are accounted for in the hydraulic model.

CALIBRATION RESULTS

The friction factors for the pipes in the modeled system are adjusted throughout the calibration process until the model output best approximates the measured values. Hazen-Williams C-factors between 110 and 130 are used throughout the system. These friction factors are typical values for most pipe. The friction factors for the pipe also compensates for system losses through valves and pipe fittings.

The model output was produced for two data comparisons, static pressure and residual pressure. The values measured in the hydrant flow tests were compared to the model output values in Table 3-19.

TABLE 3-19

Calibration Results

Test No.	Flow (gpm)	Static Pressure (psi)			Residual Pressure (psi)		
		Field	Model	Difference	Field	Model	Difference
1	840	64	66	2	40	37	-3
2	750	42	43	1	20	20	0
3	1,180	70	72	2	56	60	4
4	1,230	72	76	4	59	61	2

Calibration of the hydraulic model produced results that varied from 1 to 4 psi of actual field test data for static pressure and from 0 to 4 psi of residual pressure. Hydraulic models are required to be within 5 psi of measured pressure readings for long-range planning, according to the DOH Design Manual, Table 8-1.

SYSTEM ANALYSIS

PEAK HOUR ANALYSIS

According to WAC 246-290, a water system must maintain a minimum pressure of 30 psi in the distribution system under peak hour demand conditions. The City's existing distribution system has been modeled under projected peak hour demand conditions for year 2024. Both Well 1 and Well 2 were off, the booster station was also off, and the reservoir was depleted of its operational storage in the model. Results of these analyses are located in Appendix J.

Peak hour analysis for 2024 demands projected in the 2005 WSP revealed no system deficiencies. A minimum pressure of 31 psi is located at 292nd Street and 81st Avenue. The 2024 peak hour demands projected in the 2005 WSP exceed buildout peak hour demands projected in this plan and therefore the system is adequate to meet a minimum pressure of 30 psi under peak hour demand conditions through buildout.

AVAILABLE FIRE FLOW ANALYSIS

The DOH *Water System Design Manual* states that a water system should be designed to provide adequate fire flow under maximum day demand conditions, while maintaining a minimum system pressure of 20 psi. The system was modeled with fire flow plus projected maximum day demand from Table 2-12 for the years 2009 and 2024. For both modeled fire flow scenarios, Well 1 was off, Well 2 was on, the diesel emergency booster station was on, and the reservoir was depleted of fire suppression storage. Well 2 was assumed to be on while Well 1 was off because backup power supply is available at Well 2. The results of fire flow modeling are presented in Appendix J.

Fire flows plus projected maximum day demands were met at a minimum of 20 psi at all points in the system for the 2009 scenario. In the 2005 WSP, projected maximum day demands for 2009 exceed updated buildout maximum day demand projections in Chapter 2 and therefore the system is adequate to meet all fire flow demands through projected buildout.

SUMMARY OF WATER SYSTEM CAPACITY AND DEFICIENCIES

There are several factors that could limit water system capacity, including source capacity, storage capacity, annual water rights and instantaneous water rights capacity. From Table 3-12 it can be seen that instantaneous water right limits and annual water right limits will not limit system growth through system buildout. Table 3-13 shows that installed source capacity will not become a system limiting factor through system buildout. Table 3-16 projects that storage capacity will not be a limiting factor with the IFC standard and nesting.

To project the ERU limit based on storage capacity is a bit more difficult. Operational storage, dead storage and fire storage are independent of ERUs while equalizing and standby storage are based on peak hour demand and average day demand, respectively, which are based on ERUs. The above formulas for peak hour demand, maximum day demand, standby storage and equalizing storage were used together with the previously estimated effective storage capacity and interim fire flow fire storage capacity to estimate the storage requirements. ERU limitations are summarized in Table 3-20.

TABLE 3-20

Water System Capacity Limits

Limiting Factor	ERU Limit
Annual Water Right(1)	785
Instantaneous Water Right(2)	2,337
Storage Capacity (Interim Fire Code)	651
Storage Capacity (International Fire Code)	Over Capacity
Storage Capacity (International Fire Code, Nesting)	1,250

(1) Based on 150 gpd/ERU + 6.2 gpd/ERU DSL.
(2) Based on MDD (150+DSL)*Peaking Factor.

WATER QUALITY

Lead and Copper

As a result of an exceedance of the action level for lead, Roy has installed a corrosion control treatment facility. The City is scheduled to resample for lead and copper in September 2017. The City has not installed corrosion control treatment at Well 2 because:

1. Well 1 has adequate capacity to meet the City's needs under most circumstances;

2. Well 2 is not as acidic as Well 1, and therefore presumed not as corrosive; and

3. If use at Well 2 is increased in the future, it will be necessary to treat for iron and manganese as well as corrosion control.

If water production at Well 2 is increased in the future it may be necessary to provide corrosion control and iron and manganese removal at Well 2 also.

Iron and Manganese

Well 2 exceeds the secondary standard for iron and manganese. The City has received few complaints about staining or dirty water to date. If complaints related to iron and manganese become a problem, or if the City increases production from Well 2, the City will have to consider providing treatment for iron and manganese removal at Well 2. The City samples for iron and manganese every 3 years.

CHAPTER 4

WATER USE EFFICIENCY PROGRAM

INTRODUCTION

The Washington Legislature passed the Water Use Efficiency Act of 1989 (43.20.230 RCW), which directs Department of Health (DOH) to develop procedures and guidelines relating to water use efficiency. In response to this mandate, Department of Ecology (Ecology), the Washington Water Utilities Council, and DOH jointly published a document titled *Conservation Planning Requirements* (1994). In 2003, the Municipal Water Supply – Efficiency Requirements Act (Municipal Water Law) was passed and amended RCW 90.46 to require additional conservation measures. The Municipal Water Law, among other things, directed DOH to develop the Water Use Efficiency (WUE) Rule, which is outlined in the *Water Use Efficiency Guidebook* and became effective January 22, 2007. These documents provide guidelines and requirements regarding the development and implementation of conservation and efficiency programs for public water systems. Conservation and efficiency programs developed in compliance with these documents are required by DOH and by Ecology as part of a public water system water right application. Conservation must be evaluated and implemented as an alternate source of supply before state agencies approve applications for new or expanded water rights. The third and most recent edition of the WUE Guidebook was released in January 2011.

The WUE Rule is an extension to the Conservation Planning Requirements and sets more stringent requirements for public water purveyors. The WUE Rule is comprised of four sections.

1. Planning Requirements
2. Distribution system leakage standards
3. Customer goal settings
4. Annual WUE reporting

This rule requires additional conservation measures related to data collection and reporting, distribution leakage, metering, goal setting, and performance reporting.

PLANNING REQUIREMENTS

Under the WUE Rule, water systems are required to implement planning methods to forecast future demands and determine necessary measures to reduce usage and demand. Elements of the planning requirements include:

1. Data collection;
2. Demand forecasts; and
3. Selection and evaluation of WUE measures

WATER USE EFFICIENCY REQUIREMENTS

The *Water Use Efficiency Guidebook* establishes varying implementation and evaluation requirements for municipal water suppliers (MWS). The new requirements focus on the importance of measuring water usage and evaluating the effectiveness of the WUE program. There are three fundamental elements to the Rule, including planning, distribution leakage standards, and goal setting and performance reporting.

TABLE 4-1

Summary of WUE Rule Deadlines

Requirement	Deadline for MWS under 1,000 connections
Meet distribution leakage standard (based on 3-year rolling average)	July 1, 2011, or 3 years after installing all service meters
Complete installation of all service meters	January 22, 2017

WATER METERS

Metering all water production and consumption is critical for determining system wide and individual water use efficiency. The WUE rule sets deadlines for meter installation and data collection. As Table 4-1 indicates, the WUE Rule requires production meters on all existing and new water sources, and requires consumption meters on all customer connections by 2017.

The installation of flow meters on each source of supply is required to measure the amount of water entering the distribution system. The water system must also maintain a periodic meter testing and repair program.

DATA COLLECTION

The WUE Rule requires regular collection of production and consumption data. Data must be reported in the District's planning documents and annual performance report to DOH. Water use data will be used for the following.

- Calculating distribution system leakage
- Forecasting demand for future water needs
- Identifying areas for more efficient water use

- Evaluating the success of your WUE program
- Describing water supply characteristics
- Aiding in the decision-making about water management

The WUE Rule set requirements for collecting source and service data. Source meters must be read monthly and reported as monthly and annual totals. Service meter totals only have to be reported in annual amounts, although it is recommended to read all service meters every 1 to 2 months.

A summary of the City's water use data collection is presented in Table 4-2. The collection frequency column refers to current practice.

TABLE 4-2

City of Roy - Water Use Data Collection Summary

Required Data Type[(1)]	Unit(s) of Measure	Collection Frequency	Comments
Source of Supply Meter Readings	Gallons	Daily log on weekdays	Meter on both well pumps record pumping time in hours. Source meter records total volume pumped.
Max Day/Max Month	Gallons per day (gpd)	Annually	From evaluation of source meter logs.
Single-Family/Commercial Service Meter Readings	Gallons	Monthly	Customer meter readings recorded in billing records.
Population Served	Customers	Annual	Estimate based on active residential services and known mobile homes.
Water Rates	Dollars per gallon	N/A	Page 4-5 details monthly meter fees and water usage rates.
Conservation Data	Dollars	Annual	Record the type, level, duration and dates of conservation measures taken.

(1) Water use data collection requirements are based on DOH Water Use Efficiency Guidebook, Revised May 2016 for a water system with less than 1,000 service connections (current active service connection estimate from Chapter 2, Table 2-1 is 369)

DISTRIBUTION SYSTEM LEAKAGE

The WUE Rule requires that water distribution systems have a leakage rate of less than 10 percent of finished water production. Distribution system leakage (DSL) is defined as all unaccounted for water that entered the distribution system, including reservoirs.

Known or credibly estimated losses can be excluded from the leakage calculation and may include uses such as construction, firefighting, and flushing.

Distribution system leakage for the City equals the difference between the volumes measured at the City's supply meters, and the volume measured at customer meters. Table 5-3 provides annual data from 2010 to 2015 distribution system leakage.

TABLE 4-3

Distribution System Leakage

Year	Production (gallons)	Consumption (gallons)	Distribution System Leakage (gallons)	Annual %	3-Year Rolling Average
2010	21,961,600	22,128,235	(166,635)	-1%	-
2011	21,649,765	20,357,100	1,292,665	6%	-
2012	19,429,531	20,136,051	(706,520)	-4%	1%
2013	19,521,510	18,247,427	1,274,083	7%	3%
2014	19,163,590	18,804,406	359,184	2%	2%
2015	20,703,770	19,878,223	825,547	4%	4%

As shown in Table 5-3, the City has historically been well below the 10 percent distribution system leakage requirement. With a current 3-year rolling average of 4.13 percent, the City is in full compliance with DOH requirements. The negative distribution system leakage in 2010 and 2012 was due to worn out source meters and the meters were replaced in August 2012.

WATER USE EFFICIENCY PROGRAM

The following section describes the City's water use efficiency goals, a description of conservation measures, and the resulting water use projections.

WATER USE EFFICIENCY GOAL

The City has exceeded its previously determined goal to reduce average daily consumption from 218 gpd by 2-4 percent. The City's goal is to continue to maintain a low DSL and to continue to provide conservation measures to limit variation in per-capita water use below 15 percent from the average of 57 gpcd.

WUE MEASURES

The WUE Rule requires the evaluation or implementation of water use efficiency measure to help meet the WUE goals. The *WUE Guidebook* states several measures that must be implemented or evaluated and provides a list of measures that can be counted as additional measures in the WUE Program. WAC 246-290-810 identifies the minimum

number of water use efficiency measures that must be evaluated based on system size. The City serves less than 500 connections and therefore must evaluate or implement one water use efficiency measure.

Mandatory Measures

Implement Source Metering and Meter Calibration

Roy had new source meters installed in 2012. Source meters should be tested annually. Roy should either get staff trained and provided with equipment for testing of their source flow meters or have a company experienced in testing flow meters routinely test Roy's source meters. The Evergreen Rural Water Association (ERWA), has staff with experience in testing source flow meters. Representatives are available to respond to such requests from members for free.

Roy may decide to purchase meter-testing equipment for the required annual testing if it is determined to be cost-effective. A detailed methodology is also available in AWWA Manual M6 entitled "Water Meters – Selection, Installation, Testing, and Maintenance," which may be purchased by calling the AWWA Bookstore at 1-800-926-7337

Implement Leak Detection and Water Accounting

The City billing staff monitors customer usage for potential leaks. If usage is out of the normal range, the City notifies the customer and take steps to located and repair the leak. The City conducts meter testing and maintains records of unbilled and unmetered water uses.

Implement Customer Education

The City provides customer bills with information on water saving and conservation. Roy has Ecology and Health conservation brochures available at City Hall and includes conservation promotion with other mailings, such as the Annual Water Quality Report.

Evaluate a Conservation Rate Structure

The City of Roy fees for water service were established by Resolutions No. 778 and 784, copies of which are included in Appendix K. The current rate structure includes connection fees, monthly service charges and a straight line rate for all water use. All customers in city limits are charged a base rate determined by the size of their meter, and $5.12 per thousand gallons of water used. The City also charges monthly fire sprinkler standby charges based on service size.

The current rate structure does not fit DOH's definition of a conservation rate structure and could be replaced with a conservation rate structure that encourages customers to use less than the current average monthly water use through increasing rates with increased

water use. This could be done in such a way that the average water bill would remain unchanged, while lower users would pay less and higher users would pay more. Any change in rate structure should be based on careful consideration of impacts on the utility's ability to pay fixed costs. The City has evaluated a conservation rate structure in the past during rate setting and will continued to do so in the future. The City has seen a decrease in water use to a relatively low level under the current rate structure and a conservation rate structure is unlikely to decrease water use further at this time.

Supplementary Measures

Bills Showing Consumption History

The City uses a billing process that shows consumption history for each customer's water bill. By being able to examine past water consumption histories, each customer can be more conscious of their water use patterns and actual increase in consumption and cost, compared to the same month of the previous year. This can have significant positive effects on conservation efforts and directly involves the customer in the City's conservation campaign.

Based on their number of connections, the City must implement or evaluate one measure. The bills showing consumption history results in a total of two measures. The City will evaluate the effectiveness of these measures by examining water use records, including seasonal use and distribution system leakage.

WATER DEMAND FORECAST WITH CONSERVATION

Neither the City's per capita water production rate of 65 gpcd, nor the ERU value of 150 gallons per day, is excessive. These moderate production and consumption rates present a challenge to improve water conservation. The City plans to continue to provide conservation measures to limit variation in per-capita water use below 15 percent from the average of 65 gpcd and therefore projected water demands with conservation can be found in Table 2-14.

SOURCE OF SUPPLY ANALYSIS

A description of Roy's source of supply was given in Chapter 1 and an analysis is included in Chapter 3. According to Department of Health's Water System Design Manual (2009), source production capacity must be sufficient to supply maximum day production requirements. Installed pumping capacity and average day production requirements must also comply with the maximum instantaneous and maximum annual withdrawal limitations of associated water rights.

WATER RIGHTS ANALYSIS

The City of Roy water rights are discussed in Chapter 1 and summarized in Table 1-5. The following compares those rights to existing installed pumping capacity, historic water use, and projected water demands to determine if there are any deficiencies in the City's water rights. The City has certificated rights with priority dates of 1983 and 1984 for a total of 600 gpm and 137.5 Acre-Feet per Year (AF/Y) of primary right. These rights are evenly split between Wells 1 and 2.

Installed pumping capacity exceeds existing instantaneous water rights at both wells. As shown in Table 1-5, the City has applied for additional instantaneous water rights to cover the existing installed pumping capacity. In 2010, the City withdrew 49 percent of its permitted annual withdrawal.

SUPPLY RELIABILITY

The City has experienced reliability issues with Well 2 and the well has been offline for periods of time in 2015. The City was able to compensate for the necessary downtime by increasing production from Well 1 and has adequate water rights to do so. The City's reservoir serves the water system by gravity and therefore provides a degree of reliability. The diesel booster pump station is installed to sustain water system pressure when the reservoir level is below 482 feet elevation. The emergency booster pump station makes most of the water stored in the reservoir available for use at the minimum required system pressure.

POTENTIAL INTERTIES

There are four known, privately owned, water systems in the vicinity of Roy. These systems are listed in Table 1-3. None of these systems have expressed any interest in obtaining water service from the City of Roy, nor do they have capacity to provide service to the City of Roy. The Roy water system currently has no interties with other water purveyors. Roy is not likely to construct interties with any other water system in the next 20 years due to lack of any neighboring utilities. Expansion of the water system to the north and west is limited by the presence of Joint Base Lewis McChord.

CHAPTER 5

WELLHEAD PROTECTION PROGRAM

INTRODUCTION

Water from underground aquifers, commonly referred to as groundwater, forms the primary source of drinking water for an estimated 65 percent of residents in Washington State. Roy relies exclusively on groundwater from its two wells as its sources of supply. Well 1 is located on leased privately-owned property and Well 2 is located on public property as described in previous chapters and shown on the Wellhead Protection Area Map, Figure 5-1.

Groundwater supplies can be susceptible to contamination from surface sources such as underground storage tanks, pesticides, accidental spills, and nitrates from fertilizers, septic systems and leaking wastewater collection pipes. To protect groundwater supplies, the U.S. Environmental Protection Agency (EPA) and Department of Health (DOH) require all Group A public water systems to develop wellhead protection programs as components of their water comprehensive plans. A Group A public water system is defined as a public water system that serves more than 25 people or more than 15 connections. A successful wellhead protection program or plan consists of a number of components that must be developed before the program can be fully implemented. The major components of the plan are described below and form the basis of the chapter that follows.

- A *susceptibility assessment* that determines the potential for contamination.
- A *delineated wellhead protection area* that is based on all reasonably available hydrogeologic information, including the Susceptibility Assessment
- An *inventory* within each wellhead protection area of potential sources of contamination.
- A *spill response plan* for each wellhead protection area containing documentation for coordination with local first responders.
- *Contingency plans* for providing alternate sources of drinking water in the event that contamination does occur. The contingency plan will include management recommendations to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.

Individual private wells are regulated by Pierce County and do not need to develop wellhead protection programs or delineate wellhead protection areas.

AQUIFER SUSCEPTIBILITY

Completion of a susceptibility assessment is an important initial step in selecting appropriate delineation methods to define wellhead protection area boundaries. Completion of the susceptibility assessment and submittal to DOH allows for a susceptibility ranking. Sources that receive low susceptibility ratings may receive susceptibility waivers from DOH to reduce or waive the amount of required monitoring for volatile organic compounds (VOCs) and synthetic organic compounds (SOCs). Table 5-1 contains the susceptibility ratings for Roy's sources as determined by DOH.

TABLE 5-1

Source Susceptibility Ratings

Source	DOH Source No.	Susceptibility
Well 1	S01	Moderate
Well 2	S03	Low

Susceptibility ratings reflect the susceptibility of a water source to contamination from a variety of contaminant sources. The susceptibility rating is dependent on factors such as well construction, hydrogeological conditions, and distances to known or suspected contaminant sources. Drinking water wells and springs vary in their susceptibility to contaminants released at the surface. Wells with poor construction or improper surface seals have increased susceptibility to contaminant migration into the saturated zone of the well. Wells located in unconfined aquifers (commonly the shallowest aquifer encountered) typically have a higher susceptibility to contamination than wells which draw water from confined aquifers.

Roy's water system derives all its water supply from two wells that are located approximately 2/3 of a mile apart. Well 1 draws from a depth of between 80 and 100 feet while Well 2 draws from a depth of between 444 and 488 feet. If one well should be contaminated by a chemical spill, it is unlikely that both wells would be contaminated by the same event. With one well out of service the water system would have no backup supply and; therefore, would be short on standby storage. A replacement source or additional storage would be required. But the capacity of either well is adequate to meet maximum day demand through buildout, so the system would not be out of water if it lost one well, and the City would have time to react to loss of the well by adding a replacement source and/or additional storage. Therefore, the system has a low overall system vulnerability.

WELLHEAD PROTECTION AREA DELINEATION

The first step in developing a wellhead protection program is to identify the land area around each well from which groundwater may be flowing to the source. These areas are

JOINT BASE LEWIS MCCHORD

JOINT BASE LEWIS MCCHORD

MAPLE ST

ASH ST.

ALDER ST

CEDAR ST.

WATER ST.

FIRST ST.

SECOND

THIRD ST

FOURTH ST

JAMES ST.

WARREN ST.

RONGE ST.

MCNAUGHT ST.

PETERSON ST.

LYLE ST.

ACADEMY ST.

81ST ST

LACAMAS C

10-YEAR

5-YEAR

1-YEAR

6-MONTHS

WELL NO.1

HUGGINS GRIEG

CITY ROAD

BURLINGTON NORTHERN RAILROAD

S.R. 507

TACOMA RAIL

73RD AVE S.

288TH ST. S

10-YEAR

5-YEAR

1-YEAR

6-MONTHS

WELL NO.2

LYONS DR. SW

N

SCALE 1"=800'

0 400' 800'

LEGEND

- CITY LIIMITS
- UGA BOUNDARIES
- WATER SERVICE AREA BOUNDARIES
- WELL NO.1 WELLHEAD PROTECTION AREA
- WELL NO.2 WELLHEAD PROTECTION AREA

BURLINGTON NORTHERN RAILROAD

S.R.507

TACOMA RAIL

CITY OF ROY

WATER SYSTEM PLAN

FIGURE 5-1

WELLHEAD PROTECTION AREA

Gray & Osborne, Inc.

CONSULTING ENGINEERS

the most likely to contribute pollutants to the groundwater and are referred to as zones of contribution. Zones of contribution require proper land use management to minimize the potential of contaminants entering the groundwater system. The most commonly accepted tools for delineating wellhead protection zones are the calculated fixed radius method, analytical models, and numerical models. A discussion of these methods follows.

WELLHEAD PROTECTION ZONES

A Wellhead Protection Area (WHPA) is defined as the surface and subsurface area surrounding a groundwater source through which contamination can potentially travel and reach the source. WHPAs are based on zones of contribution (ZOCs) which are derived from the estimated time of travel required for a contaminant to move from the point of introduction into the water bearing formation to the source. The Washington Wellhead Protection Program requires a WHPA to be subdivided into five zones, which include:

- A sanitary control zone of at least a 100-foot radius, unless engineering justification supports a smaller area (WAC 246-290-135). No source of contamination may be constructed, stored, disposed of, or applied within the sanitary control zone without the permission of DOH and the water purveyor.

- Four primary zones based on 6 month, 1-year, 5-year, and 10-year time of travel boundaries. These zones are referred to as the zones of contribution of the WHPA. Within this report, these zones will be abbreviated as $ZOC_{½}$ – 6-month zone of contribution, ZOC_{1} – 1-year, ZOC_{5} – 5-year, and ZOC_{10} – 10-year zone of contribution.

- One buffer zone (if necessary) extending from ZOC_{10} to a groundwater divide and highlighting areas where the aquifer may be particularly susceptible or vulnerable to contamination.

The ZOC_{10} defines the boundary of the WHPA and defines the area to be inventoried and managed to reduce the risk of contamination.

DELINEATION METHODS

There are four general delineation methods acceptable to DOH to determine ZOCs and WHPAs.

- Calculated Fixed Radius (CFR)
- Analytical Models

- Hydrogeologic Mapping
- Numerical Flow/Transport Models

In general, there is an increase in complexity and required input data from the top to the bottom of the list. However, the increase in input data and complexity generally results in greater accuracy and reliability. The CFR method is the minimum acceptable interim method of delineation for public water systems with fewer than 1,000 connections. There are two scenarios under which the water system would be expected to upgrade their initial delineation: (1) the susceptibility assessment indicates that the system is highly susceptible; or (2) there are irregular or steep groundwater gradients in the vicinity of the well. If either of these two conditions exist, the public water supply would be expected to upgrade the initial delineation to an analytical or groundwater flow model within 5 years.

ANALYSIS

The Calculated Fixed Radius Method was used to analyze the wellhead protection area zones of contribution for the Wells 1 and 2. This method is the minimum acceptable method of delineation for public water systems. The following equation is applicable:

$$r = \sqrt{\frac{Qt}{\pi n H}}$$

where

r = Radius of ZOC_t
Q = Volume of water withdrawal (cubic feet per year)
t = travel time (½, 1 ,5 and 10 years)
n = Porosity = 0.22 (default value)
H = well screen interval (ft)

This equation was used to calculate zone of contribution radii for the 6-month (1/2 year), 1-year, 5-year and 10-year time horizons for the Roy wellfield. The value to be used for Q, the groundwater withdrawal rate, should be a value that will reflect the maximum annual withdrawal anticipated for each well. Current water rights limit withdrawals to a combined total of 137.5 AF/Y, which equates to 5.990 million cubic feet per year. From Table 2-14, the estimated average day withdrawal at system buildout is 88,890 gpd. That equates to 4.34 million cubic feet per year. If one of these wells is ever put out of commission for an extended period, all source would have to come from the other well until a replacement well could be constructed. Therefore, the wellhead protection area for each well will be 4.34 million cubic feet per year, based on meeting projected buildout demand from one well.

The screened interval length as shown in well logs is 15.8 feet for Well 1 and 35.8 feet for Well 2. Radius values calculated for the various times of travel are presented in Table 5-2.

TABLE 5-2

City of Roy Wellhead Protection Zones of Contribution (CFR Method)

Parameter	Well 1	Well 2
Screened Interval	15.8	35.8
Annual Withdrawal Rate	4.25 Million Cubic Feet(1)	4.25 Million Cubic Feet(1)
Time of Travel	**Zone of Contribution Radius, feet(2)**	**Zone of Contribution Radius, feet(2)**
6 month	440	290
1 year	620	420
5 years	1,390	920
10 years	1,960	1,300

(1) The annual withdrawal estimates are based on meeting projected annual demand at system buildout (87,166 gpd from Table 2-14) from one well or the other. This value was chosen to provide maximum protection for both City wells.

(2) Calculated values have been rounded up to the nearest 10 feet.

The Wellhead Protection Area Map, Figure 5-1, shows the limits of the 6-month, 1-year, 5-year, and 10-year zones of contribution. Residents identified in the 1-year time-of-travel and businesses within the 10-year time-of-travel will be sent an educational letter on source water protection.

INVENTORY OF POTENTIAL CONTAMINANT SOURCES

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination in and around the delineated wellhead protection areas. The purpose of the inventory is to identify past, present, and proposed activities that may pose a threat to a source.

Other purposes for maintaining an inventory of potential contaminant sources are to help plan management strategies, establish a mailing list to notify potential contaminant sources located within the wellhead protection areas and notification of agencies regarding inventory findings. An accurate description of inventory data sources is also necessary and can be used to update the plan as required in WAC 246-290-135.

POTENTIAL CONTAMINANT SOURCES

Within a wellhead protection zone, there are many diverse activities that may contaminate an aquifer and potentially prevent its use as a viable drinking water source. It is important that these activities are properly inventoried and, if necessary, regulated to

prevent degradation of groundwater quality. Relevant activities and sources include land use practices, industrial and commercial operations, underground storage tanks (USTs), leaking underground storage tanks (LUSTs), hazardous materials storage and use, septic tanks, and dry wells among others. A discussion of these activities, their potential effects on groundwater, and the regulatory requirements that may apply are included in the following sections.

A review of possible contaminant sources in the vicinity of Roy was conducted in the preparation of this plan. The Washington State Department of Ecology Regulated Facility Site Identification services were used to identify all Ecology-regulated sites in the Roy area. The search found seven sites within 2 miles of the Roy city center. Six of those sites involve potential groundwater contaminants and one site is regulated by water resources. The sites found within 2 miles of the Roy city center that involve potential groundwater contaminants are listed below in Table 5-4, and are shown on the Wellhead Protection Area Map, Figure 5-1.

In addition to Ecology-regulated sites, other potential sources of contamination include landfills, industrial and commercial activities, hazardous materials storage, agricultural activities, underground storage tanks, confirmed and suspected contamination sites, clandestine drug labs, septic tanks, stormwater disposal, flooding, and accidental spills and leaks.

Landfills

A landfill is a disposal facility in which solid waste is permanently placed. Minimum functional standards for solid waste hauling are regulated by the Washington State Department of Ecology (Ecology) under WAC 173-304. These regulations set siting and closure criteria, performance standards, and operating requirements for landfills. Abandoned and improperly maintained landfills and dump sites are often a major source of groundwater contamination. Leachate from landfills poses a threat to groundwater quality should it migrate to the water table. Ecology is responsible for mitigating dump site cleanup when potentially hazardous leachates are present.

There are no landfills listed on the Department of Ecology's regulated solid waste handling facilities within the wellhead protection area of Roy's wells. The Tacoma-Pierce County Health Department has a record of an abandoned solid waste disposal site near the north end of Hinkleman Road near a creek that shows up as Graivaille Creek on Road Maps and as Murray Creek on the USGS Topographic Map. This location is approximately 1.5 miles SE of Roy. This site does not appear on Ecology's list of confirmed and suspected contamination sites. This site is included in Table 5-4, below, but is off the map in Figure 5-1.

Industrial and Commercial Activity

Industrial and commercial activity poses a potential threat to groundwater quality due to the potential use of hazardous materials within these areas. Examples include gasoline service stations and auto repair shops (petroleum fuels, heavy metals), dry cleaners (dry cleaning solvents), printers and publishers (solvents, inks, and dyes), and metal plating shops (cyanides and heavy metals). These wastes can potentially enter the groundwater system through inadequate disposal practices or accidental spills.

Table 5-3 presents typical commercial and industrial activities and the potentially hazardous chemicals that may be associated with them. Currently, there are no known commercial or industrial sites within Roy's WHPA other than the Ecology Regulated Facilities listed in Table 5-3.

The only industrial and commercial activities listed in QWESTDEX in the Roy area are four auto repair shops. These are listed in Table 5-4. Two of these facilities have Roy addresses but are actually located a few miles from Roy.

TABLE 5-3

Chemicals Associated with Commercial and Industrial Activities

Commercial/Industrial Activity	Contaminants
Automobile/Truck Service	Waste oils, solvents, acids, paints, soaps
Dry Cleaners	Solvents (perchloroethelyene, petroleum solvents, Freon) Spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Cemeteries	Fertilizers, pesticides
Country Clubs/Golf Courses	Fertilizers, herbicides, pesticides, swimming pool chemicals, automotive wastes
Electric/Electronic Equipment Manufacturers	Nitric, hydrochloric and sulfuric acid, heavy metal sludges, ammonium persulfate, cutting oil and degreasing solvent, corrosive soldering flux, waste plating solution, cyanide, methylene chloride, perchloroetheylene, trichloroethane, acetone methanol
Furniture/Wood Manufacturing	Paints, solvents, degreasing and solvent recovery sludge
Metal Plating Shops	Sodium and hydrogen cyanide, metallic salts, alkaline solutions, acids, solvents, heavy metal contaminated wastewater/sludge
Lawns and Gardens	Fertilizers, herbicides, pesticides
Painters. Publishers	Solvents, inks, dyes, oils, miscellaneous organics, photographic chemicals
Sand and Gravel Mining	Diesel fuel, motor oil, hydraulic fluids
Scrap, Salvage and Junkyards	Used oil, gasoline, antifreeze, PCB contaminated oils, lead acid batteries

Hazardous Material Storage

Hazardous material storage is a specific function of industrial/commercial activity. On the Federal level, hazardous material storage and use is regulated through the Resource Conservation and Recovery Act. In Washington State, the Ecology regulates facilities that generate more than 220 pounds of hazardous waste per month under WAC 173-303, Dangerous Waste Regulations. The State maintains a database of dangerous waste generators that can be searched. However, small quantity (< 220 lbs.) dangerous waste generators are not included in the database.

The only facility listed in the Roy area for hazardous materials storage is the US West (now CenturyLink) Communications facility on 288th Street South near SR 507. This site is listed with Ecology for use of storage batteries that contain a corrosive substance. This site is listed in Table 5-4 and shown on Figure 5-1.

Agricultural Activity

Agricultural activity can be a concern due to the potential for bacteriological and nitrate contamination. There is also a potential of contamination by agricultural chemicals such as pesticides and herbicides. Agricultural practices can help minimize the potential by managing animal wastes and by proper application and disposal of agricultural chemicals. RCW 90.64 – *Dairy Waste Management* specifies that dairy farms with more than 700 confined mature dairy cows or 200 mature dairy cattle whose wastes are discharged to navigable, surface, or ground waters are required to complete dairy waste plans that specify how a dairy farm manages its wastes. However, most programs involving agricultural activity are voluntary and may be administered by the State Conservation Commission or the Natural Resource Conservation Service. Municipalities that work with these organizations have the opportunity to educate farmers whose activities occur in WHPAs of the potential impacts of the farmers' agricultural practices on the WHPA.

There are farms in the vicinity of Roy and Silva Seed operates a tree farm near Well 2; however, there is no tracking system available for farming activities, so additional farms are not listed in Table 5-4 and are not shown in Figure 5-1.

Underground Storage Tanks

Underground storage tanks (USTs) and leaking underground storage tanks (LUSTs) are a significant threat to groundwater quality. Petroleum products are the most commonly stored substances in USTs. The majority of petroleum products stored in USTs are less dense than water and tend to migrate to the top of an aquifer (or water surface in an unconfined aquifer) when released in the vadose (unsaturated) zone or in groundwater. Petroleum products and impurities found in them tend to be rather mobile in aquifers with generally increasing mobility with decreasing organic content in soils. The greatest amount of petroleum contaminant movement is in the lightest hydrocarbons (e.g., gasoline) with the greatest solubility in water. The most common causes of leaks are structural failure, corrosion, improper fittings, and improper installation.

Ecology regulates USTs in the State under WAC 173-360. The regulations require that tank owners and operators of underground storage tanks comply with the following sections of the regulations:

- Notification, reporting, and record keeping
- Performance standards and operating closure requirements
- Registration and licensing
- Financial responsibility

The WAC allows a number of exemptions including tanks whose capacity is 110 gallons or less, farm and residential tanks with less than 1,100 gallons, heating oil tanks less than 1,100 gallons per premises, and septic tanks.

Owners and operators of all existing nonexempt USTs must have a permit from Ecology. A valid permit is a requirement for delivery of regulated substances and must be updated annually. As a condition of the permit, the owner must have completed the following requirements:

- An assessment of the tank condition by an Ecology licensed tank service provider.
- Replacement of leaking tanks and site cleanup.
- Installation of leak detection devices.
- Proof of insurance to compensate a third party in the event of bodily injury or property damage stemming from a leaking tank. One million dollars insurance is required for petroleum marketing facilities.

By 1998, all existing nonexempt USTs were required to provide cathodic protection and spill and overflow containment in addition to the above requirements.

Installation and replacement of USTs must meet the specifications and performance and design standards listed in the WAC. Ecology follows the federal UST guidelines, which at this time do not require double walled tanks.

UST inspections are performed by Ecology primarily through the information developed in the permitting process. Although routine annual inspections are not performed, Ecology inspectors do prioritize sites considered potentially hazardous. Technical assistance visits are also conducted at the request of the owner/operators.

Ecology maintains a database of all permitted USTs in the State, as required by the Resource Conservation and Recovery Act (RCRA), Subtitle 1. The database provides the site name and address, tank identification number, date of installation, size, tank status, and the substance stored on the site. An additional database maintained by Ecology contains information about known LUSTs and corrected LUSTs. Both databases are updated twice a year.

There are no LUSTs listed in the Roy area. Five USTs within Roy are listed in Table 5-3 and shown on the WHPA map, Figure 5-1.

Confirmed and Suspected Contamination Sites

Under the Model Toxics Control Act Cleanup Regulation, WAC 173-340, Ecology is responsible for ensuring that all hazardous waste sites are properly remediated. This includes confirmed and suspected sites of contamination as well as LUSTs. A separate

inventory for each, which includes the status of cleanup efforts, is maintained by Ecology. Ecology conducts an initial site investigation within 90 days of learning of a potentially contaminated site. If this investigation shows that remedial action is required, the site will appear on the Confirmed and Suspected Contaminated Sites Report. The sites are also given a Washington Ranking Code BIN number between 1 and 5 with 1 indicating the greatest assessed risk to human health and the environment and 5 indicating the least. The contaminant type and the affected media, such as groundwater, are also noted. Once the remedial action has been completed, Ecology's Toxics Cleanup Program determines if the site can be removed from the list.

According to available Ecology data, there are no confirmed or suspected contamination sites within Roy's WHPA. There is one site that has been that has been removed from the Ecology Hazardous Sites List because all remedial actions have been completed. That site is known as the Robert Rosch Property at 30220 72nd Avenue South. The site had been contaminated with petroleum products and solvents. The Rosch Property site is listed in Table 5-4

Clandestine Drug Labs

Labs that produce illicit drugs use a wide variety of solvents and toxic, caustic and acidic substances. Because their activities are strictly illegal they rarely dispose of wastes in an environmentally friendly manner. Therefore, these sites are potentially sources of groundwater contamination. The Tacoma-Pierce County Health Department maintains a list of clandestine drug labs that have been discovered in the county. The list dated May 16, 2016, contains 1367 sites, 48 of which have Roy addresses and 6 of which are in the immediate Roy area and are listed in Table 5-4. The sites that are listed have been discovered and closed. In most cases they have been cleaned up and are considered to no longer be a threat to the environment. Unfortunately, there is no way to know the location of sites that have not been discovered and closed.

Septic Systems

Contaminants associated with septic system effluent include pathogenic organisms, toxic substances, and various nitrogen compounds including ammonia and nitrate which are highly soluble in water. Septic systems discharge effluent to the unsaturated zone above unconfined aquifers. A properly designed and operated septic system provides acceptable removals of pathogens and reduction of many constituents in wastewater through filtration and biological processes. However, one product of a properly operating septic system is nitrate. Overloading of an area with too many septic systems can result in elevated nitrate in groundwater, and improperly operating septic systems can allow other contaminants to enter the groundwater. Also, septic systems are not effective in removing certain contaminants such as solvents, pesticides, anti-freeze, waste oil and petroleum products. These substances should not be disposed of in septic systems.

The nitrate levels in the City's wells have been between 2 and 3 mg/L in Well 1 and less than 0.2 mg/L in Well 2. These levels are well below the DOH established maximum contaminant level of 10 mg/L. An increase in nitrate concentration over time could indicate a problem with septic tanks, fertilizers or agricultural waste. The City will continue to monitor nitrate levels in its wells to anticipate problems before they occur.

Because there is no sewer system in the City of Roy, all developed properties are on septic systems. Septic systems are not listed in Table 5-4 nor shown in Figure 5-1. Septic systems within Pierce County are regulated by the Tacoma-Pierce County Environmental Health. The Department can be reached at (253) 798-6470

Stormwater and Flooding

Stormwater can contain many chemicals that are derived from road runoff. These include heavy metals such as lead, chromium, and zinc; oil and grease; pathogens; and nutrients. Typically, the concerns regarding stormwater are related to the impacts on surface water. However, groundwater can be adversely affected by stormwater. The Department of Ecology Stormwater Manual establishes stormwater control measures including flow quantities and characteristics and minimum acceptable stormwater treatment practices.

The City of Roy does not own or operate a stormwater collection or treatment system.

The Pierce County Department of Planning and Land Services Flood Hazard Areas map indicates no flooding areas within the City of Roy. A 100-year flood zone is indicated north of the City along Lacamas and Muck Creeks and an area identified on the USGS topographic map as "Brandenburg Marsh." The 100-year flood zone may encroach as close as 500 feet from Well 1. A 500-year flood zone lies to the West of Roy in an area identified on Topographic maps as "Denton Marsh." The 500-year flood zone may encroach as close as 500 feet from Well 1. The Pierce County map and a blowup of the Roy area are included in Appendix L.

Accidental Spills and Leaks

Under the Model Toxics Control Act cleanup regulation, WAC 173-340, the Department of Ecology is responsible for ensuring all hazardous waste sites are properly remediated. Confirmed and suspected sites of contamination, such as accidental spills or releases contaminants, can potentially impact groundwater supplies. Potential sources of small spills or leaks include USTs, traffic accidents, rail accidents, pipeline leaks and poor waste disposal practices. Burlington Northern Railway, Tacoma Rail, Olympic Pipeline, SR 507, Pierce County roads, and City streets, are all potential locations for accidental spills. A major spill could render one or the other of the Roy wells unusable due to the threat to human health. The railroads, Olympic Pipeline, the highway, roads and streets are all shown in Figure 5-1.

TABLE 5-4

Potential Sources of Contamination in Roy Area

Facility Name	Location	Description
Pierce County Fire District 20	302 South McNaught Street	Underground Storage Tank
Roy Elementary School	4th and Peterson	Underground Storage Tank
Roy General Store	104 South McNaught Street	Underground Storage Tank
Roy Market & Deli	404 South McNaught Street	Underground Storage Tank
Walter Franczyk Roy Tire Service (Walt's Tire Factory)	2nd Street East and McNaught Street	Underground Storage Tank, Solvents
Westcoast Automotive	122 South McNaught Street	Solvents
Dave's Complete Auto Repair	215 Water Street East	Local Source Control
US West (CenturyLink) Communications	South 288th and SR 507	Hazardous Materials Storage (inactive)
Abandoned Dump Site	Hinkleman Road	Solid Waste Disposal
Gypsy Auto Repair	4015 357th Street South	Solvents, Waste Oil
Mr. G's Autowrench	38702 30th Avenue South	Solvents, Waste Oil
Robert Rosch Property	30220 72nd Avenue South	Petroleum Products, Solvents
Silva Seed Farm	28918 Spanaway-McKenna Highway	Agricultural Activity
Clandestine Drug Lab	206 3rd Street	Solvents, Toxics
Clandestine Drug Lab	7405 288th Street South	Solvents, Toxics
Clandestine Drug Lab	7815 290th Street South	Solvents, Toxics
Clandestine Drug Lab	29219 Lyons Drive South	Solvents, Toxics
Clandestine Drug Lab	7606 297th Street South	Solvents, Toxics
Clandestine Drug Lab	7711 South 295th Street	Solvents, Toxics
Septic Systems	Throughout Area	Nitrate, Pathogens
Flooding	See Appendix L	Non-Potable Water
Olympic Pipeline	See Figure 6-1	Petroleum Products
Burlington Northern Railway	See Figure 6-1	Varies
Tacoma Rail	See Figure 6-1	Varies
Highways, Roads and Streets	See Figure 6-1	Varies

INVENTORY DATA SOURCES

The inventory of potential contaminant sources was compiled using various data sources. Agencies such as Ecology and EPA maintain contaminant databases that list businesses that handle and store potential contaminants. In addition to the documents discussed previously, the following data sources were used to create the inventory for Roy:

- *Underground Storage Tank Report, June 2016.* The most recent version of the Underground Storage Tanks Report was obtained from Ecology's Toxics Cleanup Program web site. This list was used to locate the facilities that contain underground storage tanks.

- *Leaking Underground Storage Tank Report, June 2016.* The most recent Leaking Underground Storage Tank (LUST) Report was also obtained from Ecology's Toxics Cleanup Program website. No Leaking Underground Storage Tanks were identified in the Roy area.

- *Dangerous Waste and Materials Generators.* The EPA's RCRA program, has been taken over by Ecology within the State of Washington and is regulated under the Dangerous Waste Regulations (173-303 WAC).

- *Confirmed and Suspected Contaminated Sites Report, June 2016.* Ecology maintains the Confirmed and Suspected Contamination Sites Report. The list is updated continuously as new information becomes available. Each site is given a site status code indicating the status of the cleanup process. The current list of known and suspected contamination sites was downloaded from the Ecology website and reviewed for sites in the Roy area. The only site listed with a Roy address is Dorman Tire Yard Fire at 35707 Kinsman Road East, which is approximately 7 miles SE of Roy.

- *Title III Facilities.* Title III facilities are identified as those facilities that generate, treat, store, or dispose of hazardous materials in sufficient quantity to pose a threat to the community. There are several different types of Title III facilities depending upon the quantity and the nature of the material handled. All companies that are designated as Title III facilities must report to the County on an annual basis. This reporting was a result of the 1986 Superfund Amendments and Reauthorization Act. Title III of the act was subsequently renamed to the Emergency Planning and Community Right to Know Act (EPCRA).

- *Clandestine Drug Lab List, May, 2016.* The Tacoma-Pierce County Health Department maintains a listing of clandestine drug labs that have been uncovered in the county. A current list and map of drug lab locations was obtained from the Tacoma-Pierce County Health Department website. Out of 1367 listed sites there are 48 sites with Roy addresses and six are shown on the map in the general vicinity of Roy. The list is included in Appendix L.

SPILL/INCIDENT RESPONSE PROGRAM

Spill response is an important part of both emergency management plans and wellhead protection programs. Specific response procedures for wellhead protection areas must be determined prior to the occurrence of a contamination incident. The information obtained as a result of the susceptibility assessment and the wellhead protection area inventory can be used to determine what types of spill response measures are necessary

for the protection of drinking water sources. In order to be accepted by local emergency responders, spill response procedures for wellhead protection areas should be realistic and easily implemented.

In order for spill response procedures to be effectively executed, coordination, cooperation, and communication among the responding agencies, organizations, and individuals is imperative. Depending on the magnitude and type of the release, any of the following organizations may be involved in a spill response for Roy's wellhead protection areas.

- *Department of Ecology (Ecology):* The Spill Response Team is responsible for determining the source and cause of the release, and responsible party. If the responsible party is unknown, Ecology will investigate to determine who is responsible and ensure that containment, clean-up, and disposal proceedings begin. The Ecology's 24-Hour Spill Response can be contacted at (360) 753-2353.

- *Department of Health (DOH):* The Department of Health, in conjunction with organizations such as Ecology's Spill Operations Section and the Association of Fire Chiefs, is developing a set of standard operating procedures that first responders can use in wellhead protection areas, critical aquifer recharge areas, and other sensitive groundwater areas. If necessary to cleanup effort, DOH also provides assistance through laboratory support services.

- *Department of Transportation (DOT):* The Washington State DOT can provide spill response assistance through traffic control, equipment, and personnel for non-hazardous clean-up activities on state and interstate highways.

- *Pierce County Road Department:* The Pierce County Road Department may be responsible for responding to spills on county roads.

- *Washington State Patrol:* The state patrol is responsible for managing spills on interstate and state highways.

- *Pierce County Fire District No. 17:* The local Fire protection provider in Roy is Pierce County Fire District No. 17. Fire protection agencies are often first responders to incidents involving spills of hazardous materials. Pierce County Fire District No. 17 can be reached at: (253) 847-4333

- *Pierce County Sheriff:* County Sheriff may be a first responder in a spill incident.

- *Pierce County Emergency Management:* County Emergency Management helps to coordinate spill response among various response agencies.

- *Tacoma Rail:* Tacoma Rail owns a rail line on the east side of SR 507 that passes through the City of Roy and the Wellhead Protection Area for Well 2. Tacoma Rail would be involved in cleanup of any spill that may occur along this rail line.

- *Burlington Northern and Santa Fe Railway:* Burlington Northern and Santa Fe Railway owns tracks that run through Roy on the west side of SR 507. Burlington Northern and Santa Fe Railway would be involved in cleanup of any spill that may occur along this rail line.

- *Olympic Pipeline Company:* Olympic Pipeline Company owns a petroleum products pipeline that goes through the City of Roy and the Wells 1 and 2 wellhead protection areas. If a spill occurred involving the Olympic pipeline they would be involved spill response.

WELLHEAD PROTECTION AREA MANAGEMENT STRATEGIES

Wellhead protection areas have been defined and potential sources of contamination have been identified. In order for this to result in actual protection for Roy's wells, a management plan must be put into place. The goals of a management plan are to:

- Reduce the likelihood that potential groundwater contaminants will be disposed, spilled, leaked or otherwise discharged in the wellhead protection area such that they could contaminate groundwater.

- Increase the likelihood that any potential groundwater contaminants that do get disposed, spilled, leaked or otherwise discharged in the wellhead protection area will get cleaned up before they reach the public water supply wells.

- Detect any groundwater contamination that may occur before public health is affected.

- Develop a plan of action in the event that Roy's water supply should become contaminated.

MINIMUM REQUIREMENTS

Minimum management requirements for wellhead protection plans are specified in WAC 246-290-135 (3)(c)(iii)-(vii). These requirements are as follows:

(iii) Inventory, including identification of site locations and owners/operators, of all known and potential groundwater contamination sources located within the defined WHPA(s) having the potential to contaminate the source water of the well(s) or spring(s). This list shall be updated every 2 years.

(iv) Notification to all owners/operators of known or potential sources of groundwater contamination listed in (c)(B)(iii) of this subsection.

(v) Notification to regulatory agencies and local governments of the boundaries of the WHPA(s) and the findings of the WHPA inventory.

(vi) A contingency plan to ensure consumers have an adequate supply of potable water in the event that contamination results in the temporary or permanent loss of the principal source of supply (major well(s) or wellfield).

(vii) Documentation of coordination with local emergency incident responders (including police, fire and health departments), including notification of WHPA boundaries, results of susceptibility assessment, inventory findings, and contingency plan.

RECOMMENDED ADDITIONAL ACTIONS

In addition to the minimum requirements in regulation there are some other measures that Roy could take to enhance the effectiveness of the wellhead protection program:

- Include tenants of property in notification of potential sources of contamination.
- Make general information available for the public at City Hall regarding location of wellhead protection area and appropriate handling of wastes.
- Public education regarding appropriate handling and disposal of potential groundwater contaminants.
- Public assistance for appropriate disposal of potential groundwater contaminants.
- Formation of a Local Wellhead Protection Committee.

CONTINGENCY PLANNING

Contingency planning is an important component of a wellhead protection program. In the event that one or both of Roy's wells need to be taken offline due to contamination, a contingency plan provides immediate mitigation. A properly prepared and updated contingency plan helps ensure the water system and local officials are prepared to respond to emergency situations. Contingency planning also includes provision of alternative sources of drinking water. The following steps are necessary for the development of an effective contingency plan:

- Identify maximum capacities of the existing system as to source, distribution system and water rights restrictions. Assume loss of well and reevaluate.

- Evaluate the expansion options of the existing system's capacities relative to existing water rights.

- Identify existing or potential interties with other public water systems.

RECOMMENDATIONS

The City of Roy water system has no intertie or other easily accessible emergency water supply. The City does, however, have two sources at different locations and different depths. This diversity of sources reduces the likelihood of both sources being lost to a groundwater contamination event.

If one well were lost to contamination, then the City's standby storage capacity would be adequate. The standby storage design standard is to meet two days of average day demand with the largest source out of service, and a minimum storage capacity of 200 gallons per connection. Roy has adequate capacity with either well out of service to meet projected maximum day demand through buildout, so the standby storage standard applied to the City is the minimum 200 gallons per connection.

The City of Roy's water rights allow for withdrawals of the entire annual water right of 137.5 AF/Y from either Well 1 or Well 2.

The following items are recommended contingency-planning efforts Roy will consider implementing:

- Develop emergency procedures for implementing water curtailment measures should one or both of Roy's wells become contaminated.

- Identify the closest water purveyor that may be available to Roy to truck water from and research the availability of trucks that could be used for

this purpose. The State Department of Health and Pierce County Department of Emergency Services can assist in locating emergency water supplies.

- Notify local and state agencies of the location of Roy's wells and their zones of contribution. Agencies to be notified include the Washington State Department of Ecology – Spill Response, the Washington State Department of Transportation; the Tacoma-Pierce County Health Department, Pierce County Planning, Pierce Emergency Services, Pierce County Roads, Pierce County Public Works; the Pierce County Sheriff; and Fire District No. 17.

- Monitor for nitrates annually. Contaminants associated with leaking septic systems include pathogenic organisms, toxic substances, and nitrogen compounds. By doing so, Roy will not only be aware of non-compliance with MCLs for nitrates, but also trends of increased nitrate levels over a period of time. Increasing nitrate levels could be an indication of source contamination.

If either of Roy's wells should become contaminated in spite of preventive efforts, Roy will implement the following contingency measures:

- If necessary, contact the Ecology Spill Response Team at (360) 407-6300.

- Inform customers through the use of local media.

- Impose outdoor watering restrictions, if required.

- Truck in water from a nearby purveyor, if required.

CHAPTER 6

OPERATION AND MAINTENANCE PROGRAM

WATER SYSTEM MANAGEMENT AND PERSONNEL

As stated in Chapter 1, Roy is governed by a City Council. The water system is operated and maintained by William Starks, WDM1, and receives office support from Roy Clerk/Treasurer, Ms. Debbie Dearinger.

OPERATOR CERTIFICATION REQUIREMENTS

The water system is considered a distribution system for Water Treatment Plant Classifications because it is a groundwater supply with only chlorination and aeration for corrosion control. The water system therefore does not require a certified Water Treatment Plant Operator. The system will be required to have a certified Water Treatment Plant Operator in the future when iron and manganese treatment is installed at Well 2. The Distribution System Classification is Class 1, with a Minimum Operator Certification Level of WDM 1. WTPO 1 requires 12 years of education and a minimum experience of 12 months operating a water treatment plant. WDM 1 requires 12 years of education and a minimum experience of 12 months operating in a water treatment plant or distribution system. Additional details of requirements are found in WAC 246-292-050 and WAC 246-292-060.

PROFESSIONAL GROWTH REQUIREMENTS

In order to promote and maintain expertise for the various grades of operator certification, Washington State requires that all certified operators complete not less than three Continuing Education Units (CEU) within each 3-year period. Programs sponsored by both Washington Environmental Training Resources Center (WETRC) and the American Waterworks Association (AWWA) Pacific Northwest Subsection are the most popular source of CEUs for certified operators in Washington State.

Besides providing CEUs, operator training is an important component in maintaining a safe and reliable water system. At a minimum, all personnel performing water system related duties should be trained in the following areas.

- Confined space
- Trenching and shoring
- Traffic Flagging
- Asbestos cement pipe safety
- Cross-Connection Control

- Chemical Handling

It is the responsibility of the City of Roy to assure that the Public Works staff receives the training required to remain certified.

SYSTEM OPERATION AND CONTROL

The locations of the major system components are shown on Figure 1-2, Water System Map. A description of the normal operation of each facility is given in the following sections.

SOURCE OF SUPPLY

Roy has two sources of supply, Wells 1 and 2. The wells operate on alternating lead and lag modes. As shown in Table 1-4, Well 1 produces approximately 490 gpm and Well 2 produces approximately 450 gpm. The wells are at different depths, tap different aquifers and have different water quality. The wells alternate in operation and, because either well is usually capable of meeting system demand, the wells usually do not run simultaneously. Either well could supply the projected maximum day water demand through buildout. Both wells have source meters that record the volume of water produced from each well. The City's water rights are detailed in Table 6-1.

TABLE 6-1

City of Roy Water Rights

Water Right Number	Status	Point of Withdrawal	Priority Date	Instantaneous Right, gpm	Annual Right, AF/Y
G2-26452C	Certificate	Well 1	12/14/83	300	137.5
G2-26633C	Certificate	Well 2	12/27/84	300	137.5 (1)
Total Certificated Rights				600	137.5 (1)
G2-29313A	Application	Well 1	10/30/95	490 (2)	148
G2-29312A	Application	Well 2	10/30/95	500 (2)	148
Total Additional Rights Applied For				990 (2)	296
G2-00933CL	Claim	Well(3)	1932	10	2

(1) The annual right of 137.5 AF/Y on Groundwater Certificate G2-26633 is entirely supplemental to the annual right of 137.5 AF/Y on Groundwater Certificate G2-26452.

(2) Applications G2-29313A and G2-29312A were intended to allow for higher withdrawal rates from Wells 1 and 2. The 490 and 500 gpm requested, respectively, would replace the existing 300 gpm instantaneous right at each well.

(3) No well currently developed.

Both wells are located inside well houses. Well 1 is located west of town on Huggins-Grieg Road, and Well 2 is located south of town on SR 507 near 292nd Street South. Records indicate that Well 1 is equipped with a 40 hp Hays pump and Well 2 is equipped with a 50-hp Hays pump. These two wells are the original wells for the water system, and were both completed in January 1986.

TREATMENT

Roy provides disinfection using liquid chlorine at each well. The pH at Well 1 is adjusted for corrosion control purposes by a packed tower aeration system.

Roy maintains a distribution system chlorine residual between 0.3 and 0.6 ppm. The liquid chlorine used in the water system is the Hasa brand, 12 percent sodium hydrochloride. The chlorine is diluted 1:1 in the chlorine tank and the amount distributed to the systems varies on demand, weather, and usage. Chlorine injection pumps are Prominent and IWAKI pumps and controllers were built by TMG Services. The injection port on each well site is in the Well room. The IWAKI pump used is Model No. EWN-C16VCURA, Serial Number 1412052147. The Prominent pump used is Model No. BT5B1008NPT2000UD010000, Serial Number 2014330547. The City has not been required to provide a minimum disinfection contact time for either of its wells.

The Well 1 aeration tower is 60 inches in diameter, 40-feet tall, and contains a blower rated for 1,635 SCFM at 6 inches of static pressure. The packing material depths is 26 feet, the sump diameter is 108 inches, and the sump overflow height is 14.5 feet. The sump volume is 2,140 gallons and the hydraulic loading rate is 25 gpm per square foot.

DISTRIBUTION

The City of Roy water distribution system is primarily 6-, 8- and 12-inch PVC main constructed in 1987. Water supply from Wells 1 and 2 is transmitted through the distribution system to the reservoir. When water demand is less than well output the excess source water goes to the reservoir. When water demand is greater than well output the excess demand comes from the reservoir.

RESERVOIR

As described in Chapter 1, Roy operates one welded steel reservoir with a storage capacity of 263,200 gallons. The water level in the reservoir is normally maintained at an elevation of between 487.5 feet and 486 feet. Water is normally pumped from the two wells to the distribution system and fills the reservoir when production exceeds demand. When demand exceeds production, water is gravity fed from the reservoir back to the distribution system. Reservoir telemetry levels are presented in Table 6-2.

TABLE 6-2

Reservoir Telemetry Levels

Lead Well On, feet	Lead Well Off, feet	Lag Well On, feet	Lag Well Off, feet	Booster Pump On, feet
486	487.5	484.5	487.5	482

EMERGENCY BOOSTER PUMP SYSTEM

When the water level in the reservoir drops below 482.5 feet, the diesel powered booster pump turns on to sustain system pressure and supply up to 1,615 gpm to the system. This, plus the capacity of the two wells, meets maximum day demand plus fire flow. When the reservoir is low but system demand is lower than the diesel pump output, a pressure relief valve allows water to flow back to the reservoir. When the well supply exceeds water system demand water and the reservoir is low, the pressure relief valve allows water to flow to the reservoir while maintaining system pressure. Emergency booster pump details are presented in Table 6-3.

TABLE 6-3

Emergency Booster Pump System

Pump Model	Pump Type	Fuel Tank Runtime	gpm	TDH
Pioneer Pump, Inc. Model SC86C14	Standard Centrifugal Series	8 hours	1,600	150 ft

TELEMETRY

The telemetry system operates over dedicated telephone lines between the reservoir and the two wells. Float switches in the reservoir provide a signal to the telemetry system for high level alarm, all well pumps off, lead well pump on, lag well pump on, diesel booster pump on and low reservoir level diesel booster pump off. Every time the reservoir is filled to the all well pumps off level the lead and lag well pumps alternate. When the diesel pump is called on an alarm is also generated advising the water operations staff that the diesel pump is running.

PREVENTIVE MAINTENANCE PROGRAM

The most cost-effective method for maintaining a water system is to provide a planned preventive maintenance (PM) program. A planned PM program can provide the optimum level of maintenance activities for the least total maintenance cost. Example maintenance reporting forms are included in Appendix M and routine maintenance procedures for each system component follow.

SOURCE OF SUPPLY

Source capacity can degrade over time due to several possible causes. These include loss of pump capacity, increased head losses in piping, leakage in pump riser pipes, reduced well screen capacity, reduced well capacity[1] and reduced groundwater levels. It is important to keep records and to be aware of changing well conditions. Important records to keep include well production volumes, well run times, well pump power demands, well discharge pressure, static water level and pumping water level.

Daily production and daily pump run time can be used to determine pump capacity. Changes in well pump power demands may indicate changes in pump conditions or problems with the pump motor or motor control equipment. The difference between the static and the pumping water level is the well drawdown at the well pumping rate. Changes in static water level indicate overall changes in water available in the aquifer. Changes in well drawdown indicate changes in the ability of water to flow from the aquifer to the well, either due to well screen problems or due to loss of well capacity. It is also important to know if the water level in the well is dropping to near the well pump intake level, because pumping air can damage the well pump and other equipment.

TREATMENT

The only water treatment processes the City of Roy provides are chlorination at both wells and aeration at Well 1 for pH adjustment. Chlorination is provided as a preventative measure to control biological growth in the water distribution system. Aeration is provided to strip excess carbon dioxide from the water to reduce the corrosivity of the water and thereby reduce the levels of lead and copper occurring at the consumers' taps due to corrosion of household plumbing.

Chlorination

Daily inspection of the chlorination tank and pump is required. Ensuring an adequate reserve of chlorine solution and feed proper pump operation will reduce the likelihood of inadequate chlorine residual in the distribution system. Also daily chlorine residual tests will assure that chlorination equipment is function properly.

[1] Wells can lose capacity due to migration of fine particles, precipitation of minerals or biological growth in the geologic structure around the well.

Aeration

The aeration system should be inspected daily to assure that all equipment is operating properly. Daily logs should be maintained of differential pressure across the aeration tower. Tower media should be inspected annually for signs of mineral or biological deposits. If mineral or biological deposits are accumulating on the media or if the differential pressure across the aeration tower is increasing, then the aeration tower media should be cleaned. Recirculation ports are provided on the aeration tower for this purpose. The operation and maintenance manual and the manufacturer's recommendation should be followed for cleaning the aeration tower.

RESERVOIR

Reservoirs can cause contamination in public water systems. This is a result of contaminants entering the reservoir through cracks or openings at the vent, overflow or drain screens. Deteriorating hatch covers and vandalism can also compromise reservoir water quality. Poorly designed and maintained reservoirs can hamper the emergency operation of a water system. If reservoir drains are not functioning properly, it may be difficult to purge a contaminant from the system. Written documentation of reservoir maintenance must be completed with each inspection and repair, and a copy of the report retained on file.

The existing reservoir should be drained, cleaned, inspected for leaks, and disinfected every 5 to 10 years. Since the reservoir is the main pressure control system for this water system it will be necessary to devise a temporary pressure control system if the reservoir is taken out of service before another reservoir is constructed. Following is a suggested procedure.

1. Install a backpressure valve on a fire hydrant to maintain distribution system pressure slightly above normal operating pressure. This must be at a location where a discharge will not damage property or cause environmental damage.

2. Turn a well pump on "hand."

3. Close the reservoir isolation valve then drain the reservoir.

4. The walls and bottoms of the reservoir should be cleaned prior to disinfection to remove all dirt and loose material. These surfaces should be cleaned by thorough sweeping or scrubbing. If there is a nearby hose bib, the floor and lower walls may be suitably cleaned from a jet of water from a hose nozzle. After cleaning is complete, care should be taken to remove any scaffolding, planks, tools, rags, or other materials that are not a part of the structure.

5. The reservoir can be adequately disinfected by the direct application of a strong chlorine solution to the inner surfaces of the structure. A 200 ppm available chlorine solution is prepared by dissolving one ounce of HTH (65 percent calcium hypochlorite) to each twenty-four gallons of water. The powder should be made into a paste and then added to the water. This solution can be applied with suitable brushes or spray equipment. The solution should thoroughly coat all exposed surfaces, including the inlet/outlet piping and drain piping, such that the piping should have available chlorine of not less than 10 ppm when filled with water.

6. Allow the strong chlorine solution to sit on the disinfected surfaces for at least 30 minutes before rinsing with potable water. The inlet/outlet and drain piping should be purged of the 10-ppm chlorinated water, and the reservoir filled to overflow level.

7. After the disinfection procedure is completed, and before the reservoir is placed in service, water from the full reservoir shall then be sampled and tested for coliform organisms and excessive chlorine residual. Subject to satisfactory bacteriological testing, the remaining water may be delivered to the distribution system.

Periodic maintenance of the reservoir will include the following. The internal coating should be checked every 5 to 10 years, to include a photo video inspection of these interior walls. The exterior of the reservoir should be pressure washed every 5 years to remove the build-up of moss. The exterior/interior of the reservoir should be inspected after 10 to 15 years of use to determine if the walls need to be painted or recoated. The reservoir was last inspected in December of 2013.

DISTRIBUTION

Dead-end water lines are susceptible to water quality problems and should be flushed to remove stagnant water and any sediments that may have been deposited. Roy currently flushes dead end water mains when there are water quality complaints. Dead end water mains should be flushed at least quarterly.

Roy should also implement a distribution valve-exercising program on an annual basis. Valves that do not close tight should be removed, repaired or replaced. An important aspect of distribution system valve maintenance is to ensure distribution valves are completely open. A partially closed valve can seriously reduce peak day operation and fire flow supply. All fire hydrants in the system should be exercised on an annual basis. However, care should be taken when conducting these maintenance programs, as pressure surges caused by sudden opening or closing of valves or hydrants can cause damage, especially to older parts of the system. Fire personnel and other individuals with access to fire hydrants should be educated regarding this issue.

SERVICE AND SOURCE METERS

Accurate water metering is an essential financial and conservation oriented component of water system infrastructure. A substantial amount of revenue may be lost through inaccurate metering of residential and commercial accounts. Without accurate master or source meter readings, the water utility cannot determine lost and unaccounted for water volumes. This issue is also addressed in Chapter 5.

Service meters, including all residential and commercial customer meters, should be calibrated and/or replaced according to the following schedule:

1. 3/4-inch and 1-inch meters should be tested every 10 years and replaced, if necessary. Replacement is recommended if it is cheaper to replace meters than to test and, if necessary, repair meters.

2. 2-inch through 4-inch meters should be tested and calibrated every 3 to 5 years.

3. 4-inch and larger meters should be tested and calibrated every 1 to 3 years.

ASSESSMENT OF FTES

This section evaluates the City's current and future staffing needs. The evaluation compares the City's staffing levels to the staffing levels of other comparable water utilities including 186 water utilities in the 2005 American Water Works Association (AWWA) *Benchmarking Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses Report.* The evaluation also includes an analysis of the City's current staff time allocation to determine that the water system is receiving the attention it requires.

FULL-TIME EMPLOYEES

Staffing evaluations refer to full-time employees (FTEs). An FTE is defined as the equivalent manpower of one person working full-time on water system operations and maintenance for 1 year, approximately 1,768 hours in 1 year.

For 2015, administration and billing of the water system required approximately 1,200 hours. Based on the historical hours required for water system management, it is recommended that the City have one part-time manager dedicated to the water system for planning, asset management, funding applications, finances, and billing. The City does not currently have the staff or necessary experience for project management should future capital improvement projects be undertaken it is recommended that the City hire a part time manager that has the necessary experience or retain an outside consultant for project

planning, asset management, funding applications, finances, and billing. The City does not currently have the staff or necessary experience for project management should future capital improvement projects be undertaken it is recommended that the City hire a part time manager that has the necessary experience or retain an outside consultant for project management purposes. One dedicated part time employee for water system administration and billing has been included in Table 9-6, Projected Revenues and Expenses, starting in 2018. It is anticipated that a full-time employee for operations and maintenance will cost the City $55,000 a year with benefits and a part time employee for water system operations will cost the City $25,000 a year with benefits.

Thurston PUD managed the water system until October 1, 2018 for the City of Roy and performed tasks including on-call standby, administrative oversight, four hours of system maintenance a week, and monthly bacteria samples collection and analysis for an estimated annual rate of $10,000. The City could have elected to have Thurston PUD take on billing as well for a total annual rate of approximately $36,000; however, this would only include 4 hours of maintenance a week. The necessary system maintenance detailed in this chapter requires one FTE to perform and the City now has one full-time WDM1 operator.

Water system operation and maintenance, meter reading, service shut off and turn on required an additional 1,300 hours. Water system operations by Clearwater Utility Services LLC for 2015 accounted for 96 hours. In the past, the Public Works Director has expressed concern that the number of hours dedicated to the water system is detrimental to other public works operations in the City and that the water system requires a dedicated full-time employee to be properly operated and maintained. The City is now carrying out all recommended operations and maintenance tasks with a dedicated full-time employee.

AWWA 2005 BENCHMARKING DATA AND REPORT

In 2005, the AWWA published a report on benchmarking performance indicator data gathered from 186 water utilities, including the City of Bremerton, Kent Public Works, the City of Richland, Sammamish Plateau Water and Sewer District, the City of Vancouver, Snohomish County PUD, and Seattle Public Utilities. These indicators are designed to be used by utility leaders as a point of comparison among peer utilities for setting effective operational goals. The AWWA Benchmarking Median Levels for operation of water systems under a population of 10,000 are 395 customer accounts per employee and 0.19 mgd delivered per employee.

Based on the customer accounts per employee and MGD per employee and water system billing records presented in Chapter 2, the City water system requires approximately 1 FTE for operations and maintenance. One dedicated FTE for water system operations and maintenance has been included in Table 9-6. Projected revenues and expenses,

starting in 2018, one dedicated FTE will allow the City to carry out the operations of the water system and the preventative maintenance schedule indicated in Table 6-4.

SYSTEM ACQUISITION

The City may elect for an outside entity to acquire the water system from the City and take on all administrative, operations, and maintenance responsibilities. It is estimated that in the event of system acquisition, the average monthly bill to water customers in the City of Roy would be similar to or more than the current average bill following recent rate increases. A potential impact of system acquisition by an outside entity on the City of Roy that should be considered is the loss of revenue generated by the water system that funds City projects. Depending on who acquires the water system, there is the potential for the loss of authority of say in the water system management and the potential for the system to be run by a for-profit enterprise.

MAINTENANCE SCHEDULE

Table 6-4 is the list and schedule for maintenance and operations activities.

TABLE 6-4

Preventive Maintenance Schedule

Frequency	Preventive Maintenance
Daily	Check oil level in the pump motors and check telemetry for any alarms. Check water system properties for general security issues and make sire access to all sites is clear of obstructions.
Daily	Check chlorine levels, test chlorine residual, inspect chlorination pumps for air locking.
Daily	Listen to well pumps run and aeration tower for any issues with failure or air locking.
Daily	Record source meter totals, pump run times and power usage.
Weekly	Grease well pump motor bearings if dry and check oil level.
Weekly	Check aeration tower blower belts, float level, and test to make sure shut off occurs at set points.
Weekly	Wash down floors of well houses and chlorination room. Check that all exterior vents close as should when well houses are shut down and heat is working during winter months.
Monthly	Run generator at Well 2 at operating temperature and on full load for a minimum of twenty minutes. Check all fluid levels, battery charge, oil pressure, fuel level, and rpm speed of motor. Repeat procedure for Booster Generator at Water Tower.

TABLE 6-4 – (continued)

Preventive Maintenance Schedule

Frequency	Preventive Maintenance
Monthly	Work all shutoff valves at wells and drain aeration tower at least a foot of water for any sediment in tank.
Monthly	Watch and listen to booster pumps at Well 1 for a full cycle for any issues with overheating.
Quarterly	Flush dead-end lines.
Quarterly	Measure static and pumping water levels and calculate drawdown at each well.
Annually	Conduct maintenance on generators at Well 2 and the Water Tower. Change oil, antifreeze, check fuel filter and air filter. If in the winter months put fuel stabilizer in fuel tanks to prevent sludge.
Annually	Check floats at water tower and overflow valve shutoff.
Annually	Pressure wash all building roofs, concrete pads, and floors.
Annually	Exercise valves and hydrants.
Annually	Inspect reservoir and aeration tower screens and hatch.
Every 5 to 10 Years	Drain and clean the reservoir.

EMERGENCY RESPONSE PROGRAM

Water utilities have the responsibility to provide an adequate quantity and quality of water in a reliable manner at all times. To do this, utilities must reduce or eliminate the effects of natural disasters, accidents, and intentional acts.

The City of Roy has an Emergency Action Plan that details procedures for power outages, water contamination, and water outages. The Emergency Action Plan has been included in Appendix F.

The City of Roy is a participant in the Pierce County Emergency Management Program. Pierce County Emergency Services has committed to provide emergency response training to City of Roy personnel as participating members of the County Emergency Response Program. Pierce County has mapped seismic hazard area, including potential seismic liquifaction hazard areas and dynamic settlement areas. Neither of these hazards is indicated in or near the City of Roy. Pierce County Emergency Management has also mapped Volcanic Hazard Areas, including areas that may be subject to flooding in the event of an eruption of Mount Rainier. Roy is also outside of the projected volcanic hazard areas.

WATER SYSTEM EMERGENCY CONTACT LISTS

Table 6-5 represents the internal emergency contact list as currently programmed into the wellhouse autodialer device. According to record drawings and independently confirmed by Roy staff, the dialer calls these numbers, in sequence, in the event of a high or low water condition at the reservoir.

TABLE 6-5

City of Roy Internal Emergency Contact List

Agency/Group	Contact	Phone Number
General Emergencies	Emergency response	911
Police	Emergency Only City Hall	911 (253) 843-1113
Pierce County Fire District 17	Emergency Business	911 (253) 847-4333
City Clerk (Debbie Dearinger)	City Hall	(253) 843-1113
Mayor (Rawlin “Anthony” McDaniel)	City Hall	(253) 843-1113

Thurston County PUD can be reached at (360) 357-8783.

EMERGENCY PROCEDURES

Although it is not possible to anticipate every disaster that could affect the water system, it is prudent to formulate procedures to manage and remedy the most common or severe types of emergencies.

Contamination Event

In the event of a potential contamination event, the City may be required to take additional samples or provide for chemical introduction in response to the event. This additional sampling will more than likely be directed by DOH or the Pierce Health District. Depending on the suspected contaminant, special care and safety precautions may be required to sample, flush, add disinfection chemicals or dispose of the contaminated water in order to protect the public, the environment, and the safety of City personnel.

Boil Water Notice

Public water systems will occasionally detect positive coliform samples, mainly as a result of minor contamination or improper bacteriological sample collection procedures.

However, the persistent detection of coliform bacteria in the water supply, particularly *E. coli* or fecal bacteria may require the issuance of a public boil water notice. This is to ensure that the health and safety of the water customers is not compromised. Emergencies such as floods, earthquakes, and other disasters can result in damage to water system infrastructure, thereby warranting a boil water notice as a cautionary measure. Prior to the issuance of a boil water notice, the District should consider experience gained by other communities in the past. In the event of a boil water notice the City's intent will be to:

1. Once the boil water notice has been issued, an initial press conference should be held to explain the situation to the public.

2. Consolidated press releases will be used to keep the public informed.

3. In order to maintain the consistency of information released, a question and answer sheet specific to the event will be created and used. The telephone line will remain staffed after the boil water notice is lifted as necessary to respond to customer inquiries.

4. A protocol will be developed specific to lifting the boil water notice and precautions to re-establish use of domestic systems.

5. Notices and information will be posted on the City web page, www.cityofroywa.us.

High Water and Flooding

Roy experienced significant flood events in 1996 due to extensive rains and high groundwater and overflows of Muck Creek. Table 6-6 addresses major system components and corresponding response actions that should be taken in the event of flooding.

TABLE 6-6

Flooding Emergency Response Actions

System Component	Action
Sources	Monitor Wells and remove from service, if floodwaters reach the air vents.
Distribution System	Check chlorine residuals throughout distribution system.
Reservoir	No effect, reservoir is above flood level No action is necessary.

Severe Earthquake

A severe earthquake could result in transmission line breaks, distribution system breaks and structural damage to the reservoir, aeration tower and to vaults which house critical valving and meters. A severe earthquake may also result in loss of electrical power. Table 6-7 addresses the water system components and response actions that should be taken in the event of an earthquake.

TABLE 6-7

Earthquake Emergency Response Actions

System Component	Action
Wells	• Repair/manipulate wells as needed to continue supply of water to system.
Critical Valving and Meters	• All meter and valve vaults should be inspected following a major earthquake to check for joint leakage caused by earth movements.
Distribution System: Distribution and transmission mains may be broken.	• Isolate broken sections and repair • In the case of severe damage, shutoff valve to reservoir to conserve water in the tank.
Reservoir: Reservoir may be leaking or structurally damaged.	• Check reservoir for structural damage and drain if in danger of failure • Check reservoir for cracks and leaks, and seal or drain as required.

Severe Snowstorm

Heavy snowfall may bring motor vehicle traffic to a standstill. Employees may not be able to reach problem areas; however, it is anticipated that water supply will not be interrupted. Table 6-8 addresses the possible emergency events and response actions that should be taken in the event of a severe snowstorm.

TABLE 6-8

Severe Snowstorm Emergency Response Actions

System Component	Action
Distribution System: Transportation to monitor system and make repairs will be limited	• Roy is responsible for plowing its roads. Snowplow is to be fueled and in good repair. Chains and other snow gear available for maintenance equipment and other vehicles. • Contact Pierce County Roads and Transportation Department to clear roads leading in and out of Roy, and assure delivery of road sand. • Contact State Department of Transportation regarding SR 507. • Valve locations should be kept current and made available for maintenance personnel
Reservoir: No immediate effect. Snow may prevent access.	• Clear snow from roads and walkways

Power Failure

Various types of weather can cause loss of power, such as wind, lightning, hail, freezing rain, and snow. Additionally, power can be lost through traffic accidents and earthquakes. During a power outage, the backup power supply at Well 2 will be capable of supplying the City with water for an extended period. The electric utility, currently Puget Sound Energy, should be contacted in all cases of power loss.

Contamination of Water Supply

Bacterial contamination of the water supply can occur due to water main breaks, backflow events, unauthorized entry into the reservoir, entry of birds or bats into the reservoir through a damaged vent screen, improperly secured hatch or any other unprotected opening, or pollution at an isolated source. Table 6-9 addresses the possible emergency events and response actions that should be taken in the event of contamination of the water supply.

TABLE 6-9

Contamination of Water Supply Emergency Response Actions

Distribution System Contamination
• Close valves if possible to isolate source.
• Repair and or remove source of pollution.
• Flush and disinfect previously contaminated section and test until free of contamination prior to resumption of use.
Reservoir Contamination
• Resample to confirm contamination.
• Check distribution system for presence of contamination.
• Isolate reservoir from system.
• Inspect vent screens, hatches, and piping to identify and repair source of contamination.
• If warranted, drain, clean and disinfect reservoir.
• Disinfect reservoir by AWWA Standards if contamination is bacteriological.

Bacteriological Presence Detection Notification Procedure

Procedures for notifying system customers, the local health department, and Washington State Department of Health (DOH) of water quality emergencies is an important component of an emergency response program. Public water systems will occasionally detect positive coliform samples, mainly as a result of contamination in distribution mains or sample taps, or improper bacteriological sampling procedures. However, the persistent detection of coliforms in the water supply, particularly E. coli or Fecal Coliform, may require the issuance of a public boil water advisory to protect public health and safety. Emergencies such as floods, earthquakes, and other disasters can affect water quality as a result of damage to water system facilities. This can also result in the issuance of a boil water advisory in advance of supply problems. A suggested boil water notice is included in Appendix F. WAC 246-290-320 requires water utilities to follow specific procedures in the event that coliform bacteria are detected in the water system. If a coliform detection occurs within the distribution system, the City must sample any active well within 24 hours.

CROSS-CONNECTION CONTROL PROGRAM

The City of Roy has an active cross connection control program. City of Roy Ordinance No. 687 addresses cross connections. A copy of ordinance 687 is included in Appendix K. The Ordinance defines cross connection terms and states that the city council has the authority to require backflow prevention devices and adopts the Pacific Northwest Section AWWA Cross Connection Control Manual.

The City of Roy maintains records of cross-connection control devices and requires annual testing and reporting of all devices on record.

CHAPTER 7

DISTRIBUTION FACILITIES DESIGN AND CONSTRUCTION STANDARDS

OBJECTIVE

The objective of this chapter is to document the City's design and construction standards to allow the City to obtain DOH approval to utilize the alternative review process for construction of new and replaced water distribution facilities. Through this process, a purveyor needs no further approval from DOH for distribution project reports, construction documents, or installation of distribution reservoirs and storage tanks, booster pump facilities, transmission mains, distribution mains, pipe linings, and tank coatings. Source of supply facilities are not eligible for the alternative review process

This chapter includes project review procedures, system standard, policies, and procedures, and construction certification and follow-up procedures.

PROJECT REVIEW PROCEDURES

Project review procedures vary with the level of complexity of the anticipated project. Pursuant to WAC 246-290-125, the following projects do not require DOH approval:

- Installation of valves, fittings, meters, and backflow prevention devices.
- Installation of fire hydrants.
- Repair of a system component or replacement with a similar component.
- Maintenance or painting of surfaces not contacting potable water.

The City will use the submittal exception process for new water distribution main projects as outlined in WAC 246-290-125. Construction documents for new water distribution mains will not be submitted to DOH for review. All other water system projects will require DOH review and approval.

The City's Water Operator reviews all water system improvements and replacement projects during the design phase. This review ensures the project is in compliance with the Developer's Guide and Construction Standards. During construction, the design engineer, in conjunction with representatives from the Water Operations Department, will make site visits to ensure the project is constructed in accordance with the construction specifications. Any changes from the construction specifications will require written approval from the Mayor.

Connection of additional water customers will be permitted on an on-going basis as requests for service are made to the City through the process outlined in Chapter 6.

Review for new customers will be done through the Water Operator. Prior to activation of the new service connection, a Cross-Connection Control Specialist is required to review the backflow prevention assembly installation, if one is required, form compliance with Cross-Connection Control requirements.

SYSTEM STANDARDS, POLICIES AND PROCEDURES

Design and construction of water facilities are to be in accordance with the construction standards set forth by the City and included in Appendix C.

CONSTRUCTION CERTIFICATION AND FOLLOW-UP PROCEDURES

During the construction of any water facility, the City's Water Operations Department will have a representative periodically inspect the construction. The representative will report progress and any variance from the construction documents to the engineer responsible for construction management. Additionally, the representative will be present for all pressure tests, disinfection procedures and water quality sampling as defined in the standards.

Significant changes in the project design during construction of DOH approved projects will require notifying DOH prior to approval to proceed. Upon completion of the project, the engineer responsible for construction management shall complete a Construction Completion Report for Water System Projects form, pursuant to WAC 246-290-040. This form is an Engineer's certification that the project was completed in conformance with the approved plans, specifications, and City's Construction Standards. For projects completed under Project Submittal Exceptions, pursuant to WAC 246-290-125, the Construction Completion Report form shall be submitted to the Mayor, where it will be maintained on file and made available for DOH review on request. For projects requiring DOH approval, the Construction Completion form will be submitted to DOH within 60 days of completion and prior to use of the installation. The construction manager shall prepare record drawings and submit them to the City for their project files.

CHAPTER 8

CAPITAL IMPROVEMENT PLAN

INTRODUCTION

This Chapter presents the Capital Improvement Plan (CIP) for the 6-, 10-, and 20-year planning periods. Recommended water system improvements and associated costs, along with scheduling information is presented in the following sections according to analyses, identified deficiencies, and recommendations identified in earlier chapters of the plan. For the proposed projects identified in this chapter, preliminary project cost estimates are provided in Appendix N. Figure 8-1, shows the locations of proposed distribution and storage improvements.

In the future, other projects may arise which are not identified as part of the City's CIP. Such projects may be deemed necessary for ensuring water quality, preserving emergency water supply, accommodating transportation improvements proposed by other agencies, or addressing unforeseen problems with the City's water system. Due to budgetary constraints, the completion of these projects may require that the proposed completion date for projects in the CIP be rescheduled. Roy retains the flexibility to reschedule proposed projects and to expand or reduce the scope of proposed projects, as best determined by City Council when new information becomes available for evaluation. Each capital improvement project should also be reevaluated to consider the most recent planning efforts, as the proposed completion date for the project approaches.

IMPROVEMENT ANALYSIS

SOURCE IMPROVEMENTS

SO-1: Well 2 Improvements (2017)

The existing well pump and motor at Well 2 were installed in 1990, making them almost 25 years old. The age of the pump and motor make it increasingly difficult to maintain due to limited availability of parts. Additionally, the pump and motor have decreased in efficiency due to wear, which reduces pumping capacity and increases power consumption and costs. Replacing the well pump and motor will ensure continued reliability of the source. It will also reduce energy consumption and costs to with a higher efficiency pump and motor. The project is planned for completion in 2017.

Estimated Project Cost: $132,840

SO-2: Well 1 Improvements (2020)

It is anticipated that Well 1 will require replacement of the pump and motor as it has reached the end of its service life. The project is anticipated to take place in 2019 and has an estimated cost of $153,000 and replacing the well pump and motor will ensure continued reliability of the source.

Estimated Project Cost: $152,000

SO-3: Well 1 Backup Power (2027)

The City of Roy has a backup power supply at Well 2, but not at Well 1. It is recommended that, for system reliability purposes a backup power supply be installed at Well 1. A preliminary cost estimate for a backup power supply for Well 1 is included in Appendix N.

Estimated Project Cost: $240,000

TREATMENT IMPROVEMENTS

T-1: Well 2 Iron and Manganese (2025)

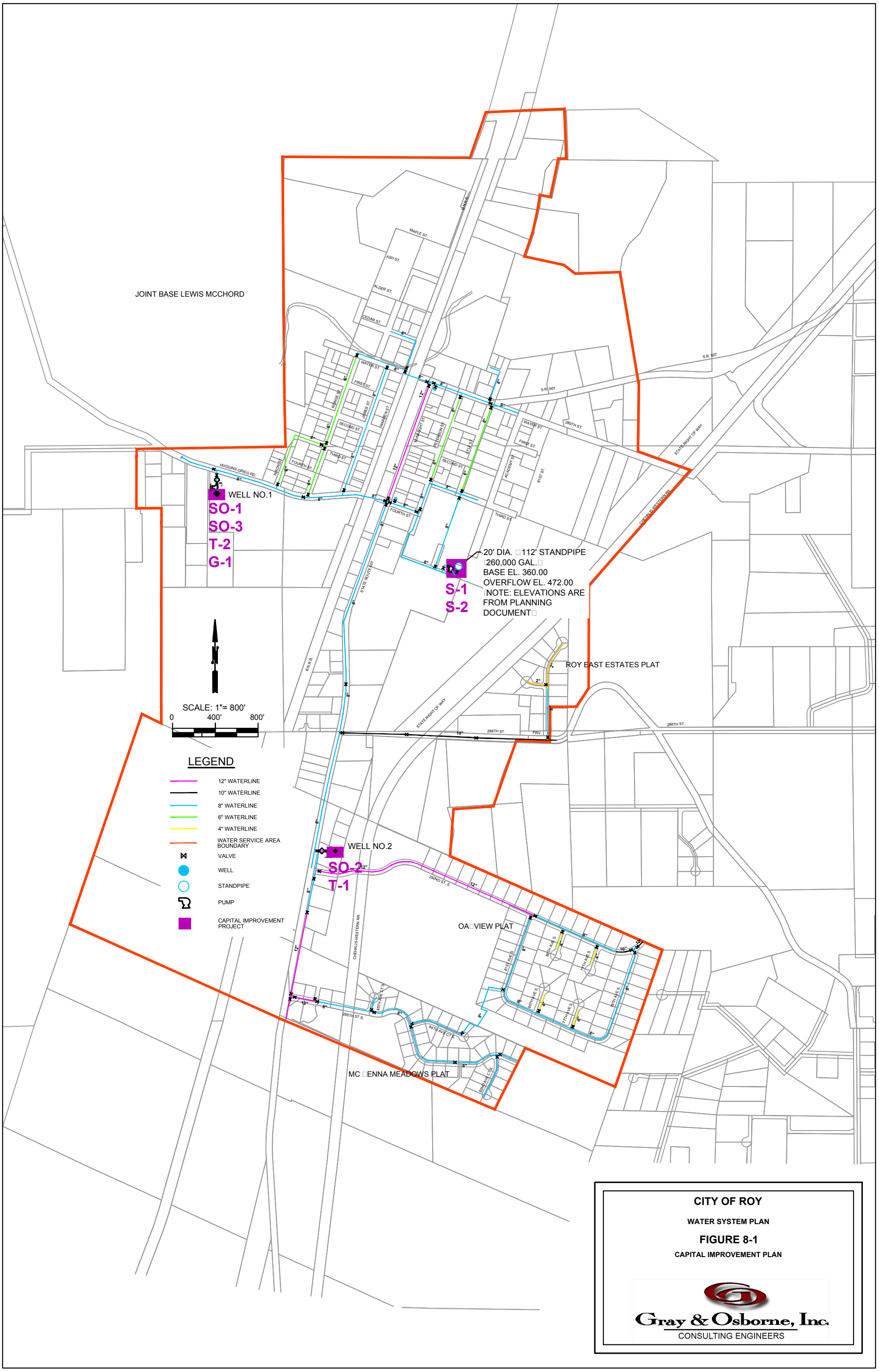
The City of Roy's Well 2 has levels of iron and manganese exceeding the secondary contaminant MCLs. These do not represent a health risk for the users of the Roy Water System, and neither the City nor the State Department of Health have been receiving complaints about iron and manganese. A preliminary cost estimate for an iron and manganese treatment system for Well 2 is included in Appendix N. The estimated cost is $850,000.

Estimated Project Cost: $844,000

T-2: Aeration Tower Blower Replacement (2028)

It is anticipated that the aeration tower blower will reach the end of its service life in 2028 and will need to be replaced.

Estimated Project Cost: $20,000



CITY OF ROY

WATER SYSTEM PLAN

FIGURE 8-1

CAPITAL IMPROVEMENT PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

STORAGE IMPROVEMENTS

S-1: Reservoir Siting Study and Funding Alternatives (2018)

The City plans to conduct a reservoir siting study to determine the location of a new reservoir. Potential reservoir sites will be evaluated based on engineering and financial factors. In addition, the City will pursue funding sources for the planned land acquisition and construction of a second reservoir.

Estimated Project Cost: $15,000

S-2: Reservoir Seismic Retrofit (2020)

The City's water system has a single standpipe reservoir that provides storage to the City and several adjacent areas. The tank does not meet current seismic codes. This project will retrofit the existing tank with a wider foundation to reduce risk of toppling, and will also install steel stiffeners on the reservoir shell to reduce risk of buckling. The City is pursuing received partial grant funding through the Hazard Mitigation Grant Program.

Estimated Project Cost: $500,000
Estimated Grant Funding: $412,500
Estimated Project Cost to the City: $87,500

S-3: Acquisition of Property and Construction of a Second Reservoir (2019)

The City currently has a single reservoir serving the water system and the reservoir is expected to undergo maintenance and recoating in 2021. In order to recoat the reservoir, it must be taken offline and the City will require a second reservoir to continue to operate the water system during this time. Following the planned Reservoir Siting Study, the City will acquire the identified land and construct a second reservoir. It is estimated that this project will cost $1,000,000 and this project is planned 2019.

Estimated Project Cost: $1,000,000

S-4: Reservoir Maintenance and Recoating (2021)

The reservoir requires maintenance and recoating of the interior and exterior. The extent of required maintenance and the existing coatings must be evaluated. Because the City has only one reservoir, maintenance and recoating of the existing reservoir will need to occur following the acquisition of land and construction of a second reservoir. It is estimated that the project will cost $300,000 and be completed in 2021.

Estimated Project Cost: $290,000

DISTRIBUTION SYSTEM IMPROVEMENTS

D-1: Touch Read Meter Replacement Program (Annual)

The City plans to replace existing service meters with touch read meters over the next three years to improve billing accuracy, maintain low unbilled water use, and allow allocation of City resources to other operations and maintenance activities.

Estimated Project Cost: $100,000

D-2: Cut In Valves (2022-2024)

Locations within the water system have been identified where valves are necessary for system operational flexibility and longevity. The City plans to cut in valves into the system over a number of years.

Estimated Project Cost: $195,000

D-3: Booster Station Replacement (2028)

It is anticipated that the booster station pump will reach the end of its service life in 2028 and will need to be replaced.

Estimated Project Cost: $190,000

GENERAL SYSTEM IMPROVEMENTS

G-1: Rate Study (2022)

The City plans to conduct a rate study to assess the current water rate structure and make changes necessary to maintain the financial and operational viability of the water system.

Estimated Project Cost: $15,000

G-2: System Takeover Feasibility Study (2020-2021)

The City plans to carry out a system takeover feasibility study to evaluate the possibility of an outside entity taking over the operation, maintenance, and ownership of the water system. The City will evaluate its ability to continue operation of the water system and if City resources may be better utilized by shifting ownership and operation to an outside entity. The City plans to pursue grant funding for this project.

Estimated Project Cost: $30,000

G-3: Acquisition of Well 1 Land (2020)

The City plans to pursue the purchase of the land upon which Well 1 is located in order to more directly control the site and ensure continued source reliability.

Estimated Project Cost: $65,000

G-4: General Facility Charge Study (2018)

The City plans to conduct a GFC rate study to assess the current rate structure and make changes necessary to maintain the financial viability of the Water System Capital Improvement Plan and charge an equitable share of existing and planned water system costs.

Estimated Project Cost: $15,000

TABLE 8-1

Capital Improvement Schedule

Project No.	Description	Total Project Cost	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027-2036
SO-1	Well 2 Improvements	$132,840	$132,840										
SO-2	Well 1 Improvements	$172,000			$172,000								
SO-3	Well 1 Backup Power	$240,000											$240,000
T-1	Well 2 Iron and Manganese	$844,000									$844,000		
T-2	Aeration Tower Blower Replacement	$20,000											$20,000
S-1	Reservoir Siting Study	$15,000		$15,000									
S-2	Reservoir Seismic Retrofit	$500,000				$500,000							
S-3	Acquisition of Property and Construction of a Second Reservoir	$1,000,000			$1,000,000								
S-4	Reservoir Maintenance and Recoating	$290,000					$290,000						
D-1	Touch Read Meter Replacement Program	$100,000		$40,000	$30,000	$30,000							
D-2	Cut in Valves	$195,000						$65,000	$65,000	$65,000			
D-3	Booster Station Replacement	$190,000											$190,000
G-1	Rate Study	$15,000						$15,000					
G-2	System Takeover Feasibility Study	$30,000				$15,000	$15,000						
G-3	Acquisition of Well 1 Land	$65,000		$65,000									
G-4	General Facility Charge Study	$15,000		$15,000									
Total		$3,823,840	$132,840	$650,000	$1,202,000	$45,000	$305,000	$65,000	$65,000	$65,000	$844,000	$-	$450,000

CHAPTER 9

FINANCIAL ANALYSIS

This chapter contains an analysis including a review of historical cash flows, a projection of future cash flows, the financing of planned improvements, and a recommendation for rate adjustments. The chapter concludes with a review of potential funding sources and low cost loans and grants available to municipal water purveyors.

The City is recently overhauled Well 2 because the existing pump and motor were 25 years old and difficult to service due to limited availability of parts. The City has also cleaned the reservoir and removed four feet of sediment as well as implemented a distribution system program twice a year. The City has established a capital improvement plan and in order to finance the improvement plan The City intends to utilize available funding sources and carry out rate studies to maintain rate revenues to fund operating and debt expenses. The following analysis examines historical revenues and expenses and presents projected operating budgets.

FINANCIAL STATUS OF EXISTING WATER UTILITY

CURRENT WATER RATES

The City currently utilizes water rates that became effective December of 2017. Water rates presented in Table 9-1 include a monthly base charge that varies depending on meter size and a water usage rate of $5.12 per 1,000 gallons of water use.

TABLE 9-1

Water Rates[(1)]

Meter Size	Monthly Charge	Water Rate
Less than 1 Inch	$50.61	$0.00512 per gallon used
1 Inch	$64.28	$0.00512 per gallon used
1-1/2 Inch	$77.43	$0.00512 per gallon used
2 Inches and Greater	$123.49	$0.00512 per gallon used

(1) Source: City of Roy Resolutions 778, 784.

For water supplied through meters to users outside the city limits, or for purposes of building sprinkler fire protection, there shall be an additional surcharge of 50 percent of rates, fees and charges for water service and usage.

According to Chapter 2, the average single-family uses 150 gallons per day or 4,500 gallons per month and therefore the average single-family is billed $84.43 per month. A water rate study is planned for 2027 in order to maintain the financial viability

of the water system. The increase will occur regardless of the system being taken over by an outside agency or not.

CURRENT CONNECTION FEES

The City connection charges are specified in Resolutions 778 and 784, effective as of January 1, 2015. These charges are applicable only to new customers connecting to the system and are intended to enable the utility to pay for growth related capacity costs. Connection fees increase with the size of water meter installed and range from $2,900 for a 3/4-inch or smaller water meter to $15,457 for a 2-inch meter. Table 9-2 lists the current connection charges.

TABLE 9-2

Water System Connection Fees(1)

Meter Size	System Development Charge
3/4 Inch or less	$2,900
1 Inch	$4,843
1-1/2 Inch	$9,657
2 Inches	$15,457
Larger than 2 Inches	To be determined by the City prior to site plan approval, based on the site's proportionate share of the City's distribution, storage, and transmission facilities

(1) Source: City of Roy Resolutions 778,784.

The City's current connection charges are relatively low compared to other systems. It is recommended that the City undertake a General Facility Charge (GFC) rate study following the approval of this water system plan and the accompanying capital improvement plan because the listed project may then be included in the GFC study and resulting connection rates. A GFC study has been included in the capital improvement plan and in Table 9-7, Planned Capital Improvement Fund Revenues and Expenses.

HISTORICAL EXPENSES

Table 9-3 summarizes water utility expenses from 2010 through 2016.

TABLE 9-3

Detailed Historical Water Utility Expenses

Expenses	2011	2012	2013	2014	2015	2016 Projected
Water Admin Supplies	$700	$832	$531	$670	$605	$625
Vehicle Fuel	$434	$1,245	$1,529	$1,605	$1,206	$1,250
General Small Equipment/Leased Vehicle	$2,600	$2,600	$86	$142	$253	$100
BIAS Contract/Misc.	$2,211	$2,407	$3,694	$3,868	$3,034	$3,400
Telephone/Postage	$2,830	$3,182	$3,518	$3,961	$3,898	$3,600
State Water Utility Tax[(1)]	$7,133	$8,028	$9,308	$10,406	$11,820	$13,950
City B&O Tax[(2)]	$8,734				$14,910	$33,286
Inter-fund Financial	$15,706	$12,608	$12,295	$19,912	$24,320	$29,350
Inter-fund Operations	$18,486	$20,221	$25,789	$26,471	$33,678	$35,400
Membership Fees	$772	$587	$1,652	$1,579	$1,638	$1,350
Maintenance Supplies	$3,651	$2,538	$5,916	$4,355	$3,389	$4,000
Maintenance Small Equipment	$761	$2,961	$2,428	$2,476		$1,500
Maintenance Services	$12,400	$13,753	$16,357	$10,799	$9,747	$7,960
Maintenance Repairs	$712	$4,936	$5,225	$1,365	$1,480	$2,210
Well Site Leases, Well Legal	$800	$800	$800	$800	$5,419	$2,800
Fuel	$53		$202	$412	$164	$400
Water Operator Training	$307	$419	$220	$301	$503	$800
Water Telemetry Telephone	$2,640	$2,640	$2,810	$3,120	$2,807	$2,870
Equipment Rent/Lease	$220	$1,405	$909	$785	$697	$908
Water Department Insurance	$12,000	$9,870	$9,527	$7,399	$9,180	$10,505
Water System Electricity	$7,519	$7,727	$7,733	$8,563	$9,469	$9,582
Total Operations Expenses	**$100,668**	**$98,758**	**$110,531**	**$108,999**	**$138,218**	**$165,846**
DWSRF Loan	$31,868	$31,868	$31,868	$31,868	$31,868	$31,869
DWSRF Loan Interest	$6,309	$5,707	$5,106	$4,504	$3,902	$3,301
Inter-Fund Transfer		$4,725	$20,000	$20,000	$35,000	$37,000
Truck Purchase			$1,000	$1,000	$1,000	$1,000
Contingency						$10,000
Other Expenses	**$38,177**	**$42,300**	**$56,974**	**$56,372**	**$70,770**	**$83,170**
Total Expenses	**$138,845**	**$141,059**	**$168,505**	**$166,371**	**$209,989**	**$249,016**

HISTORICAL REVENUES

Table 9-4 lists historical water utility revenues for the years 2010 through 2016.

TABLE 9-4

Historical Water Utility Revenues

Revenues	2011	2012	2013	2014	2015	2016 Projected
B&O Tax on Water Sales	$8,254				$13,464	$31,585
Water Sales	$145,415	$159,700	$172,605	$206,921	$235,042	$245,800
Penalties for Late Payments	$7,410	$5,203	$5,698	$6,378	$17,961	$12,000
Misc. Revenue	$200	$1,245	$55	$284	$46	$50
Other Fees (Hook-ups, etc.)	$150	$160				$5,000
Total Revenues	**$161,429**	**$166,308**	**$178,358**	**$213,583**	**$266,513**	**$294,435**
Fund Balance	**$52,277**	**$82,794**	**$92,647**	**$139,859**	**$196,383**	**$241,802**

CAPITAL IMPROVEMENT FUND REVENUES AND EXPENSES

Table 9-5 lists historical capital improvement fund revenues and expenses.

TABLE 9-5

Capital Improvement Fund Revenues and Expenses

	2011	2012	2013	2014	2015	2016 Projected
Equipment Replacement	$4,931	$6,344	$2,626	$131		$18,300
Water Plan					$1,949	$29,034
Loan for PD Vehicles					$22,718	-
Well 2 Pump						$10,128
Fund Expenses	**$4,931**	**$6,344**	**$2,626**	**$131**	**$24,668**	**$57,462**
CDBG Grant						$10,128
Investment Interest	$46	$96	$108	$79	$89	$95
Interest Inter-Fund Loan	$510	$245	$139	$34	$1	$6
Connection Fees						
Loan Payment - Building	$6,873	$6,976	$7,082	$5,433		
Inter-Fund Transfers	$13,591	$4,725	$20,000	$20,000	$35,000	$37,000
Inter-Fund Loan Repayment for PD Vehicles					$2,999	$20,105
Fund Revenues	**$21,019**	**$12,042**	**$27,329**	**$25,547**	**$38,089**	**$67,334**
Fund Excess/(Deficit)	**$106,382**	**$112,080**	**$136,782**	**$162,198**	**$176,003**	**$185,875**

PROJECTED EXPENSES, REVENUES, AND RESERVES

GROWTH

Chapter 2 provides an analysis of system growth for engineering planning purposes. These growth estimates are used to project capital expenses. Projected ERU growth in Table 2-14 shows approximately 9 ERUs per year, and a 2016 ERU value of 439. Based on this growth rate, this financial analysis will utilize an average annual growth rate of 2 percent per year for forecasting future rate revenues.

FUTURE EXPENSES

Table 9-6 summarizes projected water utility revenues and expenses for the years 2017 through 2026. Future revenues, expenses, and reserves have been projected based on the 2017 budget and historical expenses since 2011, increased for the effects of price inflation, and no growth in customers and water consumption.

Based on the water system size and conversations with City staff, the water system requires one dedicated FTE for the water system operations and maintenance and one part-time dedicated employee for water system administration. Projected expenses beginning in 2018 include the hiring of one full time employee for water system operation and maintenance and one part-time employee for water system administration. The cost of adding employees was calculated based on the historical costs for public works personnel including benefits.

The projected Capital Improvements Fund assumes that the City will carry out planned CIP projects with outside funding sources. In reality, the projects the City undertakes will be dependent on the availability of partial funding from outside sources and the City will not shoulder the full project costs, allowing the City to maintain a positive Capital Improvements Fund balance.

TABLE 9-6

Projected Revenues and Expenses

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Expenses										
Water Admin Supplies	$700	$714	$728	$743	$758	$773	$788	$804	$820	$837
Vehicle Fuel	$1,600	$1,632	$1,665	$1,698	$1,732	$1,767	$1,802	$1,838	$1,875	$1,912
General Small Equipment/Leased Vehicle	$100	$102	$104	$106	$108	$110	$113	$115	$117	$120
BIAS Contract/Misc.	$4,050	$4,131	$4,214	$4,298	$4,384	$4,472	$4,561	$4,652	$4,745	$4,840
Telephone/Postage	$3,800	$3,876	$3,954	$4,033	$4,113	$4,196	$4,279	$4,365	$4,452	$4,541
State Water Utility Tax[(1)]	$13,950	$13,950	$13,950	$13,950	$13,950	$13,950	$13,950	$13,950	$13,950	$13,950
City B&O Tax[(2)]	$33,286	$33,286	$33,286	$33,286	$33,286	$33,286	$33,286	$33,286	$33,286	$33,286
Inter-fund Financial	$37,750	$38,505	$39,275	$40,061	$40,862	$41,679	$42,513	$43,363	$44,230	$45,115
Inter-fund Operations	$42,600	$123,452	$125,921	$128,439	$131,008	$133,628	$136,301	$139,027	$141,808	$144,644
Membership Fees	$1,900	$1,600	$1,600	$1,600	$1,600	$1,600	$1,600	$1,600	$1,600	$1,600
Maintenance Supplies	$4,000	$4,080	$4,162	$4,245	$4,330	$4,416	$4,505	$4,595	$4,687	$4,780
Maintenance Small Equipment	$4,500	$2,550	$2,601	$2,653	$2,706	$2,760	$2,815	$2,872	$2,929	$2,988
Maintenance Services	$10,000	$10,200	$10,404	$10,612	$10,824	$11,041	$11,262	$11,487	$11,717	$11,951
Maintenance Repairs	$11,241	$5,100	$5,202	$5,306	$5,412	$5,520	$5,631	$5,743	$5,858	$5,975
Well Site Leases, Well Legal	$2,800	$2,800	$2,800	$2,800	$2,800	$2,800	$2,800	$2,800	$2,800	$2,800
Fuel	$750	$765	$780	$796	$812	$828	$845	$862	$879	$896
Water Operator Training	$800	$800	$800	$800	$800	$800	$800	$800	$800	$800
Water Telemetry Telephone	$4,200	$3,060	$3,121	$3,184	$3,247	$3,312	$3,378	$3,446	$3,515	$3,585
Equipment Rent/Lease	$920	$938	$957	$976	$996	$1,016	$1,036	$1,057	$1,078	$1,099
Water Department Insurance	$11,560	$11,791	$12,027	$12,268	$12,513	$12,763	$13,018	$13,279	$13,544	$13,815
Water System Electricity	$10,462	$10,671	$10,885	$11,102	$11,324	$11,551	$11,782	$12,018	$12,258	$12,503
Total Operations Expenses	**$200,969**	**$274,004**	**$278,435**	**$282,955**	**$287,566**	**$292,268**	**$297,065**	**$301,957**	**$306,948**	**$312,038**
DWSRF Loan	$31,869	$31,869	$31,869	$31,869	$31,869	$15,696	$0	$0	$0	$0
DWSRF Loan Interest	$2,700	$2,099	$1,498	$897	$897	$442	$0	$0	$0	$0
DWSRF Loan – Second Reservoir			$1,000	$45,683	$46,368	$47,064	$47,064	$47,064	$47,064	$47,064
DWSRF Loan Interest – Second Reservoir			$15,000	$15,000	$14,315	$13,619	$12,913	$12,197	$11,469	$10,731
Inter-fund Transfer	$36,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Truck Purchase	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Contingency	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Other Expenses	**$81,569**	**$59,968**	**$75,367**	**$119,449**	**$119,449**	**$102,821**	**$85,977**	**$85,261**	**$84,533**	**$83,795**
Total Expenses	**$282,538**	**$333,972**	**$353,802**	**$402,404**	**$407,015**	**$395,089**	**$383,042**	**$387,218**	**$391,481**	**$395,833**

TABLE 9-6 – (continued)

Projected Revenues and Expenses

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenues										
B&O Tax on Water Sales	$31,585	$31,585	$31,585	$31,585	$31,585	$31,585	$31,585	$31,585	$31,585	$31,585
Water Sales	$245,800	$392,082	$392,082	$392,082	$392,082	$392,082	$392,082	$392,082	$392,082	$392,082
Penalties for Late Payments	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Misc. Revenue	$60	$50	$50	$50	$50	$50	$50	$50	$50	$50
Other Fees (Hook-ups, etc.)	$4,000	$500	$500	$500	$500	$500	$500	$500	$500	$500
Total Revenues	**$291,445**	**$434,217**	**$434,217**	**$434,217**	**$434,217**	**$434,217**	**$434,217**	**$434,217**	**$434,217**	**$434,217**
Fund Balance	**$250,709**	**$350,954**	**$431,369**	**$463,182**	**$490,385**	**$529,513**	**$580,688**	**$627,687**	**$670,423**	**$708,808**

(1) Amounts shown in this table are based on the 2017 budget and historical expenses since 2011.
(2) Revenues are projected based on no system growth and no change in rates.
(3) These expenses are increased annually for 2 percent.
(4) Starting in 2018, Operations and Maintenance expenses include one full time operations and maintenance employee, and one half-time administrative employee.

PLANNED CAPITAL IMPROVEMENT PROJECTS

Table 9-7 shows the capital improvement projects recommended to occur in the next 10 years as identified in Chapter 8. Each project is financed with low cost public loans (e.g., DWSRF loans) at 1.5 percent over a 20-year term or Pierce County Community Connections Community Development Block Grants (CDBG). Planned capital improvement projects are contingent on the availability of funding and may be deferred if funding is unavailable.

TABLE 9-7

Planned Capital Improvement Fund Revenues and Expenses

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Equipment Replacement	$55,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Water Plan	$3,400	$-	$-	$-	$-	$-	$-	$-	$-	$-
Well 2 Improvements	$132,840	$-	$-	$-	$-	$-	$-	$-	$-	$-
Well 1 Improvements	$-	$-	$172,000	$-	$-	$-	$-	$-	$-	$-
Reservoir Maintenance and Recoating	$-	$-	$-	$-	$290,000	$-	$-	$-	$-	$-
Well 2 Iron and Manganese Treatment	$-	$-	$-	$-	$-	$-	$-	$-	$-	$844,000
Reservoir Siting Study		$15,000	$-	$-	$-	$-	$-	$-	$-	$-
Reservoir Seismic Retrofit			$-	$500,000	$-	$-	$-	$-	$-	$-
Acquisition of Property and Construction of a Second Reservoir	$-	$-	$1,000,000	$-	$-	$-	$-	$-	$-	$-
Touch Read Meter Replacement Program		$40,000	$30,000	$30,000	$-	$-	$-	$-	$-	$-
Acquisition of Well 1 Land		$-		$65,000	$-	$-	$-	$-	$-	$-
Cut in Valves						$65,000	$65,000	$65,000		
Rate Study			$-	$-	$-	$15,000	$-	$-	$-	$-
System Takeover Feasibility Study	$-	$-	$-			$-	$-	$-	$-	$-
General Facility Charge Study		$15,000								
Fund Expenses	**$191,240**	**$85,000**	**$1,217,000**	**$610,000**	**$305,000**	**$95,000**	**$80,000**	**$80,000**	**$15,000**	**$859,000**
CDBG Grant	$132,840	$-	$-	$-	$-	$-	$-	$-	$-	$-
Planned Pierce County CDBG		$555,000	$202,000	$30,000	$290,000	$65,000	$65,000	$65,000	$-	$844,000
DWSRF 20-Year Loan	$-	$-	$1,000,000	$-	$-	$-	$-	$-	$-	$-
DWSRF Grant										
Investment Interest	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100
Inter-fund Transfers	$36,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Fund Revenues	**$168,940**	**$570,100**	**$1,217,100**	**$45,100**	**$305,100**	**$80,100**	**$80,100**	**$80,100**	**$15,100**	**$859,100**
Fund Excess/(Deficit)	**$163,575**	**$648,675**	**$648,775**	**$83,875**	**$83,975**	**$69,075**	**$69,175**	**$69,275**	**$69,375**	**$69,475**

AVAILABLE CAPITAL PROJECT FUNDING SOURCES

This section describes several funding sources available to the City without reference to any specific project:

Grants:	Pierce County Community Connections Community Development Block Grant (CDBG) USDA Rural Development (RD)
Loans:	Community Economic Revitalization Board (CERB) Drinking Water State Revolving Fund (DWSRF) USDA Rural Development (RD)
Bonds:	Revenue Bonds
Other:	Utility Local Improvement Districts (ULID) Developer Financing System Development Charges

USDA RURAL DEVELOPMENT

USDA Rural Development (RD) has a loan program that, under certain conditions, includes a limited grant program. Grant determination is based on a formula that incorporates existing utility debt service and existing utility service rates, comparing rates to those of neighboring water service providers.

In addition, RD has a loan program for communities that cannot obtain funding by commercial means or through the sale of revenue bonds. The loan program provides long-term 30- to 40-year loans at interest rates that are based on federal rates and vary with the commercial market. Interest rates currently range from 1.375 percent to 2.375 percent and require a 1.1 debt coverage payment to a capital reserve. Currently, RD's base rate for facilities projects for communities with a Median Household Income (MHI) over $60,049 is 2.375 percent. The rate for low-moderate income communities was 1.875 percent in September 2016. These rates are updated quarterly.

PUBLIC WORKS TRUST FUND (PWTF)

The Public Works Trust Fund is a revolving loan fund designed to help local governments finance public works projects through low-interest loans and technical assistance. The PWTF, established in 1985 by legislative action, offers loans substantially below market rates, payable over periods ranging up to 20 years.

Interest rates for 2016 loans were 1.66 percent with a maximum loan amount of $10 million with no match requirement. Rates can be reduced for communities recovering from a Federally-Declared Disaster; **however, no Emergency Loan Funds**

are currently available. The useful life of the project determines the loan term, with a maximum term of 20 years. The Public Works Board has proposed $1.2 million to fund future emergency projects. For the FY 2016 Loan Funding Round (May 2014 application period) the Board recommended funding 49 Construction Loans for a total of $170 million. All funding is subject to approval by the Legislature.

To be eligible, an applicant must be a local government such as a City, Town, County, or special purpose utility district, and have a long-term plan for financing its public work needs. If the applicant is a Town, City, or County, it must adopt the 1/4 percent real estate excise tax dedicated to capital purposes. Eligible public works systems include streets and roads, bridges, storm sewers, sanitary sewers, and domestic water. Loans are presently offered only for purposes of repair, replacement, rehabilitation, reconstruction or improvement of existing service users. A recent change has now made projects intended to meet reasonable growth (as detailed in a 20-year growth management plan) eligible for PWTF funding.

The funding program operates on an annual cycle for construction funds, with a May application date. The program also accepts preconstruction applications on a monthly basis when such funding is available. **The PWTF Program operates at the discretion of the Governor and the Legislature. The fund has been re-allocated to the State's General Fund to cover budget deficits in recent years.**

COMMUNITY ECONOMIC REVITALIZATION BOARD (CERB)

This low interest loan and grant program is managed by the Department of Trade and Economic Development. Funding is available for infrastructure that supports projects, which will result in specific private developments or expansions in manufacturing, and businesses that support the trading of goods and services outside the State's border. Funding is not available to support retail shopping developments or acquisition of real property. The projects must create or retain jobs. The average is one job per $3,000 or CERB financing. The interest rate fluctuates with the state bond rate. Grant funding is limited to $50,000 per application and requires 25 percent matching funds (9-2016).

REVENUE BONDS – WATER

A common source of funds for construction of major utility improvements is the sale of revenue bonds. These are tax-free bonds issued by a City. The major source of funds for debt service on revenue bonds is from monthly service charges. In order to qualify to sell revenue bonds marketable to investors, the bonds typically have contractual provisions for the city to meet debt coverage requirements. The City must show that its annual net operating income (gross income less operation and maintenance expenses) is must be equal to or greater than a factor, typically 1.2 to 1.4 times the annual debt service on all par debt. If a coverage factor has not been specified it will be determined at the time of any future bond issues.

UTILITY LOCAL IMPROVEMENT DISTRICTS – WATER

Another potential source of funds for improvements can be obtained through the formation of Utility Local Improvement Districts (ULIDs) involving a special assessment made against properties benefiting by the improvements. ULID bonds are further backed by a legal claim to the revenues generated by the utility, similar to revenue bonds.

ULID financing is frequently applied to system extensions into areas previously not served. Typically, ULIDs are formed by a municipality at the written request (by petition) of the property owner within a specific area of the municipality. Upon receipt of a sufficient number of signatures on petitions, the local improvement area is defined. Each separate property in the ULID is assessed in accordance with the special benefits the property receives from the system improvements.

There are several benefits to a municipality in selecting ULID financing. The assessment places a lien on the property and must be paid in full upon sale of the property. Furthermore, property owners may pay the assessment immediately upon receipt reducing the costs financed by the ULID. The advantages of ULID financing, as opposed to rate financing, to the property owner include:

- The ability to avoid interest costs by early payment of assessments.
- If the ULID assessment is paid in installments, it may be eligible to be deducted from federal income taxes.
- Low-income senior citizens may be able to defer assessment payments until the property is sold.

The major disadvantage to the ULID process is that it may be politically difficult to approve formation. The ULID process may be stopped if 40 percent of the property owners protest its formation. Also, there are significant legal and administrative costs associated with the ULID process, which increases total project costs by approximately 30 percent over other financing options.

DEVELOPER FINANCING

Developers must fund the construction of extensions of the water system to property within new plats. The developer extensions are turned over to the water system for operation and maintenance when completed.

It may be necessary, in some cases, to require the developer to construct facilities outside of the plat limits to provide service to the plat and/or larger pipelines for the ultimate development of the water system. The municipality may, by policy, reimburse the developer through direct outlay, latecomer charges, or reimbursement agreements for the

additional costs of facilities, including increased size of pipelines over those required to serve the property under development.

Construction of any pipe in commercial or industrial areas that is larger than the size required to service the development may also be considered as an oversized line possibly eligible for compensation. Developer reimbursement (latecomer) agreements provide up to 15 years or more for developers to receive payment from other connections made to the developer-financed improvements.

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

Pierce County Community Connections administers the County's CDBG funds independent of the Washington State CDBG general purpose grants. The Community Development Block Grant program is a competitive source of federal funding for a broad range of community development projects. A primary requirement of the CDBG program is that the project must principally benefit at least 51 percent of the low-to-moderate income residents of the project area. Pierce County typically receives about $900,000 to $1.2 million in federal funds per funding cycle. The public facilities program provides grant funds for the design, construction, or reconstruction of water, sewer systems, and other community infrastructure up to the amount of $750,000.

Eligible applicants for the CDBG programs include cities and towns with less than 50,000 people or counties with populations less than 200,000. Though port districts and economic development districts are not eligible to apply directly, a city or county can submit a joint application and include these entities as partners.

Some Community Block Grant funds are available to property owners with incomes near or below poverty level. Funds are available only to reduce assessments.

DRINKING WATER STATE REVOLVING FUND (DWSRF)

In 1996, Congress established the Drinking Water State Revolving Fund through the reauthorization of the federal Safe Drinking Water Act. The program is managed by both the Washington State Department of Health and the Washington State Public Works Board. The purpose of the program is to provide low-interest loans to assist publicly- and privately-owed water systems improve drinking water and protect public health.

Eligible publicly-owned water systems include city and county governments, public utility districts, and special purpose districts. Privately-owned systems are eligible as long as they are a Group A system.

Eligible projects include the following:

- Water systems that exceed health standards;
- Replacement of aging infrastructure;

- Acquisition of real property;
- Planning and design costs;
- Water conservation projects;
- Reservoirs (clear wells) that are part of a treatment process;
- Distribution reservoirs (finished water);
- Existing systems who chose to connect to a municipal system;
- Upgrade to or creation of a Group A system.

Maximum award per single water system is $3,000,000 and for combining systems an award of $6,000,000 is available. DWSRF requires a 2 percent loan fee, but no local match. A summary of interest rates and loan terms follows:

TABLE 9-8

Drinking Water State Revolving Fund Loan Terms

Applicant's Income Level	Interest Rate	Repayment period
Water system not financial distressed	2.5% Fixed	20 years or life of project, whichever is less
Water system in distressed county	1.5% Fixed	20 years or life of project, whichever is less
Income survey results demonstrates that 51 percent of the households are at 80 percent or below the county's median household income.	1.5% Fixed	20 years or life of project, whichever is less
Income survey results demonstrates that 51 percent of the households are at 50 percent or below the county's median household income.	0.0% Fixed	30 years or life of project, whichever is less

APPENDIX A

DOH WATER FACILITIES INVENTORY AND DOH WSP CHECKLIST

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

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 2
Updated: 05/02/2017
Printed: 5/8/2017
WFI Printed For: On-Demand
Submission Reason: SMA 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
45027 K	ROY, CITY OF	PIERCE	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

KIMBERLY S. GUBBE [CONTRACT MANAGER]
THURSTON PUD
921 LAKERIDGE WAY SW SUITE 301
OLYMPIA, WA 98502

7. OWNER NAME & MAILING ADDRESS

ROY, CITY OF
RAWLIN "ANTHONY" MCDANIEL MAYOR
PO BOX 700
ROY, WA 98580

8. OWNER NUMBER: 012793

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN ROY, CITY OF
ADDRESS 216 MCNAUGHT ST
CITY ROY STATE WA ZIP 98580

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone: (360) 357-8783
Primary Contact Mobile/Cell Phone: (360) 359-8554
Primary Contact Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 357-1172 E-mail: xxxxxxxxxxxxxxxxxxx

10. OWNER CONTACT INFORMATION

Owner Daytime Phone: (253) 843-1113
Owner Mobile/Cell Phone:
Owner Evening Phone: (xxx)-xxx-xxxx
Fax: (253) 843-0279 E-mail: xxxxxxxxxxxxxxxxxxx

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

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

- ☐ Not applicable (Skip to #12)
- ☐ Owned and Managed
- ☒ Managed Only
- ☐ Owned Only

SMA NAME: PUD No.1 of Thurston County SMA Number: 147

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- ☐ Agricultural
- ☒ Commercial / Business
- ☒ Day Care
- ☒ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☒ Recreational / RV Park
- ☒ Residential
- ☒ School
- ☐ Temporary Farm Worker
- ☒ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☒ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☐ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

263,000

15	16	17	18 SOURCE CATEGORY										19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	WELL #1 AEF351		X										X			Y		X				X	80	325	NW SE	33	18N	02E
S02	WELL #2 ABR133		X										X			Y		X					444	400	SE NW	03	17N	02E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
45027 K	ROY, CITY OF	PIERCE	A	Comm

	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?)		292	481
A. Full Time Single Family Residences (Occupied 180 days or more per year)	292		
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.	31	31	0
28. TOTAL SERVICE CONNECTIONS		323	481

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 805

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?	250	250	250	250	250	100	100	100	250	250	250	250
B. How many days per month is water accessible to the public?	31	28	31	30	31	30	31	31	30	31	30	31

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	400	400	400	400	400	30	30	30	400	400	400	400
B. How many days per month are they present?	23	20	21	22	22	21	23	21	22	23	20	23

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
* Requirement is exception from WAC 246-290	2	2	2	2	2	1	1	1	2	2	2	2

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
45027	ROY, CITY OF

Total WFI Printed: 1

Washington State Department Of Health
Project Approval Application

Comprehensive Water System Plan (project name)			Pierce (county)		DOH Project #
City of Roy (water system name)			Russell Porter, P.E. (design engineer)		
Rawlin "Anthony" McDaniel (system owner)			Gray & Osborne, Inc. (engineering firm)		
216 McNaught Rd S (street)			701 Dexter Avenue North (street)		
Roy (city)	Washington (state)	98580 (zip code)	Seattle (city)	WA (st)	98109 (zip code)
(253) 843-1113 (phone number)			(206) 284-0860 (phone number)		

(project contact if different than above) (daytime phone number) (evening phone number)

SYSTEM CLASS: ☒ Group A Community ☐ Group A NTNC ☐ Group A TNC ☐ Group B

 # SERVICE CONNECTIONS *(for Group A systems only - # services after project completion):*

☐ less than 100 ☒ 100 - 500 ☐ 501 - 999 ☐ 1,000 - 9,999 ☐ 10,000 or more

PROJECT DESCRIPTION: The City of Roy has updated its Comprehensive Water System Plan.

AREA SERVED *(for distribution projects only-name of subdivision, site address, parcel numbers, etc.)*:

TYPE OF PROJECT *(check all that apply)*:

☒ water system plan:
- ☒ non-complete new or updated plan
- ☐ non-minor alteration

☐ satellite management (SMA)
☐ ownership plan
☐ amendment
☐ operation plan

☐ project report: (Is water system plan required: ☐Y ☐N If required, is it current and approved: ☐Y ☐N)
(Is project identified as part of capital improvement plan: ☐Y ☐N)
- ☐ filtration or other complex treatment
- ☐ chemical addition only (ion exchange, hypochlorination, corrosion control or fluoridation)
- ☐ complete new water system
- ☐ major system modification

☐ special reports or plans:
- ☐ corrosion control report
- ☐ corrosion control study
- ☐ plan to cover uncovered reservoir
- ☐ predesign study
- ☐ uncovered reservoir plan of operation
- ☐ tracer study plan
- ☐ surface water or GWI treatment facility operation plan

- ☐ filtration pilot study

☐ construction documents:
- ☐ filtration or other complex treatment
- ☐ chemical addition only
- ☐ complete new water system
- ☐ new source only
- ☐ system modification
- ☐ system modification; design standards used; PE prepared

☐ existing system approval
- ☐ non-expanding; not detailed evaluation
- ☐ non-expanding, detailed evaluation
- ☐ expanding, not detailed evaluation
- ☐ expanding, detailed evaluation

☐ waivers:
- ☐ inorganic chemical (initial)
- ☐ organic chemical (initial)
- ☐ use

- ☐ inorganic chemical (renewal)
- ☐ organic chemical (renewal)
- ☐ use (renewal)
- ☐ coliform (w/departmental inspection)
- ☐ coliform (w/ third-party inspection)

☐ other
- ☐ well-site evaluation and approval
- ☐ regulatory monitoring plan
- ☐ unfiltered system annual report
- ☐ water system compliance report (loan letter)
- ☐ water right self-assessment (if applicable)

other projects (describe)_____

For department use only below this line:

Log-in #_____; Initial fee _____; Invoice mailed _____;

Invoice #_____; Fee received _____; # review letters_____

Approval Date:_____ Date construction report received:_____ #approved connections_____

Area served:_____

_____

Provisions:_____

Water System Plan Submittal Form

This form is required to be submitted along with the Water System Plan (WSP). It will serve to expedite review and approval of your WSP. WSPs will not be reviewed until the submittal form and checklist are completed.

1) System Name	2) SYSTEM ID #	3) SYSTEM OWNER	
City of Roy	**45027K**	**Rawlin "Anthony" McDaniel**	
4) CONTACT NAME FOR UTILITY	PHONE NUMBER	TITLE	
Debbie Dearinger	**(253) 843-1113**	**City Clerk**	
ADDRESS	CITY	STATE	ZIP
216 McNaught Rd S	**Roy**	**Washington**	**98580**
5) PROJECT ENGINEER	PHONE NUMBER	TITLE	
Russell Porter, P.E.	**(206) 284-0860**	**Project Manager**	
ADDRESS	CITY	STATE	ZIP
701 Dexter Avenue North, Suite 200	**Seattle**	**WA**	**98109**

6. How many services are presently connected to the system? **324 in 2016**
7. Is the system expanding? (seeking to extend service area or increase number of approved connections) **No**
8. If number of services is expected to increase, how many new connections are proposed in the next six years? **142 additional by 2023**
9. If the system is private-for-profit, is it regulated by the State Utilities and Transportation Commission? **No**
10. Is the system located in a Critical Water Supply Service Area? **No**
11. Is the system a customer of a wholesale water purveyor? **No**
12. Will the system be pursuing additional water rights from the Sate Department of Ecology in the next 10 years? **No**
13. Is the system proposing a new intertie? **No**
14. Do you have projects(s) currently under review by Department of Health? **No**
15. Are you requesting distribution main project report and construction document submittal exception, and if so, does the WSP contain standard construction specifications for distribution mains? **Yes**
16. Are you requesting distribution related project report and construction document submittal exception, and if so, does the WSP contain distribution facilities design and construction standards, including internal engineering review procedures? **No**
17. Have you sent copies of the draft WSP to adjacent purveyors and the County for their review and comment? **Yes**

    If yes, list adjacent utilities/entities that have received a copy of the draft WSP
    - Pierce County
    - (Tacoma N/A)

18. Is this plan an: **Initial Submittal**

Please enclose the following number of copies of the WSP:

- 2 copies for Department of Health Review
- 1 additional copy if you answered "YES" to question 9
- 1 additional copy if you answered "Yes" to question 12 and/or13

3 Total Copies Attached

DOH 331-040 (rev 3/99)

WSP Checklist

	Content Description	*Must Be Submitted (√)	(Page #) in WSP
Chapter 1	**Description of Water System**		
	• Ownership and Management	(√)	1-1
	• System History and Background	(√)	1-2
	• Inventory of Existing Facilities	(√)	1-6
	• Related Plans (e.g., CWSP, local land use plans)	(√)	1-11
	• Service Area and Characteristics	(√)	1-11
	• Agreement (signed in accordance with CWSP)	( )	
	• Map	(√)	Figure 1-4
	• Service Area Policies (Including SMA policy and conditions of service)	(√)	1-12
Chapter 2	**Basic Planning Data**		
	• Current Population, Number of Service Connections, and ERUs	(√)	2-1, 2-7
	• Current Water Use and Data Reporting	(√)	2-3
	• Current and Future Land Use	(√)	Figure 1-3
	• Future Population and Number of Service Connections and ERUs (6 and 20 years)	(√)	2-11,
	• Future Water Use (Demand forecast for 6 and 20 years)	(√)	2-12
Chapter 3	**System Analysis**		
	• System Design Standards	(√)	3-1
	• Water Quality Analysis	(√)	3-2
	• System Inventory, Description and Analysis	(√)	3-14
	• Source	(√)	3-15
	• Treatment	( )	
	• Storage	(√)	3-17
	• Distribution System/Hydraulics	(√)	3-26
	• Summary of System Deficiencies	(√)	3-27
	• Analysis of Possible Improvement Projects	(√)	Chapter 8
Chapter 4	**Conservation Program and Source of Supply Analysis**		
	• Conservation Program	(√)	Chapter 7
	• Water Right Assessment	(√)	4-7
	• Source of Supply Analysis and evaluation of supply alternatives	(√)	4-7
	• Water Supply Reliability Analysis With Water Shortage Response Plan	(√)	5-17
	• Interties	(√)	4-7
Chapter 5	**Source Water Protection (Check One or Both)**		
	• Wellhead Protection Program	(√)	Chapter 5
	• Watershed Control Program	( )	
Chapter 6	**Operation and Maintenance Program**		
	• Water System Management and Personnel	(√)	6-1
	• Operator Certification	(√)	6-1
	• Routine Operating Procedures, Preventive Maintenance and Record Keeping	(√)	6-2
	• Water Quality Sampling Procedures (Comprehensive Monitoring Plan)	(√)	3-13
	• Coliform Monitoring Plan	(√)	Appendix H
	• Emergency Response Program	(√)	6-10
	• Safety Procedures	(√)	6-11
	• Cross-Connection Control Program	(√)	6-14
	• Service Reliability in accordance with WAC 246-290-420	( )	
Chapter 7	**Distribution Facilities Design and Construction Standards**		
	• Standard Construction Specification for Distribution Mains	(√)	Appendix C
	• Design and Construction Standards for distribution Related Projects	(√)	Appendix C
Chapter 8	**Improvement Program**		
	• Capital Improvement Schedule (6 and 20 years)	(√)	8-5
Chapter 9	**Financial Program**		
	• Summary of past income and expenses	(√)	9-2
	• Balanced Operating Budget (1 year if >1,000 connections / 6 year if < 1,000 connections)	(√)	9-5
	• Demonstration of revenue and cash flow stability to fund CIP and emergency improvements	(√)	9-7
	• Rate Structure that considers affordability of rates and water conservation	(√)	4-5
	• Systems < 1,000 connections may do DOH Financial Viability Test to complete above reqs.	( )	
	• UTC Financial Viability and Feasibility Test (for UTC regulated systems)	( )	
Chapter 10	**Miscellaneous Documents**		
	• For Community Systems, Meeting of the Consumers (date and description)	(√)	Appendix K
	• County/Adjacent Utility Correspondence	(√)	Appendix A
	• Documentation of State Environmental Policy Act (SEPA) Compliance	( )	
	• Agreements	( )	
	• Satellite Management Program	( )	

* Requirement will be determined at the pre-plan conference.

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

Pre - Adequacy Data Summary
As of: 5/8/2017

Administrative Data

"Mailing Information:"
ROY, CITY OF , 45027

Kimberly S Gubbe
(360) 357-8783
Thurston PUD
921 Lakeridge Way SW Suite 301
Olympia, WA 98502

Last WFI Update:5/2/2017

Group.....: A

Type.....: Comm

DOH Region.....: Northwest

County.....: PIERCE

Ownership:
Owner Type..: Other
Owner Name.: ROY, CITY OF

Connections:

Active Connections.....: 323

Approved Connections.: See approved numbers - 481

Pre - Adequacy Data Summary
As of: 5/8/2017

Operating Permit Description

Current and Valid Operating Permit (Yes/No) - Yes

Permit Category Color.: Green
DOH Recommendation:

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

Water Quality Violations

Incident Date	Severity

*** No Current Violation Found for Water System ***

Operator Certification Requirement

In Compliance

Water System Plan Requirement

Out of Compliance

Compliance Actions

Action	Status	Issue Date	Reason

*** No Current Compliance Actions Found ***

Regional Staff Comments

Disclaimer

This is a DOH Pre - Adequacy Data Summary for this water system that is based on information available at this time. Other entities such as Local Building, Planning and Health Jurisdictions, or financial institutions have alternative authority to make final decisions involving development, building permits and financing.

**** End of Report ****

APPENDIX B

WELL LOGS

DECLARATION OF COVENANT

The Grantors, Roy Pioneer Rodeo Association, a Washington non-profit corporation, and the City of Roy, a municipal corporation of the State of Washington, do hereby declare as follows:

WHEREAS, Grantor, Roy Pioneer Rodeo Association, is the owner and Grantor, City of Roy, is the Lessee of the following described real estate situated in Pierce County, State of Washington, to-wit:

> That portion of the Roy Pioneer Rodeo Association property recorded under Auditor's Fee Number 2265659, Records of Pierce County, Washington, located in the Northeast Quarter of the Southeast Quarter of Section 33, Township 18 North, Range 2 East W.M., as set forth in Exhibit "A" which is attached hereto and made a part hereof, and described as follows:
>
> Beginning at the intersection of the most Westerly line of Parcel "B" of the Roy Pioneer Rodeo Association property as described in a quit claim deed from Manning Seed Co., Inc. recorded October 29, 1968 under Auditor's Fee No. 2265659, with the Southerly line of Huggins-Greig County Road described in dedication deed to Pierce County recorded May 22, 1964, under Auditor's Fee 2056363; thence Easterly along the Southerly line of said county road to its intersection with a line parallel with and 200.00 feet Easterly of (when measured at right angles) the most Westerly line of said Parcel "B"; thence Southerly along said parallel line a distance of 200.00 feet; thence Westerly along a line perpendicular to the most Westerly along a line of said Parcel "B" to its intersection with said Westerly line; thence Northerly along the most Westerly line of said Parcel "B" to the point of beginning.

on which the Grantor, City of Roy, owns and operates a well and waterworks supplying water for public use located on the above described real property, which well site is described as follows, to-wit:

> Center of well located 100.00 feet North (when measured along the West property line) and 100 feet East (when measured perpendicular to the West property line) of the Southwest corner of the above described property.

WHEREAS, Grantor, City of Roy, is required to keep the water supplied from said well free from impurities which might be injurious to the public health, and

WHEREAS, it is the purpose of this covenant to prevent certain practices hereinafter enumerated in the use of said Grantors'land which might contaminate the well, now, therefore,

IT IS HEREBY MUTUALLY AGREED as follows:

1. Grantors hereby agree and covenant that each of said Grantors, their successors and assigns shall not construct, maintain or suffer to be constructed or maintained upon said land of Grantors within 100 feet of the well site above described, so long as the same is operated to furnish water for public consumption, any of the following: 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.

2. This covenant 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.

IN WITNESS WHEREOF, the parties hereto have executed this Declaration of Covenant this 8th day of December, 1986.

ROY PIONEER RODEO ASSOCIATION

By: Leon Redeske
President

By: Elsie Bergren
Secretary

CITY OF ROY

By: [signature]
Mayor

Attest:

Donna L. Porter
Clerk-Treasurer

88 OCT 17 AM 11:25

8810170267

STATE OF WASHINGTON)
)ss.
County of Pierce)

On this 8th day of DECEMBER, 1986, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn personally appeared Leon G. Rediske and Elsie Berggren, to me known to be the President and Secretary, respectively of the corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute the said instrument and the seal affixed is the corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

GORDON A. SCRAGGIN NOTARY PUBLIC STATE OF WASHINGTON 7-31-88

NOTARY PUBLIC in and for the State of Washington, residing at Tacoma.
My commission expires July 31, 1988.

STATE OF WASHINGTON)
)ss.
County of Pierce)

On this 8th day of DECEMBER, 1986, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn personally appeared Charles Wolf and Donna Porter, to me known to be the Mayor and Clerk-Treasurer, respectively of the municipal corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said municipal corporation, for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute the said instrument and the seal affixed is the corporate seal of said municipal corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

GORDON A. SCRAGGIN NOTARY PUBLIC STATE OF WASHINGTON 7-31-88

NOTARY PUBLIC in and for the State of Washington, residing at Tacoma.
My commission expires July 31, 1988.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 14, 1983	G 2-26452	G 2-26452 P	

NAME: City of Roy

ADDRESS (STREET): P.O. Box 700 | (CITY): Roy | (STATE): Washington | (ZIP CODE): 98580

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

PUBLIC WATER TO BE APPROPRIATED

SOURCE: well

TRIBUTARY OF (IF SURFACE WATERS):

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5

QUANTITY, TYPE OF USE, PERIOD OF USE		
137.5 acre-feet per year	municipal	continuously
	Fire protection	as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL:
400 feet South and 600 feet West of the East Quarter corner of Section 33.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼SE¼	33	18	2 E	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The water will be used within the boundaries of the city of Roy Water Service area.

DESCRIPTION OF PROPOSED WORKS

This water system will consist of a well, a 260,00 gallons storage tank and transmission lines to an undetermined number of services within the City of Roy.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
~~September 1, 1984~~ 1985	~~September 1, 1985~~ 1986	~~September 1, 1986~~ 1987

RSC 1/10/85 (see memo)

PROVISIONS

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).

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

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.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

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 Olympia *Washington, this*.....16th.....*day of* January, *19*...85.....

DONALD W. MOOS, Director
Department of Ecology

by Clark Haberman
Clark Haberman, Regional Manager

ENGINEERING DATA
OK..MB.....

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
December 14, 1983	G 2-26452		

NAME: City of Roy

ADDRESS (STREET): P.O. Box 700 (CITY): Roy (STATE): Washington (ZIP CODE): 98580

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: well

TRIBUTARY OF (IF SURFACE WATERS):

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5

QUANTITY, TYPE OF USE, PERIOD OF USE		
137.5 acre-feet per year	municipal	continuously
	Fire protection	as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL: 400 feet South and 600 feet West of the East Quarter corner of Section 33.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼SE¼	33	18	2 E	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The water will be used within the boundaries of the city of Roy Water Service area.

DESCRIPTION OF PROPOSED WORKS

This water system will consist of a well, a 260,00 gallons storage tank and transmission lines to an undetermined number of services within the City of Roy.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
September 1, 1984	September 1, 1985	September 1, 1986

REPORT

BACKGROUND:

This application was received by the department on December 14, 1983. Public notice was published in The Tacoma News Tribune in Pierce County on January 20, and 27, 1984. No protests to this application have been received by the department. The applicant is requesting 300 gallons per minute for municipal water supply and fire protection.

INVESTIGATION:

Investigation of this application was made on June 29, 1984 and coordination regarding a municipal water system was discussed with Mr. Glaudrone.

The City of Roy is currently served by individual wells or small group domestic services. There are more than 50 wells known to exist within and adjacent to the city limits.

The city intends construct and operate a city municipal water system. Once the city system is constructed, a number of homes receiving water from individual or group system wells, will obtain this water from the city. In some cases the existing small wells will be abandoned.

At present, the city operates one well which serves water to the city park. This well has been in operated since 1932 under Water Right Claim No. 9330.

The Roy Elementary School operates a school water system from a well west of the rodeo grounds under Water Right Claim No. 149303. The school well has a capacity of 80 gallons per minute.

Because these two wells may be inter-connected, the amount of water normally required for the school will also be considered in this report.

Construction plans call for a 260,000 gallons storage tank to be erected near the elementary school with transmission lines to serve 400 services and an estimated population of 700 to 750 within 20 years.

The normal water requirement in a community within this environmental will approximate 300 gallons per day or 1/3 acre-feet per year per service. This will amount to 133 acre-feet per year for approximately 400 services.

The elementary school is serving 275 students. The school has a small gymnasium, a newly constructed kitchen and cafeteria.

The per capita use of water for this type school is 30 gallons per day. Therefore, the annual use for 275 students for 180 days per year will be about 4.5 acre-feet.

The total water use, including the school, will be approximately 137.5 acre-feet per year.

A review of well logs in the area indicates that an adequate water supply exists.

CONCLUSION:

In accordance with Section 90.03 and 90.44 RCW, I find that there is water available for appropriation from the source in question and that the appropriation as recommended is a beneficial use and will not impair existing rights or be detrimental to the public welfare. Therefore, permit should issue, subject to existing rights and indicated provisions.

RECOMMENDATION:

I recommend this application be approved for withdrawal of ground water from a well in the amount of 300 gallons per minute on continuous basis and 137.5 acre-feet per year for municipal supply and for fire protection as required.

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

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 (Installation, operation and maintenance requirements attached hereto).

This authorization to use public waters of the state is classified as a Public Water Entity Permit in accordance with Chapter 90.66 RCW (Initiative Measure No. 59.)

REPORTED BY: Robert Kavanaugh

DATE: Sept 11, 1984

The statutory fee for this permit is $20.00.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 14, 1983	G 2-26452	G 2-26452 P	G 2-26452 C

NAME			
City of Roy			
ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 700	Roy	Washington	98580

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5

QUANTITY, TYPE OF USE, PERIOD OF USE

137.5 acre-feet per year	municipal	continuously
	Fire protection	as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
400 feet South and 600 feet West of the East Quarter corner of Section 33.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼SE¼	33	18	2 E	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The water will be used within the boundaries of the city of Roy Water Service area.

PROVISIONS

The access port shall be maintained at all times on the well(s).

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104, Washington Water Well Construction Act of 1972, and Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040 (installation, operation, and maintenance requirements are attached).

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia, Washington,

this 1st *day of* November, *19* 91.

Christine O. Gregoire, Director
Department of Ecology

ENGINEERING DATA
OK gb

by Jane Blomstrom

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 27, 1984	G 2-26633	G 2-26633 P	

NAME
CITY OF ROY

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 700	Roy	Washington	98580

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well No. 2

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5 acre-feet/yr

QUANTITY, TYPE OF USE, PERIOD OF USE

137.5 acre-feet per year — Municipal supply — continuously

Supplemental — 400 services and school

fire protection as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
1175 feet South and 390 feet East of the Northwest Corner of Section 3.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼NW¼	3	17	2 E.	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by City of Roy.

DESCRIPTION OF PROPOSED WORKS

State approved Class I water system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
September 1, 1988	September 1, 1989	September 1, 1990
9-1-90	9-1-91	9-1-92

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.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

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).

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 Olympia *Washington, this* 5th *day of* September, *19* 85.

X

ANDREA BEATTY RINIKER, Director
Department of Ecology

by Clark Haberman

Clark Haberman, Regional Manager

ENGINEERING DATA
OK.....

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
December 27, 1984	G 2-26633		

NAME: CITY OF ROY

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 700	Roy	Washington	98580

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Well No. 2

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5 acre-feet/yr

QUANTITY, TYPE OF USE, PERIOD OF USE

137.5 acre-feet per year — Municipal supply — continuously

Supplemental — 400 services and school

fire protection as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

1175 feet South and 390 feet East of the Northwest Corner of Section 3.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼NW¼	3	17	2 E.	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by City of Roy.

DESCRIPTION OF PROPOSED WORKS

State approved Class I water system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
September 1, 1986	September 1, 1989	September 1, 1990

REPORT

BACKGROUND

The application was received and accepted by the Department on December 27, 1984. Public Notice appeared in the Tacoma News Tribune on January 12 and 19, 1985. There were no protest filed as a result of the public notice.

The applicant seeks a permit to withdraw public ground waters from a well on a continuous demand basis for municipal supply and as needed for fire protection. The proposed well would be integrated into the water system as proposed under the provisions of Ground Water Permit No. G 2-26452 P and would serve mainly as a back-up supply.

INVESTIGATION

A field examination of the proposed well site was made on February 26, 1985.

At present, the city operates one well, which serves the city park and operates under Water Right Claim 9330. The Roy Elementary School operates a school water system from a well West of the rodeo grounds under Water Right Claim No. 149303.

Ground Water Permit G 2-26452 P was issued on the basis of integrating the school well with a new city well and serving 400 services by the year 2005 and for fire protection as needed.

Based on 300 gallons per day, per service, and 30 gallons per day, per capita for the school. Ground Water Permit No. G 2-26452 P was issued for 300 gallons per minute and 137.5 acre-feet per year.

Issuance of a permit under this application would be totally supplemental to existing permits and/or claims.

CONCLUSION:

In accordance with Section 90.03 and 90.44 RCW, I find that there is water available for appropriation from the source in question and that the appropriation as recommended is a beneficial use and will not impair existing rights or be detrimental to the public welfare. Therefore, permit should issue, subject to existing rights and indicated provisions.

RECOMMENDATIONS:

I recommend this application be approved for permit to withdraw public ground waters from the well subject to this application in the amount of 300 gallons per minute on a continuous demand basis and 137.5 acre-feet per year for municipal supply and supplemental to amounts under existing rights. Provided that the total annual withdrawal under all rights does not exceed 137.5 acre-feet and the total instantaneous does not exceed 600 gpm. Also withdrawal as needed for fire protection.

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.

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells.)

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

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).

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Water Supply and Waste Section, Department of Social and Health Services, Mail Stop LD 11, Building 4, Olympia, Washington 98504, prior to any new construction or alterations of a public water supply.

REPORTED BY: Walter Bergstrom

DATE: July 24, 1985

The permit fee for municipal supply and fire protection is $20.00.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917 and amendments thereto, and the rules and regulations of the Department of Ecology)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 27, 1984	G2-26633	G2-26633 P	G2-26633 C

NAME
City of Roy

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 700	Roy	Washington	98580

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 2

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	300	137.5 acre-feet/year

QUANTITY, TYPE OF USE, PERIOD OF USE		
137.5 acre-feet per year Supplemental	Municipal supply 400 services and school fire protection as needed	Continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
1175 feet south and 390 feet east of the northwest corner of Section 3.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N	RANGE, (E OR W) W.M.	WRIA	COUNTY
NW¼NW¼	3	17	2E	11	Pierce

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Roy.

PROVISIONS

An approved measuring device shall be maintained in accordance with RCW 90.03.360, WAC 508.64.020 through WAC 508-64-040 (Installation, operation and maintanance requirements attached hereto).

The access port shall be maintained at all times on the well (s).

All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells.)

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia *Washington, this* 16 *day of* May *19* 88

Christine O. Gregoire, Director
Department of Ecology

by Clark Haberman
Clark Haberman, Regional Manager

ENGINEERING DATA
OK Sam

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT

WATER RIGHT CLAIM

MAR 16 72 0 12476

1. NAME City of Roy (Roy City Park)

ADDRESS 816 Mc Naught

Roy, Washington ZIP CODE 98580

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Ground (SURFACE OR GROUND WATER)

W.R.I.A. 11 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS Well

B. IF SURFACE WATER, THE SOURCE IS

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 10 g.p.m. PRESENTLY USED 5 g.p.m. (CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED 2 PRESENTLY USED 1 (ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED N/A PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: Continuously

4. DATE OF FIRST PUTTING WATER TO USE: MONTH YEAR 1932

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: FEET AND FEET FROM THE CORNER OF SECTION

BEING WITHIN NW¼ OF SECTION 34 T. 18 N. R. 2 E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY. LOT 4 BLOCK 4 OF

James McNaught's 2nd addition.
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Lots 1, 2, 3, and 4 of Block 4 of James McNaught's 2nd addition located in the NW¼ of Section 34, Twp. 18N Range 2 E W.M.

COUNTY Pierce

7. PURPOSE(S) FOR WHICH WATER IS USED: Domestic

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: Appropriation

[illegible]

DEPARTMENT OF [illegible]

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF

X Leon H. Radke, Mayor

DATE March 13, 1972

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE

ORIGINAL
DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT ALONG WITH YOUR FEE TO
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT
UNION AVE BUILDING OLYMPIA, WASHINGTON 98501

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

August 18, 2003

Mr. Karl Johnson, P.E.
Gray & Osborne, Inc.
2401 Bristol Court SW
Olympia, WA 98506

Dear Mr. Johnson:

RE: City of Roy WRAT Request

Per your recent request enclosed are copies of the ROEs for certificates G2-26633 and G2-26452 for the City of Roy. Also enclosed are copies of applications G2-29312 and G2-29313. These applications are still in the initial stages and have not gone beyond the application stage.

In your original request you also listed claim G2-00933. When I looked for this claim I found it was for Stevens County, not the City of Roy. In my research I was unable to find any claims for the City of Roy.

If you have any questions or concerns about any of this information, please contact me at (360) 407-6918.

Sincerely,

Tina Russell
Water Resources

TR:tr
Enclosures

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

Application No. .....
Permit No. .....

(1) OWNER: Name CITY OF ROY Address ROY, WA.

(2) LOCATION OF WELL: County PIERCE — NE¼ SE¼ Sec. 33 T. 18 N., R. 2E W.M.

Bearing and distance from section or subdivision corner APPROX. 500' W. AND 2300' N OF SE COR SEC 33

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .... WELL 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12 inches.
Drilled 154 ft. Depth of completed well 106.1 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12 " Diam. from +1.9 ft. to 80 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 ☐
Manufacturer's Name JOHNSON
Type WATERMARK, S.S. Model No. .....
Diam. 10" P.S Slot size 100 from 79.8 ft. to 90.2 ft.
Diam. " Slot size 100 from 94.8 ft. to 100.2 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 38 ft.
Material used in seal NEAT CEMENT / 5% 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 N.A.
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... TOPO 320± ft.
Static level 8.0 ft. below top of well Date 12/30/85
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? ROBINSON & NOBLE
Yield: 6.25 gal./min. with 3.14 ft. drawdown after 9.4 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	11.14	100	8.06		
1	8.45				
10	8.14				

Date of test 12/30/85
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water 51 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
SANDY LOAM, SOME GRAVEL	0	3
GRAY-BROWN SILTY SAND AND GRAVEL	3	10
BROWN GRAVEL AND SAND, SILT LAYERS	10	28
GRAY-BROWN MEDIUM SAND	28	39
BROWN MEDIUM SAND, OCC LARGE GRAVEL	39	48
BROWN POORLY SORTED MEDIUM SAND W/ GRAVEL	48	76
BROWN WELL SORTED GRAVEL WITH SAND	76	90
BROWN GRAVEL, SAND AND SILT	90	93
BROWN WELL SORTER GRAVEL WITH SAND	93	100
BROWN GRAVEL, SAND AND SILT	100	108
BROWN SAND, GRAVEL AND SILT, WEATHERED MATRIX, TIGHTER WITH DEPTH, COBBLE SIZE GRAVEL COMMON, SEE PAGE.	108	154

STATE OF WASH. JAN 29 AM 11:08

PREPARED BY:
ROBINSON & NOBLE, INC.

Work started 9 19 85 Completed JAN 19 86

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 RAMLO WELL DRILLING
(Person, firm, or corporation) (Type or print)

Address P.O. BOX 1686 GIG HARBOR

[Signed] Michael Ramlo
(Well Driller)

License No. 1199 Date 1-16, 19 86

ORIGINAL SIGNED BY DRILLER
(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

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

Application No. .....

Permit No. .....

(1) OWNER: Name CITY OF ROY Address ROY, WA.

(2) LOCATION OF WELL: County PIERCE NW¼ NW¼ Sec. 3 T. 17 N., R. 2E W.M.

Bearing and distance from section or subdivision corner APPROX. 400'E AND 1100 S. OF NW COR SEC 3

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .... WELL 2
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12 inches.
Drilled 500 ft. Depth of completed well 496.3 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12 " Diam. from +2.0 ft. to 445 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.

443.9
Screens: Yes ☒ No ☐
10' 30 SLOT
6' 25 Manufacturer's Name JOHNSON
9' 30 Type WATERMARK, S.S. Model No. .....
449.4 Diam. 10"ϕ Slot size ..... from ..... ft. to ..... ft.
478.2 Diam. ..... Slot size ..... from ..... ft. to ..... ft.
488.5 EC 10' 20 SLOT
Gravel packed: Yes ☐ No ☒ Size of gravel: .....
496.3 Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 40 ft.
Material used in seal CEMENT GROUT/5% 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 N.A.
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... TOPO 330± ft.
Static level 60.0 ft. below top of well Date 12/16/85
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 ROBINSON
Was a pump test made? Yes ☒ No ☐ If yes, by whom? & NOBLE
Yield: 496 gal./min. with 21.7 ft. drawdown after 24 hrs.
" " " " "
" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) 80.1 67 NAT 98

Time	Water Level	Time	Water Level	Time	Water Level
0	81.7	60	66.35	3208	61.33
1 MIN	68.5	180	65.35	10274	60.4
10	67.5	1888	62.1		

Date of test 12/16-17/85
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water 52.5 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
BRN V. SILTY F-M. SAND	0	17
BRN WELL SORTED SAND AND GVL., SOME SILT MATRIX	17	28
BRN M. SAND W/ GVL.	28	32
BRN. WELL SORTED SAND + GVL.	32	36
BRN. GVL, SAND + SILT, BOULDERS COMMON, SEEPAGE, W.B. FROM 116 to 120'.	36	188
GRAY SAND, SILT + CLAY, SOME GVL.	188	205
BRN. SAND + SILT, SOME GVL.	205	229
GRAVEL, SILT + CLAY MATRIX	229	246
SILTY SAND + GVL, SOME WATER	246	259
GRAY SILTY SAND, OCC. GVL.	259	310
BRN-GRAY SANDY SILT, ORGANIC RICH, GRADES TO PINKISH GRAY	310	340
GRAY AND LAVENDAR SILTY SAND	340	359
SAND AND PEAT, SOME GVL	359	363
SILTY SAND, SOME GVL, W.B. SOME BINDING MATRIX	363	386
GREEN SANDY CLAYEY SILT W/ GVL.	386	395
DARK GREEN TO GRAY SAND, SOME GVL, W.B.	395	397
GVL, SAND, SILT, + CLAY, ORGANIC RICH	397	400
BROWN-GREEN SAND SILT	400	432
GREEN-GRAY + GRAY SAND + SILTY SAND, W.B., W GVL TO 15%, WOOD OR COAL DETRITUS.	432	500

PREPARED BY:
ROBINSON + NOBLE, INC.

Work started SEPT. 1985 Completed JAN. 1986

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 RAMLO WELL DRILLING
(Person, firm, or corporation) (Type or print)

Address P.O. BOX 1646, GIG HARBOR

[Signed] Michael Ramlo
(Well Driller)

License No. 1199 Date 1-16 1986

ORIGINAL SIGNED BY DRILLER

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

APPENDIX C

DEVELOPER STANDARDS

CITY OF ROY

WATER SYSTEM DESIGN STANDARDS

November 22, 2004

EXECUTIVE SUMMARY

The "Conditions and Standards for Construction of Developer Extensions to the Water System", commonly referred to as the Water Extension Manual, is a comprehensive guide and specification manual for Developers to use in the preparation of water main extension projects. The Manual is divided into six main sections which cover procedures, construction requirements, engineering specifications, standard details, as-built requirements and City approved forms. This Extension Manual, together with the latest adopted edition of the Washington State Department of Transportation/APWA Standard Specifications for Road, Bridge and Municipal Construction, comprise the standards which govern the design and construction of water extensions within the City of Roy.

Section One gives details on the various methods of extensions, the extension process and other City established procedures and requirements necessary to complete the agreement to construct a water extension.

Section Two covers details of how the work is to be administered and what the role of the parties in the agreement is during design and construction of the improvements. This section also includes definitions of included terms, and requirements for insurance coverage.

Section Three supplements the Washington State Department of Transportation/APWA Standard Specifications, and gives specific information on required materials and construction procedures called for by the City.

Section Four contains standard details which show construction features covered in the Standard Specifications and in Section Three of the Extension Manual.

Section Five contains standards for as-built drawings.

Section Six contains City approved forms for use in applying for the developer extension, submitting required easements, and other actions requiring the submittal of forms.

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SECTION ONE

EXTENSIONS TO THE WATER SYSTEM

1. Method of Extensions: Extensions (a) may be constructed by the City and financed by means of assessments against the property benefited within the limits of the Utility Local Improvement District formed for this purpose, or (b) may be constructed by the property owner or Developer in accordance with these regulations. No extension of the City's system by owner or Developer will be permitted until all applications and permits required hereunder have been approved by the City and all provisions of the City's regulations concerning such extensions have been fulfilled.

2. Annexation: Territory adjacent to the City's water service area which is not already served by another water utility may be annexed in accordance with State law. Information regarding annexation procedures will be furnished upon request.

3. Procedural Notes:

   (a) At the time that the preliminary proposal is submitted to the City, a letter requesting the availability of water should be submitted to the City for approval. A map showing the area to be served and a completed Fire Flow Requirement (FORM 1) should accompany this request.

   (b) Prior to the installation of water mains a "Developers Agreement for Watermain Extensions" must be signed by the Developer, and approved by the City. The Agreement should be accompanied by an application fee in the amount as set forth by current City ordinance. At this time the Developer should authorize his consulting engineer to proceed with design and furnish the City four (4) copies of the preliminary drawings. After review and approval by all applicable agencies the Developer's engineer shall provide four (4) copies of the final water system extension design to the City.

   (c) After the plans are complete and approved by the City, the Developer, if he wishes, may call for bids for the work described herein. If a contractor not previously experienced with the City is selected by the Developer, he should notify the City immediately upon his selection so that the city may review his qualifications to perform this contract. It is required that the Developer secure a Performance Bond guaranteeing the completion of this work and payment of bills. It is required that Washington State licensed and bonded contractors be employed by the Developer.

   (d) After the award of the Contract and before proceeding with any work on the job, the City shall be notified at least 7 days in advance of start of work. The City at this time may require a pre-construction conference. Any work that is performed without proper notification of the City will be summarily rejected.

   (e) During the progress of the work the City shall be kept informed and inspection requested prior to backfilling pipe and covering other major phases of construction. The City will determine the amount of inspection required and the Developer shall pay all costs of inspection.

(f) After completion of construction the standard pressure test shall be performed.

(g) After the pressure test, lines shall be tested and approved for purity.

(h) All fees shall be paid prior to ordering meters. This includes cut-in fees, engineering fees, inspection fees and connection charges that might be applicable to this development.

(i) At this point the Developer and the Contractor shall ask for an inspection and acceptance of the water system. This inspection shall be performed by the City, Contractor and the Developer.

(j) The Developer shall furnish the City with a cost break-down showing the total cost of construction for this development.

(k) The Developer shall furnish the City permanent executed easements that are necessary or applicable to this installation and all necessary as-built drawings.

(l) The Developer shall furnish to the City a Maintenance Bond guaranteeing materials and workmanship for a period of one year from the date of final project acceptance by the City. This Bond can be a part of the Performance Bond.

(m) At this time of development, the Developer may order and secure meters from the City. Any areas where excessive pressure exists (in excess of 80 pounds per square inch) the Developer is responsible for the installation of individual pressure reducing valves.

(n) After acceptance of the Water System by the City, the Developer shall sign a Bill of Sale deeding these improvements to the City. The Conditions and Standards, which correspond to the Specifications, on all Developer's jobs are on file at the Roy City Hall. It is the responsibility of the Developer and his contractor to familiarize themselves with the Specifications prior to starting work. On all construction work the Developer is responsible to the City for performance of all required work and any advice given by the City is just that, and the Developer shall be responsible for directing his contractor. Nothing contained herein or advice given by the City or its agents shall relieve the Developer from his responsibility for conformance with the approved plans and specifications or the City of Roy Standards and Specifications.

4. Information for Plan Preparation: Prior to plan preparation by an Engineer licensed in the State of Washington, the Developer shall submit four (4) copies of his plat, approved road plan, storm drainage plans and plans for any other underground utilities. Minimum scale shall be 1" = 50'. Any revision in plans or installed water mains caused by revisions in such plans shall be carried out at the sole expense of the Developer.

(a) Scope of the Work

(i) Work included: Furnishing and installing all water mains, fittings, valves, blocking, fire hydrants, meter setters, blow-offs, air and

vacuum relief assemblies and other appurtenances as required by the City. It shall be required that the streets have been rough graded to the approved grade. The water mains shall be placed at such a depth that a 36" minimum cover from finished street grade is maintained. The trenches shall be backfilled so that there will be no settlement as a result of this construction.

(ii) Work not included:

(1) Notifying City customers by City of Roy.
(2) Purity Test.

(b) Site of the Work

As shown on the Contract Drawings.

(c) Contract Time and Damages

As specified by Developer and approved by the City.

(d) List of Drawings

As furnished by the Developer and as required by the City.

5. Permits Required:

(a) City of Roy, Washington, Permit and Bond for Road Restoration for all work in existing City right-of-way.

(b) State of Washington Permit and Bond for all work in existing State rights-of-way.

(c) Pierce County Permit and Bond for Road Restoration for all work within the rights-of-way of the County.

(d) Any other permits as required (railroad, shorelines, wetlands, etc.).

6. Notification Required:

Notification by the applicant shall take place in writing to the following:

(a) Responsible City Official 7 days prior to starting construction.

(b) Responsible City Official 7 days prior to any cut-in.

(c) Responsible City Official 7 days prior to final inspection and acceptance.

(d) Furthermore, applicant shall: Provide coordination with any other contractors or utilities which may be affected by the extension construction, including proper notification of the "one-call" locating service prior to construction.

(e) Complete the work, including clean-up, to the point where the work complies with the plans and specifications, and is ready for acceptance by the City within the time limit provided.

(f) Notify the customers of any water shutdown at least 48 hours in advance.

(g) Provide verbal notification for all other inspection work required.

7. Review and Approval Fees: The fee for service shall be on a time and expense basis. The Developer will be invoiced for actual costs incurred in the project review and approval process by the City of Roy, plus an additional 15% to cover administrative and accounting costs. The City will not give final approval of the improvements until all fees are paid. Review and approval fees for Developer Extensions cover the following:

(a) Pre-hearing conference with City Engineer on schematic drawings.

(b) Review of final design by City Engineer of extensions granted preliminary approval.

(c) Inspection of the work in progress.

(d) Inspection of pressure tests.

(e) Review of Record Drawings.

(f) Taking and submitting water samples for bacteriological test by the Department of Health.

(g) Other work necessary to assure compliance with City standards.

8. Connection Fee Charge: The City presently has a connection fee charge for installation of meters for new water services. These fees are as currently established by the City Council, and must be paid prior to meter installation and activation of the water service.

9. Reimbursement Agreement: The City may enter into an agreement for reimbursement with the Developer, upon request, for those properties that can be served from the construction of a water extension that are not a party to this Agreement. The reimbursement will be in accordance with the current policies of the City.

10. Final Drawings Required Of Contractor: (See Standards for As-Built Drawings/Section 5). "As Built" drawings specifically noting approved route changes, locations and depths are required. A minimum of four (4) sets of Blue-line drawings, one (1) set of original mylars, and one (1) copy of project drawings on the latest release of AutoCAD shall be provided to the City before final acceptance of the work by the City. These drawings shall be clearly marked as "As Built" and shall contain all field changes and shall be signed by the Developer's licensed Engineer. The Developer, in addition, shall file a "Construction Report for Public Water System Projects" with the Department of Health.

REFER TO CITY OF ROY "CONDITIONS AND STANDARDS" FOR REMAINING SPECIFICATIONS.

SECTION TWO

GENERAL CONDITIONS OF CONSTRUCTION

1. **Purpose:** The City of Roy, Washington, as a municipal corporation, has the responsibility to the public to ensure that water lines laid in public streets or easements are constructed in accordance with currently accepted City standards for public work. The requirements imposed upon Developers by these regulations are not intended by the City in any sense as a contract with the Developer, but solely as minimum standards which are prerequisite to acceptance of the work by the City as part of its water distribution system.

2. **Standard Specifications:** All work shall conform to the latest City adopted edition of the Standard Specifications for Road, Bridge and Municipal Construction prepared by the Washington State Department of Transportation and the Washington State Chapter of the American Public Works Association, except as specifically modified herein.

3. **Definitions:** As used herein:

   (a) "Developer": The party having an agreement with the City to cause the installation of water works improvements that will become a part of the City's water system upon completion and acceptance. The term shall also include the Developer's contractor employed to do the work or the Contractor's employees.

   (b) "Plans" mean drawings, including reproductions thereof, of the work to be done as an extension to the City's water distribution system, prepared by an Engineer licensed in the State of Washington.

   (c) "Specifications" means the directions, provisions, and requirements designated by an Engineer licensed in the State of Washington for the performance of the work and for the quantity and quality of materials, as contained or referenced herein.

   (d) "Performance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the work will be completed in accordance with the plans and specifications.

   (e) "Maintenance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the Developer will repair any defects found in the work within one year of the date of formal acceptance of the work by the City.

(f) "Contract Documents": The contract documents shall consist of the following and in case of conflicting provisions, the first mention shall have precedence:

(i) Developers Agreement for Water Main Extensions
(ii) Plans
(iii) Standard Details
(iv) Specifications - Conditions and Standards of the Contract
(v) Addenda
(vi) Change Orders
(vii) General Conditions

These documents shall form the Contract.

(g) "Work": The labor or materials or both, superintendence, equipment, transportation, and other facilities necessary to complete the Contract.

(h) "City": City of Roy, Washington, Pierce County, a municipal corporation, existing under and by virtue of the laws of the State of Washington. Actions designated as taken by the City are the acts of the Council acting through the Mayor and/or the Clerk.

(i) "Mayor" means mayor of the City of Roy or his authorized representative.

(j) "Contractor" means the Developer's contractor or subcontractor.

(k) "Engineer" means the City's Engineer, whether a staff engineer or consultant.

4. **Developer to be Informed:** The Developer is expected to be fully informed regarding the nature, quality, and the extent of the work to be done, and, if in doubt, to secure specific instructions from the City.

5. **Authority of Mayor:** The Mayor shall have the authority to stop work whenever, in his opinion, the same shall be necessary to insure compliance with the plans and specifications, and shall have authority to reject work and materials which do not so conform and to decide questions which may arise in the execution of the work.

6. **Authority of the Engineer:** The Engineer shall have the authority to determine the amount, quality, acceptability and fitness of the several kinds of work, material and equipment and to decide all questions relative to the classification of materials and the fulfillment of this Contract, and to reject or condemn all work or material which does not conform to the terms of this Contract. The Engineer's decision in all matters is the decision of the City, and can only be changed by the City.

Moreover, the City has not so delegated, and the Engineer does not purport to be a safety expert, is not so engaged in that capacity under this Contract, and has neither the authority nor the responsibility to enforce construction safety laws, rules, regulations or procedures, or to order the stoppage of work for claimed violations thereof. The furnishing by the Engineer of resident project representation and inspection shall not make the Engineer responsible for the enforcement of such laws, rules, regulations or procedures, nor shall such make the Engineer responsible for construction means, methods, techniques, sequences, procedures or for the Developer's failure to properly perform the work herein described.

It is expressly agreed and understood that the Engineer will have no liability whatsoever resulting from the obligations entered into under the contract; that the City must look solely to the Developer for the furnishing of the work. And that the City and the Developer must look solely to each other for the enforcement of any claims or liabilities arising under or by reason of the Contract.

If the Developer or the successor to the Developer files any suit arising under the contract and names the Engineer as a party, and if no recovery is had against the City then the City shall recover its costs of defense, including, by way of illustration but not by way of limitation, its attorneys' fees, expert witness fees and the costs of the services of engineering and other personnel whose time is reasonably devoted to the preparation and attendance of depositions, hearings, arbitration proceedings, settlement conferences and trials. This provision is specifically intended as a contract between the Developer and the City.

Nothing in these documents shall, in any way, be so construed as to require or place responsibility for the method, manner, direction or superintendency of the performance of the work by the Developer's forces under this contract upon the City. Such responsibility rests solely with the Developer.

It is expressly agreed that neither the Engineer nor any of his assistants or agents shall have any power to waive the obligation of the contract for the furnishing by the Developer of good and suitable material and for his performing good work as herein described. Failure or omission on the part of the Engineer or any of his assistants or agents to condemn defective or inferior work or materials shall not imply acceptance of the work or release of the Developer or his bond. Neither shall such failure or omission, nor any acceptance by the Engineer of any part or of the whole of the work be construed as barring the City at any subsequent time from recovery of such a sum of money or damages as may be needed to remove and to build anew all portion of work in which fraud was practiced or improper or defective work or materials used.

7. **Authority to Proceed:** The City will authorize the Developer to proceed with installation of the water main only after all necessary grading and fills are completed, and other utilities or pipes which, in the opinion of the City, should be installed prior to the water main have been completed. The City reserves the right to stop installation of portions of the water system which, in the opinion of the City, will be damaged by other utility or pipe installation until such installations are complete.

8. **Excavation:** It shall be the duty of the Developer to determine the existence of underground facilities used in connection with the conveyance of water, sewage, electronic, telephonic or telegraphic communications, cablevision, electric energy, petroleum products, gas, or other substances located within the proposed area of any excavation involved in the work. It shall also be the duty of the Developer to give notice of the scheduled commencement of excavation to all owners of underground facilities. For this purpose, the Developer shall contact all utilities who service the area and have the locations marked by the owner of these utilities. The Developer shall not commence excavation until all known facilities have been marked. Once marked by the owner of the underground facility, the Developer is responsible for maintaining the markings. If the Developer discovers underground facilities which have not previously been identified, the

Developer shall cease excavating in the vicinity of the facilities and immediately notify the owner or operator of the facilities.

The Developer is advised that the marking of underground facilities is often done on the best information available to the owner of the underground facility, but that the marking may be approximate. Therefore, the Developer shall use great care to locate the underground facility and to avoid damaging the underground facility.

Should the Developer damage an underground facility during the course of the work, the Developer shall immediately notify the utility operating the facility and the City. If the Developer, or Developer's Contractors or Subcontractors are liable for damages to the owner or operator of an underground facility damaged during the course of the work, the Developer shall pay or post security in the form of a cash bond or a bond acceptable to the City to provide for payment of the damages for which the Developer may be adjudged liable. In carrying out any excavation involved in the work, the Developer shall comply with the provisions of Chapter 19.122 of the Revised Code of Washington.

The Developer shall also provide the City with the schedule for excavation not less than two business days before the commencement of excavation. Where the proposed excavation is near existing City water mains, the Developer shall not commence excavation until the City has marked its water mains. The Developer is advised that the City's marking of water mains and services is an approximate marking of the location of the City's underground facilities and services only, and the Developer should take great care to locate the underground facilities and avoid damaging them.

If the Developer is unable to find an underground facility in the area marked for that facility, the Developer shall cease work and immediately notify the owner or operator of the underground facility, and the City of Roy.

9. **Inspection:** All work contemplated in this contract and all subdivisions thereof; all materials and equipment furnished for same and the manufacture and preparation thereof shall, throughout the performance of the Contract, in order to ascertain whether or not said work, materials or equipment are in strict accordance therewith, be subject to inspection by the City, who may, at any time in the performance of their duties, enter upon the work or the shops where any part of the work or equipment may be in preparation or the factories where any materials for use in the work are being or are to be manufactured. The Developer shall provide proper facilities for inspection and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent as the City's interests may require.

Inspection shall not relieve the Developer of his obligation to furnish satisfactory materials and workmanship. Work or materials found unsatisfactory at any time during the life of the contract shall be corrected or replaced immediately by the Developer at his own expense on the written order of the City, notwithstanding that it may have been previously overlooked or approved by an Inspector.

When required, the Developer shall furnish all tools and labor and material necessary to make an examination of any work under the contract that may be completed or in progress, even to the extent of uncovering or taking down

portions of finished work. Should such work destroyed or taken down be found unsatisfactory, the cost of making such examination and of reconstruction shall be defrayed by the Developer. Should the work be found satisfactory, the examination will be paid for by the City.

The Developer is entitled to inspection upon application to the City, provided that should the Developer request the special inspection of materials not yet delivered to the site of the work at time and place not contemplated in the Specifications or by the Engineer, he shall, if such inspection be granted, pay the reasonable keep and traveling expenses of the City's agent, be it the Engineer or any other Inspector, agent or agents in making such inspection, and he shall not require the continued presence of the City or agent at the place of manufacture or shipment, for the purpose of making intermittent or occasional inspection.

The Developer shall regard and obey the directions and instructions of the Engineer or any authorized agent of the City with reference to correcting any defective work or replacing any materials found to be not in accordance with the Specifications and Plans, and in case of dispute, the Developer may appeal to the City, whose decision shall be final; but pending such decision, the instruction of said Engineer or agent shall be followed, and the Developer shall make no claim for damages or delay on this account.

10. **Authority & Duties of Inspectors:** Inspectors are placed on the work to keep the City informed as to the progress of the work and the manner in which it is being done; act as liaison between the Developer and the City; also to call the attention of the Developer to any deviations from the Plans or Specifications, but failure of the Inspector to call the attention of the Developer to faulty work or deviations from the Plans or Specifications shall not constitute acceptance of said work.

    The Inspector may reject or accept materials and equipment to be incorporated in the work.

    Since the Inspector cannot control how the material is used, the responsibility for its safe and proper use will be the Developer's. Until the job is finally completed, the Developer might do work that changes or modifies work previously done, and even though at any given time a piece of work might be well done and acceptable in quality, the responsibility for keeping it in that condition until the job is completed is the sole responsibility of the Developer. For this reason, it is impossible to accept finally any portion of a Project until the Project, as a whole, is acceptable, and control of said project is withdrawn from the Developer by final official written acceptance by the City.

    Since one of the Inspector's primary interests is to see that work on the Project progresses expediently and in a workman-like manner, he may, at various times, offer suggestions to the Developer which the Developer may or may not follow, at his discretion. Such suggestions are never to be considered as anything but suggestions and involve no assumption of responsibility, financial or otherwise, by either the Inspector himself, the Engineer or the City.

    The presence or absence of an Inspector on any job will be at the sole discretion of the City, and such presence or absence of an Inspector will not relieve the Developer of his responsibility to obtain the construction results specified in the contract documents.

The Inspector will not be authorized to approve or accept any portion of the work or to issue instructions contrary to the Plans and Specifications; such approvals, acceptances or instruction, when given, must be in writing and signed by the City. The Inspector will have the authority to reject defective material; however, the failure of the Inspector to reject defective material or any other work involving deviations from the contract documents will not constitute acceptance of such work. Only the City can make final acceptance of the Contract.

Moreover, the City has not so delegated, and the Inspector does not purport to be a safety expert, is not so engaged in that capacity under this contract, and has neither the authority nor the responsibility to enforce construction safety laws, rules, regulations or procedures, or to order the stoppage of work for claimed violations thereof. The furnishing by the Inspector of resident project representation and inspection shall not make the Inspector responsible for the enforcement of such laws, rules, regulations or procedures, nor shall such make the Inspector responsible for construction means, methods, techniques, sequences, procedures or for the Developer's failure to properly perform the work herein described.

11. **Protection of Completed Work:** The Developer is solely responsible for protection of completed portions of the water main during construction of other facilities or utilities on the site. The City may require additional inspections of such exposed work when, in its opinion, the water system is exposed to damage. All costs of such additional inspection shall be borne by the Developer.

12. **Final Inspection and Acceptance:** All materials and work are subject to final inspection by the Engineer, who shall have the right to subject any portion thereof to such tests as in the opinion of the Engineer shall be necessary to determine whether or not the work complies with the plans and specifications. No work shall be accepted until all other utilities are completed, and all grading and paving completed and all services, valves, hydrants and other appurtenances located, brought to proper grade, and deemed operable. The City reserves the right to retest any or all portions of the completed system prior to final acceptance.

13. **Plans and Specifications Accessible:** The developer shall have one copy of the approved project plans and specifications constantly accessible on the job, including the Standard Specifications and Plans.

14. **Omissions and Discrepancies:** Minor items of work or material omitted from the plans or specifications, but clearly inferable from the same and which are called for by accepted good practice, shall be provided and/or performed by the Developer as part of the construction. In case of doubt, the Engineer shall be consulted.

15. **Quality of Materials and Workmanship:** Unless otherwise specified, all materials shall be new, and workmanship and materials shall be of the highest quality commonly used. The Developer shall furnish satisfactory evidence as to the kind and quality of materials for approval to the City prior to installation.

16. **Compliance with Public Authority:** The work shall be done in accordance with the regulations of each public authority, including the County, public health departments, Department of Social and Health Services, and the City

which have jurisdiction over the manner and quality of performance of the work. The public shall not be unnecessarily inconvenienced in its use of the public streets. The Developer shall enforce discipline and good order among his employees, and shall not employ on the project any unfit person or anyone not skilled in the work assigned to him.

17. **Prevention Of Environmental Pollution & Preservation Of Natural Resources:** Developers are expected to familiarize themselves and comply with all statutes, regulations and ordinances which relate to their proposed work and which deal with the prevention of environmental pollution and the preservation of natural resources, including but not limited to the National Environmental Policy Act of 1969, PL 911-190, Executive Order 11514, and the State Environmental Policy Act of 1971, RCW 43.21C.

18. **Material and Equipment List:** The Developer shall file a material and equipment list with the City prior to beginning the construction, including the quantity, manufacturer, and model number, if applicable, of material and equipment to be installed as part of the work. The Engineer's approval is required before materials are installed.

19. **Determination of "As Equal":** The City Engineer shall be the sole judge whether supplies or material quality are "as equal" under the plans and specifications.

20. **Defective Materials & Workmanship:** Materials, work or workmanship which, in the opinion of the Engineer, do not conform to these Specifications and Plans or fail to meet the tests herein described or are not equal to the sample submitted to and approved by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended will be rejected. The Developer shall remove from the work and its vicinity, without delay, all rejected materials.

    Unsatisfactory materials and workmanship may be rejected at any time, notwithstanding any previous testing, inspection or acceptance of such materials, equipment or workmanship.

21. **Correcting Defective Work:** If the work or any portion thereof shall be damaged in any way or from any cause, or if defects shall develop before the final completion and acceptance of the whole work, the Developer shall forthwith make good such damage or defect, in accordance with the intent of the Plans and Specifications.

22. **Subcontractors:** A subcontractor is a person or organization who has a direct contract with the Developer to perform any of the work at the site. The term subcontractor is referred to throughout the contract documents, as if singular in number and masculine in gender, and means a subcontractor or his authorized representative.

    A sub-subcontractor is a person or organization who has a direct or indirect contract with a subcontractor to perform any of the work at the site. The term sub-subcontractor is referred to throughout the contract documents, as if singular in number and masculine in gender, and means a sub-subcontractor or an authorized representative thereof.

    Nothing contained in the contract documents shall create any contractual relation between the City and any subcontractor or sub-subcontractor, and no performance undertaken by any such subcontractor or sub-subcontractor,

whether with or without the City's consent, shall relieve the Developer of his obligation and responsibilities hereunder.

23. **Developer to Furnish Construction Markers:** The Developer shall furnish all batter boards or other construction markers for the laying out of the work including all line and grade points for said batter boards or construction markers.

24. **Mutual Responsibility of Developer and Contractors:** If, through acts of neglect on the part of the Developer, any contractor or any subcontractor shall suffer loss or damage on the work, the Developer agrees to settle with such contractor or subcontractor by agreement or arbitration, if such contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the City on account of any damage alleged to have been sustained, the Developer shall indemnify and save harmless the City to the extent of and in accordance with the provisions set forth in Section 41 below.

25. **Damage to Existing Improvements:** All damage done to existing improvements during the progress of the work on the structures covered by these Specifications shall be repaired or restored by the Developer to the satisfaction of the Engineer, using for such repair, materials and methods conforming to the requirements of the "Conditions and Standards" of the City, Project Plans and Specifications, and any additional instructions issued therefore by the Engineer, with the intent that such damaged improvements be restored to equal or superior condition existing prior to damage. If the Developer fails to furnish the necessary labor and materials for such repairs, when ordered, the City may cause said labor and materials for such repairs to be furnished by other parties, and the cost thereof shall be paid by the Developer.

26. **Public Safety:** During the performance of the work, the Developer shall erect and maintain temporary fences, bridges, railing and barriers, and shall take all other necessary precautions and place proper guards for the prevention of accidents, shall put up and keep suitable and sufficient lights and other signals, and shall indemnify and save harmless the City, the City's Engineer, inspectors, officers, agents and employees from all damages and costs to which they may be put by reason of injury to persons or property resulting from the Developer's operations, his negligence or carelessness in the performance of the work or in guarding the same or from any improper materials, implements or appliances used in its construction, or by or on account of any act or omission of the Developer or his agents. The duty of the Engineer to conduct construction review and/or inspection of the Developer's performance is not intended to include review of the adequacy of the Developer's safety measures in or near the construction site, and the Developer's insurance shall be provided accordingly.

27. **Permits:** The Developer shall not begin work until all necessary permits have been issued by public authority. The Developer shall reimburse the City for all costs incurred by the City on behalf of the Developer for permits, inspection fees, and other charges imposed by public authority.

28. **Surveying:** The Developer shall provide, under the direction and supervision of a Professional Land Surveyor currently registered in the State of Washington, property corner, street centerline and right-of-way stakes. The Developer shall provide reasonable and necessary stakes and reference points to install all lines and appurtenances as shown on the plans, to check

locations, and to obtain "As-Built Information". The work shall be done in strict conformity with such points and instructions. The developer shall instruct the Professional Land Surveyor to base all horizontal control surveys on the existing control system (NAD27) within the City and to utilize the existing vertical control benchmark system (NGVD29) within the City.

The developer shall carefully preserve bench marks, reference points and stakes and in case of destruction, shall be responsible for any errors which may be caused by their absence or disturbance and shall replace any monuments disturbed to the satisfaction of the City.

All land surveying work shall be done in conformity with State Statutes and regulations and local ordinances.

29. **Restoration of Improvements:** Culverts, driveways, roadways, pipelines, or other existing improvements which are disturbed or removed in the course of the work shall be restored to their original condition. In cutting through established lawns, the sod shall be removed before trenching, and replaced after backfilling.

30. **Access:** Bridging shall be provided across private driveways and roadways during the period when trenches are open, so as to interfere as little as possible with the normal flow of traffic.

31. **Developer's Supervision:** The Developer shall keep on the work during its progress, a competent supervisor who shall represent the Developer during his absence, and who has the authority to make decisions and represent the Developer in all matters related to the project. The supervisor shall make himself familiar with the plans and specifications and shall promptly report to the Engineer any error, inconsistency, or omission he may discover. If the supervisor has cause to be absent from the job for a period of greater than four (4) hours, he shall designate an assistant and so inform the City.

32. **Public Hazard or Inconvenience:** If the performance of the work should result in hazard or substantial inconvenience to the public, the City may correct the same, if in the opinion of the City, the same should be necessary, and the Developer shall, on request, reimburse, the City for the expense incurred. The Developer shall also reimburse the City for the expense incurred for complying with any order of public authority lawfully made with respect to the work during performance of the work or within one year after acceptance of same.

33. **Alignment:** The Developer shall give a minimum notice of seven (7) days to the City prior to the start of construction work. The Developer shall furnish sufficient horizontal control, including lot stakes, to permit location and staking of the water main and appurtenances. Correctness of such horizontal control is the sole responsibility of the Developer and any modification of location of any facility shall be at the Developer's expense.

34. **Pavement Cutting Prohibition:** All pavement types shall not be cut for a period of five (5) years after the pavement has been constructed or resurfaced. In cases of emergency or construction failures or if all alternatives to pavement cutting have been exhausted, provisions to allow cutting of the pavement may be obtained if approved by the City. Provisions shall be conditioned on providing a standard asphalt patch and minimum 150

foot overlay for asphalt concrete pavement and bituminous surface treatment pavement or standard cement concrete restoration for cement concrete pavements.

35. **Grade:** The water main shall be installed on the ground or roadway rough grade with three feet minimum cover. The notice by the Developer to the City that the ground or roadway is ready for water main installation shall be considered a representation that the Developer has brought the ground or roadway to grade or subgrade, and that he intends no further grading work. Any modification of the main or appurtenances required to adjust to grade changes shall be at the Developer's expense. If the Developer contemplates off-roadway grading after installation of the water main that will affect the setting of fire hydrants or other appurtenances, he shall so state in writing prior to the installation of the main. Any adjustments required by such grading shall be at the Developer's expense.

36. **Delay in Completion:** The Developer is expected to carry on the work and to complete it without unnecessary delay once the work has begun. If the work is not completed within a reasonable time from the date the work is begun, the City may revoke its acceptance of the Developer's Agreement, or it may impose reasonable conditions as a prerequisite to continuation of the work, including a charge paid by the Developer for such cost or damage as the City has suffered because of the delay. In the event the City finds it necessary to complete the work to be performed by the Developer, or is otherwise damaged by the Developer's failure to complete the work, the Developer shall be liable to the City for its costs, expenses, and damages arising out of his failure to complete the work.

37. **Clean-up:** The construction site shall be kept clear during the progress of the work. Before the work shall be considered complete, the Developer shall clean out ditches that may have been filled during the work, replace the damaged surfacing, remove surplus materials and trash, dispose of brush, repair all damages, and otherwise leave the job in a neat, orderly and workmanlike condition.

38. **Bill of Sale:** Upon completion of the work and approval of the Engineer, the Developer shall, as a condition of acceptance by the City, convey the work lien-free to the City by bill of sale, in accordance with the form attached as an appendix to these regulations.

39. Abandonment of the Work: If the Developer abandons the work for any cause or refuses to comply with the provisions of the Plans and Specifications, the City has the right to notify the Developer's surety and require said surety to complete the work in accordance with the Plans and Specifications.

    Should the Developer abandon the work, fail or refuse to complete the work embraced in the contract or fail to pay just claims for labor and materials, the City reserves the right to charge against the Developer all extra legal, engineering or other costs caused by such abandonment, failure or refusal. The legal costs will also include all attorney's fees and other costs to the City in defending or prosecuting any suits in connection with such abandonment, failure or refusal and non-payment of claims, wherein the City is made a co-defender, and the Developer agrees to pay all such costs.

40. **Disputes:** If the Developer considers any work demanded of him to be outside the requirements of the Contract, or if he considers any record or ruling of the Engineer or any Inspector to be unfair, he shall immediately, upon such

work being demanded or such record or ruling being made, ask for written instructions or decisions whereupon he shall proceed without delay to perform the work or conform to the record or ruling, but unless the Developer finds such instructions or decisions satisfactory, he shall, within ten (10) days after receipt of same, file a written protest with the City, stating clearly and in detail his objections and the reason therefore. Except for such grounds of protest or objections as are made of record, in the manner specified and within the time stated herein, the Developer hereby waives all grounds for protests or objections to the records, rulings, instructions or decisions of the Engineer, or any Inspector, and hereby agrees that as to all matters not included in protests, the records, instructions and decisions of the City shall be final and conclusive.

41. **Hold Harmless Clause:** The Developer shall indemnify and hold harmless the City and the Engineer, and their agents and employees, from and against all claims damages, losses, and expenses, including attorney's fees, arising out of or resulting from the performance of the work, and shall, after reasonable notice, defend and pay the expense of defending any suit and will pay any judgement, provided that any such claim, damage, loss, or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission or by any other action giving rise to strict liability of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

    In any and all claims against the City or Engineer, or any of their agents or employees, by any employee of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this article shall not be limited in any way on the amount or type of damages, compensation, or under workman's compensation acts, disability benefit acts, or other employee's benefit acts.

    The obligations of the Developer under this article shall not include the sole negligence of the City or the Engineer.

42. **Developer's Public Liability & Property Damage Insurance:** The Developer shall not commence work until he has furnished evidence (in duplicate copy) of insurance required hereunder, and such insurance has been approved by the City Attorney; nor shall the Developer allow any contractor or subcontractor to commence work on his contract or subcontract until the same insurance requirements have been complied with by such contractor or subcontractor. Approval of the insurance by the City Attorney shall not relieve or decrease the liability of the Developer thereby.

    Companies writing the insurance under this article shall be licensed to do business in the State of Washington or be permitted to do business under the Surplus Line Law of the State of Washington.

    The Developer shall maintain, during the life of the Contract, Comprehensive General and Automobile Liability Insurance, as detailed herein. The insurance shall include, as Additional Named Insured, the City. All insurance policies shall be endorsed to provide that the policy shall not be canceled or reduced in coverage until after ten (10) days prior written

notice, as evidenced by return receipt of a registered letter given to the City.

Comprehensive General Bodily Injury and Property Damage Insurance shall include:

(a) Premises & Operations;
(b) Developer's Protective Liability;
(c) Products Liability, including Completed Operations Coverage
(d) Contractual Liability
(e) Broad Form Property Damage;

Comprehensive Automobile Bodily Injury and Property Damage Insurance shall include:

(a) All owned automobiles;
(b) Non-owned automobiles;
(c) Hired automobiles.

The insurance coverages listed above shall protect the Developer from claims for damages for bodily injury, including death resulting therefrom, as well as claims for property damage, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly employed by either of them, it being understood that it is the Developer's obligation to enforce the requirements of this article as respects any contractor or subcontractor.

Comprehensive General and Automobile Liability Insurance shall provide coverage for both bodily injury and property damage, as follows:

Comprehensive General and Automobile Bodily Injury Liability Insurance on an occurrence basis of not less than One Million dollars ($1,000,000.00) for bodily injury, sickness or disease, including death resulting therefrom, sustained by each person; and for limits of not less than One Million Dollars ($1,000,000.00) for each occurrence.

Comprehensive General Property Damage Liability Insurance on an occurrence as is for limits of not less than One Million Dollars ($1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence, and in an amount of not less than One Million Dollars ($1,000,000.00) in aggregate.

Comprehensive Automobile Property Damage Liability Insurance on an occurrence basis for limits of not less than One Million Dollars ($1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence.

Comprehensive Liability Insurance shall include the City as Additional Named Insured.

Comprehensive General Property Damage Liability Insurance shall include liability coverage for damage to or destruction of property of other, including loss of use of property damaged or destroyed, and all other indirect and consequential damage for which liability exists in connection with such damage to or destruction of property of others, and shall include coverage for:

("X") Injury to or destruction of any property arising out of blasting or explosion;

("C") Injury to or destruction of any property arising out of the collapse of/or structural injury to any building or structure due:

1. to excavation, including borrowing, filling or backfilling in connection therewith, or tunneling, pile driving, coffer-dam work or caisson work, or

2. to moving, shoring, underpinning, raising or demolition of any building or structure or removal or rebuilding of any structural support thereof.

("U") 1. Injury to or destruction of wires, conduits, pipes, mains, sewers or other similar property or any apparatus in connection therewith, below the surface of the ground, if such injury or destruction is caused by and occurs during the use of mechanical equipment for the purpose of excavating or drilling, or

2. Injury to or destruction of property at any time resulting therefrom.

There shall be included in the liability insurance, contractual coverage sufficiently broad to insure the provisions of the "Hold Harmless Clause".

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Developer's responsibility for payment of damages resulting from his operations under this Contract.

In the event the Developer is required to make corrections on the premises after the work has been inspected and accepted, he shall obtain, at his own expense, and prior to commencement of any corrective work, full insurance coverage, as specified herein.

The Developer shall furnish, upon request by the City, certified copies of the insurance policy or policies within two weeks of the City's request.

43. **Compensation & Employer's Liability Insurance:** The Developer shall maintain Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state or federal statute for all of his employees to be engaged in work on the Project and, in case any such work is sublet, the Developer shall require the contractor or subcontractor similarly to provide Workmen's Compensation Insurance or Maritime Workmen's Insurance for all of the latter's employees to be engaged in such work. The Developer's Labor & Industries account number shall be noted in the Proposal in the space provided.

In the event any class of employees engaged in work at the site of the Project is not covered under the Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state and federal statute, the Developer shall maintain and shall cause each contractor or subcontractor to maintain Employer's Liability Insurance with a private insurance company for limits of at least One Hundred Thousand Dollars ($100,000.00), each person,

and Three Hundred Thousand Dollars ($300,000.00), each accident, and furnish satisfactory evidence of same.

44. **Developer Responsible for Work:** The Developer shall be responsible for all work until it is accepted by the City and he will remain responsible under the terms of the warranty contained in the required bill of sale.

45. **Use of Completed Portion:** The City reserves the right to use and occupy any portion of the work which has been completed sufficiently to permit use and occupancy, and such use and occupancy shall not be construed as an acceptance of the work as a whole or any part thereof. Any claims which the City may have against the Developer shall not be deemed to have been waived by such use and occupancy.

46. **Traffic Control:** Prior to commencement of construction, the Developer shall be required to furnish a traffic plan, to show how access will be maintained. The Plan shall also show how restrictions to through traffic shall be kept to a minimum in keeping with good construction practice.

(i) This Plan shall include a one sheet overall project map of scale not less than 1" = 400'. The map shall contain a total program indicating traffic flow patterns for the construction site. The map shall be supplemented by a signing plan in accordance with the U.S. Department of Transportation "Manual of Uniform Traffic Control Devices for Streets and Highways". This plan shall be subject to the review and approval of the City.

(ii) All lane closures shall be approved by the City prior to construction. Lane closures will not be permitted prior to 8:30 a.m. and not after 3:30 p.m.

(iii) The Developer shall be required to provide five (5) working days notice on any traffic revisions. The City will not furnish flagmen or any devices for the control of traffic.

(iv) If at any time the Developer's activities result in closure, substandard condition, or restrictions to traffic use of all or portions of the roadway which are specified to remain open to traffic, the Developer shall immediately, at his own expense, furnish all material, labor, equipment, necessary to restore the streets to the satisfaction of the City. Work necessary to restore the streets to traffic shall continue on a round-the-clock basis until they are reopened to traffic in conformance with the specifications. Upon failure of the Developer to immediately provide the necessary material, labor, equipment, to restore the streets to traffic when ordered to do so by the City, the City shall be at liberty without further notice to the Developer or his Surety, to provide the necessary material, labor, equipment to restore the streets to traffic and all costs thereof shall be at the Developer's own expense.

47. **Dust Control:** The Developer shall furnish all labor, equipment and means required and shall carry out protective measures, wherever and so often as necessary to prevent his operations from producing dust in amounts damaging to property or causing nuisance. The Developer shall be responsible for any damage resulting from dust originating from his operations. The dust abatement measures shall be continued until all required resurfacing is

complete, or until the Developer has completed arrangements with the City, whereby he is relieved of further responsibility.

48. **Defense Costs:** The City and Developer each agree that in the event either of said parties brings an action in any court arising out of this Contract, the prevailing party in any such lawsuit shall be entitled to an award of its cost of defense.

"Costs of Defense" shall include, without limiting the generality of such term, expense of investigation of plaintiff's claim, engineering expense, expense of depositions, exhibits, witness fees, including reasonable expert witness fees and reasonable attorney's fees. The obligation of payment under this clause shall be incorporated in any judgment rendered in such action either in the form of a judgment against plaintiff for any defendant or in the form of reduction of the judgment otherwise rendered in favor of plaintiff against any defendant, and shall be paid within 30 days after entry of judgment.

49. **Stipulation of Venue:** It is agreed by the Developer that venue for any lawsuit arising out of this contract shall be the county wherein the primary construction site for the Project is located. Developers shall include a stipulation of venue in said county clause in all subcontracts hereunder.

50. **Performance & Maintenance Bond:** The Developer shall, prior to the commencement of the work, furnish a surety bond by a licensed insurance company in the amount of not less than 100% of the cost of the work as estimated by the City's Engineer, insuring the City that the work will be performed in accordance with the plans and specification, and that any defective work or material discovered by the City within one year after the work has been accepted will be corrected or replaced by the Developer in accordance with the provisions of these regulations.

The Developer shall, prior to acceptance of the work by the City, furnish a Maintenance Bond in the amount of not less than 10% of the amount of the Performance Bond, insuring the City that any defective work or material discovered by the City within one year after the work has been accepted will be corrected or replaced by the Developer in accordance with the provisions of these regulations. The Surety Bond shall assure correction of any defect covered by the Developer's warranty within thirty days.

51. Easements:

(a) General: The Developer shall deliver to the City utility easements and rights of access for all properties over which his extension to the water system is to be constructed and such other easements as the Council may require. The Developer shall hold the City harmless from all expenses of removing any encumbrances or restrictions on the City's right to use, and have right-of-way to, the property through which the water main and appurtenances are to be constructed.

Unless otherwise approved by the Council, all easements shall be ten (10) feet wide and shall grant the City the right of access over the Grantor's property to repair and maintain the water mains. All easements shall prohibit the construction of any structures, or other substantial objects over the easement. The easements shall be exclusive in nature, such that other utilities may cross them but not run parallel

to the water lines within the easement without the express permission of the City.

Easements may be submitted on forms provided by the City. However, no easement will be accepted by the Council until the Developer has first submitted a fully executed copy of the proposed easement to the City Attorney.

(b) Plats: In the case of extensions which are part of a development done concurrently with the platting of the property involved, the easement granted the City shall be boldly shown on the face of the plat. The plat shall contain the following restriction and grant of right-of-way, boldly displayed:

BUILDING RESTRICTIONS AND RIGHTS-OF-WAY

No permanent structure shall be erected, and no large trees or large shrubs shall be planted in the area of ground for which easements in favor of the City of Roy or its successors have been designated in this plat. The City of Roy and its successors shall have the right to enter upon property within this plat to install, lay, construct, renew, operate, and maintain water and utility lines and mains.

(c) Survey: After construction of the extension, the Developer shall provide the City with a survey map showing the legal description of the property involved, the location of easements granted by the Developer to the City and the location of all water mains and appurtenances thereto which are part of the extension. The survey map shall be prepared and signed by a surveyor or civil engineer registered in the State of Washington.

(d) Procedure: Before final approval of any application of extension of the City's system is effective, and before any service is given, the City's regulations with respect to easements must be fulfilled. One should begin as soon as possible to comply with these regulations by taking the following steps:

(1) Complete and execute the easement document, including a legal description, and submit it to the City. Approved forms are available through the City offices at the address listed below, and as contained in the attached appendix. Both husband and wife must sign the easement and have their signatures notarized. If the easement is signed by a single person, this needs to be stated on the form. The corporate form is for corporations to use. When using this form, a copy of the corporate resolution must be included which authorizes the signature.

City:

City of Roy
P.O. Box 700
107 Warren Street South Suite B
Roy, Washington 98580

(2) Direct the Developer's surveyor to prepare a survey map showing the easements and the location of the water main, and to send copies of the map to the City.

52. **Cross Connection Control:** Department of Social and Health Services regulations with regard to the protection of the public through the provisions of minimum requirements for design, construction, operation and maintenance of public water supplies are adopted herein by reference, and all applicants shall comply with such requirements and standards. Developers shall familiarize themselves with these regulations and insure compliance to protect the public health. Copies of the regulations are available at the City's office.

53. **Sampling Station:** Sampling stations are to be located at all dead end mains that are not planned for extension or that are not planned to be extended for two (2) or more years. Sampling stations shall also be installed at every facility that will repump or mix City water with its process water.

54. **Construction Drawings:** The Contractor shall maintain on the job site, project plans marked to indicate plan revisions made in the field, and other details of construction. The drawings shall be made available to the City upon completion of the project in the form of "as-built" records.

55. **Pressure Reducing and Relief Valves:** There are two uniform plumbing codes: one is prepared by the International Association of Plumbing and Mechanical Officials, another is prepared by the International Conference of Building Officials. Both codes require installation of pressure reducing valves in the water service pipe when street main pressures exceed 80 psi, as follows:

    When street main pressure exceeds 80 psi, an approved pressure-reducing valve with an approved pressure relief device shall be installed in the water service pipe near its entrance to the building to reduce the pressure to 80 psi or lower, except where the water service pipe supplies water directly to a water-pressure boost system, an elevated water gravity tank, or to pumps provided in connection with a hydropneumatic or elevated gravity water-supply tank system. Pressure at any fixture shall be limited to no more than 80 psi under no-flow conditions.

    Where local water pressure is in excess of eighty (80) pounds per square inch (551 kPa), an approved type pressure regulator preceded by an adequate strainer shall be installed and the pressure reduced to eighty (80) pounds per square inch (551 kPa) or less. For potable water services up to and including one and one-half (1-1/2) inch (38.1 mm) regulators, provision shall be made to prevent pressure on the building side from exceeding main supply pressure. Approved regulators with integral bypasses are acceptable. Each such regulator and strainer shall be accessibly located and shall have the strainer accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. All pipe size determinations shall be based on eighty (80) percent of the reduced pressure.

    Both uniform plumbing codes also require installation of pressure and temperature relief valves for hot water tanks as follows:

    Pressure-Relief Valves: Pressure-relief valves shall meet the ANSI Standards and the ASME Standards when required by the building office. The valves shall have a pressure relief rating adequate to meet the pressure conditions of the equipment served. They shall be installed either directly in a top tank tapping or in the hot or cold outlet line close to the tank. There shall be no shutoff valve between the pressure

relief valve and the tank. The pressure relief valve must be set to open at not less than 25 psi above the street main pressure or not less than 25 psi above the setting of any house water pressure-regulating valve. The setting shall not exceed the tank rated working pressure.

Temperature-Relief Valves: Temperature-relief valves shall be adequate relief rating, express in Btu/hr, for the equipment served. They shall be installed so that the temperature-sensing element is immersed in the hottest water within the top six inches of the tank. The valve shall be set to open when the stored water temperature is 210 degrees Fahrenheit (or less). These valves must conform to an approved standard and shall be sized so that when the valve opens, the water temperature cannot exceed 210 degrees Fahrenheit with the water heating element operating at maximum input.

All storage-type water heaters and hot water boilers deriving heat from fuels or types of energy other than gas, shall be provided with, in addition to the primary temperature controls, an over-temperature safety protection device constructed, listed and installed in accordance with nationally recognized applicable standards for such devices.

The City recommends to its customers, the installation of such pressure-reducing valves in the water service pipe when the street main pressure exceeds 80 psi. The City will make pressure information available upon request.

56. Standards for Water Supply:

I. Design Standards

A. Domestic Demand - Peak Instant Flow

Single Family and Multi-Family Residential
By Facility

Commercial
By Facility: generally low impact

Industrial
By Facility: generally low impact unless water used in industrial process or peak use occurs after 5:00 p.m.

Irrigation
By system capacity: significant users schedule for off-peak demand, if feasible.

B. Fire Flow Demand

Use the latest edition of "Guide for Determination of Required Fire Flow" of Insurance Services Office, Municipal Survey Service, with the following minimum flows:

Village 750 gpm

Single-Family Residential Areas 1,000 gpm

Schools in above areas 2,500 gpm

Multi-Family Residential, Commercial 2,500 gpm

Industrial 4,000 gpm

C. Design Criteria: Flows - Pressure

Minimum Static Pressures - Domestic Service 45 psi

Residential during peak flows - 30 psi, but not less than 75% of static pressure.

Maximum Static Pressure	100 psi
Acceptable Emergency Minimum Pressure	15 psi
Minimum Pressure Under Fire Flow Conditions	20 psi

D. Design Flow Analysis:

Residential Demands

(a) Peak Instant Domestic Flow with Minimum Residential Pressures indicated above.

(b) 95% Peak Instant Domestic Flow plus 750 gpm (village) or 1,000 gpm (single family residential) fire flow, residual pressure 20 psi.

II. Physical Facility Standards

Use Grading Schedule for Municipal Fire Protection of Insurance Services Office and the following minimum standards:

A. Minimum Main Size - Main sizes will be designed for fire flow requirements as determined by the City Fire Standards.

1. Single Family Residential

8" for looped systems or dead ends with fire hydrants.

4" for dead ends with all of the following conditions met:

(a) No possibility of extension by easements.
(b) No fire hydrants, and
(c) Less than 200 feet in length

2. Multi-Family Residential, Commercial, Industrial:

Fire Flow to 3,000 gpm
8" for looped systems
12" for dead ends

Fire Flow over 3,000 gpm
12" for looped systems
16" for dead ends

B. Fire Protection

Fire Hydrants
5-1/4" MVO with 6" run
1 - 5" Pumper, "STORZ" or equivalent fittings and cap
2 - 2-1/2" hose nozzles, NTS threads

Spacing: Hydrant spacing shall conform to the following minimum requirements.

Single Family Areas
660' maximum between hydrants
All buildings within 300' of one hydrant, and 900' of a second hydrant.

High Value
Use Table 5 of Grading Schedule with the following additional minimums:

One accessible fire hydrant for each 1,250 gpm of required flow within 150' of building up to 5,000 gpm fire flow.

b. System Valving

Generally provide 3 valves at intersections. Provide mid-block valves in residential areas to limit the number of fire hydrants in valve section to one. In high valve areas limit fire hydrants in valved section to two.

57. **Patent Royalties & Process Fees:** The Developer shall furnish the City a license or licenses for the use of any process or processes in connection with the Project.

58. **Sanitation:** Necessary sanitation conveniences for the use of workmen on the job, properly secluded from public observation, shall be provided and maintained by the Developer.

59. **Trimming And Clean-up:** Trimming and cleanup shall be carried out in accordance with Section 2-11 of the current City adopted edition of the Standard Specifications for Road, Bridge & Municipal Construction of the State of Washington. All debris and rubbish caused by the Developer's operations shall be removed and the areas occupied during such operations left in a neat, presentable condition.

(i) The Developer shall keep the construction site reasonably clear during the progress of the work.

(ii) The Developer shall be required, upon completion of the work, to furnish the City a written guarantee covering all material and workmanship for a period of one year after the date of final acceptance and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing, poor materials and/or workmanship.

60. **Emergency Service:** The Developer shall designate and shall provide the City with names and telephone numbers of those persons who will be available at

all times in case of emergency. The Developer will be charged for such expenses as may be incurred by the City to provide such service, if said emergency is not immediately rectified.

*** End of Section ***

SECTION THREE

ENGINEERING SPECIFICATIONS

STANDARD SPECIFICATIONS

All work shall be constructed in conformance with the most current Standard Specifications for Road, Bridge & Municipal Construction and current amendments thereto, State of Washington revised as to form by the APWA Supplement to make reference to Local Governments, and this specification shall be included as a part of the Specifications.

MATERIALS OF CONSTRUCTION

1. GENERAL

The type and class of materials to be used shall be as shown on the project plans reviewed and approved by the City. Where no specific reference is shown, the following specifications shall govern the materials used. All materials shall be new and undamaged, of a known brand, with replacement parts readily available from the general Seattle/Tacoma area.

Prior to the installation of any facilities required for the project, all materials shall be approved by the City.

All reference specifications herein shall be of the latest revision.

2. DUCTILE IRON PIPE

The ductile iron pipe shall conform to ANSI Specification A21.51 or AWWA Specification C151, and current amendments thereto. Grade of iron shall be a minimum of 60-42-10. The pipe shall be cement-lined in accordance with ANSI/AWWA C104/A21.4 and the exterior shall be coated with an asphaltic coating. Each length shall be plainly marked with the manufacturer's identification, year cast, thickness, class of pipe and weight. Bolts furnished for mechanical joint pipe shall be high strength cast iron, with a minimum tensile strength of 50,000 psi. The class of ductile iron pipe shall be Class 52 for 4-inch and larger diameter pipe:

The pipe shall have a nominal inside diameter of the size indicated on the Plans. All pipe shall be of one manufacturer and be carefully installed in complete compliance with the manufacturer's recommendations and these Specifications.

All ductile iron pipe shall be push-on, mechanical joint or flanged. All joints shall conform to ANSI Standard A21.11 (AWWA C-111).

Flanged joints shall conform to ANSI A21.10/AWWA C110.

Internally locked joints shall be in accordance with ANSI A21.11 and equal to Clow F-128 Series of U.S. Pipe "Field Lock". Bell and socket joints shall be in accordance with ANSI A21.10 and equal to Clow F-141 Series, or U.S. Pipe "Usiflex".

3. POLYVINYL CHLORIDE (PVC) PIPE

PVC pipe and fittings up through 2" may be schedule 40 PVC, Type I, Grade I, (PVC) 1120, conforming to ASTM D1784. Joints shall conform to ASTM D3139 using a retained rubber gasket conforming to ASTM F477.

PVC Pipe greater than 2" shall be AWWA C-900 Class 150 with ductile iron fittings.

4. SERVICE LINE MATERIALS

a) Copper Service Pipe

For 3/4" through 2" services, line from main to meter may be copper, type K.

b) Ductile Iron Service Pipe

Service connections above 2" may use ductile iron pipe Class 53 or as specified.

c) Polyethylene Pipe

The 1-1/2-inch and two-inch diameter service connections from the water main to the customer's service may be made with high molecular polyethylene pipe conforming with ANSI/AWWA C902-78. The two-inch diameter services shall be supplied and installed with a two-inch diameter threaded gate valve, with valve box at the main. The one inch and smaller diameter service connections from the water main to the customer's service may be made with Driscipipe 5100 Ultra-line or approved equal, ultra high molecular plastic pipe.

5. FITTINGS

a) Ductile Iron Fittings

Fittings for ductile iron pipe shall be ductile iron or Class 250 gray iron conforming to AWWA C110 and C111, and shall be cement-mortar lined conforming to AWWA C104 (ANSI Standard A21.4).

Rubber gaskets for push-on (Tyton) or mechanical joint (M.J.) shall be in accordance with ANSI Standard A21.11 (AWWA C-111).

b) Transition, Reducing and Flexible Couplings

Smith-Blair or Romac: Couplings for cast iron pipe or asbestos cement pipe shall be cast iron. Couplings for steel pipe shall be steel.

6. TAPPING TEE AND TAPPING VALVE

The tapping tee shall be cast iron or stainless steel with a ductile iron or stainless steel flange. The tapping valve shall meet the specifications of the gate valves.

7. CASING

Steel pipe casing, ASTM Designation A53 or comparable, minimum 3/8" wall thickness for 20" casing pipe.

8. FIRE HYDRANTS

Fire hydrants shall be a breakaway type and conform to AWWA Standard C502-85 and be one of the following: M & H Style 929 Reliant, Mueller Centurion or Clow F2500.

They shall be non-rising stem compression-type which open counter-clockwise, and close with pressure. The main valve opening diameter shall be 5-1/4 inches and the hydrant barrel shall have a diameter of 7 inches unless otherwise specified. The hydrant seat and hydrant seat retaining ring shall be bronze. All external bolts, nuts and studs shall be cadmium plated in accordance with ASTM A165 Type HS or rust proofed by some other process approved by the City. Gaskets shall be of rubber composition.

Fire hydrants shall be equipped with one 5" Storz or equal pumper connection and with two 2-1/2" NT hose ports. Ports shall be fitted with renewable bronze nipples locked in place.

The fire hydrants shall be painted with two (2) coats of Parker Paint Safety

Yellow or Kelly-Moore Sun Burst Yellow No. 1700. (See Standard Detail Fire Hydrant Assembly for additional specifications.)

9. GATE VALVES

Gate Valves 12" and smaller shall conform with the requirements of AWWA Standard Specifications for gate valves for ordinary water works service number C-500 and C-509, except where superseded by the following: They shall be iron body with epoxy coating inside and out with vulcanized resilient rubber wedge seat. The valves shall be non-rising stem, open to the left, and shall be equipped with standard 2" square operating nuts. Valves shall be equipped with "o-ring" packing. Valves shall be M & II 3067-NRS or Mueller A2370.

Gate valves utilizing hub end with asbestos-cement pipe shall be installed with proper gaskets to match the pipe end.

All 1-1/2" and 2" valves shall be ball valves or gate valves approved by the City. Said ball valves shall be equipped with a slotted operator, and with an adapting 2" square operating nut (Ford Cat. No. QT-67, or equal) secured with a stainless steel cotter pin.

10. BUTTERFLY VALVES

All valves larger than 12 inches shall be butterfly valves. Butterfly valves shall be Class 150 or better, either M & H 450 or 4500 or Pratt equivalent, and shall meet the requirements of AWWA C-504-70.

Valve shafts shall meet or exceed the strength requirements of AWWA C-504-70 and be one-piece. Packing shall be "o-ring", or other design approved by the City.

Butterfly valves to be installed underground shall have sealed mechanical operators, open to the left and have 2" standard square operating nuts.

Complete manufacturer's specifications for the valves proposed for use shall be submitted to the City for approval. No valves shall be used which have not been approved by the City.

11. BLOW-OFF ASSEMBLY

Per City of Roy standard plan for water system construction Section 4 for "End-Line" and "In-Line Blow-off Assembly" as applicable.

12. AIR & VACUUM RELEASE ASSEMBLY

Per City of Roy standard plan for water system construction Section 4.

13. SAMPLING STATIONS

Sampling stations shall be Eclipse No. 88 or City approved equal with a lockable, non-removable, aluminum-cast housing and an all brass waterway. All working parts will be of brass and be removable from above ground. A copper vent tube will enable each station to be pumped free of standing water. The exterior piping will be galvanized.

14. VALVE BOXES

Valves boxes shall be Rich 940 or City approved equal and be cast iron with adjustable sections; 18" top section and regular 24" base section as required. A valve cover marked "WATER" shall be provided.

15. VALVE STEM EXTENSIONS

The materials for the valve stem extension shall be as shown on the standard detail.

16. CONCRETE MARKER POSTS

A concrete valve marker post shall be 4" minimum square section and a minimum of 42" in length, with beveled edges and containing at least one (1) 3/8" x 37" bar of reinforcing steel. Paint shall be as for fire hydrants (paragraph 8).

17. FIRE HYDRANT GUARD POSTS

The guard posts shall be precast reinforced concrete, nine inches in diameter, six feet long. Paint shall be as for fire hydrants (paragraph 8).

18. RAISED PAVEMENT MARKERS

Raised pavement markers for fire hydrant locations shall be Type 2, two-way blue and shall conform to Section 8-09 of the Standard Specifications for Road, Bridge and Municipal Construction.

19. LOCATING WIRE

Locating wire shall be 14 gauge solid copper, with neoprene coating. All connections or splicing shall be made with ILSCO split bolt connectors, Catalog No. 1 KS, or equal.

20. METER BOXES

Brooks, Fog-Tite, or Carson inverted with reading lid, or approved equal.

21. SERVICE SADDLES

All service connections shall be installed with service saddles which shall be by Ford, as specified in the Standard Details.

22. METERS

5/8" to 1" meters shall be Sensus "SR" series. Meters 1-1/2" and larger shall be Sensus "SRH" or "W" series and be equipped with strainers. Registers shall be Sensus "TRC" and be capable of both direct visual reading and remote reading.

23. FOUNDATION GRAVEL

Foundation gravel shall be manufactured in accordance with the provisions of Section 9-03.12(1)A of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington. The materials shall be uniform in quality and free from wood, roots, bark and other extraneous material. Materials also shall conform to and be placed in accordance with Section 4-04 of the current Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington.

24. GRAVEL BASE

This material shall conform to and be placed in accordance with Section 4-02 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, for gravel base formerly designated as Class "B". The material shall also be used for select backfill of trenches, if the excavated material is unsuitable for backfill, or as directed by the City.

25. COLD MIX ASPHALT CONCRETE

During the course of construction, it may be necessary to provide improved temporary access along the streets within the construction route and such major property access roads, as may be designated by the City in the field. Such improved temporary access shall be provided by patching the crossings and designated entrance roads with cold mix asphalt concrete, until such time as the permanent asphalt pavement is installed. Cold mix asphalt concrete shall consist of a mixture of mineral aggregate and a minimum of five-and-one-half percent (5-1/2%) cutback asphalt binder, MC-250, combined in a mechanical mixer. All materials and preparation shall be in conformance with the following specifications.

The mineral aggregate shall consist of a mixture of approved materials containing any or all of the following constituents; broken stones, broken slag, crushed or uncrushed gravel, sand stone screenings and mineral dust. It shall be furnished in not less than two sizes, designated respectively as coarse and fine aggregate, with No. 4 sieve as the division point.

When tested by means of laboratory sieve, the mixed aggregate shall meet the following requirements:

Total Passing	Percent by Weight
1" Sieve	100
1/2" Sieve	75-90
No. 4 Sieve	50-70
No. 10 Sieve	35-50
No. 40 Sieve	20-30
No. 200 Sieve	4-8

The asphaltic binder shall be MC-250, free from water and meet the following requirements:

Designation	MC-250
Flash Point (Open Tag) of	150+
Kinematic Viscosity at 104°F	100-200
Distillation	
Distillate percent of total distillate to 680° F.	
to 437°F.	10-
To 500°F.	15-55
To 600°F.	60-87
Residue from distillation to 680°F. Volume percent by difference.	
Test on residue from distillation	
Penetration 77°F., 100 G., 5 secs.	120-250
# Ductility 77°F.	100+
Percent soluble in carbon tetrachloride	99.5+

26. ASPHALT CONCRETE PAVEMENT REPAIR

Asphalt concrete shall be Class B asphalt concrete and shall conform to Section 5-04 of the Standard Specifications for Road, Bridge, and Municipal Construction. The paving asphalt shall be viscosity grade AR 4000W.

Asphalt sealer for tacking joints shall be SS-1 emulsified asphalt.

Asphalt sealer for sealing joints shall be AR-4000.

27. LANDSCAPE

The Developer shall furnish and place Bassett-Western 3-Way Mix Planting Soil or approved equal for all plant beds.

The Developer shall furnish and apply planting fertilizers. "Transplanter" Formula 4-2-4 as manufactured by Pacific Agro Co., with Hercules Nitroform and W.R. Grace's "Magamp" and trace elements, or approved equal.

Plant material shall be the size, quality and condition as necessary to complete the required restoration. Measurements, grading and quality, are to follow quality standards: "American Standard for Nursery Stock" issued by the American National Standards Institute.

Groundcover stock shall be nursery stock, hardened off, well rooted and established and shall comply with the American Association of Nurserymen Grades.

Plantings shall not be pruned prior to delivery.

Topsoil shall have a pH value between 6 and 7, shall be fertile, friable, natural loan, containing 5 - 8% of humus and shall be capable of sustaining vigorous lawn growth. It shall be free of any admixture of subsoil, stones two inches in diameter or larger, clods of earth, plants or their roots, sticks or other extraneous material. Topsoil shall not be used while in a frozen or muddy condition.

28. SEEDING, FERTILIZING AND MULCHING

The seed mixture shall have the following composition, proportion and quality.

Kind & Variety of Seed In Mixture	Percent By Weight	Minimum Percent of Pure Seed	Minimum Percent of Germination
Colonial Bent Grass: (Highland or Astoria)	10%	9.8%	85%
Creeping Red Fescus: (Illahee Rainier or Pennlawn)	40%	39.2%	90%
Perennial Rye Grass:	30%	29.4%	90%
White Clover: (Pre-inoculated)	20%	19.6%	90%
Maximum Percentage of Weed Seed	1.0%		
Maximum Inert & Other Crops	1.0%		

The seed shall be applied at a minimum rate of 120 pounds per acre.

A commercial fertilizer of the following formulation shall be furnished as specified: All fertilizer shall be pre-mixed prior to bringing on the job. The fertilizer shall be applied at the rate of 500 lbs. per acre.

Nitrogen (Inorganic)	Phosphorous	Potassium	Lbs/Acre
as N_2	as $P_2 0_5$	as $K_2 0$	
10%	20%	20%	400
Nitrogen (Organic) Ureaformaldehyde	38%		100

Total lbs. of fertilizer per acre shall be 500 lbs/acre.

Wood cellulose fiber mulch shall be applied at the rate of 2000 pounds per acre.

29. CEMENT CONCRETE CURB, GUTTER & SIDEWALK

The integral cement concrete curb and gutter shall be constructed in accordance with Section 8-04 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, using air-entrained Class "3000" concrete, in accordance with Section 6-02 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, and as further described below and shown on the Plans.

30. EXTRUDED CEMENT CONCRETE CURB

Extruded cement concrete curbs shall be constructed with a cement concrete mix that will have a dense, uniform texture which will not sag or displace behind the machine.

The concrete mix shall be proportioned as follows:

Sacks of cement per cubic yard	6.5
Pounds of dry fine aggregate per sack of cement	245
Pounds of dry 3/4" maximum coarse aggregate per sack of cement	238
Slump (ASTM Designation C143)	Not Over 1"

The 3/4" maximum coarse aggregate shall meet the following requirements for grading:

Passing 1" square screen	100%
Passing 3/4" square screen	95-100%
Passing 3/8" square screen	20-40%
Passing U.S. No. 4 sieve	0-3%

The Developer will be allowed to use a different concrete mix if approved by the City, provided that it develops not less than 4,000 pounds per square inch compressive strength at 28 days. It is the intent of these Specifications to provide a concrete mix having such characteristics of mobility and workability that it can be extruded without slumping, deforming or displacing. The finished curb shall have a dense, smooth and uniform surface texture and shall develop a minimum of shrinkage cracks upon curing.

METHODS OF CONSTRUCTION

1. GENERAL

A pre-construction conference will be held at the City office prior to the start of construction.

The developer shall notify the City seven (7) days in advance of proposed construction to allow for checking of materials to be used on the job.

Except as otherwise noted herein, all work shall be accomplished with adopted standards of the City of Roy, as recommended in applicable American Waterworks Association (AWWA) specifications, and according to the recommendations of the manufacturer of the material or equipment used. The Contractor performing actual construction shall have a copy of the plans and specifications on the job site at all times.

2. ALIGNMENT

All water mains shall be placed five (5) feet north or east of the centerline of the street right-of-way. Unless otherwise specified, the location of the water mains, hydrants, valves, and principal fittings will be in accordance with the approved plans. The Developer shall provide sufficient horizontal control, in the form of centerline stakes, property corners, or other markers, as required for proper pipe location.

3. CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of all trees, stumps, brush, and debris and shall be confined within the limits of the easements obtained for the construction of this project, and/or existing public rights-of-way. Construction work in forested and native unimproved areas shall be conducted with extra precaution. Construction activity, stored materials and piles of earth shall not extend beyond the designated work limits. Trees and foliage which are not to be removed in construction shall be protected. Finished grades after completion shall match original grades, sloped to prevent ponding. Remove any surplus dirt or over burden piled around trees to prevent future damage; remove such material by hand if necessary. Clear and fall trees with sufficient care to prevent damage.

All trees which are removed by the Developer shall become the property of the Developer and shall become his responsibility to remove from the site, unless otherwise noted in the easement stipulations or elsewhere in these specifications. Removal of clearing and grubbing debris shall be subject to the approval of the City and shall, in no way, constitute a hazard to the continuous operation of any existing utilities. Any damage to the existing utilities shall be repaired by the

respective utility company, at the expense of the Developer. Any private improvements in the rights-of-way and easement areas shall not be removed until permission has been given by the City.

All fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed and temporarily erected on the adjoining property or stored for reinstallation as directed by the City.

No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. All waste material shall be hauled to a waste site arranged for by the Developer. Any permits required for disposal shall be secured and paid for by the Developer.

The Developer shall be responsible for all damage to existing improvements resulting from his operations.

4. EXCAVATION AND BACKFILL

a) Traffic to be Maintained

The Developer shall make suitable, safe, and adequate provision for necessary traffic around, over, or across the work in progress and shall schedule pavement patching to follow after backfill is completed.

b) Excavating in Paved Areas

Prior to excavating in paved areas, the existing road surface shall be cut one (1) foot (minimum) back from the outer edge of the excavation with a cutter and removed. The cuts are to be made in clean, straight lines to insure a minimum of damage to existing pavements. All cuts in existing concrete pavement are to be made with a concrete saw, except that where the concrete has been overlaid with asphalt, the pavement will be cut with a cutter 1 foot (minimum) from the outer edge of the excavation on each side of the trench section. If the Developer fails to adequately protect the trench edges during trenching and backfilling, he will be required, at his own expense, to recut the edges prior to repairing the pavement.

c) Trench Excavation

Trench excavation shall be unclassified. The terms earthwork or excavation include all materials excavated or removed regardless of material characteristics. The Developer shall make his own estimate of the kind and extent of materials which will be encountered in the excavation.

Trenches shall be excavated to the line and depth so that all new pipelines

constructed shall have not less than three (3), nor more than five (5) feet of cover, measured from the top of the pipe to the approved finished grade, unless otherwise approved by the City.

If a grade revision is made, the cover over the water main must remain within these limits. Otherwise, the water main shall be reconstructed. All added costs of inspecting such water main reconstruction shall be charged to the Developer.

The excavation shall be made in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in the street grades so that there are no abrupt changes in pipeline grade.

Where it is necessary to cross sanitary sewer or storm sewer trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

The root systems of all trees not to be removed which are located on or near the easements and right-of-way shall not be cut or disturbed, but shall be tunneled or otherwise protected by the Developer to ensure that no damage is done.

During trenching, installation of pipelines and appurtenances, and the placing of backfill, trenches shall be kept free of water. The Developer shall furnish all equipment necessary to dewater the trench and shall dispose of the water in such a manner as not to cause a nuisance or menace to the public.

When so directed by the City, the trench shall be extended below the pipeline grades to permit the placing of foundation gravel.

Foundation gravel required in the bottom of the trench to provide proper pipe support shall be furnished by the Developer. The Developer shall perform all excavation of every description and of whatever substance encountered. Boulders, rocks, roots, and other obstructions shall be completely removed or cut out to the new width of the trench and to a depth 6 inches below the water main grade. Where material is removed from below water main grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

The maximum length of open trench permissible on any line, in advance of pipe laying, will be 100 feet.

Upon completion of work each day, all open trenches shall be completely backfilled, leveled, and temporarily graveled or patched.

d) Trench Backfill

All brush, stumps, logs, planking, disconnected drains, boulders, paving, etc., shall be removed from the material to be used for backfilling the trench.

No timber bracing, lagging, sheathing, or other lumber shall be left in any excavation.

Where, in the opinion of the City, the existing material removed from the trench is not suitable for roadway subgrade, gravel base or other approved material shall be used as backfill.

At all roadway and driveway crossings within existing paved rights-of-way, and in such additional locations as may be directed by the City, the trench shall be immediately backfilled after the pipe is installed and inspected, and shall be immediately provided with a temporarily graveled surface, and continually maintained on a daily basis until replaced with permanent repair as required.

All paved crossings shall have a temporary asphalt paved surface installed, which surface shall be a minimum of two (2) inches in thickness, and fully maintained level with existing undisturbed pavement until replaced with permanent repair.

Sufficient cold mix to make immediate repairs and to maintain repairs until permanent repair is made, shall be on the job site.

The Developer shall be responsible for restoring to a condition equal to their original condition, any and all exiting culverts, ditches, drains, landscaping, or other facilities which are damaged as a result of the Developer's operations.

e) Timbering and Sheeting

The Developer shall provide and install timbering and sheeting as necessary to protect workmen, the work, and existing utilities and other properties. All work involving timbering and sheeting shall be done in accordance with all applicable local, State and Federal safety regulations. All timbering and sheeting above the pipe shall be removed prior to backfilling. Sheeting below the top of the pipe may be cut off and left in place. Removal of timbering shall be accomplished in such a manner that

there will be no damage to the work or to other properties. The design of all timbering and sheeting shall be the Developer's responsibility.

f) Tunneling

Tunneling may be ordered by the City under pavements or otherwise. The Developer may tunnel in lieu of open trenching for deep cuts. Except where authorized by the City, such tunneling shall not be longer than 20 feet between shafts. Tunneling shall not be less than 4 feet high and 2 feet wide, and not less than 1 foot wider than the outside diameter of the pipe. Tunnels shall be backfilled with material acceptable to the City and backfill shall be mechanically compacted. Subsequent low pressure grouting may be required.

5. DEWATERING AND CONTROL OF WATER

The Developer shall dewater and dispose of the water so as not to cause injury to public or private property, or cause a nuisance or menace to the public. Dewatering systems shall be designed and operated so as to prevent the removal of natural soils.

During excavating, installation of water mains, placing of trench backfill, and the placing and setting of concrete, excavations shall be kept free of water. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils, and allow the placement of backfill to the required density. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill, and prevent flotation or movement of structures, and water mains.

In carrying out the work within the limits of streams, or an area that will drain to a stream during a rain, the Developer is required to comply with the regulations of the appropriate local, State, and Federal agencies. Any isolated potholes remaining from the Developer's operations shall be provided with open water channels in such a manner that there will be a direct drainage outlet at the lowest elevation of the pothole.

Dust control water shall be applied as designated by the City, and for such period of time as the City deems necessary.

The Developer shall contact the applicable agencies and secure such permits as

may be necessary to cover his proposed method of operation within the areas described above. If no permit is necessary, and if directed by the City, he shall obtain a letter from the appropriate agency.

6. COMPACTION OF TRENCH BACKFILL

Unless otherwise approved, compaction of trench material is required. The density of compacted backfill material shall meet requirements outlined in the Standard Specifications.

7. TRENCH SAFETY SYSTEMS

All trenches which exceed a depth of four feet shall be provided with safety systems that meet the requirements of the Washington Industrial Safety & Health Act, Chapter 49.17 RCW.

8. ROADWAY RESTORATION AND PAVEMENT PATCHING

This work shall consist of the preparation, placing, and compaction of the subgrade, and the patching of various types of pavement cuts, to the complete resurfacing of roadways. The performance of this work shall be in accordance with the requirements outlined herein. Roadway surface restoration and patching shall be in accordance with the Standard specifications, unless specifically directed otherwise by the City.

Before patching material is placed, all pavement cuts shall be trued so that marginal lines of the patch will form a rectangle with straight edges and vertical faces a minimum of one (1) foot back from the maximum trench width.

Proper signs, barricades, and other warning devices shall be maintained 24 hours of the day until the patch is completed and ready for traffic.

a) Crushed Surfacing

All crushed surfacing top course shall be in accordance with the requirements of Sections 4-04 of the Standard Specifications.

b) Gravel Base

All gravel base shall conform to the requirements of Section 9-03.10 Standard Specifications for Gravel Base. Gravel base shall be spread in accordance with the requirements of the Standard Specifications before material for succeeding courses is spread.

Gravel base shall be used as shown on the plans and as directed by the City.

c) Asphaltic Concrete Surfacing

Asphalt concrete surfacing shall be constructed in accordance with Section 5-04 of the Standard Specifications.

All edges and joints of asphaltic concrete pavement repair shall be sealed with emulsified asphalt. After pavement is in place, all joints shall be sealed with AR-4000W or equal.

d) Cement Concrete Pavement

Concrete shall conform with and shall be placed in accordance with Section 5-05 of the Standard Specifications, shall be 3-day standard mix design, and shall be furnished only by manufacturers who are members of the Portland Cement Association. Concrete cylinders will be taken by the City for the purpose of testing the compressive strength of the concrete. Subgrades shall be prepared as shown on the plans and in compliance with the Standard Specifications.

All reinforcing steel shall conform with and be placed in accordance with Section 5-05 of the above Specifications, and shall conform to the requirements of AASHTO M31 latest revision.

e) Rigid-Type Pavements Resurfaced with Asphalt Concrete

Those areas that now have portland cement concrete base and are surfaced with asphaltic concrete mat shall be replaced in kind. The base shall be five (5) sack mix using "High Early" cement. The surface of the cement concrete portion of the patch shall be left low enough to accommodate the asphalt portions of the patch. Brush finishing will not be required. Joints shall be placed if directed by the City. The asphaltic concrete surface mat to be placed over the portland cement concrete base shall be as designated by the Washington State Department of Transportation as Class "B". Both the base and the surface mat shall be carefully prepared, placed, and cured in full compliance with Section 5-05.3 of the Standard Specifications.

Asphalt concrete or bituminous plant mix shall not be placed until the day after the cement concrete has been placed unless otherwise permitted by the City. The edges of the existing asphalt pavements and castings shall be painted with asphalt emulsion immediately before placing the asphalt patching material. The asphalt concrete cement shall then be placed, leveled and compacted to conform to the adjacent paved surface.

Immediately thereafter, all joints between the new and the original asphalt pavement shall be painted with hot asphalt or asphalt emulsion, and covered with dry paving sand before the asphalt solidifies.

9. FOUNDATION, BEDDING AND BACKFILL GRAVEL

a) Bedding Material

Bedding material shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the pipe. The minimum thickness of the required bedding material layer shall be 4 inches under the bell for all pipe sizes of 24 inches and smaller, and 6 inches under the bell for all pipe diameter where rock is excavated. To provide this firm, continuous support for the pipe, it is necessary to hand tamp or "slice" bedding material solidly under the pipe.

After the pipe laying operation, additional bedding material shall be placed and compacted for the full width of the trench up to the top of the pipe.

b) Backfill Gravel

When excavated material is not approved for backfill, Gravel Base, as specified in Section 4-02 of the Standard Specifications; or granular material commonly known as pit run gravel, shall be used as directed by the City.

Pit run gravel shall be free from wood, roots, bark, or other extraneous material. It shall have such characteristics of particle size and shape that it will compact readily to a firm, stable base.

The maximum size of stone shall not exceed that which will pass a 2-1/2 inch square sieve opening. Gradation shall be as follows: 25 percent minimum passing 1/4 inch sieve; 10 percent minimum passing U.S. No. 200 sieve; dust ratio 2/3 maximum; sand equivalent 30 minimum.

Prior approval for the use of a pit from which the Developer desires to provide pitrun material may be granted by the City.

10. WATER PIPE INSTALLATION

All pipe shall be installed in accordance with these specifications and the instructions of the manufacturer, subject to the approval of the City. All pipe ends shall be square with the longitudinal axis of the pipe, and any damage to the ends shall be cut off prior to installation, if approved by the City. When it is necessary to cut the pipe, the pipe shall be cut with approved cutting tools.

The pipe shall be laid in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in street grades so that there are no abrupt changes in pipeline grade. To maintain the required alignment, use short lengths and deflect the joints or use necessary bends.

Each pipe section shall be carefully lowered into place onto bedding material that is placed to a minimum depth of four inches in the trench after inspecting it for defects and removing any gravel or dirt, etc., from the interior of the pipe.

When necessary, water mains to be constructed under other utilities shall meet the minimum cover requirements. Where it is necessary to cross sanitary sewer or storm drain trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

The Department of Social and Health Services requires a 10-foot horizontal separation between all sanitary sewer lines and water mains. A 5-foot horizontal separation is required between all water facilities and underground power, telephone, and other facilities unless otherwise approved.

11. ROAD AND STREAM CROSSINGS

The Developer may use any method which produces satisfactory results, and is acceptable to the City and the governmental agencies having control of the road or stream, provided that the Developer restores the road or stream to its original condition. Normally, highway and stream crossings require the placing of a steel pipe casing by jacking or tunneling and laying the water main inside the casing.

Steel casing shall be of sufficient diameter, size, and strength to enclose the water main and to withstand maximum highway loading. Sizing and wall thickness of the casing are to be approved by the City. Sand backfill between the casing and the water main, or other approved means of pipe support, will be required. The ends of the casing are to be sealed with low pressure grout after installation, backfill, and testing of the pipe are completed.

12. EROSION CONTROL

The detrimental effects of erosion and sedimentation are to be minimized in conformance with the following general principals:

a. Leaving soil exposed for the shortest possible time.

b. Reducing the velocity and controlling the flow of run-off.

c. Detaining run-off on the site to trap sediment.

d. Releasing run-off safely to downstream areas.

In applying these principles, the Developer shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop material, providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; properly controlling and conveying run-off; and establishing permanent vegetation and installing erosion control structures as soon as possible.

a) Trench Mulching

Where, in the opinion of the City, there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, material shall be held in place by covering the disturbed area with straw and holding it in place with a covering of jute matting or wire mesh anchored down with wooden stakes, or as directed by the City.

b) Cover Crop Seeding

A cover crop shall be sown in all areas disturbed or excavated during construction that were not paved, landscaped, and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original condition. Cover crop seeding shall follow backfilling operations.

The Developer shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be reseeded, if required, and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

13. CONCRETE BLOCKING

Concrete blocking mix shall be Cement Concrete Class 3000, and shall be cast in place and have a minimum of 1/4 square foot bearing against the fittings and two

square feet bearing against undisturbed soil. Blocking shall bear against fittings only and shall be clear of Joints so as to permit taking up or dismantling the joint. All bends and tees shall be blocked in accordance with Standard Blocking Details. The developer shall install blocking which is adequate to withstand full test pressure as well as to continuously withstand operating pressures under all conditions of service. For concrete blocking based on 200 psi test pressure, with safe soil load bearing of 2,000 pounds per square foot, see Standard Details. Pea gravel, and other smooth surfaced rock are not acceptable as concrete mix aggregate.

14. FIRE HYDRANT INSTALLATION

Fire hydrants shall be set as shown in the Standard Detail. Shackle rods, or other thrust restraint approved by the City, are to be used. The hydrant and gate valve must have lugs. Fire hydrant ports are to be oriented as directed by the Pierce County Fire District #17 Fire Chief.

In some instances, it may be necessary to make a cut or provide fill to set hydrants. Where this occurs, the area for at least a three (3) foot radius around the hydrant shall be graded and levelled, and the cut or fill slopes shall be neatly graded by hand, unless otherwise approved by the City and the Fire Chief.

No tool other than an approved hydrant operating wrench shall be used when opening or closing hydrants.

The fire hydrants shall be relocated, as shown on the standard Plan, by installing fittings, new ductile iron pipe and shackle rods between the gate valve and the fire hydrant. New gaskets shall be installed at each connection.

All new and relocated hydrants located adjacent to a paved road shall have Type 2 raised pavement markers installed 4" from the centerline on the hydrant side of the road.

15. WATER SHUTOFF

Where it is necessary to shut off the existing mains to make a connection, the Developer shall notify the City forty-eight (48) hours in advance of such shut off and the City will shut off the mains. Once the water has been shut off, the Developer shall diligently pursue the connection to completion so that the time required for the shut off may be held to a minimum.

All connections to existing mains shall be completed the same day as they are started. The Developer shall time his operations so that the water will not be shut off overnight or over weekends or during holidays.

16. SERVICE CONNECTIONS

All new service connections shall be installed by the Developer as per these Specifications and the Standard Details. Water meters will be provided by the City and charged to the Developer, and shall be installed by the Developer under the supervision of the City.

Where existing services are to be transferred to new water mains installed by the Developer, the Developer shall maintain existing service connections in service until replacement services are fully installed, tested and accepted by the City and all existing service connections have been transferred to the new water main. For each transferred existing service, the Developer shall furnish and install a new meter box and meter setter per these Specifications and the Standard Details. Any meters damaged or clogged during construction will be replaced by the City and back-charged to the Developer. After installation, testing and disinfection of water mains and acceptance by the City, the existing water meters and customer service lines shall be transferred to the new meter boxes. Transfer of existing meters and services by the Contractor shall be performed under the supervision of the City.

17. GATE VALVE INSTALLATION

Gate valves shall be set in the ground vertically and shall be opened and shut under pressure to check operation and, at the same time, show no leakage. Valves 6 inches and larger that are not flanged to other fittings shall be blocked in accordance with the Standard Blocking Details.

18. BUTTERFLY VALVE INSTALLATION

Butterfly valves shall be installed and tested in the same manner as gate valves. All butterfly valves shall be installed with a flanged spool piece between the valve and the tee to which it is attached. The length of the spool piece shall be equal to the diameter of the pipe.

19. VALVE BOX INSTALLATION

Valve boxes shall be set flush in pavement. In gravel shoulder and in unimproved roadway areas, install a protective concrete collar and asphalt pad as shown in Standard Detail. 18. Valve boxes shall be installed such that the slots in the valve box lid shall be oriented in the direction of the pipe. Where valve boxes are in asphaltic pavement, the cover shall be painted as directed by the City.

20. INSTALLATION OF VALVE MARKER POSTS

Valve markers shall be installed for all valves except fire hydrant valves and valves located in paved areas at the location as directed by the City. The markers shall be set to leave 18 inches exposed above ground. The exposed portion of the markers shall be painted the same as the fire hydrants. The valve size and the distance to the valve, rounded off to the nearest foot, shall be stenciled on the marker in two-inch-high numbers using black paint.

21. INSTALLATION OF FIRE HYDRANT GUARD POSTS

When directed by the City, guard posts shall be set with the tops of the posts at the same elevation as the top of the hydrant. The exposed portion of the posts shall be painted the same as fire hydrants.

22. BLOW-OFF ASSEMBLY INSTALLATION

Per City of Roy standard plan for water system construction Section 4 for "End-Line" and "In-Line Blow off Assemblies" as applicable.

23. AIR AND VACUUM RELEASE VALVE INSTALLATION

Air and vacuum release valve assemblies shall be installed as shown in the Standard Details. Location of air and vacuum release valves shall be at the high points of the line. Water mains must be constructed so that the valves may be installed in a convenient location.

24. SAMPLING STATIONS

Sampling stations shall be set in the ground vertically and shall be opened and shut under pressure to check operation. A concrete base shall be provided at finished grade. Sampling stations shall be located as described in Section 2-53.

24. LOCATING WIRE

All non-metallic water mains and services shall have 14 gauge solid copper wire and neoprene coating placed in the trench over the water line and the ends brought up into the valve or meter boxes. OR TRACER TAPE - WORDING

25. CONNECTIONS TO EXISTING FACILITIES

Where necessary to connect to existing facilities, the operation of the existing facility shall be maintained while making the connection.

Wet tap connections shall be installed as shown on the Plans and the standard detail and the tapping valve shall remain closed.

Cut-in tees and crosses shall be installed as shown on the plans and the valves on the branches of the tee or cross shall remain closed.

At connections of new piping to existing piping where no valve is installed to separate the system, all of the new piping, appurtenances and blocking shall have been installed, disinfected and tested up to the point of cutting into the existing line before the connection is made.

Provide the City with 48 hours notice prior to making connections to the existing system and proceed only after receiving permission. Assemble all necessary material and equipment 48 hours before starting work to allow the City inspector to examine the material for acceptability. Notify all affected customers at least 48 hours in advance. No cut-in connections or connections of new piping to existing piping will be scheduled on Fridays or Mondays.

Bolts, flanges, gaskets, couplings and all accessories shall be checked and assembled where possible by the Developer and verified by the District prior to shut down of the water system. Before connection or cut-in, the fittings, pipes, valves, and couplings shall be cleaned and sterilized with chlorine solution in the same manner as provided for the pipeline. The cleaning and sterilizing shall be done immediately prior to installation and in the presence of the City. Once the water has been shut off, the Developer shall proceed rapidly and without interruption to complete the connection.

After connection to the existing system, the opening of the valves shall be done with the authorization of, and in the presence of the City's authorized representative.

The Developer shall not operate any valves or make any connections to the existing water main without prior approval of the City. The Developer shall make the necessary arrangements with the City for the connection to the existing water main.

26. TESTING & DISINFECTING

The water main pipes shall be disinfected and tested prior to acceptance of work. Water for testing and disinfecting must be obtained by the Developer by

arrangement with the City. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. Feed for the pump shall be from a barrel or other container, wherein the actual amount of "makeup" water can be measured periodically during the test period.

Prior to conducting the pressure test all services, (up to the meter by) air vacuum release assemblies, hydrants, blow-offs, etc. shall be installed.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking and remove it after testing.

As soon as pipe is secured against movement under pressure, it may be filled with water. Satisfactory performance of air valves shall be checked while the line is filling. The Developer shall pre-flush all water mains after water has remained in the main for 24 hours and before pressure testing the main. After the pipe is filled and air expelled, it shall be pumped to a test pressure of 250 psi, and this pressure shall be maintained for a period of not less than thirty (30) minutes to insure the integrity of the thrust and anchor blocks. **The Contractor/Developer is cautioned regarding pressure limitations on butterfly valves.** All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Hydrostatic tests shall be performed on every complete section of water main between two valves, and each valve shall withstand the same test pressure as the pipe with no pressure active in the section of pipe beyond the closed valve.

In addition to the hydrostatic pressure test, a leakage test shall be conducted on the pipeline. The leakage test shall be conducted at one hundred fifty pounds per square inch (150 psi) for a period of not less than one (1) hour. The quantity of water lost from the main shall not exceed the number of gallons per hour determined by the formula:

$$L = \frac{ND(P)^{0.5}}{7{,}400}$$

In which
- L = allowable leakage, gallons/hour
- N = number of joints in the length of pipeline tested
- D = nominal diameter of the pipe in inches
- P = average test pressure during the leakage test, psi.

Gauges used in the test shall be accompanied with certification of accuracy from a laboratory approved by the City.

Any visible leakage detected shall be corrected by the Contractor regardless of the allowable leakage specified above. Should the tested section fail to meet the pressure test successfully as specified, the Contractor shall, at no expense to Contracting Agency, locate and repair the defects and then retest the pipeline.

All test shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. After the test has been completed, each gate valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the gate valve will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Contractor shall verify that the pressure differential across the valve does not exceed the rated working pressure of the valve. Sections to be tested shall normally be limited to 1,500 feet.

Prior to calling out the City to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to ensure that the pipe is in a satisfactory condition.

Defective materials or workmanship, discovered as a result of the tests, shall be replaced by the Developer at the Developer's expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be rerun at the Developer's expense, until a satisfactory test is obtained.

As sections of pipe are constructed and before pipelines are placed in service, they shall be sterilized in conformance with the requirements of the State of Washington Department of Health Services.

The Contractor shall be responsible for flushing all water mains prior to water samples being acquired. The water mains shall be flushed at a rate to provide a minimum 2.5 feet per second velocity in the main.

In all disinfection processes, the Contractor shall take particular care in flushing and wasting the chlorinated water from the mains to assure that the flushed and chlorinated water from the mains to assure that the flushed and chlorinated water does no physical or environmental damage to property, streams, storm sewers or any waterways. The Contractor shall chemically or otherwise treat the chlorinated water to prevent damage to the affected environment, particularly aquatic and fish life of receiving streams.

Chlorine shall be applied in one of the following manners, listed in order of preference, to secure a concentration in the pipe of at least 50 ppm.

1) Injection of chlorine-water mixture from chlorinating apparatus through corporation cock at beginning of section after pipe has been filled, and

with water exhausting at end of section at a rate controlled to produce the desired chlorine concentration;

2) Injection similarly of a hypochlorite solution;

3) Other City pre-approved method(s) selected by Developer/Contractor.

After the desired chlorine concentration has been obtained throughout the section of line, the water in the line shall be left standing for a period of twenty-four (24) hours. Following this, the line shall be thoroughly flushed and a water sample collected. The line shall not be placed in service until a satisfactory bacteriological report has been received.

City forces only will be allowed to operate existing and new tie-in valves. The Contractor's forces are expressly forbidden to operate any valve on any section of line which has been accepted by the City.

27. ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO GRADE

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

a) General

On asphalt concrete paving projects, the valve boxes shall not be adjusted until the pavement is completed, at which time the center of each valve box lid shall be relocated from references previously established by the Developer. The pavement shall be cut as further described, and base material removed to permit removal of the lid.

The asphalt concrete pavement shall be cut and removed to a neat circle, the radius of which shall not exceed 15 inches from the center of the lid. The valve box and lid shall be brought up to desired grade, which shall conform to the surrounding road surface.

Asphalt concrete patching shall not be carried out during wet ground conditions or when air temperature is below 50 degrees F. Asphalt concrete mix must be at the required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 2" shall then be filled with Class B asphalt concrete and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the existing pavement and the patch shall then be carefully painted with hot asphalt cement or asphalt emulsion, and shall be immediately covered with dry paving sand before the asphalt cement solidifies. All debris, such as asphalt pavement, cement bags, etc., shall be removed and disposed of by the Developer. Before acceptance of the job, valve and meter boxes shall be cleaned of all debris and foreign material. Any damage occurring to the existing facilities due to the Developer's operations shall be repaired at his own expense.

b) Adjustment of Monuments and Cast Iron Frames and Covers

Monuments and monument castings shall be adjusted to grade in the same manner as for valve boxes.

28. LANDSCAPE RESTORATION

Landscape restoration shall include preparation of subgrade, placement of topsoil, fine grading, installation of plant material, fertilizing, mulching, clean-up and maintenance through final acceptance.

The Developer or his contractor or subcontractor shall be experienced in landscape work. The Developer shall acquaint himself with all other work related to street improvements, and any other work which might affect preparation for/or installation of plantings.

The Developer shall locate all underground utilities and promptly notify the City of any conflict. Failure to do so shall place upon the Developer the responsibility and the expense for making any and all repairs for damage.

The Developer shall protect and maintain planting until final acceptance of all work. Maintenance shall include watering, weeding, cultivation, mulching, removal of dead material, resetting plants to proper grades or upright position, pesticide spraying, fertilizing, plant replacement and other necessary functions to bring all plant materials to a vigorous, healthy state. Maintenance shall begin after the first plant is planted and continue through final acceptance of the Project.

The Developer shall guarantee all planting for one full growing season after the final inspection and acceptance and shall be alive and in satisfactory growth at the end of that period.

The Developer shall plant at once all plant material delivered and accepted. Plants that cannot be planted within one day after arrival are to be "heeled-in" in accordance with accepted horticultural practice.

The Developer shall establish finished grades, insuring that no pockets or any other surface obstructions prevent positive drainage. Topsoil and bark mulch shall be flush with adjacent surfaces.

If water, hardpan or clay is encountered in excavations, the Developer shall contact the City immediately for resolution of planting method.

The Developer shall place at normal planting season, all plantings, unless otherwise approved by the City, and after all major construction work is completed.

All topsoil shall be furnished as necessary to complete the required restoration. A certified analysis of the topsoil from each source shall be submitted to the City before delivery to the site.

Bark mulch shall be medium ground, free of resin, tannin or other compounds that would be detrimental to plant life.

Bark mulch shall be placed to a depth of two (2) inches.

29. GRASS SOD

Particular care shall be taken to minimize damage to landscaped areas within and adjacent to construction areas. In the event construction is to be carried out in areas which are landscaped, appropriate measures shall be taken to restore such areas to conditions equal or superior to existing prior to construction. Such measures shall include, but shall not be limited to, sod removal and replacement.

The area of sod to be removed shall be laid out in squares or strips of such size as to provide easy handling and matching. The sod shall then be carefully cut along these lines to a depth of four (4) inches, taking care to keep all cuts straight and cut all strips to the same width. After the sod has been cut vertically, it shall be removed to a uniform depth of approximately three (3) inches with an approved type of sod cutter. This operation shall be performed in such a manner as to insure uniform thickness of sod throughout the operation.

As the sod stripping proceeds, the sod strips shall be placed in neat piles at convenient locations, and from then on, they shall be maintained in a damp condition continuously until the sod strips are replaced on the lawn. In no case shall the sod remain in piles longer than ten (10) days before replacement on the lawn.

Prior to replacing the strips of sod, the striped area shall be carefully shaped to proper grade and be thoroughly compacted. Wherever the construction

operations have resulted in the placement of unsuitable or poorer soils in the area to be resodded, the surface shall be left low and covered with a minimum of four (4) inches of topsoil.

All tools used shall be of the type specially designed for the work and be satisfactory to the City. In the event the Developer is required to install damaged or additional grass sod, then the sod shall be of a commercial quality which closely matches existing sod in the immediate area. It shall be purchased locally and, as such, accustomed to the existing climate and soil conditions of the local area.

30. SEEDING, FERTILIZING & MULCHING

Seeding, fertilizing and mulching shall be installed in conformance with Sections 8-01 and 9-14 of the Standard Specifications for Road, Bridge & Municipal Construction of the State of Washington, 1988, and current amendments thercto.

Seeding, fertilizing and mulching shall be installed using an approved-type hydro-seeder.

The materials will be applied in two applications.

The first application shall consist of seed and a non-toxic tracer.

The second application shall consist of a homogeneous mixture of fertilizer and wood cellulose fiber mulch, and shall be uniformly applied over the seed within 48 hours of the seed application unless otherwise directed by the City.

When weather conditions are not conducive to satisfactory results from seeding operations the City may order the work suspended and it shall be resumed only when the desired results are likely to be obtained.

Inspection of any area will be made upon completion of each area of application of seeding and fertilizing and again upon completion of the application of the mulching.

The work in any area will not be measured for payment until a uniform distribution of the materials is accomplished at the specified rate.

Areas not receiving a uniform application of seeding at the specified rate as determined by the City shall be reseeded at the Developer's expense prior to mulching.

Areas not receiving a uniform application of mulching and fertilizing at the specified rate as determined by the City shall be remulched and refertilized at the Developer's expense.

31. CEMENT CONCRETE CURB, GUTTER & SIDEWALK

Cement concrete curb, gutter and sidewalk shall be replaced by the Developer at his own expense at all locations disturbed by the installation of the water system improvements.

The integral cement concrete curb and gutter shall be constructed in accordance with Section 8-04 of the Standard Specifications for Road, Bridge & Municipal Construction, using air-entrained Class "B" concrete, in accordance with Section 6-02 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, and as further described below and shown on the Plans.

Steel forms are required. The curb returns shall be of fifteen-foot (15') radius, or as directed by the City.

The cement concrete sidewalks shall be constructed in accordance with Section 8-14 of the Standard Specifications for Road, Bridge & Municipal Construction, of the State of Washington, using air-entrained Class "B" concrete, and as further described below.

Joint fillers in the sidewalk shall be of the same material and thickness as that used in the curb, and shall be placed in the same location as that in the curb.

The sidewalk shall be marked across the entire width every five feet (5'). The sidewalk marking shall be extensions of the construction joints in the curbs. No concrete for either curbs or sidewalks shall be poured against dry forms or dry subgrade.

The Developer shall provide suitable vibrating finishers for use in finishing concrete sidewalks. The type of vibrator and its method of use shall be subject to the approval of the City.

Curbs shall be first placed and cured prior to sidewalk installation. After troweling and before jointing or edging, the surface of the curbs, gutters and sidewalks shall be lightly brushed in a transverse direction with a soft brush to give a broom finish. The Developer shall not use any two course construction of any type in any location. All work shall be single course, finished to existing lines and grades, or as directed by the City.

Wheel chair ramps shall be replaced as directed by the City.

All completed work shall be barricaded to prevent damage by unauthorized use. Any damaged sections shall be removed and replaced at the Developer's own expense.

32. EXTRUDED CEMENT CONCRETE CURB

Extruded cement concrete curb shall be replaced by the Developer at his own expense at all locations disturbed by the installation of the water system improvements.

Where the extruded curb is to be constructed, the existing pavement shall be kept clean of all drippings from cars, grease, dirt and any other matter found objectionable by the City.

The curb shall be placed utilizing an epoxy resin in accordance with Section 9-26 of the Standard Specifications for bonding freshly mixed concrete to an existing hardened surface. The curb shall be shaped and compacted true to line and grade with an approved machine capable of shaping and thoroughly compacting the material to the required cross section.

The extruded cement concrete curb shall be protected from traffic for a period of 48 hours by the use of sufficient portable barricades, and by lighted bombs or flashing lights of a type approved by the City, during hours of darkness.

Joints

Through joints shall be made at all points of tangents to returns, and not to exceed 15-foot intervals elsewhere. The through joints shall be made by hand sawing through the entire curb section so it will be clearly opened throughout while the concrete is yet in plastic state. The cut shall be neatly dressed. No filler will be required.

33. FINISHING AND CLEANUP

Before acceptance of water main construction, all pipes, catch basins, and other surrounding facilities shall be cleaned of all debris and foreign material. After all other work on the project is completed, and before final acceptance, the entire roadway, including the roadbed, planting and sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades, and cross-sections shown on the plans and as hereinafter specified.

On water main construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction

shall be so shaped that, upon completion, the area will present a uniform appearance, blending into the contours of adjacent properties. All other requirements outlined previously shall be met. Slopes, sidewalk areas, planting areas, and roadway shall be smoothed and finished to the required cross-section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by hand work to meet the requirements herein, to the satisfaction of the City.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All grade areas shall be true to line and grade as shown on the typical sections and/or as required by the City. When the existing planting is below sidewalk and curb, the area shall be filled and dressed out to the walk regardless of the limits shown on the plans. Wherever fill material is required in the planting area, it shall be left enough higher to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks in excess of one (1) inch diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes shall be dressed neatly so as to present a uniform, well sloped surface.

All excavation material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from the clearing and grubbing or grading operations shall be removed, and disposed of at the Contractor's prearranged location. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer shall remove, dispose of and replace the same as applicable at his own expense.

Drainage facilities, such as catch basins, inlets, culverts, and open ditches, shall be cleaned of all debris which is the result of the Developer's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements, such as portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the City.

Castings for manholes, monuments, water valves, lamp poles, vaults, and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the City.

34. FINAL INSPECTION

The Developer shall bear all costs incurred in correcting any deficiencies found during inspection, including the cost of any additional inspection that may be required by the City to verify the correction of said deficiency.

35. GENERAL GUARANTEE AND WARRANTY

The Developer shall be required, upon completion of the work, and acceptance by the City, to furnish to the City a written guarantee covering the material and workmanship for a period of one year after the date of final acceptance, and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as a result of furnishing, under this agreement, poor materials and/or workmanship. The Developer shall obtain warranties from the Contractors, subcontractors, and suppliers of material or equipment where such warranties are specifically required herein, and shall deliver copies of same to the City upon completion of the work.

36. SALVAGE

When directed on the plans, salvage all abandoned fire hydrants, valve boxes, valve marker posts, and hydrant guard posts, and return the material to the City's yard. Do not use salvaged materials in new construction unless approved by the City. Remove hydrants by first cutting the supply pipe to avoid damage to the hydrant.

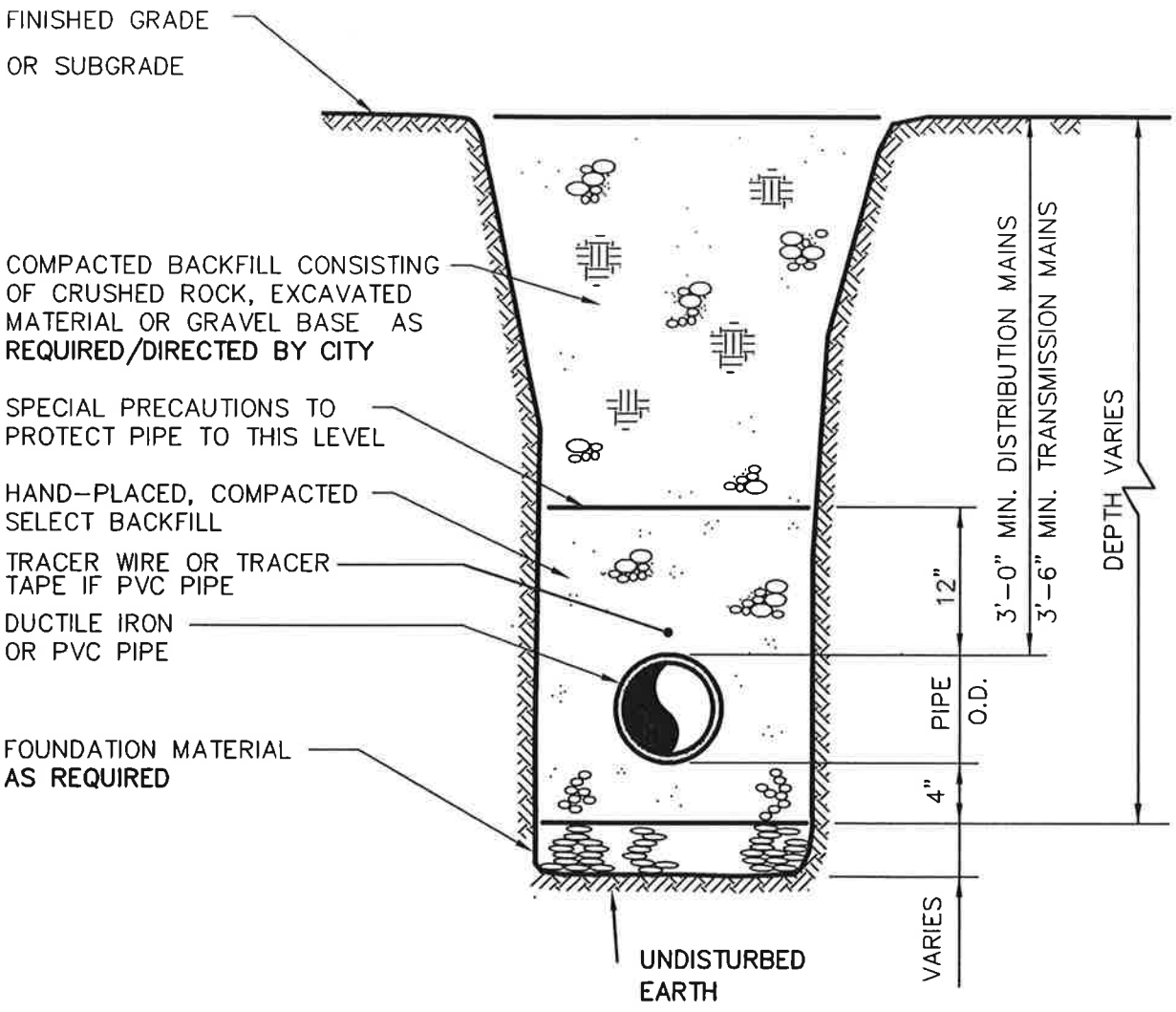
*** END OF SECTION ***

SECTION FOUR

CITY OF ROY

WATER MAIN STANDARD DETAILS

INDEX



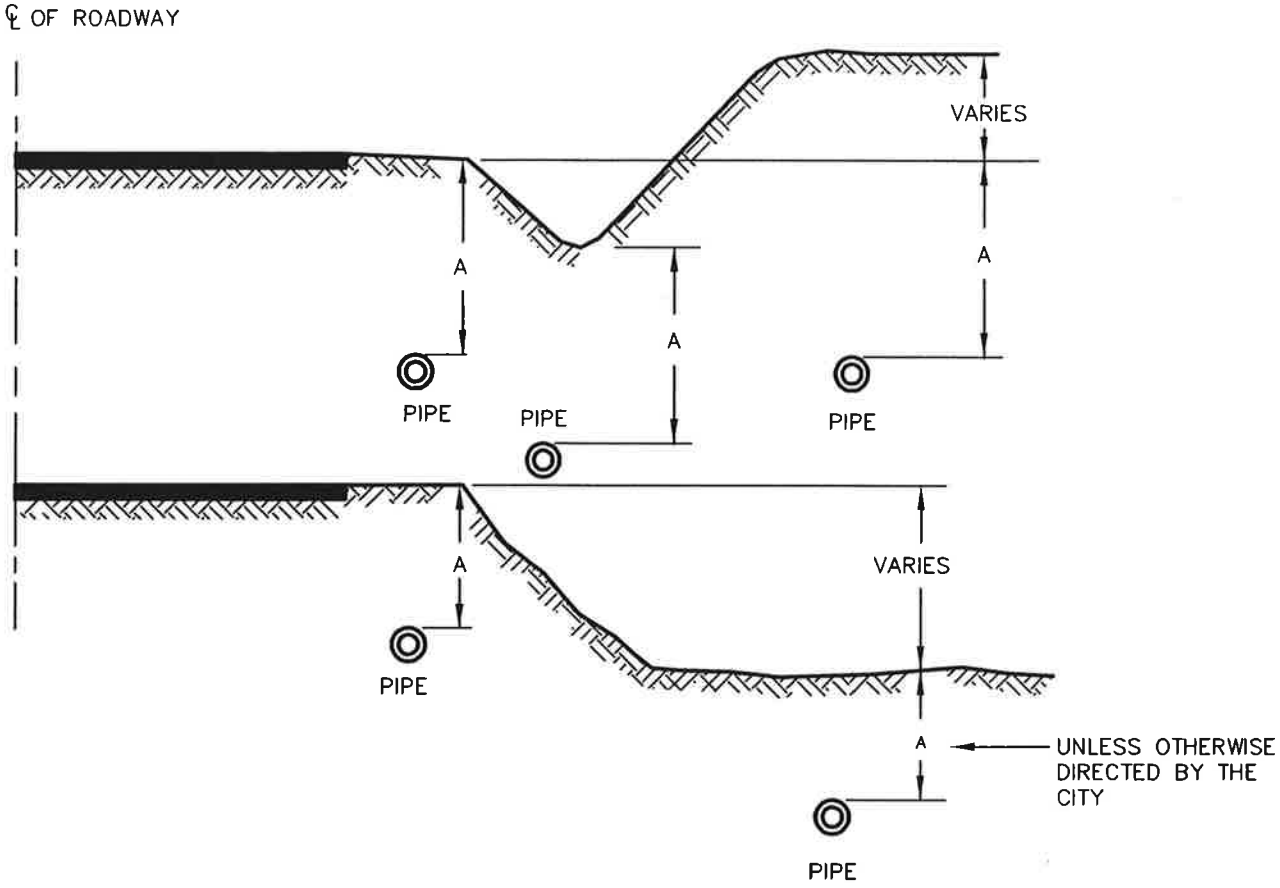
NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH THE CITY STANDARDS AND\OR THE STATE OR COUNTY PERMIT REQUIREMENTS (AS MAY BE REQUIRED)

REVISED 11/04

WATER MAIN TRENCH SECTION

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 1**

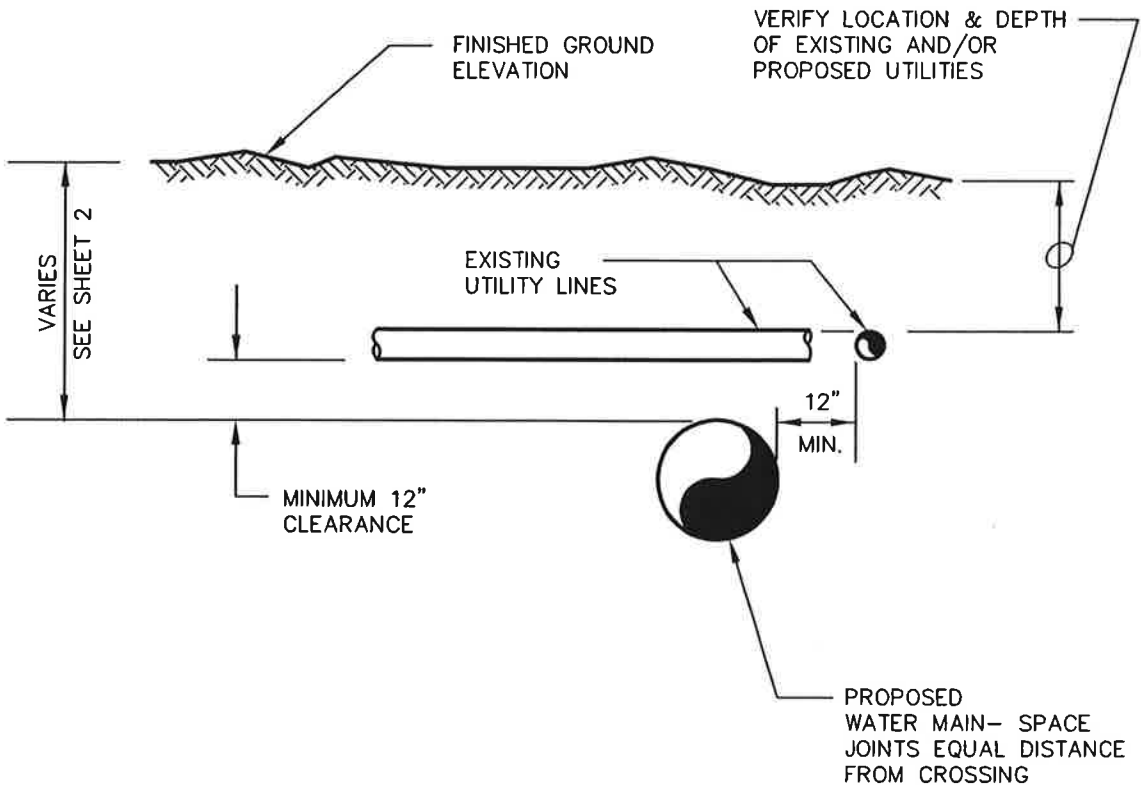


PIPE SIZE	A
6" – 12"	36"
14" – 18"	42"
20" & OVER	48"

REVISED 11/04

WATER MAIN DEPTH REQUIREMENTS

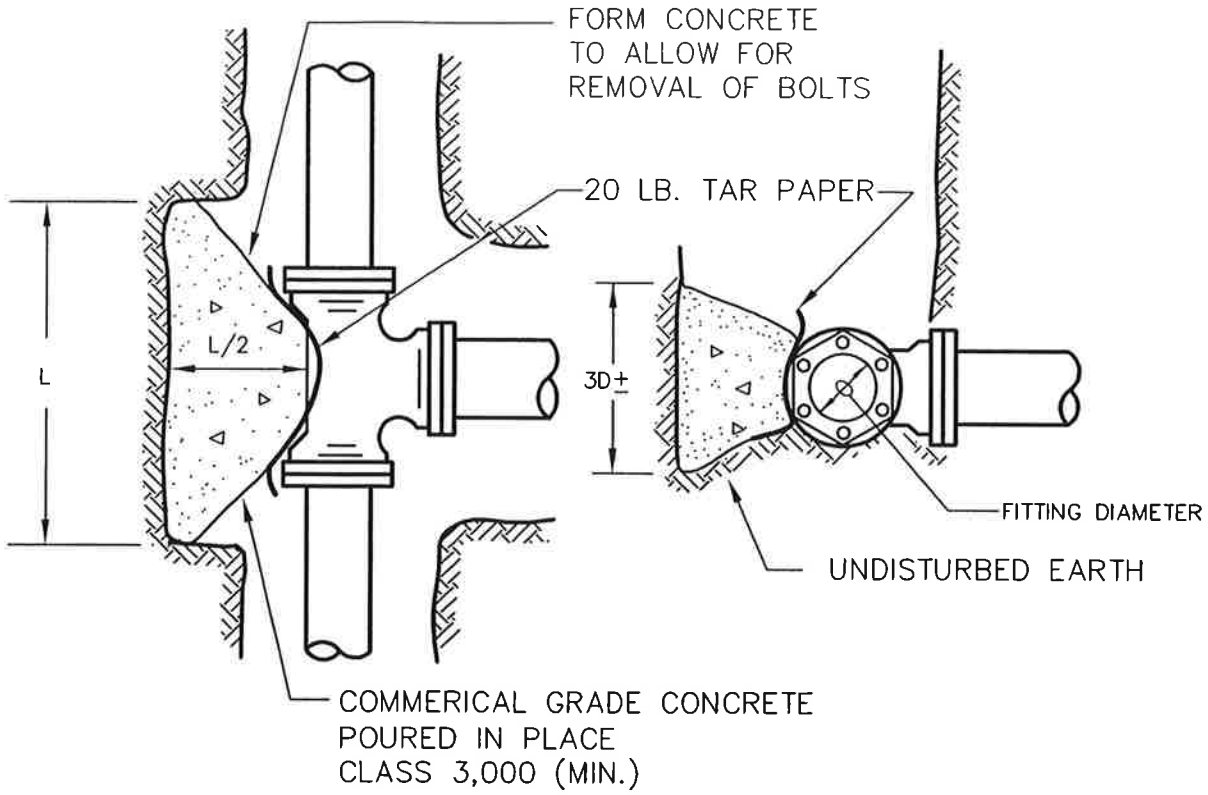
STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 2**



REVISED 11/04

TYPICAL UTILITY CROSSING

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 3**



PLAN **ELEVATION**

MINIMUM BEARING AREA TABLE					
FITTING D	TEE	90°	45°	22 1/2°	11 1/4°
6"	4 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.	2 SQ.FT.
8"	7 SQ.FT.	10 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.
10"	10 SQ.FT.	15 SQ.FT.	9 SQ.FT.	5 SQ.FT.	3 SQ.FT.
12"	14 SQ.FT.	22 SQ.FT.	12 SQ.FT.	6 SQ.FT.	4 SQ.FT.
16"	25 SQ.FT.	38 SQ.FT.	21 SQ.FT.	11 SQ.FT.	7 SQ.FT.
18"	32 SQ.FT.	48 SQ.FT.	27 SQ.FT.	14 SQ.FT.	8 SQ.FT.

NOTE:

BEARING AREA TABLE BASED ON 250 PSI PRESSURE AND 2000 PSF SOIL BEARING. IF PRESSURE IS GREATER OR SOIL BEARING IS LESS, THE THRUST BLOCK SIZE SHALL BE INCREASED. DESIGN FOR THRUST BLOCK TO BE PROVIDED BY THE DEVELOPER.

THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN AND SIZING OF ALL BLOCKING BASED ON SOIL CONDITIONS, TEST PRESSURES, AND OTHER RELEVENT CONDITIONS.

REVISED 11/04

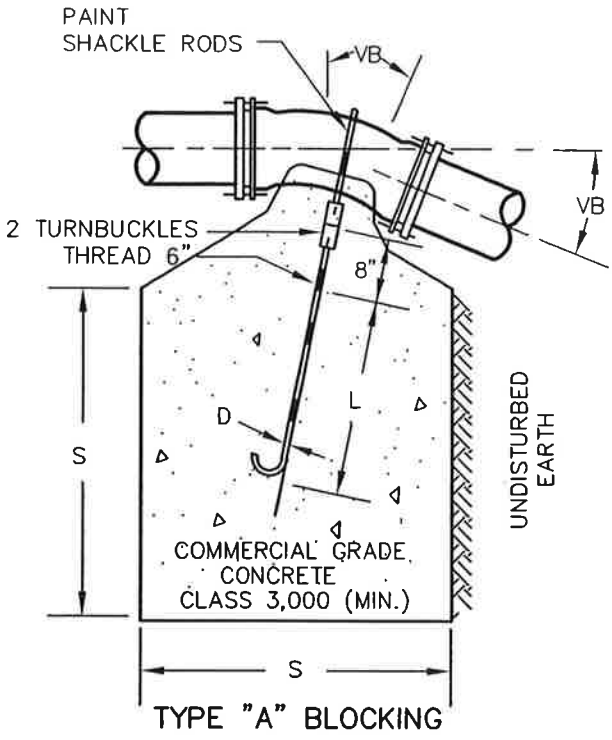
THRUST BLOCK DETAILS

TYPE "A" BLOCKING
FOR 11 1/4°–22 1/2° VERTICAL BENDS

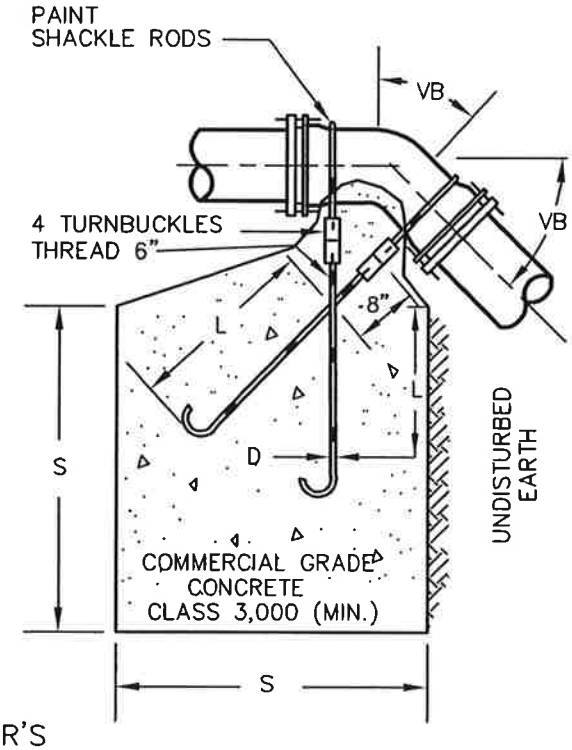
PIPE SIZE NOMINAL DIAMETER– INCHES	TEST PRESSURE PSI	VB VERTICAL BEND DEGREES	No. OF CU. FT. OF CONC. BLOCKING	S SIDE OF CUBE (LIN. FT.)	d DIAM. OF SHACKLE RODS (2) INCHES	L DEPTH OF RODS IN CONCRETE (LIN. FT.)
4"	300	11 1/4	8	2	5/8"	1.5
		22 1/2	11	2.2		2.0
6"	300	11 1/4	11	2.2	5/8"	2.0
		22 1/2	25	2.9		
8"	300	11 1/4	16	2.5	5/8"	2.0
		22 1/2	47	3.6		
12"	250	11 1/4	32	3.2	5/8"	2.0
		22 1/2	88	4.5	7/8"	3.0
16"	225	11 1/4	70	4.1	7/8"	3.0
		22 1/2	184	5.7	1 1/8"	4.0
20"	200	11 1/4	91	4.5	7/8"	3.0
		22 1/2	225	6.1	1 1/4"	4.0
24"	200	11 1/4	128	5.0	1"	3.5
		22 1/2	320	6.8	1 3/8"	4.5

TYPE "B" BLOCKING
FOR – 45° VERTICAL BENDS

		VB		S	d	L
4"	300	45	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		232	6.1	3/4"	2.5
16"	225		478	7.8	1 1/8"	4.0
20"	200		560	8.2	1 1/4"	
24"			820	9.4	1 3/8"	4.5



TYPE "A" BLOCKING



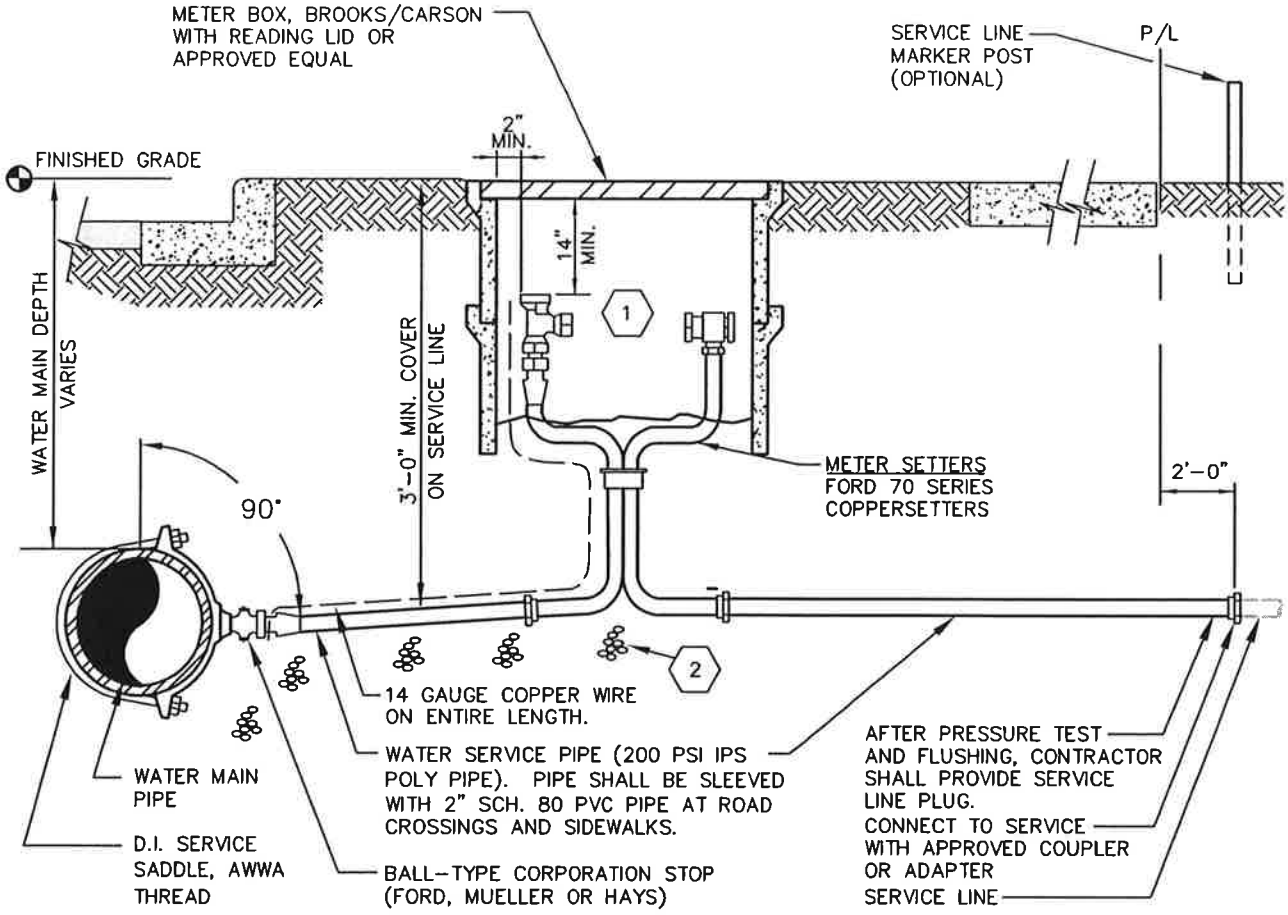
TYPE "B" BLOCKING

NOTE:

THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN AND SIZING OF ALL BLOCKING BASED ON SOIL CONDITIONS, TEST PRESSURES, AND OTHER RELEVENT CONDITIONS.

REVISED 11/04

VERTICAL ANCHOR BLOCK



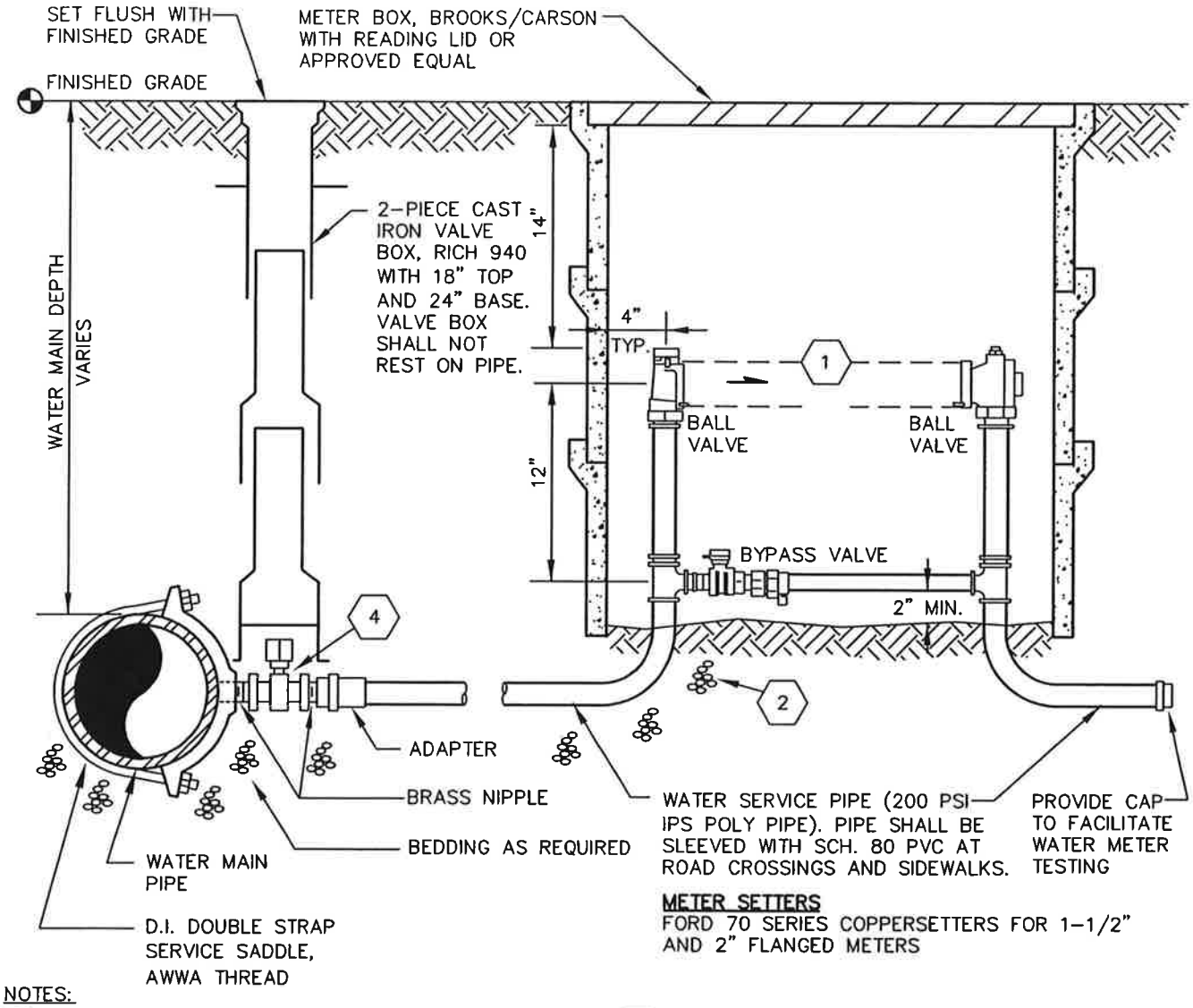
NOTES:

1. METER NOT SHOWN FOR CLARITY. REFERENCE SENSUS SRII WATER METER STANDARDS FOR TYPE AND DIMENSIONS FOR REQUIRED METER.
2. TRENCH BACKFILL FOR SERVICE PIPE SHALL CONSIST OF SAND AND PEA GRAVEL.
3. ANY METERS DAMAGED OR CLOGGED DURING CONSTRUCTION SHALL BE REPLACED BY THE DEVELOPER, WITH METER SUPPLIED BY THE CITY AT THE DEVELOPER'S EXPENSE.

REVISED 11/04

1" & SMALLER WATER SERVICE

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 6**



METER SETTERS
FORD 70 SERIES COPPERSETTERS FOR 1-1/2" AND 2" FLANGED METERS

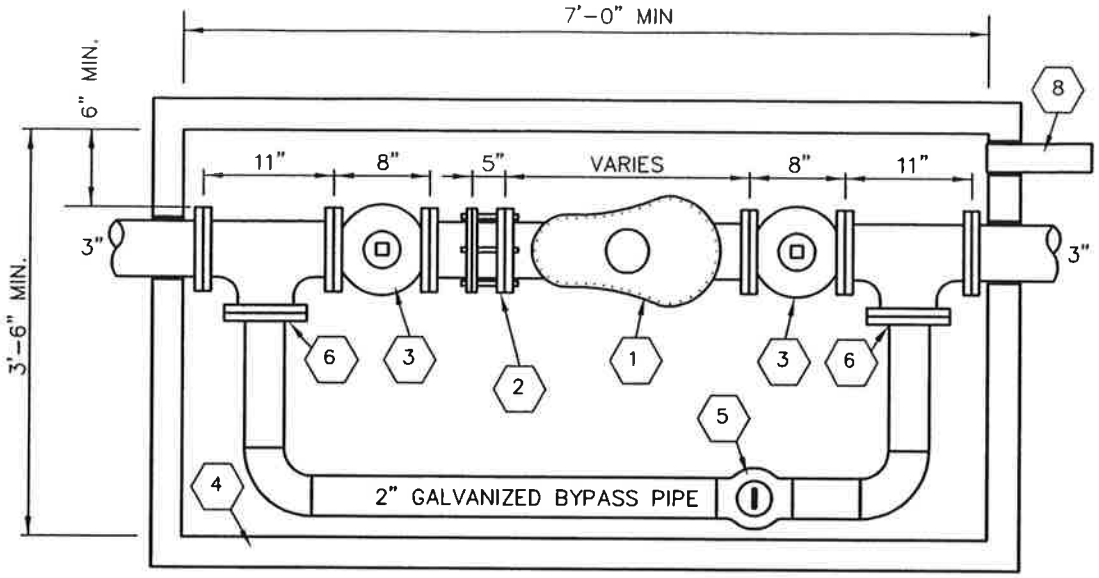
NOTES:

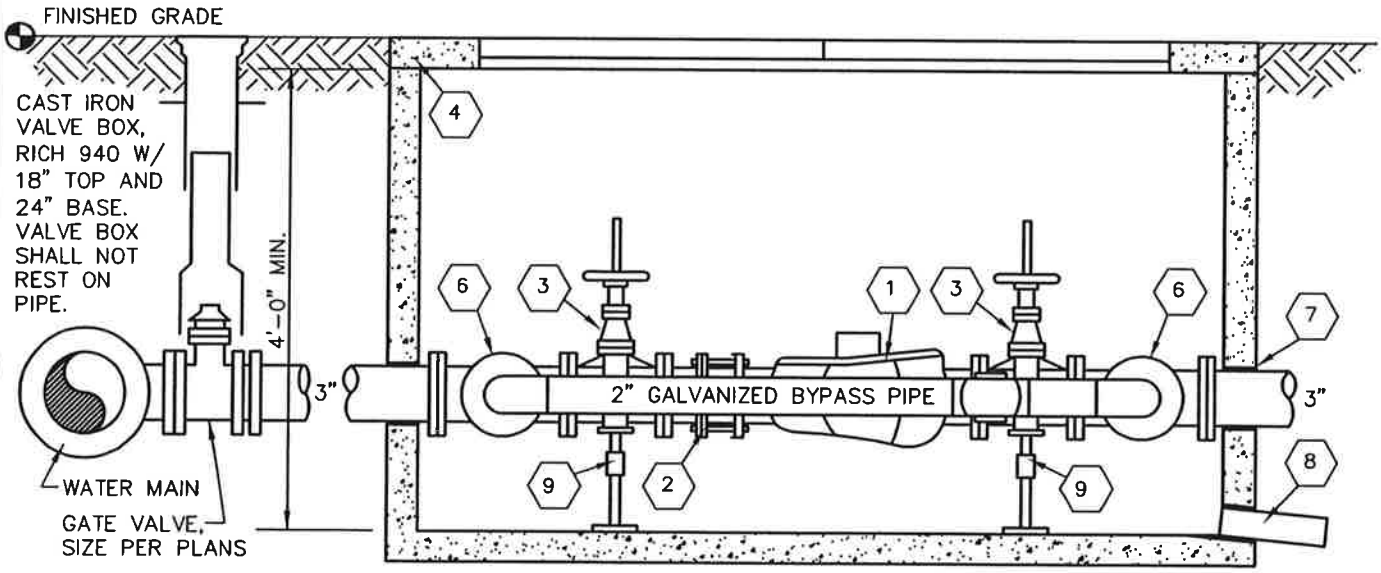
1. METER NOT SHOWN FOR CLARITY. REFERENCE SENSUS PMM MULTIJET WATER METER STANDARDS FOR REQUIRED METER. **VERIFY METER TYPE AND DIMENSIONS PRIOR TO ORDERING METER SETTER.**
2. TRENCH BACKFILL FOR SERVICE PIPE SHALL CONSIST OF SAND AND PEA GRAVEL.
3. ANY METERS DAMAGED OR CLOGGED DURING CONSTRUCTION SHALL BE REPLACED BY THE DEVELOPER. WITH METER SUPPLIED BY THE CITY AT THE DEVELOPER'S EXPENSE.
4. BALL VALVE FOR IRON PIPE, FORD NO. B11-666, B11-777, OR EQUAL WITH 2" OPERATING NUT ADAPTER, FORD NO. QT-67.

REVISED 11/04

1-1/2" & 2" WATER SERVICE

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 7**





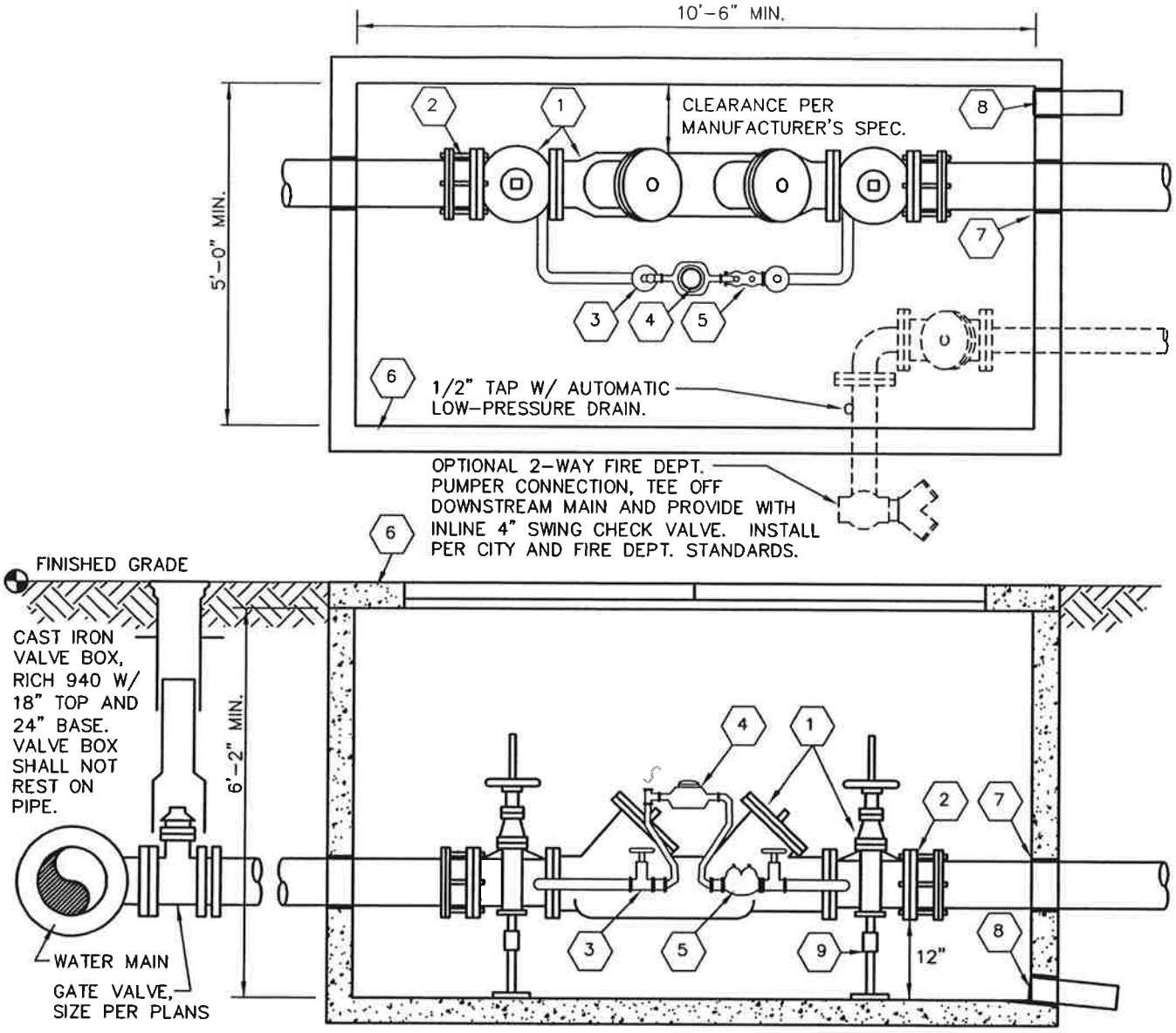
1. COMPOUND METER W/ STRAINER, SENSUS SRH OR EQUAL, SIZE AS NOTED ON PLANS. (SEE METER TABLE).
2. ROMAC STYLE FLANGED COUPLING ADAPTER.
3. RESILIENT SEAT GATE VALVE W/ NON-RISING STEM.
4. PRE-CAST CONCRETE VAULT, UTILITY VAULT CO., NO. 575-LA WITH SPRING LOADED, LOCKABLE STEEL PLATE COVER NO. 2-332P TYPICAL OR APPROVED EQUAL. VERIFY VAULT SIZE TO FIT COMPLETE ASSEMBLIES.

   2" LOCKABLE BALL VALVE.
5. NOTES:
   1) PROVIDE FLEXIBLE COUPLINGS ON BOTH INLET AND OUTLET PIPES OUTSIDE VAULT.
   2) INLET AND OUTLET PIPE FLANGES SHALL BE A MINIMUM 6" FROM INSIDE WALL OF VAULT.
6. BLIND FLANGE, DRILL AND TAP FOR 2" THREADED GALVANIZED PIPE.
7. WATER TIGHT GROUT, TYPICAL ALL PENETRATIONS.
8. 6" PVC DRAIN TO DAYLIGHT OR TO STORM SYSTEM OR SUMP PUMP.
9. ADJUSTABLE STANCHIONS.

REVISED 4/02

3" & LARGER WATER SERVICE

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 8**



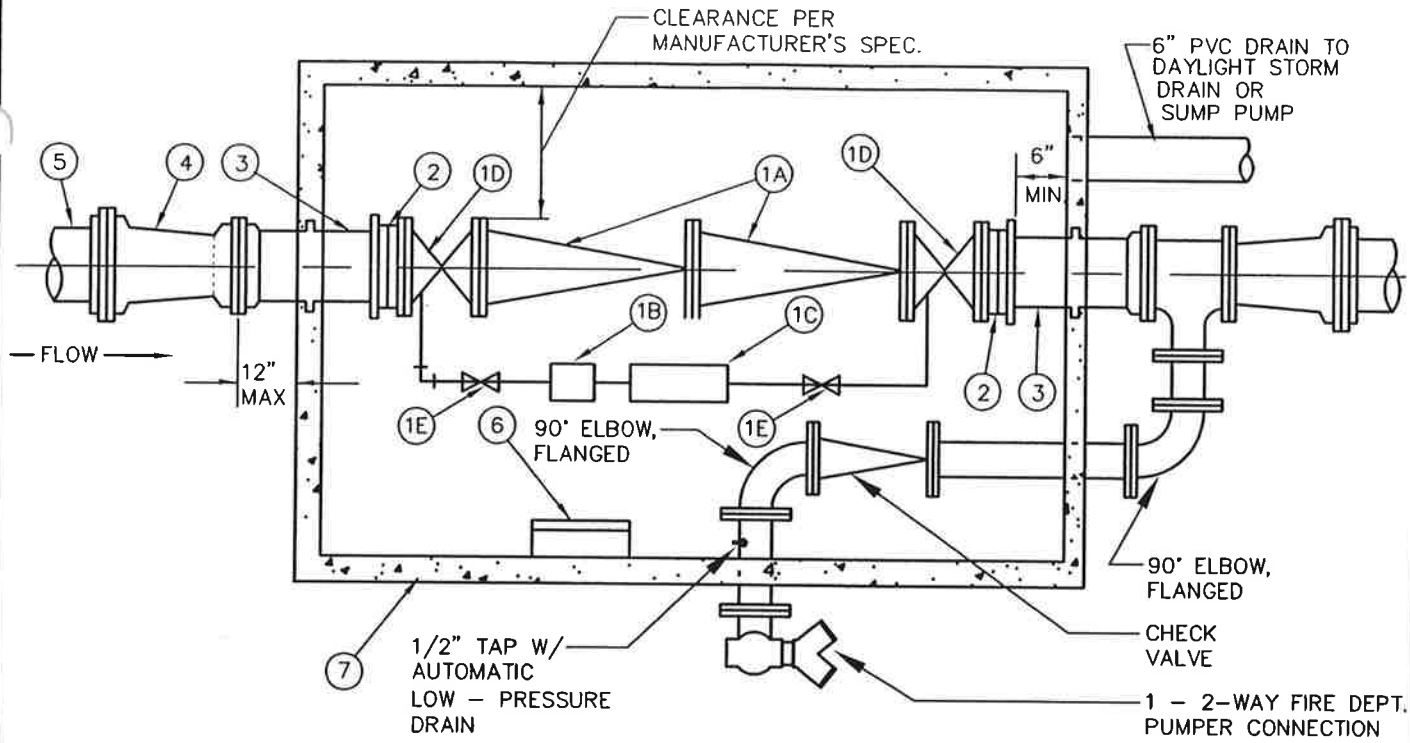
1. STATE DOH APPROVED DOUBLE-CHECK DETECTOR BACKFLOW PREVENTION ASSEMBLY WITH O.S. & Y.V., SIZE AS NOTED ON PLANS.
2. ROMAC STYLE FLANGED COUPLING ADAPTER, 6" MIN. FROM INSIDE VAULT WALL.
3. SHUT-OFF VALVES PER STATE REQUIREMENTS.
4. 5/8"x3/4" SENSUS SRII BYPASS METER (IN GALLONS).
5. STATE DOH APPROVED 3/4" DOUBLE CHECK VALVE ASSEMBLY.
6. PRE-CAST CONCRETE VAULT, UTILITY VAULT CO., NO. 5106-LA WITH SPRING LOADED, LOCKABLE STEEL PLATE COVER NO. 2-332P TYPICAL. VERIFY VAULT SIZE TO FIT COMPLETE ASSEMBLIES.
7. WATER TIGHT GROUT, TYPICAL ALL PENETRATIONS.
8. 6" PVC DRAIN TO DAYLIGHT OR TO STORM SYSTEM OR SUMP PUMP
9. ADJUSTABLE STANCHIONS (2 TOTAL).

NOTES:
1) PROVIDE FLEXIBLE COUPLINGS ON BOTH INLET AND OUTLET PIPES OUTSIDE VAULT.
2) A CERTIFIED TEST REPORT SHALL BE SUPPLIED TO THE CITY FOR EACH DCDA.

REVISED 11/04

DOUBLE-CHECK DETECTOR ASSEMBLY

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 9**



LEGEND

1. DOUBLE–CHECK DETECTOR VALVE ASSEMBLY CAPABLE OF METERING WATER USAGE UNDER LOW FLOW CONDITIONS. 10.0 P.S.I. HEAD LOSS AT 1600 GPM FOR 8" SIZE. ASSEMBLY TO BE STATE DSHS APPROVED. SIZE AS SPECIFIED ON PLANS.
   - 1A. 2 – CHECK VALVES, (FL)
   - 1B. 1 – BY–PASS METER 5/8" X 3/4" SENSUS SR II TR–PL W/ MXV 505 "GALLONS" READING METER COMPLETE WITH SPUD NUT.
   - 1C. 1 – DOUBLE CHECK VALVE ASSEMBLY, (DSHS APPROVED.) 3/4" FOR 8" D.D.C.V.
   - 1D. 2 – GATE VALVES, (FL) W/HAND WHEEL; NON RISING STEM, RESILIENT SEATED AS PER STATE REQUIREMENTS.
   - 1E. 2 – GATE VALVES, (FL) W/ HAND WHEEL; NON–RISING STEM, RESILIENT SEATED AS PER STATE REQUIREMENTS.
2. 2 – FLANGED COUPLING ADAPTER, SIZE AS SPECIFIED ON PLANS. (LOCATE MINIMUM 6" FROM INNER WALL)
3. 2 – PIPE SPOOLS, PLAIN END. SAME SIZE AS SPECIFIED ON PLANS.
4. 1– REDUCER (MJ X MJ), IF REQUIRED. SIZE AS SPECIFIED ON PLANS.
5. WATER MAIN CL52, SIZE AS SPECIFIED ON PLANS.
6. LADDER, LOCATE AS DIRECTED BY CITY.
7. UTILITY VAULT CO. VAULTS SHALL BE CITY STD. OF QUALITY; SUBMIT ALTERNATIVES FOR APPROVAL. HINGED AND SPRING LOCKED STEEL DIAMOND P/L COVER 2–332P, (DOUBLE HATCH COVER.) 4" C.I. FLOOR DRAIN INTO 6" PVC DRAIN LINE. DAYLIGHT OR STORM SYSTEM CONNECTION. (NO SUMP PUMPS) CHECK VAULT SIZE REQUIRED FOR ENCLOSING COMPLETE ASSEMBLIES.

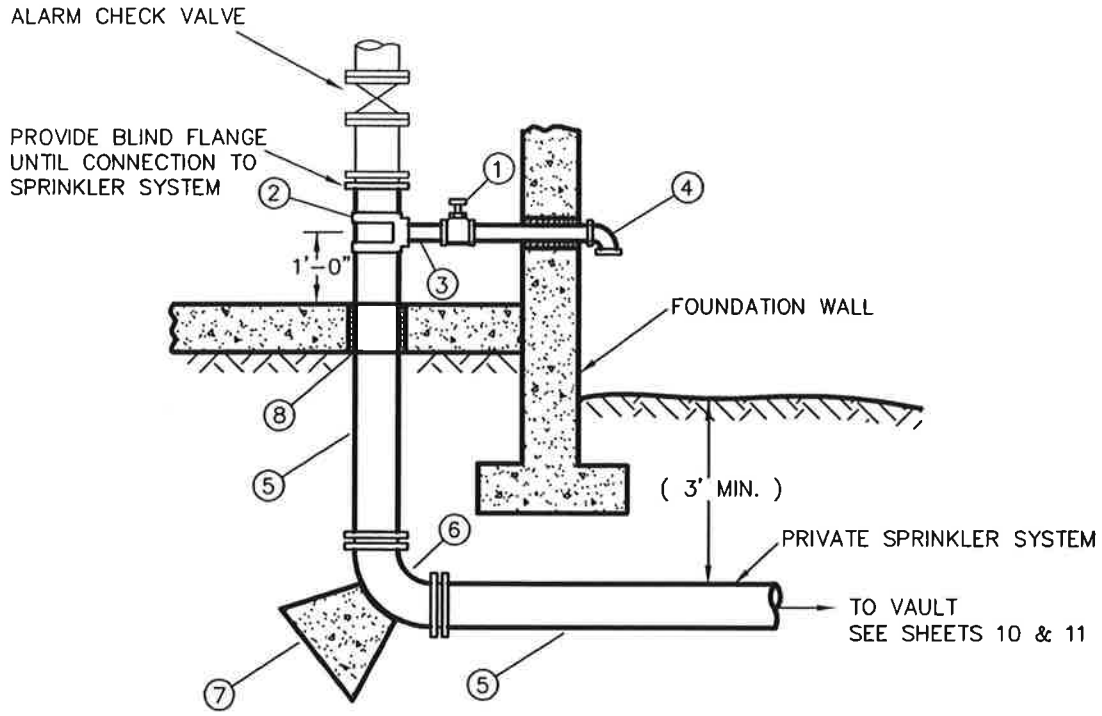
MIN. VAULT SIZES:

4"	5106 LA	--	5'–0" X 10'–6" X 6'–3" HIGH
6"	5106 LA	--	5'–0" X 10'–6" X 6'–3" HIGH
8"	612 LA	--	6'–0" X 12'–0" X 6'–6 1/2" HIGH
10"	612 LA	--	6'–0" X 12'–0" X 6'–6 1/2" HIGH

REVISED 11/04

DOUBLE–CHECK DETECTOR WITH FIRE CONNECTION

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 10**



NO.	DESCRIPTION
1	2" GATE VALVE
2	FORD STAINLESS STEEL DOUBLE STRAP SADDLE (OR APPROVED EQUAL)
3	2" GALV. NIPPLE
4	2" GALV. 90° ELL
5	D.I. CL. 52 SUPPLY MAIN (SIZE AS DETERMINED BY FIRE FLOW REQUIREMENTS)
6	90° BEND (MJ X MJ) WITH MEGALUG ADAPTER
7	CONCRETE THRUST BLOCK (SIZE TO BE APPROVED BY CITY)
8	PIPE SLEEVE

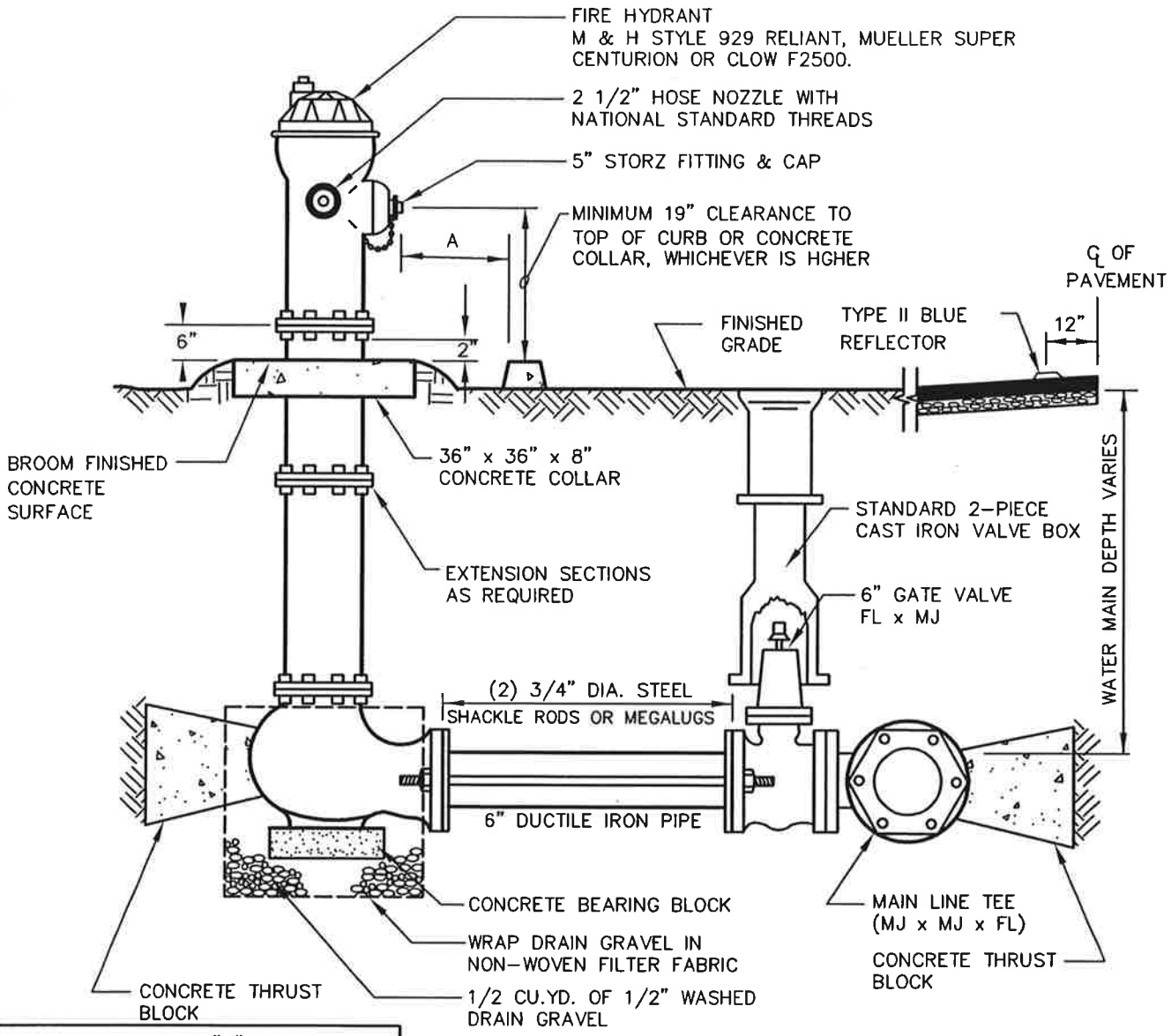
NOTES:

1. AFTER SYSTEM IS TESTED, PURITY SAMPLES WILL BE TAKEN AT ALL RISERS IN SYSTEM

REVISED 11/04

RISER DETAIL

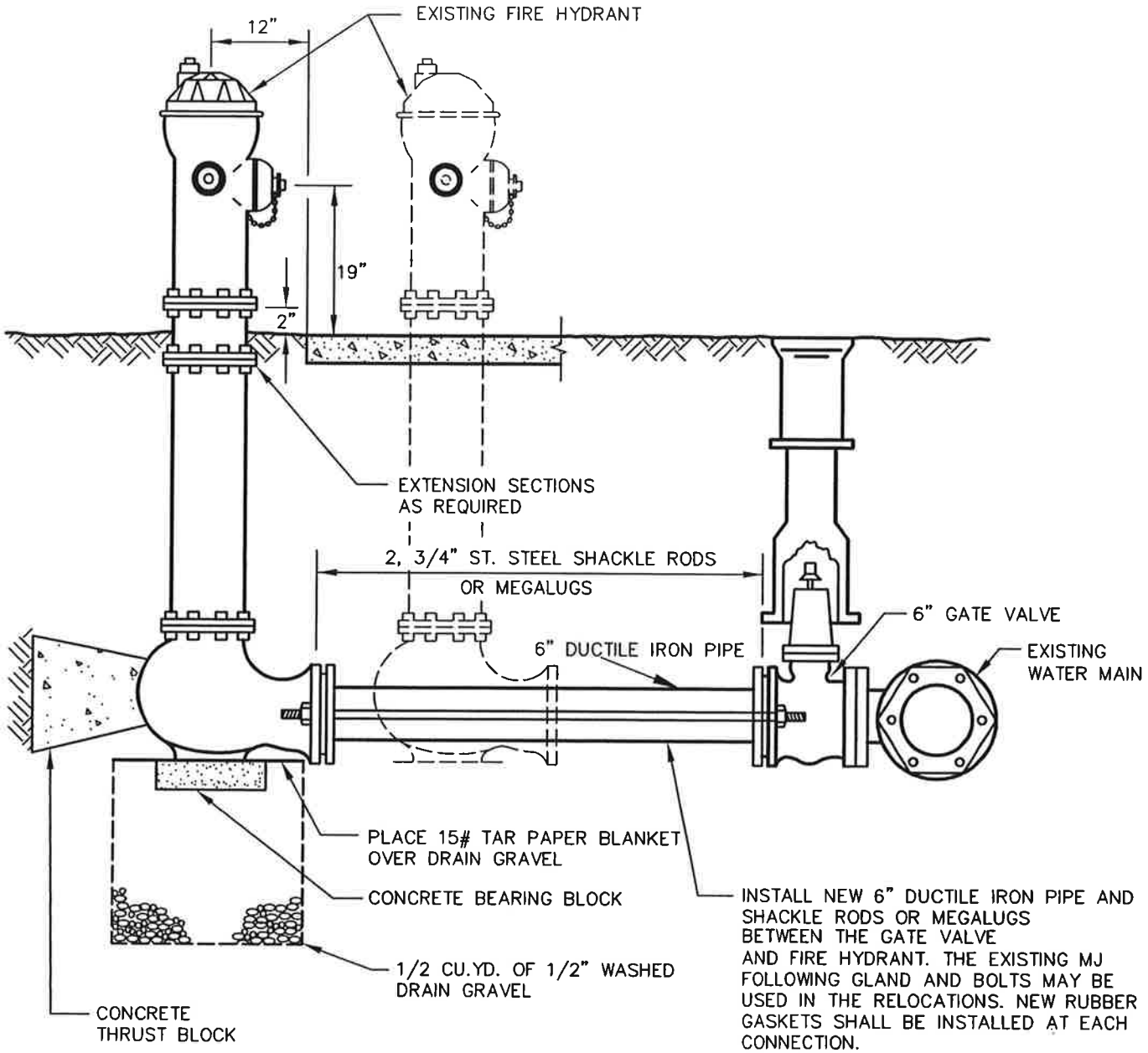
(FROM DOUBLE-CHECK DETECTOR BACKFLOW ASSY.)



SETBACK "A"
1 FOOT TO 2.5 FEET TO BACK OF CURB
3 FEET TO PAVED ROADWAY, (INCLUDING PARKING AND BICYCLE LANE)
1 FOOT TO BACK OF SIDEWALK

REVISED 11/04

FIRE HYDRANT INSTALLATION



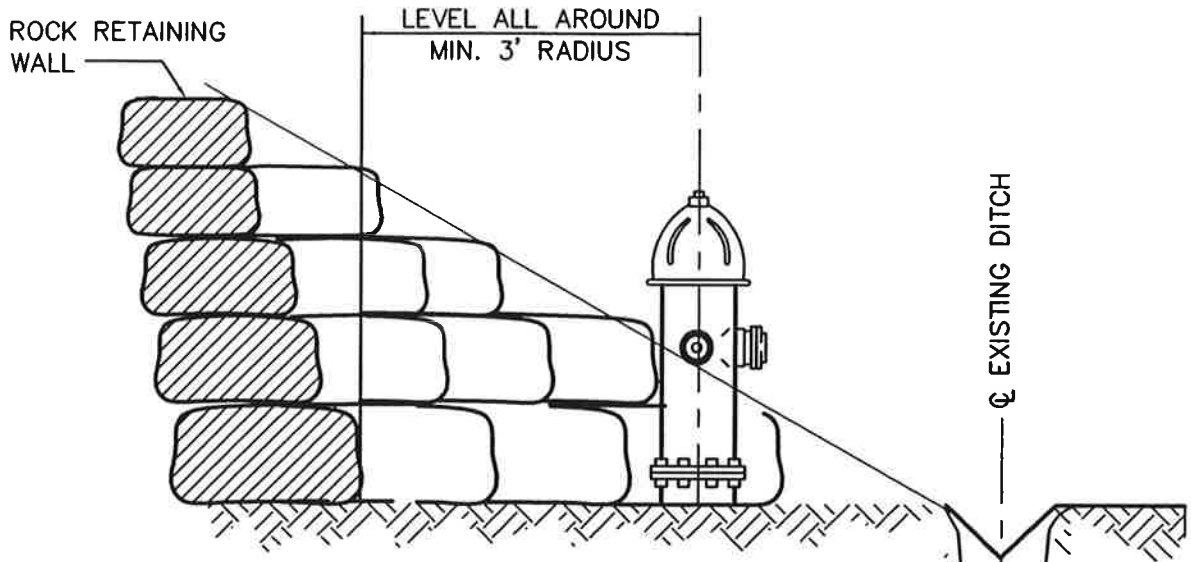
NOTE :

ALL RELOCATED FIRE HYDRANTS SHALL HAVE 5" PUMPER PORTS WITH STORZ OR EQUIVALENT FITTING & CAP.

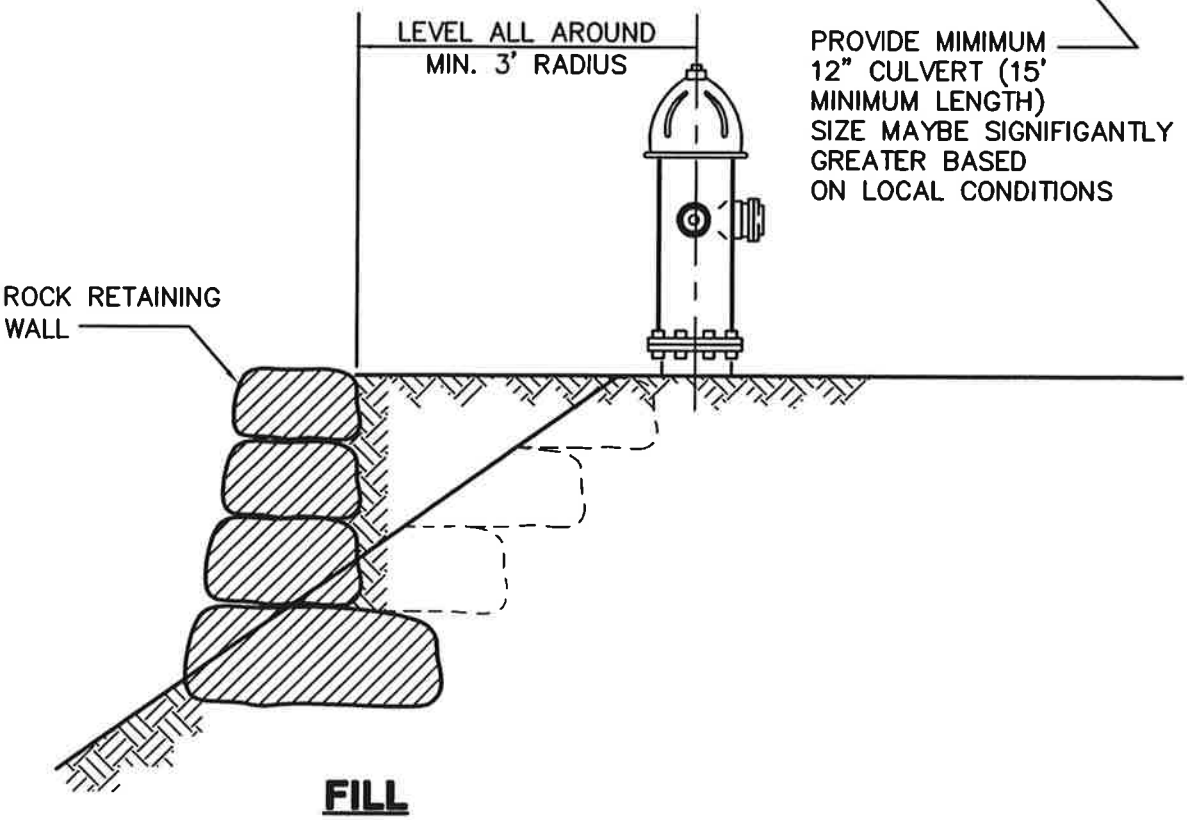
REVISED 11/04

FIRE HYDRANT RELOCATION

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 13**



CUT

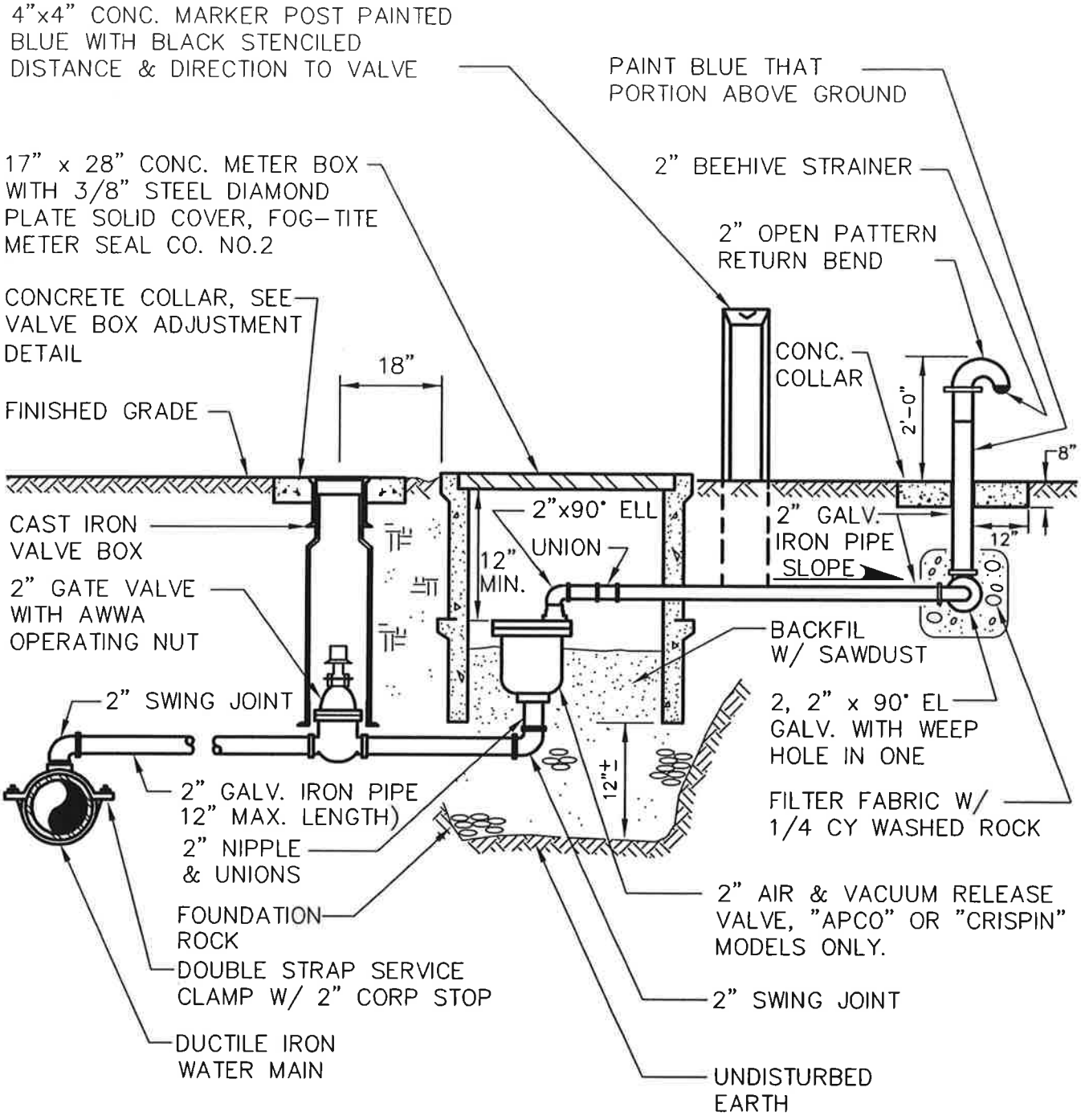


FILL

REVISED 11/04

FIRE HYDRANT LOCATION IN CUT OR FILL

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 14**



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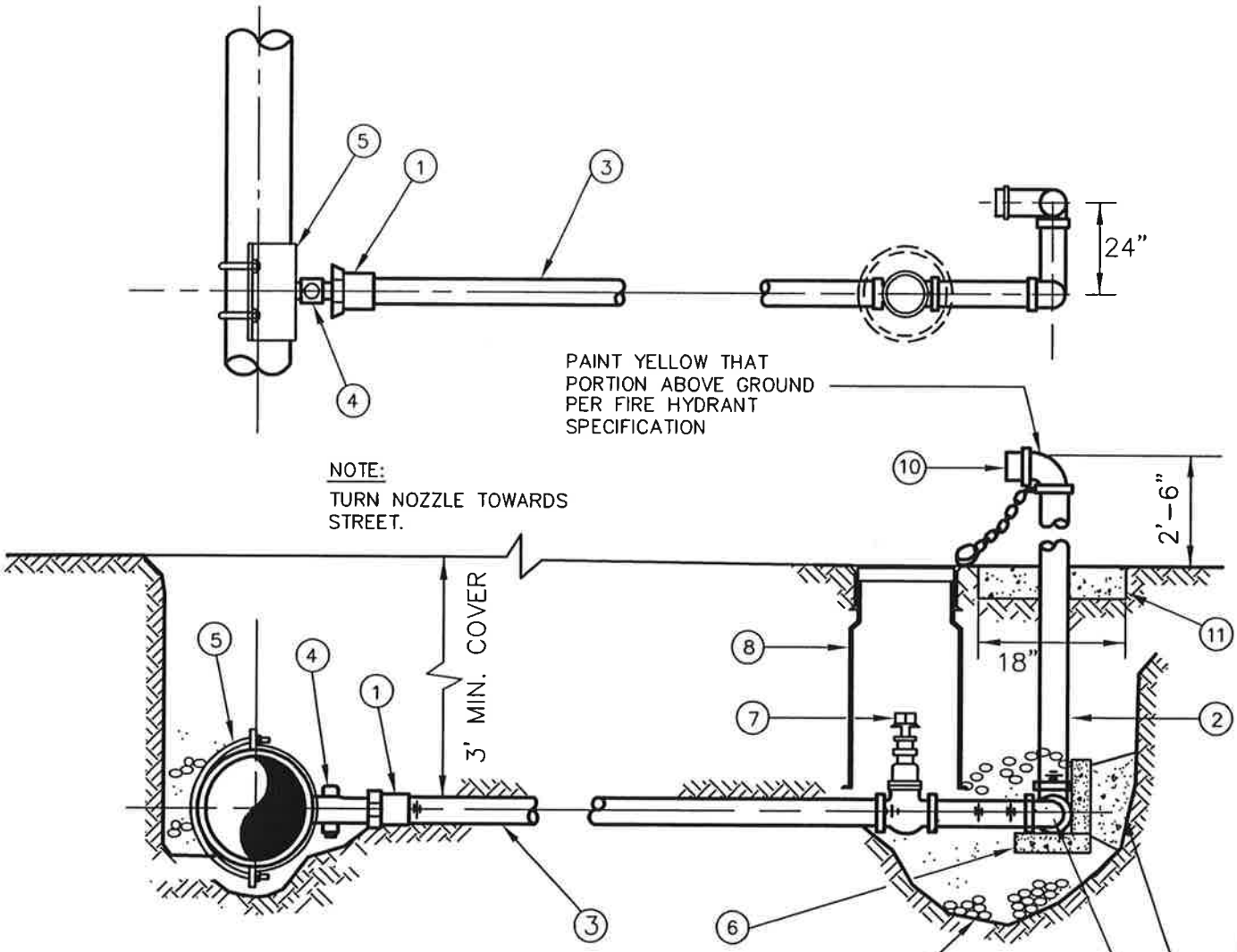
AIR & VACUUM RELEASE ASSEMBLY

STANDARD DETAILS	CITY OF ROY	SHEET 4 - 15

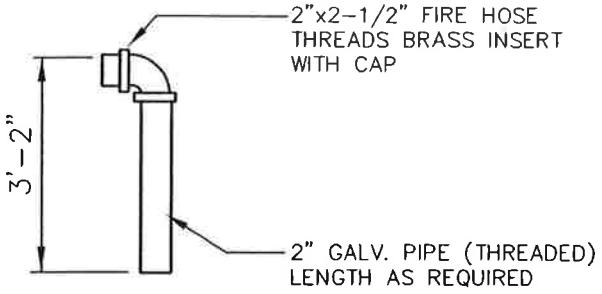


1. ADAPTER
2. GALVANIZED PIPE – 2"
3. COPPER PIPE – 2" (3" SCHEDULE 80 PVC SLEEVE UNDER PAVEMENT)
4. 1–1/2" CORP STOP
5. D.I. SERVICE SADDLE
6. 2 – 2" x 8" x 16" CONC. BLOCKS.
7. 2" GATE VALVE WITH HEX NUT.
8. CAST IRON VALVE BOX , RICH 940
9. 1.4 CUBIC YARD WASHED GRAVEL POCKET
10. 2"x 2–1/2" HOSE THREADS BRASS INSERT WITH CAP AND CHAIN
11. 8" THICK CONCRETE COLLAR

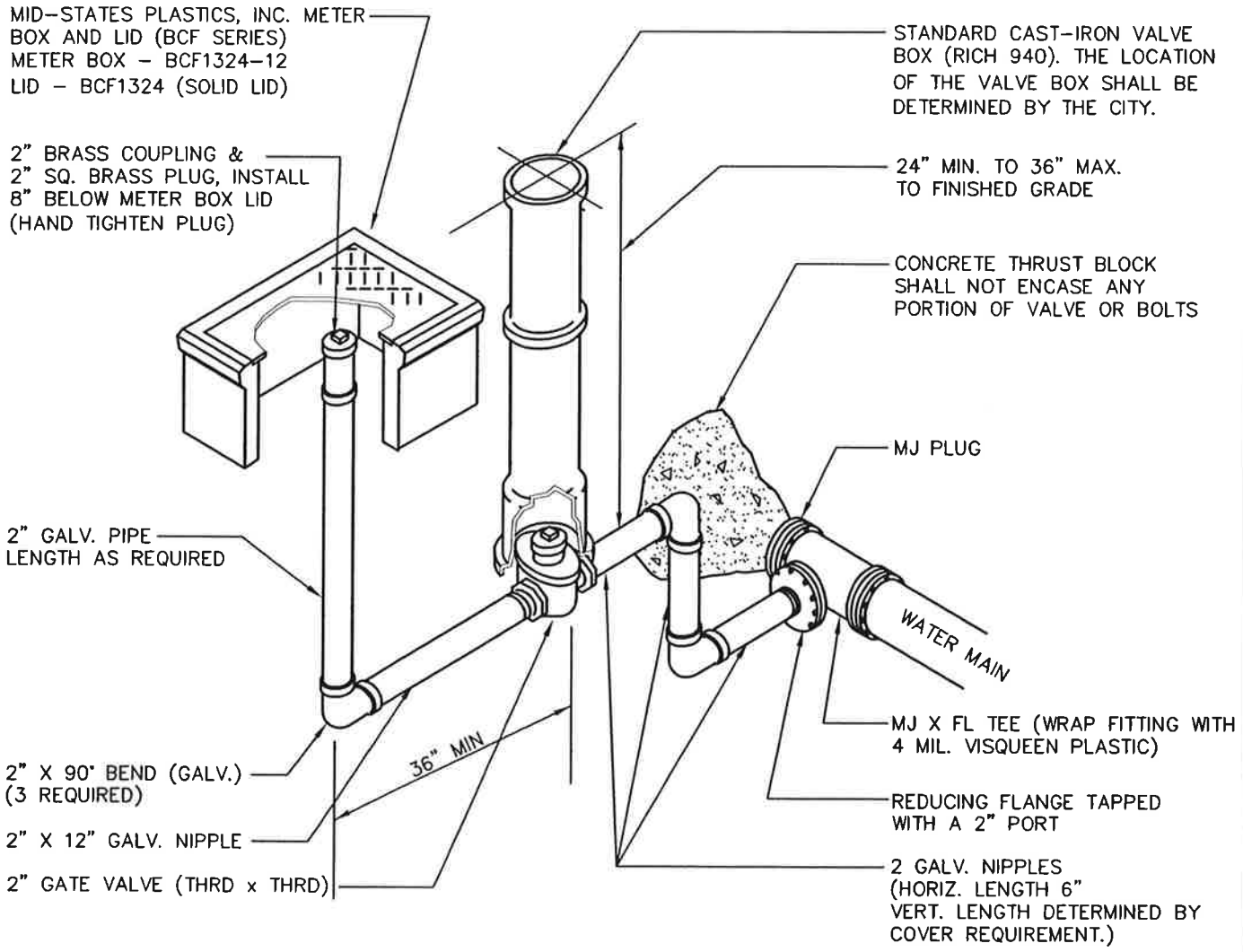
REVISED 11/04

IN–LINE BLOW OFF ASSEMBLY

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 16**



BLOWOFF PIPE ASSEMBLY



NOTE:

1. A 4"x4" CONC. MARKER POST PAINTED YELLOW WITH THE DISTANCE AND DIRECTION TO THE VALVE STENCILED IN BLACK ON THE FACE OF THE POST SHALL BE INSTALLED WITH THE BLOWOFF ASSEMBLY.

2. ONE BLOWOFF PIPE ASSEMBLY (SEE DETAIL) SHALL BE PROVIDED FOR EVERY 4 BLOWOFF ASSEMBLIES INSTALLED.

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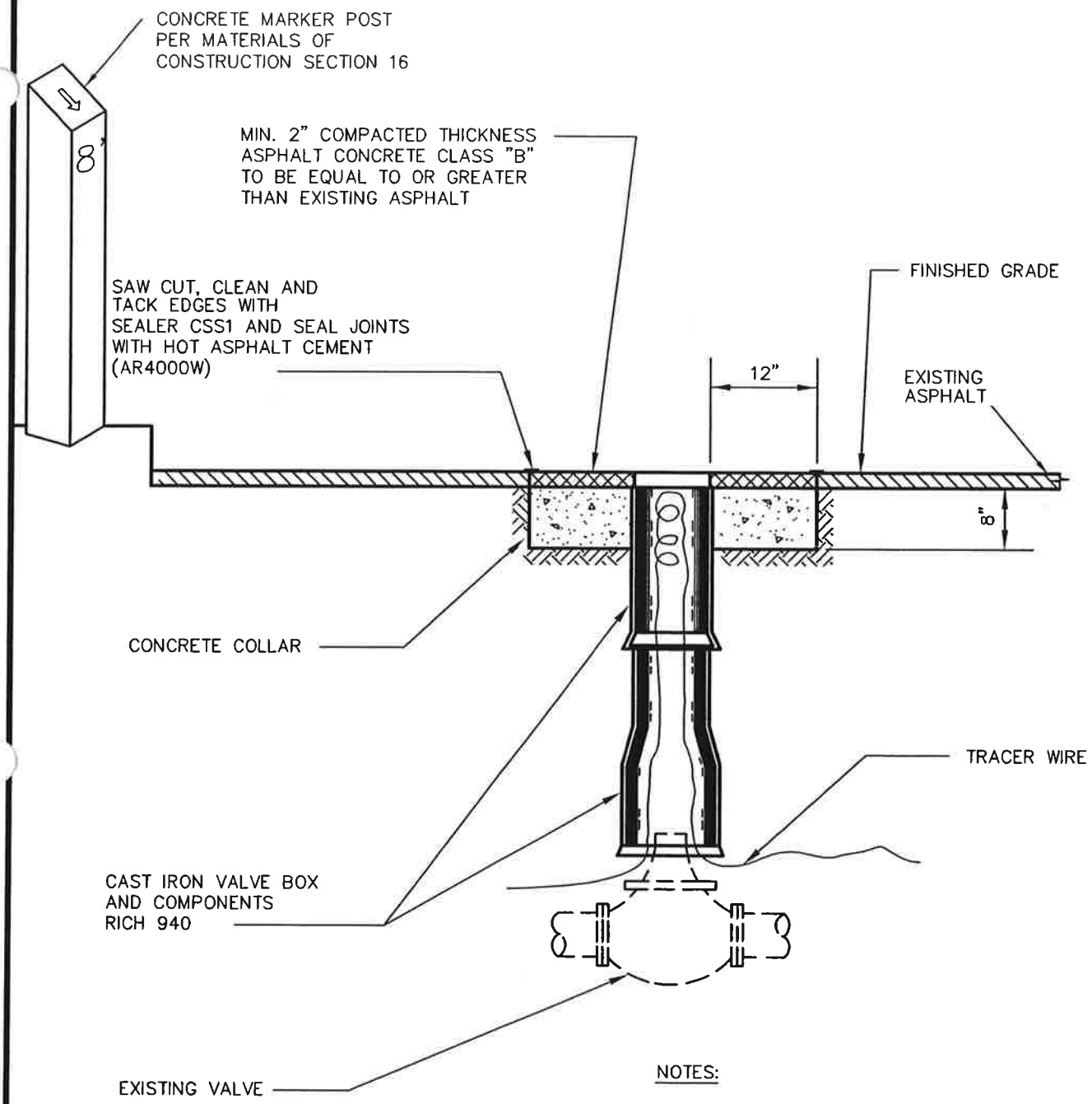
END LINE BLOWOFF ASSEMBLY

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 17**



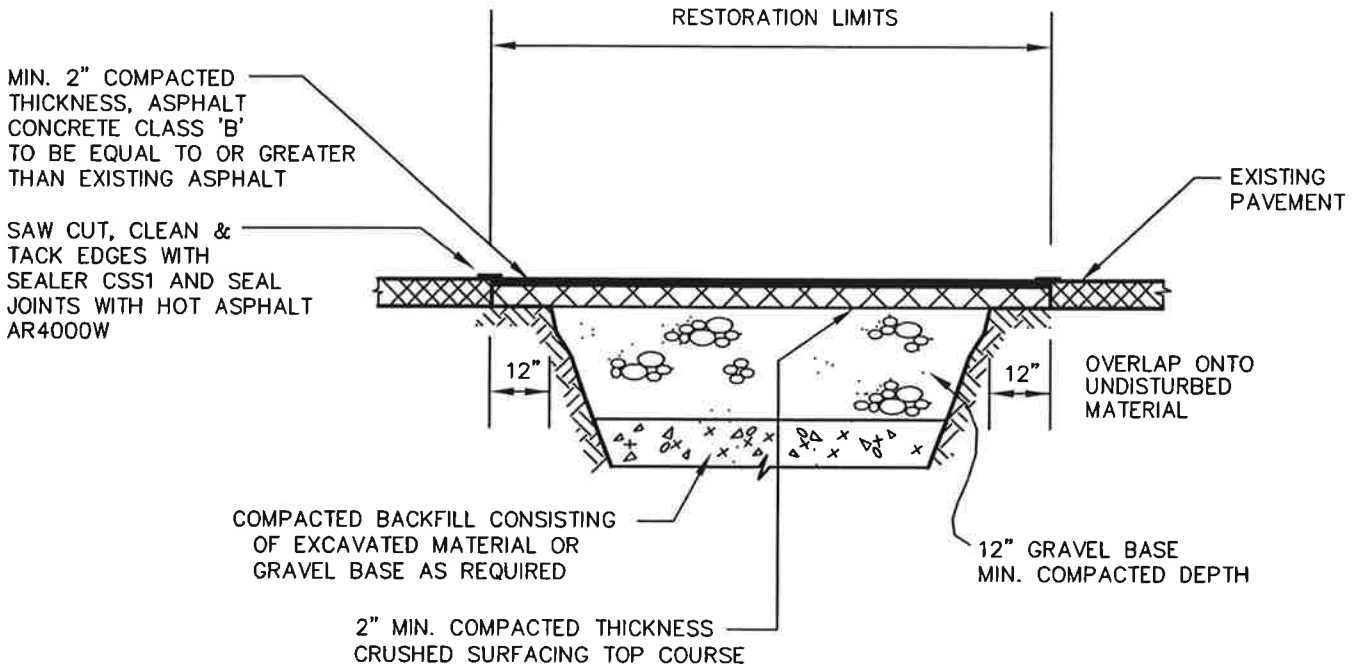
NOTES:

1. ALL EXISTING CAST IRON VALVE BOXES SHALL BE ADJUSTED TO GRADE WITH CAST IRON COMPONENTS.
2. ALIGNMENT OF THE VALVE BOX SHALL BE THE DEVELOPERS RESPONSIBILITY AND CARE SHALL BE TAKEN TO ENSURE THAT THE VALVE MAY BE OPERATED.

REVISED 11/04

VALVE BOX ADJUSTMENT

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 18**



REVISED 11/04

ASPHALT PAVEMENT REPAIR

STANDARD DETAILS	**CITY OF ROY**	SHEET **4 - 19**

SECTION FIVE

CITY OF ROY

Standards for As-Built Drawings

The following are requirements for all as-built drawings submitted for approval and/or acceptance to the City of Roy.

1. Each and every sheet shall have a statement signed by a Professional Engineer registered in the State of Washington, attesting to the completeness and accuracy of the as-built drawings. Easements for water facilities not located in the public right-of-way shall be recorded and the recording number shall be shown on the as-built drawings.

2. The water system drawings shall show all valves, tees, fittings and hydrants. All dimensions shall be listed on the plans.

3. Where services are tapped off of new or existing water mains, location of taps shall be shown on a separate table on the as-built drawing. Location of the meter box and setter, depth of service line, size of service line and address or addresses served shall also be shown on this table.

4. As-built drawings shall show distances to the water main from each near side property corner and/or right-of-way line at 100 foot intervals.

5. All hydrants shall show depth of bury and a completed hydrant installation report shall be submitted. Hydrant installation report forms can be obtained at the City. Projects which involve the installation of new fire hydrants shall require flow testing of each hydrant by the Developer in the presence of a City of Roy Fire Department or City Engineer representative. The Developer, his contractor and/or engineer shall co-ordinate the required flow testing and the information shall be included on the as-built drawings in a separate table or note.

6. All valves shall show depth of bury and a complete valve installation report shall be submitted. Valve installation report forms can be obtained at the City.

7. All as-built drawings shall be on 24" x 36" reproducible Mylar.

8. All meters shall clearly show that they are in the public right-of-way or easements must be provided and the recording number shown on the as-built drawing. Distances from the meter to the nearest property corner or fixed point shall be shown on the as-built drawing.

9. AutoCAD files containing the project as-built drawings shall also be supplied to the City. The computer files shall be supplied on three and one half (3-1/2) inch discs and be of the latest release of AutoCAD.

SECTION SIX

CITY APPROVED FORMS

CITY OF ROY

FIRE FLOW REQUIREMENT

Date: _____

Project: _____

Location: _____

Inquirer: _____

Phone: _____

Number of Stories: _____ % of 1st Floor: _____

Type of Construction: _____

Ground Area: _____

I.S.O. Flow Per Chart _____ G.P.M.
Add up to 25% for High Fire Load _____ G.P.M.
Subtract up to 25% for Low Fire Load _____ G.P.M.
Subtract 50% for Sprinklers _____ G.P.M.

SUBTOTAL: _____ G.P.M.

(FORM 2)

CITY OF ROY

DEVELOPER AGREEMENT

THIS AGREEMENT, by and between the City of Roy, a municipal corporation, hereinafter referred to as "City", and , hereinafter referred to as "Developer":

WITNESSETH: That whereas the City of Roy, a municipal corporation, provides water service within the corresponding water service area boundary, and the above-named Developer is preparing to construct a water system, or additions thereto, and said development requires the City's water service;

WHEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Developer agrees to construct the water system, or additions thereto, to be connected to the City's water lines, and to maintain such additions until such time as the improvements are accepted by the City, with the agreements conditioned as set forth below. The water system, or additions thereto, shall be located within that area commonly referred to as , which property is described in Exhibit "A" attached hereto and referred to hereinafter as "Premises".

2. As a condition precedent to City obligations under this agreement, the Developer shall construct the proposed water system, or additions thereto, within said premises in conformance with the City's "Conditions and Standards for Water System Construction", as adopted together with any amendments thereto hereinafter made, and further to conform with the City's comprehensive water plan, which agreement shall include oversizing of water mains necessitated by the comprehensive plan.

3. The developer agrees that the construction of the water system, or additions thereto, shall not commence until the following conditions have been fulfilled:

a. The developer shall furnish the City with four (4) sets of detailed plans for the water system, or additions thereto, at Developer's own expense, prepared by a qualified engineer licensed in the State of Washington.

b. The above plans shall require the review and approval by the City and its Engineer, and the cost of such review shall be at the Developer's own expense.

c. Minimum requirements for all plans for water system, or additions thereto, submitted to the City for review are:

(1) Four (4) sets of all plans and documents shall be submitted, wherein two (2) sets will be retained by the City, and two (2) sets will be returned to the applicant.

(2) A preliminary plat of the area in which said water system, or additions thereto, are to be constructed, which plat has been approved by the City.

(3) A map showing the location of the plat in relation to the surrounding area.

(4) A contour map of the plat with contour intervals of five feet or less.

(5) A map showing the location and depth of all proposed utilities and any connections and/or interconnections to existing facilities or future extensions and connections.

(6) A 1" = 50' plan of the water system showing streets, lot lines, dimensions, and location of bench marks and monuments for the proposed plat, together with an indication of the development of the adjacent property.

(7) A profile 1" = 50' horizontal and 1" = 5' vertical of the finished road grades with the water system and other pertinent underground utilities located, with elevations noted thereon. The elevation datum shall be the same as used by the City. It shall be the responsibility of the Developer to confirm such datum with the City.

(8) Full-sized detail sheets shall be included as part of the construction drawings, as required to clearly indicate the details for all of the water system, or additions thereto, to be constructed, consistent with City standards.

(9) Specifications sufficient to fully describe the work, consistent with City's "Conditions and Standards".

(10) Approvals from all regulatory agencies.

d. Construction requirements in addition to the City standards and details for developer extensions, as adopted, are as follows:

(1) All streets and/or roadways shall be graded to within six inches of final grade before installation of water improvements.

(2) All lots shall be fully staked to assist all parties involved in the proper location of the water system including services.

(3) All contractors and subcontractors shall have a current Washington State Contractors License.

(4) The Developer's water system, or additions thereto, on Premises shall not be connected to the City water system until authorized by the City, and such connection shall be performed under the supervision and direction of the City.

e. For the purpose of applying RCW 4.24.115 to this Contract, the Developer and the City agree that the term "damages" applies only to the finding in a judicial proceeding and is exclusive of third party claims for damages preliminary thereto.

The Developer agrees to indemnify and hold harmless the City from all claims for damages by third parties, including costs and reasonable attorney's fees in the defense of claims for damages, arising from performance of the Developer's express or implied obligations under this Agreement. The Developer waives any right of contribution against the City.

It is agreed and mutually negotiated that in any and all claims against the City or any of its agents or employees by any employee of the Developer, any contractor or subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation hereunder shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Developer or any contractor or subcontractor under Workman's Compensation Acts, disability benefits acts or other employees' benefit acts. The City and the Developer agree that all third part claims for damages against the City for which the Developer's insurance carrier does not accept defense of the City may be tendered by the City by the Developer who shall, if so tendered by the City, accept and undertake to defend or settle with the Claimant. The City retains the right to approve claim investigation and counsel assigned to said claim and all investigation and legal work product regarding said claim shall be performed under a fiduciary relationship to the City. In the event that the City agrees or a court finds that the claim arises from the sole negligence of the City, this indemnification shall be void and the City shall be responsible for all damages payable to the third party claimant. In the event that the City and the Developer agree or a court finds that the claim arises from or includes negligence of both the Developer and the City, the Developer shall be responsible for all damages payable by the Developer to the third party claimant under the court findings, and, in addition thereto, the Developer shall hereunder indemnify the City for all damages paid or payable to the City under the court findings in an amount not to exceed the percentage of total fault attributable to the Developer. For example, where the Developer is 25% negligent, the Developer shall not be required to indemnify the City for any amount in excess of 25% of the claimant's total damages.

f. In the event the Developer in his operation damages or disrupts existing improvements, the repairs shall be made at the Developer's expense. In the event they are so damaged or the service disrupted and the Developer fails or is unable to immediately restore the service, then the Owners of the improvements may cause the repairs to be made by others and all costs for the same shall be at the Developer's own expense.

Where the construction crosses or is adjacent to existing utilities, the Developer shall exercise extreme care to protect such utilities from damage.

If any damage is done to an existing utility, the Developer shall notify the utility company involved, who will dispatch a crew to repair the

damage at the Developer's expense. All costs for the same shall be at the Developer's own expense.

The Developer shall be aware that some existing water facilities are known to contain asbestos cement pipe. The Developer shall conduct all work related to existing asbestos cement pipe in strict accordance with current WISHA safety regulations and provisions contained within WAC 296-62-077. All costs related to work in compliance with established rules and regulations shall be the responsibility of the Developer. Demolition of existing asbestos cement pipe, if required, will be permitted only after the proper permits are obtained from the Puget Sound Air Pollution Control Agency. The Developer shall be responsible for all associated fees and permits required for asbestos removal and disposal. Work crews shall be provided with proper protective clothing and equipment. Hand tools shall be used, and the asbestos cement pipe shall be scored and broken in lieu of sawing or other methods which release fibers into the atmosphere. Waste asbestos pipe shall be buried in the trench. Asbestos pipe to be abandoned in place shall not be disturbed, except as noted herein, and shall remain in its original position.

The Developer is cautioned that all existing drainage systems, whether open ditch, buried pipe, or drainage structures, are not on record. It shall be the responsibility of the Developer to repair or replace all such systems found during construction, which are damaged by the Developer's construction in a manner which is satisfactory to the City.

Where the Developer is allowed to use private property adjacent to the work, the property so used shall be returned to its original or superior condition. The Developer shall make all arrangements in advance with such property owners, to insure that no conflicts will ensue after the property is restored as described above. The Developer will be required to furnish the City with a written release from said private property owners, if the City deems it to be necessary to obtain such document.

4. The construction of the Developer's water system, or additions thereto, on the Premises shall be supervised by the City in such a manner and at such times as the City deems reasonably necessary to assure that construction of the system will conform with the above-mentioned plans and specifications. The Developer herewith agrees to allow such inspections and agrees to cooperate providing reasonable advance notice on his construction schedule during the various construction phases as requested by the City. The Developer further agrees to reimburse the City for all engineering fees and expenses incurred by the City for such supervision.

5. The Developer's water system, or additions thereto, on Premises shall not be accepted for service and use until the same have been fully inspected and approved, and the following requirements have been performed:

a. Submit to the City in AutoCAD format, latest release, the project computer files supplied on three and one half (3-1/2) inch discs accompanied by the original mylars, with all changes from the original design clearly marked to reflect the as-built conditions. The Developer's Engineer shall certify the accuracy of the record drawings and shall affix his seal and signature.

b. Payment of all permit fees and equivalent assessment charges and any other applicable City charges required for Premises.

c. Payment of all plan check and inspection fees.

d. Prepare and furnish the required easements in accordance with City's standard form, and furnish same to the City for approval by the City Attorney, along with the necessary recording fees.

e. Furnish the City with an affidavit warranting there are no liens against the improvements constructed on Premises by the Developers, this affidavit shall be in the form prescribed by the City.

f. Furnish the City with a Bill of Sale conveying the water system to the City, which shall include a one-year guarantee that the water system shall be free of defects in labor and materials. Form shall be as prescribed by the City.

6. In the event any warranty repairs are required, the City agrees, whenever feasible, to provide the Developer with reasonable notice before directly undertaking such repairs. The City reserves the right, however, to effect emergency repairs as deemed necessary by the City. The City shall be reimbursed by the Developer for all costs thereof.

7. Upon performing all requirements, including those as set forth in Paragraph 5 above, the City shall accept the water system, and agree therewith to operate and maintain said system.

SUBMITTED this ____ day of _____, 19__.

BY DEVELOPER:

_____

CITY OF ROY
DEVELOPER AGREEMENT

Accepted this ____ day of_____, 19__.

_____
Mayor

CITY OF ROY

DEVELOPER AGREEMENT

EXHIBIT "A"

PLAT NAME:

DEVELOPER:

LEGAL DESCRIPTION:

EXHIBIT "B"

AFFIDAVIT OF NO LIENS

STATE OF WASHINGTON)
) ss
COUNTY OF PIERCE)

Re:

The undersigned, being first duly sworn upon oath, depose and say:

I am the developer of a water system, or additions thereto, for the above-referenced project, and hereby certify as follows:

1. That there are no liens against or which may be filed against said project.

2. That all debts, labor bills, and the state sales taxes have been paid in connection with the above-referenced project.

By:

SUBSCRIBED AND SWORN before me this ___ day of _____, 19__.

Notary Public in and for the State of
Washington, residing at

(Notary Seal)

(FORM 3)

CITY OF ROY

DEVELOPER EXTENSION CHECKLIST

NAME OF PLAT_____

DEVELOPER_____

CONTACT PERSON_____ PHONE_____

DEVELOPER'S ENGINEER_____ PHONE_____

CONTRACTOR_____ PHONE_____

JURISDICTION_____ COUNTY_____

RESIDENTIAL_____ MULTI-FAMILY_____ COMMERCIAL_____

INDUSTRIAL_____ MIXED_____

	DATE	INITIAL
MASTER PLAN RECEIVED	_____	_____
DEVELOPER AGREEMENT/FEE	_____	_____
SEPA CHECKLIST RECEIVED	_____	_____
DECLARATION OF NON-SIGNIFICANCE MADE	_____	_____
COUNCILS PRELIMINARY APPROVAL OF DEVELOPER'S AGREEMENT	_____	_____
WATER PLANS COMPLETED AND TRANSMITTED AND APPROVED	_____	_____
PERFORMANCE BOND RECEIVED	_____	_____
INSURANCE CERTIFICATE RECEIVED	_____	_____
PRE-CONSTRUCTION CONFERENCE	_____	_____
CITY, COUNTY & STATE PERMITS APPLIED FOR	_____	_____
CITY, COUNTY & STATE PERMITS RECEIVED	_____	_____

CONSTRUCTION

1. START _____ _____

INSPECTION REPORT

1. PRESSURE TEST COMPLETE _____ _____

2. WATER SAMPLE REPORT _____ _____

3. FINAL INSPECTION _____ _____

4. HYDRANT & VALVE
REPORTS COMPLETE _____ _____

CONSTRUCTION FILE SENT TO ENGINEER _____ _____

ENGINEER'S APPROVAL _____ _____

BILL OF SALE RECEIVED AND REVIEWED _____ _____

EASEMENTS RECEIVED AND APPROVED _____ _____

MAINTENANCE BOND RECEIVED _____ _____

ATTORNEY'S REVIEW MEMO _____ _____

*COUNCILS FINAL APPROVAL GIVEN _____ _____

EASEMENTS RECORDED _____ _____

TITLE REPORT ON EASEMENTS RECEIVED _____ _____

COUNCIL MINUTES FILED _____ _____

SERVICE AGREEMENT COMPLETED _____ _____

AUTHORITY TO INSTALL SERVICES _____ _____

AS-BUILTS COMPLETED AND IN CITY'S FILE _____ _____

CAPITAL DEVELOPMENT FEE PAID _____ _____

* Final approval granted this ___ day of _____, 19__.

_____
Mayor

_____
Councilman

_____
Councilman

(FORM 4)

PERFORMANCE BOND

Developer: _____

Surety: _____

City: _____

Amount: _____

Development: _____

KNOW ALL MEN BY THESE PRESENTS: Whereas the City has accepted an agreement by the Developer for the construction of an extension to the City's water distribution system to serve the development, in accordance with the City's regulations governing water developer extensions, which regulations are incorporated into this agreement by reference, and which require the Developer to furnish a bond for the faithful performance of the work, and completion of the project within 365 days (within twelve months) from the date of preliminary approval of the Developer's application.

NOW, THEREFORE, we, the Developer and surety, are held and firmly bound to the State of Washington and to the City in the amount named above for the payment of which we do jointly and severally bind ourselves, our heirs, personal representatives, successors, and assigns by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, or the Developer's heirs, personal representatives, successors, and assigns shall well and truly keep all the provisions of the regulations of the City applicable to the work described in the Developer's Agreement, and pay all laborers, mechanics, subcontractors, and materialman, and all persons who shall supply such person or subcontractors with provisions and supplies for carrying on such work and shall indemnify and save harmless the City, its officers and agents, from any pecuniary loss resulting from the breach of said regulations, including the obligation of the Developer to replace or correct any defective work or materials discovered by the City within one year from the date of acceptance of the work, then this obligation shall become void; otherwise, it shall remain in full force and effect.

No change, extension of time, alteration or addition to the work to be performed by the Developer shall affect the obligation of the principal or surety on this bond, and the surety waives notice of any such change, extension, alteration, or addition thereunder.

This bond is furnished pursuant to the requirements of Chapter 39.08 of the Revised Code of Washington, and the regulations of the City, and in addition to the foregoing, is made for the benefit of the City, together with all laborers, mechanics, subcontractors, materialmen, and all persons who supply such person or subcontractors with supplies and equipment for the carrying on of the work covered by this agreement, whether or not such work is deemed to be "public work" under the laws of the State of Washington.

In witness whereof, the principal and surety have caused this bond to be signed and sealed by their duly authorized officers or representatives this ____ day of _____, 19_____.

_____
Principal

By_____

_____
Surety

By_____

(FORM 5)

CITY OF ROY, PIERCE COUNTY

BILL OF SALE

KNOW ALL BY THESE PRESENTS that for and in consideration of the sum of One Dollar ($1.00) and other good and sufficient consideration, receipt whereof is hereby acknowledged, the undersigned grantor(s) do(es) by these presents hereby convey, set over, assign, transfer and sell to the City of Roy, Pierce County, Washington, a municipal corporation, the following described water mains and all appurtenances thereto, situated in the City of Roy, Pierce County, Washington:

ALONG FROM TO SIZE LENGTH

the said grantor(s) hereby warrants that he, they, it, is/are the sole owner(s) of all the property above described; that they have full power to convey all rights herein conveyed and agree to hold the City of Roy harmless from any and all claims which might result from execution of this document.

IN WITNESS WHEREOF the grantor(s) has/have executed these presents this _____ day of _____, 19__.

STATE OF WASHINGTON)
) ss.
PIERCE COUNTY)

On this _____ day of _____, 19__, before me the undersigned Notary Public personally appeared _____, to me known to be the individual(s) who executed the within and foregoing instrument and acknowledged that___ he___ signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year in this certificate above written.

Notary Public in and for the State of Washington

Residing at

(FORM 6)

EASEMENT FOR WATER MAINS & APPURTENANCES (INDIVIDUAL)

_____ (herein called the "grantor") hereby dedicates, conveys, and grants to City of Roy (herein called the "grantee") and its successors and assigns an easement for water mains and appurtenances thereto and for other utilities under and upon the following described property situated in Pierce County, Washington, more particularly described in the attached legal description:

That said grantee shall have the right without prior institution of any suit or proceeding of law, at times as may be necessary, to enter upon said property and adjoining property owned by the grantor and his assigns and successors to install, lay, construct, renew, operate and maintain mains and necessary facilities and other equipment, for the purposes of serving the property or other properties with water and other utility service.

The grantor covenants that no permanent structure shall be erected, and no large trees or large shrubs shall be planted in the area of ground for which the easement in favor of the City of Roy has been provided herein.

This easement and the covenants herein shall be covenants running with the land and shall be binding on the successors, heirs, and assigns of both parties hereto.

The grantor warrants that the grantor has good title to the above property and warrants the grantee title to and quiet enjoyment of the easement conveyed herein.

No other easements for utilities shall be granted within the afore described easement area except for necessary crossings and the grantee shall have exclusive right to construct and maintain utilities within the easement area except for necessary crossings.

By_____ By_____
Grantor Grantor

State of Washington)
) ss.
County of Pierce)

On this _____ day of _____, 19__, before, me the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____, to me known to be the person who executed the foregoing instrument, and acknowledged the said instrument to be his free and voluntary act and deed, for the uses and purposes therein mentioned.

WITNESS my hand and official seal affixed the day and year first above written.

_____
Notary Public in and for the State

of Washington, residing at _____

(FORM 7)

EASEMENT FOR WATER MAINS & APPURTENANCES (CORPORATE)

_____ (herein called the "grantor") hereby dedicates, conveys, and grants to City of Roy (herein called the "grantee") and its successors and assigns an exclusive utility easement for water mains and appurtenances thereto under and upon the following described property situated in Pierce County, Washington, more particularly described in the attached legal description:

The grantee shall have the right without prior institution of any suit or proceeding of law, at times as may be necessary, to enter upon said property and adjoining property owned by the grantor and his assigns and successors to install, lay, construct, renew, operate and maintain mains and necessary facilities and other equipment, for the purposes of serving the property or other properties with water and other utility service.

The grantor covenants that no permanent structure shall be erected, and no large trees or large shrubs shall be planted in the area of ground for which the easement in favor of the City of Roy has been provided herein.

This easement and the covenants herein shall be covenants running with the land and shall be binding on the successors, heirs, and assigns of both parties hereto. The grantor warrants that the grantor has good title to the above property and warrants the grantee title to and quiet enjoyment of the easement conveyed herein.

No other easements for utilities shall be granted within the afore described easement area except for necessary crossings and the grantee shall have exclusive right to construct and maintain utilities within the easement area except for necessary crossings.

By_____ By_____
Grantor Grantor

State of Washington)
) ss.
County of Pierce)

On this _____ day of _____, 19__, before, me the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared _____ and _____, of _____, the corporation that executed the foregoing instrument, and acknowledged the said instrument to be his free and voluntary act and deed, for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument.

WITNESS my hand and official seal affixed the day and year first above written.

_____
Notary Public in and for the State

of Washington, residing at _____

(FORM 8)

WATER SERVICE

Water service locations will be referenced and locations marked with a 2" x 4" stake. Wire will be attached to the service and the stake. The 2" x 4" stake will be painted white with water stenciled on that portion facing the street. These reference points will be removed by City of Roy personnel only.

When application is made, and all fees paid, City of Roy personnel will furnish and install all necessary material to provide water service to the property line. Service line locations will follow current City regulations.

It is understood that if the reference stakes are removed or destroyed, and the services cannot be located in a reasonable time by other reference information, (plat maps, curb markings) the added expense in locating service stubs will be charged to the Developer.

When the complete service is installed, it shall be the responsibility of the Developer to insure that his contractors and subcontractors do not tamper with or alter the service in any way. Only that work necessary to make connection to the service shall be authorized. Any charges resulting from tampering or altering of, or damage to, the service due to lack of care and caution will be charged to the Developer. Meters will be removed by City personnel. Unauthorized meter removal or tampering with the service will result in a charge of $50.00.

It shall be the responsibility of the Developer to insure that his contractors and subcontractors are aware of the conditions of this regulation, and act in compliance with the terms of the regulation.

CITY OF ROY

Approved as presented _____
Developer

_____
Agent

(FORM 9)

MAINTENANCE BOND

Developer: _____

Surety: _____

City: _____

Amount: _____

Development: _____

KNOW ALL MEN BY THESE PRESENTS: Whereas the City has accepted an agreement by the Developer for the construction of an extension to the City's water distribution system to serve the development, in accordance with the City's regulations governing water developer extensions, which regulations are incorporated into this agreement by reference, and which require the Developer to furnish a bond for the faithful performance of the work, and completion of the project within 365 days (within twelve months) from the acceptance of construction.

NOW, THEREFORE, we, the Developer and surety, are held and firmly bound to the State of Washington and to the City in the amount named above for the payment of which we do jointly and severally bind ourselves, our heirs, personal representatives, successors, and assigns by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, or the Developer's heirs, personal representatives, successors, and assigns shall well and truly keep all the provisions of the regulations of the City applicable to the work described in the Developer's Agreement, and pay all laborers, mechanics, subcontractors, and materialman, and all persons who shall supply such person or subcontractors with provisions and supplies for carrying on such work and shall indemnify and save harmless the City, its officers and agents, from any pecuniary loss resulting from the breach of said regulations, including the obligation of the Developer to replace or correct any defective work or materials discovered by the City within one year from the date of acceptance of the work, then this obligation shall become void; otherwise, it shall remain in full force and effect.

Any corrections required shall be completed within thirty (30) days of the date of notification of the need for such correction by the City. If the work is not performed in a timely manner or in cases of emergency, the City shall have the right, without recourse to legal action, to have said work performed, at the expense of the Developer.

□

No change, extension of time, alteration or addition to the work to be performed by the Developer shall affect the obligation of the principal or surety on this bond, and the surety waives notice of any such change, extension, alteration, or addition thereunder.

This bond is furnished pursuant to the requirements of Chapter 39.08 of the Revised Code of Washington, and the regulations of the City, and in addition to the foregoing, is made for the benefit of the City, together with all laborers, mechanics, subcontractors, materialmen, and all persons who supply such person or subcontractors with supplies and equipment for the carrying on of the work covered by this agreement, whether or not such work is deemed to be "public work" under the laws of the State of Washington.

In witness whereof, the principal and surety have caused this bond to be signed and sealed by their duly authorized officers or representatives this ____ day of _____, 19_____.

_____
Principal

By_____

_____
Surety

By_____

DEVELOPER EXTENSION PROCESS

The following steps must be followed to complete the Developer Extension requirements. All items in Application and Planning phases must be completed prior to the start of construction. The steps are presented in the order that they are normally performed. The required forms are to be found in Section Six of this manual.

APPLICATION PHASE

Submit the following:

1. At the time the preliminary plat and conceptual drawings are submitted to the City, a letter requesting the availability of water should be submitted for approval. A map showing the area to be served and a completed Fire Flow Requirement (FORM 1) should accompany this request.

2. Completed DEVELOPER AGREEMENT with fee. (FORM 2)

3. Completed DEVELOPER EXTENSION CHECKLIST. (FORM 3)

4. Master Plan of Development (phased development). If a phased development is anticipated, all phases must be disclosed.

5. Environmental checklist.

6. Legal description of property.

7. Site plans showing lots or subdivisions and zoning.

8. Topographic map.

9. Vicinity map.

10. Description of type of construction proposed, number of units and stories and description of building type, use and size, and requirements for sprinklers (commercial and industrial developments).

11. Four (4) copies of this plat, approved road plan and storm drainage plan, and plans for any other underground utilities for review. Minimum scale shall be 1" = 50'. Any revision in plans or installed lines caused by this review shall be carried out at the sole cost of the Developer.

12. Four (4) sets of the schematic design of the proposed water system extension and engineering plans in conformance with these regulations and the Developer's Agreement.

PLANNING PHASE

1. Developer's Performance Bond completed and received by City (if required). (FORM 4). Also see Section 2.50.

2. Insurance certificate completed and received by City. See also Section 2.42.

3. Water plans prepared by an engineer licensed in the State of Washington approved and transmitted.

4. County and State permits and approvals received.

5. Railroad protective policy (if applicable) received by City.

6. Pre-construction conference held.

7. Backflow prevention requirements established. See also Section 2.52.

8. Approval of the Mayor to start construction.

NOTE: All requirements noted above must be met prior to contractor being authorized to start construction.

CONSTRUCTION & ACCEPTANCE PHASE

1. All phases of the water system complete and in accordance with City regulations.

2. Inspection: See also Section 2.9.

   (a) Pressure test complete and approved.

   (b) Water sample report approved.

   (c) Final inspection complete and approved.

   (d) Hydrant and valve records complete.

3. Copy of corporate resolution granting authority of signator to execute easements on behalf of the corporation (if applicable).

4. Easement form and legal description received and approved by Engineer and Attorney. (FORM 6 or 7). See also Section 2.51.

5. Bill of sale received and reviewed. (FORM 5). See also Section 2.38.

6. Water service agreement complete and received by City (FORM 8).

7. Developer's Maintenance Bond completed and received by City (if required)(FORM 9). Also see Section 2.50.

8. City Council approval and acceptance of water system.

NOTE: All of the above-mentioned requirements will be met and completed before any water service will be authorized.

APPENDIX D

CROSS-CONNECTION CONTROL

ORDINANCE NO. 687

CITY OF ROY, WASHINGTON

AN ORDINANCE adopting by reference the City of Roy Cross-Connection Control Program regulating the use of cross connections to the City's public water system.

WHEREAS, the City of Roy's Public Works Department has established a proposed Cross Connection Control Program designed to identify and regulate actual and potential cross connections to the City of Roy water system, which may permit contaminants or pollutants to enter the City's drinking water supply by means of backflow;

WHEREAS, in order to protect the public health, safety and property of the citizens of the City, it is now necessary to adopt the proposed Cross Connection Control Program; now, therefore,

THE CITY COUNCIL OF THE CITY OF ROY, WASHINGTON

DO ORDAIN AS FOLLOWS:

Section 1. The City hereby adopts by reference the City of Roy Cross-Connection Control Program.

Section 2. Effective Date. This ordinance shall become effective five (5) days from and after its passage, approval and publication as provided by law.

Passed by the City Council and approved by the Mayor of the City of Roy, Washington, at a regular meeting thereof this 11 day of October, 2004.

Ray C. Bourne
MAYOR RAY BOURNE

ATTEST:

Betty J. Garrison
BETTY J. GARRISON, CMC
City Clerk/Treasurer

Approved as to Form:

HARRY R. BOESCHE, JR., WSBA #29893
City Attorney

1st Reading 9-13-04
2nd Reading 9-27-04
3rd Reading 10-11-04

CROSS CONNECTION CONTROL PROGRAM

City of Roy
107 Warren Street
PO Box 700
Roy, Washington 98580
Phone: 253.843.1113

SECTIONS

ACRONYMS:

AG - Air Gap
AVB - Air Vacuum Breaker
BAT - Backflow Prevention Assembly Tester (Certified)
CCS - Cross Connection Specialist
DCVA - Double Check-valve Assembly
UPC - Uniform Pluming Code
PVB - Pressure Vacuum Breaker
RCW - Revised Code of Washington
RPBA - Reduced Pressure Backflow Assembly
WAC - Washington Administrative Code

Definitions

1.1 **Accessible** In reference to the installation of backflow preventers, accessible shall mean that such backflow preventers shall be placed so that they can be reached for testing and /or maintenance safely. On approval of the CCS, panels, doors, etc. may be allowed.

1.2 **Air Gap (AG)** The vertical separation between the free flowing discharge end of the potable water supply line and the overflow rim of a non-pressurized receiving vessel.
The separation must be at least twice the inside diameter of the supply line, but never less than one inch when unaffected by vertical surfaces (sidewalls) and;
three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and the intersecting vertical surface is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

1.3 **Approved/Approval** Approved in writing by the agency having jurisdiction.

1.4 **Atmosphere Vacuum Breaker (AVB)** A device that only prevents back-siphonage by creating an atmospheric vent when there is negative water pressure in the distribution system. It is designed to protect against backsiphonage only.

1.5 **Auxiliary Water Supply** Any water supply on or available to a premise in addition to the purveyor's approved public potable water supply.

1.6 **Backflow** The flow of water or other liquids, gases or solids from any source back into the customer's plumbing system or the water purveyor's water distribution system.

1.7 **Backflow Assembly Tester, Certified (BAT)** A person who is certified by the health authority to test backflow prevention assemblies.

1.8 **Backflow Prevention Assembly** The nomenclature "assembly" refers to a backflow preventer which are designed to be in line tested and repaired, and to meet the head loss and flow requirements of the recognized approval authority. The "assembly" consists of the backflow prevention unit, two resilient seated shut off valves and test cocks(s).

1.9 **Backflow Prevention Assembly – Approved** An assembly that has been listed by the Washington State Department of Health, Drinking Water Program, and so shown on their current listing of approved assemblies.

1.10 **Backflow Prevention Device** The nomenclature "device" refers to a backflow preventer that is not designed for in-line testing.

1.11 **Backpressure** Water pressure which exceeds the operating pressure of the public potable water supply. Any increase in pressure above the supply pressure, at a given point in the water distribution system (caused by pump, elevation of piping, heat expansion and/or air pressure) which would cause backflow.

1.12 **Backsiphonage** means flow of water, mixtures, substances, or gases into the potable water distribution system from a partial vacuum within the system itself. A negative or reduced pressure within the public potable water supply.

1.13 **Board** The duly elected City Council, of the City of Roy, employees of the City Council and/or duly appointed or assigned representatives of the City Council.

1.14 **Bore Sight to Daylight** Providing adequate drainage for backflow prevention assemblies installed in vaults through the use of unobstructed drain pipe.

1.15 **Code Authority & Enforcement** The enforcement of this cross-connection control program in the area served by the purveyor, will be in accordance with WAC 246-290-490.

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

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

1.18 **Contaminant** A substance that will impair the quality of water to a degree that it will create a health hazard to the public leading to poisoning, the spread of disease or is a violation of the water quality standards.

1.19 **Cross-Connection** A physical arrangement connecting a public water system, directly or indirectly, or has the potential of being connected to any source that is not a part of the public water supply.

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

1.21 **Cross-Connection Control Specialist (Certified)** A person who is certified by the administrative authority having jurisdiction to administer a cross connection control program and to conduct cross connection surveys.

1.22 **Degree of Hazard** The low or high hazard classification that shall be attached to all actual or potential cross connecdtions.

1.23 **Distribution System** The net work of pipes and other facilities which are used to distribute water from the source, treatment, transmission, or storage facilities to the water user.

1.24 **Double Check Detector Assembly (DCDA)** An approved assembly consisting of two approved double check valve assemblies with suitable connections for testing, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use. This unit must be purchased as a complete assembly. The assembly may be allowed on fire line water services in place of an approved double check valve assembly upon approval by the CCS or local water authority.

1.25 **Double Check Valve Assembly (DCVA)** An approved assembly consisting of two independently operating check valves, loaded to the closed position by springs or weights, and installed as a unit with, and between, two resilient seated shut-off valves and having suitable connections for testing. This unit may only be used to protect against non-health hazards and must be purchased as a complete assembly.

1.26 **Dual Distribution System** A facility, or property which has two water systems, one potable and the other non-potable.

1.27 **Flood Level** The highest level to which water , or other liquid, will rise within a tank or fixture (i.e. the overflow rim of the receiving vessel).

1.28 **Health Authority** The appropriate state department of public health or in some cases, a local agency having jurisdiction.

1.29 **Health Hazard** An actual or potential threat of contamination of a physical or toxic nature to the public potable water system or the consumer's potable water system that would be a danger to health.

1.30 **High Cross-Connection Hazard** A condition, device, or practice which could impair the quality of potable water and create an actual public health hazard through the introduction of waterborne disease organisms, or harmful chemical, physical, or radioactive substances into the public water system, and which presents an unreasonable risk to health.

1.31 **Industrial Piping System** A customer's "industrial piping" system refers to that piping system that transmits, confines, or stores any fluids that are not approved potable water. Such a system would include all pipes, tanks, fixtures, equipment and other extensions of the non-potable water system.

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

1.33 "**Local administrative authority**" means the City Council, of the City of Roy, Board or Mayor authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW. The local administrative authority may appoint a certified cross-connection control program administrator to administer and enforce the provisions of the UPC as they apply to Cross-Connection Control.

1.34 "**Low health cross-connection hazard**" means a cross-connection that could cause an impairment of the quality of the potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of such potable water for domestic use.

1.35 **Maximum Contaminant Level** The maximum amount of a contaminant allowed in a sample of water according to federal and state regulations. The importance of this to cross connection control is that the presence of a higher level than at the source may signify the occurrence of a cross connection incident.

1.36 **Non-Potable Water** Any water, other liquid, gas or substance which is not safe for human consumption, or is not part of the public potable water supply as described by the health authority.

1.37 **Non-Potable Piping System** A piping system which is made of non-potable material. Such material, such as black iron and certain plastics are to be considered non-potable if they can affect either the aesthetics or degradation of the healthfulness of the water.

1.38 **Potable Water** Water which is safe for human consumption, free from harmful or objectionable materials, as describe by the health authority.

1.39 **Public Water System** is water furnished by the Water Department, City of Roy, to the general public , the residences of the City of Roy and the immediate surrounding area which is intended or used for human consumption. It includes the source, treatment, storage, transmission and distribution facilities.

1.40 **Purveyor** means The City of Roy. Purveyor also means the authorized agents of The City of Roy.

1.41 **Reduced Pressure Backflow Assembly (RPBA)** means a Washington State approved backflow prevention assembly containing a minimum of two (2) independently acting, approved check valves including tightly closing resilent seated ball shutoff valves located at each check valve, together with an automatically operated pressure differential relief valve located between the two approved check valves. During normal flow, the pressure between these two valves shall be less than the upstream (supply) pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, shall operate to maintain the pressure between the two check valves at less than the supply pressure.

1.42 **Safe Drinking Water Act** The Safe Drinking Water Act was legislation that was enacted by the United State Congress in 1974 to ensure that the public is provided with safe drinking water, thereby protecting the public welfare.

1.43 **Service Connection** means the piping connection by means of which water is conveyed from the water purveyor's distribution main to a customer's premise. For the City of Roy, the portion of the service connection which conveys water from the distribution main to the customers service meter and including the meter, is under the jurisdiction of the water purveyor.

1.44 **Thermal Expansion** Thermal expansion is the pressure increase due to a rise in water temperature. The problem becomes acute in a heated water piping system when such system becomes "closed" due to a backflow preventer which disallows expansion beyond that point.

1.45 **Unreasonable Risk to Health** A risk to health which is not necessary or acceptable to the water purveyor and/or the customer; a term which is used to distinguish what type of backflow prevention should be required.

1.46 **Used Water** Any potable water which is no longer in the purveyor's water distribution system. In most cases, the potable water has moved past (downstream of) the water meter and/or the property line.

1.47 **Water System** All parts of a system that supplies water to customers including wells, pumps, components and equipment, storage facilities, piping and all appurtenances, structures, treatment facilities, necessary vehicles and equipment and anything required to meet current regulations and standards of operation.

Purpose & References

This program is adopted by the Council of the City of Roy and provides requirements to prevent actual or potential cross-connections, and defines the degree of protection necessary when such cross-connections cannot be eliminated. The following references are the basis for this program.

2.1 **Washington Administrative Code 246-290-490** establishes requirements for a cross-connection control program for Group A water systems and allows for the disconnection of service.

2.2 **Revised Code of Washington, Chapter 70.54** establishes failure to furnish pure water as a criminal misdemeanor.

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2.4 **Cross-Connection Control Manual,** a guide to purveyor's in establishing and operating a cross connection control program published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual).

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General Rules

It is the intention of this policy to provide for the permanent abatement or control of all cross-connections to the public water system. A complete cross connection control program identifies actual and potential cross connections between the potable water supply lines and any pipe or vessel that may contain a contaminant or pollutant which could enter the drinking water system by means of backflow

No cross connection or potential cross connection shall be created, used or maintained within the City of Roy water system. WAC 246-290, Group A Public Water Systems, shall be the basis for this program, and specific requirements of that document will be followed.

When it is deemed necessary by the administrator of the cross-connection control program, there shall be installed at the service connection a suitable backflow prevention assembly commensurate with the degree of hazard to the public water supply.

3.1 The City of Roy water system, under the direction of the elected Board, is the water purveyor and has the right to protect public health. Water service shall be terminated immediately, if the Board determines at anytime a threat exists to the public health.

(A) As a condition of water service, and after reasonable notice, owners shall allow all properties to be inspected for potential cross-connections and shall follow the requirements of this program if a cross-connection or potential cross-connection is found.

(B) Approved backflow assemblies, if required, shall be installed, at the expense of the owner, at the service connection (premises isolation) or, in limited cases, within the premises as approved by the Board.

(C) A Reduced Pressure Backflow Assembly (RPBA) shall be installed at the service connection to the premises, at the expense of the owner, in an approved installation, if the owner wishes to preclude inspections.

3.2 The most common source of cross connections in residential settings are on-site wells, water troughs, swimming pools, ponds, fountains, and lawn irrigation systems.

(A) Leaving a hose pressurized or using a hose bib to provide water to trailers/campers or to fill any kind of tank, also allows for potential contamination. These types of activities must be isolated from the public water system, either by air-gap. or approved backflow assemblies.

(B) All irrigation and lawn sprinkler systems shall have, as a minimum, an Atmospheric Vacuum Breaker (AVB) protection. Increased protection may be required for unusual or complex systems.

(C) If an owner desires to keep an on-site well operational as an auxiliary water supply, an approved Reduced Pressure Backflow Assembly (RPBA) shall be installed. Capping the well or pulling the pump is not proper abandonment and shall require premises isolation. An owner shall properly abandon a well using a licensed well-driller and complying with (WAC) 173-160 and 248-54.

3.3 The Board shall ensure that plans for all new construction are reviewed, cross connection hazard inspections are performed prior to water system connection, and will inform the owner of required or recommended corrections for the prevention of cross connectios. The home owner or business owner shall pay inspection costs, which are included in the connection fee.

3.4 The Board shall develop an information flyer, which will provide information on cross connections. This will be given to new customers and will be included in the annual Consumer Confidence Report mailing.

3.5 The Board shall utilize a Cross Connection Control Specialist (CCS) to implement this program and provide technical assistance as necessary. The CCS will coordinate with local officials, as necessary to ensure water system policy and rules compliment the Uniform Plumbing Code, and other local requirements.

3.6 The purveyor shall ensure that inspections and/or test of approved air gaps and approved backflow assemblies are conducted:

(1) At the time of installation;

(2) Annually after installation, or more frequently, if required by the purveyor for connections serving premises or systems that pose a high health cross-connection hazard or for assemblies that repeatedly fail;

(3) After a backflow incident; and

(4) After an assembly is repaired, reinstalled, or relocated or an air gap is re-plumbed.

3.7 Should a backflow incident occur, the Board shall take immediate action to prevent further hazard to the public health, and will notify the community, the Department of Health, immediately.

3.8 The Board shall re-evaluate potential cross-connection hazards and conduct a system assessment from time to time, but not less than every two years, based upon new connections or change of use of water.

Surveillance Program

The control of cross-connections requires cooperation between the customer, water purveyor, the health officer, and the plumbing inspector. The water purveyor has primary responsibility to prevent contamination of the public water supply (WAC 246-290-490). The local Administrative Authority, the Public Health Officer, and the customer served are jointly responsible for contamination of the water system within the customers premises. The property owner must realize that he/she may be held responsible for acts of negligence.

A surveillance program for cross-connection and sanitary hazards requires the inspection and evaluation of all new and existing buildings, structures, and grounds. As proposed, the premises isolation procedure requires a certified cross-connection control specialist (CCS) who shall be designated as the Cross-Connection Control Program Administrator.

The systematic program of inspection and evaluation shall be established with priority given on the basis of risk to public health and shall be conducted as outlined below:

4.1 Upon application for a building permit, the authorized CCS shall evaluate the proposed premises and determine the appropriate backflow assembly installation required for premises isolation.

4.2 During the construction phase of any new building, structure, or ground installation, the authorized CCS for the City of Roy shall perform the required premises isolation cross-connection control inspection. Upon completion of the inspection, but prior to the establishment of a water service connection, the CCS shall advise the customer of the results of the inspection. The CCS will notify the customer at that time that a Washington State certified backflow assembly tester (BAT) shall test any backflow assemblies required prior to use of the new water service, and on a continuing annual basis.

Existing Buildings, Structures, and Grounds

4.3 An initial premises inspection and /or evaluation shall be conducted on all existing structures (prioritized by degree of health hazard) by an authorized CCS. Upon completion of the initial premises inspection/evaluation, the CCS shall notify the customer orally of his/her findings.

4.4 The CCS shall issue a compliance letter to the property owner. The compliance letter shall include the recommendations and requirements for corrective actions and a corrective action completion date (normally 90 calendar days) depending on the degree of hazard.

4.5 On the corrective action completion date of the warning letter, the CCS shall insure the corrective actions have been completed. If the corrective actions have not been completed, the CCS shall issue a termination letter notifying the property owner that water service to the premises shall be discontinued within 15 calendar days (depending on the degree of hazard) if the corrective actions have not been completed.

4.6 The compliance and corrective action letter and the compliance termination letter shall be issued as certified mail with return receipt requested. A copy of all communications between the customer and the purveyor shall be filed in the permanent cross-connection control file for the premises in the administrator's office.

4.7 When all required actions have been completed, the file copy of the completed actions shall be placed in the CCS control file for the premise/facility, together with any completed backflow assembly test report forms. Records will be kept on file for a minimum of ten years, and as long as the backflow assembly remains in service.

4.8 Evaluation and/or re-inspection of each premise found to be subject to this procedure shall be accomplished at least annually, or more often if the degree of hazard so indicates.

Records & Reports

Cross-Connection Control Inspection File:

5.1 A separate jacket file shall be established by the water division Cross-Connection Control Program Administrator, for each individual customer that requires the installation of a backflow prevention assembly. Jacket files shall be filed in alphabetical sequence by customers name (last name first) and files shall be separated by geographic location.

5.2 The following information shall be maintained in each individual jacket file:

(a) Copies of all correspondence with customer relative to cross-connection control.
(b) Copy of inspection reports completed with field drawings.
(c) Copy of application and completed installation order.
(d) Copies of backflow assembly test reports for all backflow assemblies.

5.3 All backflow assemblies shall be kept on index file showing owner, address, phone number, location, serial number, date of activation, date of last inspection, and shall be filed by month of installation.

5.4 Upon demand, an annual Cross-Connection Control summary shall be made available to the Washington State Department of Health. This report will describe the status of the purveyor's Cross-Connection Control Program.

CROSS CONNECTION CONTROL PROGRAM

City of Roy
107 Warren Street
PO Box 700
Roy, Washington 98580
Phone: 253.843.1113

SECTIONS

ACRONYMS:

AG - Air Gap
AVB - Air Vacuum Breaker
BAT - Backflow Prevention Assembly Tester (Certified)
CCS - Cross Connection Specialist
DCVA - Double Check-valve Assembly
UPC - Uniform Pluming Code
PVB - Pressure Vacuum Breaker
RCW - Revised Code of Washington
RPBA - Reduced Pressure Backflow Assembly
WAC - Washington Administrative Code

Definitions

1.1 **Accessible** In reference to the installation of backflow preventers, accessible shall mean that such backflow preventers shall be placed so that they can be reached for testing and /or maintenance safely. On approval of the CCS, panels, doors, etc. may be allowed.

1.2 **Air Gap (AG)** The vertical separation between the free flowing discharge end of the potable water supply line and the overflow rim of a non-pressurized receiving vessel.
The separation must be at least twice the inside diameter of the supply line, but never less than one inch when unaffected by vertical surfaces (sidewalls) and;
three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and the intersecting vertical surface is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

1.3 **Approved/ Approval** Approved in writing by the agency having jurisdiction.

1.4 **Atmosphere Vacuum Breaker (AVB)** A device that only prevents back-siphonage by creating an atmospheric vent when there is negative water pressure in the distribution system. It is designed to protect against backsiphonage only.

1.5 **Auxiliary Water Supply** Any water supply on or available to a premise in addition to the purveyor's approved public potable water supply.

1.6 **Backflow** The flow of water or other liquids, gases or solids from any source back into the customer's plumbing system or the water purveyor's water distribution system.

1.7 **Backflow Assembly Tester, Certified (BAT)** A person who is certified by the health authority to test backflow prevention assemblies.

1.8 **Backflow Prevention Assembly** The nomenclature "assembly" refers to a backflow preventer which are designed to be in line tested and repaired, and to meet the head loss and flow requirements of the recognized approval authority. The "assembly" consists of the backflow prevention unit, two resilient seated shut off valves and test cocks(s).

1.9 **Backflow Prevention Assembly – Approved** An assembly that has been listed by the Washington State Department of Health, Drinking Water Program, and so shown on their current listing of approved assemblies.

1.10 **Backflow Prevention Device** The nomenclature "device" refers to a backflow preventer that is not designed for in-line testing.

1.11 **Backpressure** Water pressure which exceeds the operating pressure of the public potable water supply. Any increase in pressure above the supply pressure, at a given point in the water distribution system (caused by pump, elevation of piping, heat expansion and/or air pressure) which would cause backflow.

1.12 **Backsiphonage** means flow of water, mixtures, substances, or gases into the potable water distribution system from a partial vacuum within the system itself. A negative or reduced pressure within the public potable water supply.

1.13 **Board** The duly elected Roy City Council, employees of the Council and/or duly appointed or assigned representatives of the Council.

1.14 **Bore Sight to Daylight** Providing adequate drainage for backflow prevention assemblies installed in vaults through the use of unobstructed drain pipe.

1.15 **Code Authority & Enforcement** The enforcement of this cross-connection control program in the area served by the purveyor, will be in accordance with WAC 246-290-490.

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

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

1.18 **Contaminant** A substance that will impair the quality of water to a degree that it will create a health hazard to the public leading to poisoning, the spread of disease or is a violation of the water quality standards.

1.19 **Cross-Connection** A physical arrangement connecting a public water system, directly or indirectly, or has the potential of being connected to any source that is not a part of the public water supply.

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

1.21 **Cross-Connection Control Specialist (Certified)** A person who is certified by the administrative authority having jurisdiction to administer a cross connection control program and to conduct cross connection surveys.

1.22 **Degree of Hazard** The low or high hazard classification that shall be attached to all actual or potential cross connecdtions.

1.23 **Distribution System** The net work of pipes and other facilities which are used to distribute water from the source, treatment, transmission, or storage facilities to the water user.

1.24 **Double Check Detector Assembly (DCDA)** An approved assembly consisting of two approved double check valve assemblies with suitable connections for testing, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use. This unit must be purchased as a complete assembly. The assembly may be allowed on fire line water services in place of an approved double check valve assembly upon approval by the CCS or local water authority.

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4.2 During the construction phase of any new building, structure, or ground installation, an authorized CCS for the City of Roy will perform the required premises isolation cross-connection control inspection. Upon completion of the inspection, but prior to the establishment of a water service connection, the CCS shall advise the customer of the results of the inspection. The CCS will notify the customer at that time that a Washington State certified backflow assembly tester (BAT) shall test any backflow assemblies required prior to use of the new water service, and on a continuing annual basis.

Existing Buildings, Structures, and Grounds

4.3 An initial premises inspection and /or evaluation shall be conducted on all existing structures (prioritized by degree of health hazard) by an authorized CCS. Upon completion of the initial premises inspection/evaluation, the CCS will notify the customer and program administrator orally of his/her findings.

4.4 The CCS or program administrator will issue a compliance letter to the property owner. The compliance letter shall include the recommendations and requirements for corrective actions and a corrective action completion date (normally 90 calendar days) depending on the degree of hazard.

4.5 On the corrective action completion date of the warning letter, the CCS shall insure the corrective actions have been completed. If the corrective actions have not been completed, the CCS shall issue a termination letter notifying the property owner that water service to the premises shall be discontinued within 15 calendar days (depending on the degree of hazard) if the corrective actions have not been completed.

4.6 The compliance and corrective action letter and the compliance termination letter shall be issued as certified mail with return receipt requested. A copy of all communications between the customer and the purveyor shall reside in the permanent cross-connection control file for the premises in the administrator's office.

4.7 When all required actions have been completed, the file copy of the completed actions shall be placed in the CCS control file for the premise/facility, together with any completed backflow assembly test report forms. Records will be kept on file for a minimum of ten years, and as long as the backflow assembly remains in service.

4.8 Evaluation and/or re-inspection of each premise found to be subject to this procedure shall be accomplished at least annually, or more often if the degree of hazard so indicates.

Records & Reports

Cross-Connection Control Inspection File:

5.1 A separate jacket file shall be established by the water division Cross-Connection Control Program Manager, for each individual customer that requires the installation of a backflow prevention assembly. Jacket files shall be filed in alphabetical sequence by customers name (last name first) and files shall be separated by geographic location.

5.2 The following information shall be maintained in each individual jacket file:

(a) Copies of all correspondence with customer relative to cross-connection control.
(b) Copy of inspection reports completed with field drawings.
(c) Copy of application and completed installation order.
(d) Copies of backflow assembly test reports for all backflow assemblies.

5.3 All backflow assemblies shall be kept on index file showing owner, address, phone number, location, serial number, date of activation, date of last inspection, and shall be filed by month of installation.

5.4 Upon demand, an annual Cross-connection control summary shall be made available to the Washington State Department of Health. This report will describe the status of the purveyor's cross-connection control program.

CROSS CONNECTION CONTROL

The State Department of Social and Health Services specifically prohibits cross-connections of a potable water system with a potential source of contamination. It is the water purveyor's responsibility to insure that these cross-connections are avoided, or if unavoidable, that the water supply is adequately protected against contamination.

A cross-connection occurs when the drinking water supply is connected to a potential source of pollution. A connection of this type may, under certain circumstances, allow back-flow or back-siphonage of the polluted source into the drinking water source. For the Roy Water System most cross-connections may be expected to occur in private residences, apartment houses, and commercial buildings, that have an auxilary water supply or that have old-style plumbing fixtures. If the water inlet of a plumbing fixture is below the overflow drain or rim, a reduced pressure in the water system may cause back-siphonage. Other sources of cross-connections around a household include bathtubs, fishponds, swimming pools with underrim inlets, and lawn sprinklers that become submerged when used.

The surest way to prevent back-flow or back-siphonage of pollutants into the drinking water system is to avoid all cross-connections. When a cross-connection is unavoidable or possible the District must require the use of an approved back-flow prevention device. The safest device is an air gap --- a physical separation of the water system with the source of pollutant. This gap should be at least two pipe diameters but in no case less than one inch. Other back-flow prevention devices include the double check-valve and reduced pressure principle back-flow preventers. The department publishes a list of approved devices.

The Water District managers and operators must be completely familiar with the State requirements concerning cross-connection control. The statement of purpose and responsibility is contained in WAC 248-54-285. The Water District should develop a program for location and prevention of cross-connections. Premises served by the Water District which may have potential for back-flow should be protected with a suitable back-flow prevention device.

All back-flow prevention devices shall be tested by a certified backflow device tester or cross-connection control specialist. Test shall be conducted: 1) at the time of installation; 2) after the device is repaired; 3) annually thereafter; or 4) more often if tests indicate repeated failures.

It is not nearly sufficient to install back-flow prevention devices to prevent pollution of the drinking water supply. These devices must also be regularly inspected and properly maintained. A faulty or inoperable back-flow prevention device serves no useful purpose.

Although repair and maintenance of back-flow preventers is normally the property owner's responsibility, it is essential for the Water District to inspect the devices to insure they are providing the protection they were intended for. Inspections, tests and repairs shall be made under the purveyors supervision and records shall be kept by the purveyor.

Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by WAC 248-54-285 shall be grounds for termination of water service to the customer or requirement for air-gap separation.

City of Roy Cross Connection Control Implementation Status

Element	Description	Status
1	Adopt local ordinance.	Adopted December 14, 1987.
2	Implement procedures for evaluating new and existing services.	Procedures in Cross Connection Control Program.
3	Implement Procedures for assuring cross connections are eliminated or backflow devices are installed.	Procedures in Cross Connection Control Program.
4	Assure that certified personnel are provided.	Mr. Thomas Jacobs is a certified Cross Connection Control Specialist.
5	Implement procedures to assure that backflow prevention devices are inspected and tested.	Procedures in Cross Connection Control Program.
6	Implement backflow prevention assembly testing quality control program.	The City requires that all backflow prevention devices be tested regularly by a certified Backflow Assembly Tester and a report of the test filed with the City.
7	Develop and implement procedures for responding to backflow incidents.	Procedures are as follows: 1. Notify public and DOH of contamination problem. 2. Identify source of contamination. 3. Isolate source of contamination. 4. Eliminate source of contamination. 5. Make corrective changes to prevent recurrence of contamination incident.
8	Implement customer education on cross connection control program.	The City addresses cross connection control in annual Consumer Confidence Reports.
9	Develop system and maintain records on cross connection control devices installed on system.	City keeps record books in Public Works office regarding backflow prevention devices installed.
10	Additional cross connection control for systems that use reclaimed water.	N/A

Backflow Assembly List

1. 29318 80th Ave E. – Possibly still in use.
2. Oakview Heights HOA 292nd St
3. Mckenna Meadows HOA8311 295th St
4. 29206 81st Ave S. -Possibly still in use.
5. 76 Gas station 35618. – Possibly in use pop machine.
6. 106 McNaught Rd S Tavern. – May have one for soda machine.
7. 108 McNaught Rd S Espresso stand. -May have one for soda machine.
8. 208 McNaught Rd S Steakhouse. – May have one for soda machine.
9. 118 mcNaught rd S Roy bar and Grill. – May have one for a soda machine.

CROSS-CONNECTION CONTROL IMPLEMENTATION PROCEDURES

Ordinance No. 687 adopted the City of Roy Cross-Connection Control Program, which is **Appendix D of the City of Roy Water System Plan**.

The Program designates the certified cross-connection control specialist ("CCS") as the Cross-Connection Control Program **Administrator**. The CCS may be a Satellite Management Agency, and in that case shall oversee but delegate the tasks of the Administrator to the City's Public Works Director. The Public Works Director delegates certain tasks to the City Clerk-Treasurer or designee.

The Program puts the direction of the water system and the Program under the elected **Board**. The city council is the elected body responsible for the water system. On 1/23/2017 the city council named a Board for the Program consisting of the council member in the position taking primary responsibility for the water system, the city clerk-treasurer and the water system's cross-connection control specialist.

Cooperation

City representatives (CCS, Administrator, Board, designees, building code staff and contractors, emergency personnel) shall exchange information and work together to ensure that public health is protected and shall seek assistance when necessary from other agencies and jurisdictions. Conflicts shall be resolved by the mayor after considering the input of those involved.

Service agreement

Every customer obtains water service by implied agreement. The agreement may be verbal or written. Initially the agreement (contract) may be in the form of the customer requesting to open a water service account or purchase a connection, payment of the associated fees, and the City opening the account or approving the service connection. Thereafter, the agreement continues in the form of the customer's payment of the water bill. The terms of the agreement (contract) are set forth in city code and adopted plans. New customers receive information about the Program, which is also accessible on the City's website. Notices to customers concerning CCC actions include an explanation of the consequences of failing to comply.

The service agreement elements incorporated into notices to the customer to test assemblies or submit a hazard survey could include the following:

- In the past, the City requested the installation of a backflow assembly on the customer's water service to protect the water distribution system;
- This benefits the customer by providing protection for the water distribution system and protection against liability for contamination by the customer;
- To continue with this arrangement, the customer must have the assemblies tested by a DOH-certified BAT and maintained, repaired, or replaced as needed to assure performance;

- The customer has an assembly on his service pipe; however, such installation will not relieve the customer of his responsibility to comply with the requirements of the Uniform Plumbing Code enforced by the City of Roy.
- Reclaimed water shall not be returned into the water system distribution system.

Corrective actions

The failure of a customer to comply with the City's requirement for inspection, testing, etc., or a backflow assembly that fails the annual test may be cause for corrective action. Corrective action is taken after appropriate notice and may include, but is not limited to:

1. Denying or discontinuing water service to a customer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the City;
2. Requiring the customer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; and/or
3. The City installing an approved backflow preventer for premises isolation commensurate with the degree of hazard."
4. Requiring the customer to install, or the City installing, a RPBA in an approved installation if the customer wishes to preclude inspections to assess degree of hazard.

Evaluation

- New connections: Customers apply for building permits and water service permits together. Applications request information about water use. The building code inspector and the CCS cooperate to determine necessary backflow assembly.
- Existing connections, new customers: If building permits are involved, the "new connections" evaluation procedure applies. If no building permits are involved, the City gives the new customer the CCC information and a water use questionnaire to be completed within 30 days. The CCS evaluates the answers and acts accordingly.
- Existing connections: A water use questionnaire was collected from customers in 2017 and will be repeated for residential customers every 5 years, from non-residential low hazard facilities every 2 years, and from non-residential high hazard facilities every 12 months. (See Table 9 of WAC 246-290-490) The CCS evaluates the answers and acts accordingly.
- Questionnaire incomplete/insufficient: The CCS will give written notice by mail or door hanger of the requirement to inspect the facility/residence within 15 days, or by a specified date. Failure to allow access will generate second and third notices with similar deadlines by door hangers subject to the City's applicable fees for posting notices. Service will then be shut off.

Specific requirements

1. For all ***new non-residential services***, the City 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). The City may accept the recommendations or submit the recommendations to the City's CCS 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 City will require that the customer submit with the application for water service a completed "Water Use Questionnaire." 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 City 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 City, at its discretion, may specify the backflow preventer required to be installed as a condition of service.
3. For ***existing services*** with water use questionnaires submitted, where a backflow preventer is not currently installed but is needed, the City will offer the customer the option of:
    a. obtaining a plumbing permit, having a contractor install the required preventer to required standards, submitting test results by a certified BAT, and passing inspection by the City's CCS and its building code inspector
    b. obtaining a plumbing permit, having a contractor install the required preventer to required standards, having the assembly tested by the City's contracted BAT with the cost added to the customer's water account, and passing inspection by the City's CCS and its building code inspector
    c. having the City's contractors perform all of these services with the cost added to the customer's water account
4. For ***all services with backflow preventers installed*** the City will contract with a certified BAT to perform annual testing, and the cost will be added to the customers' water bills monthly at the amount specified in the City of Roy Fee Schedule.

<u>Type of backflow assembly required</u>

The City uses the method of premises isolation for backflow prevention, due to the potential for plumbing to be changed without the City's knowledge and the variations in pressure within the water system. Within this method, cross connections are controlled commensurate with the degree of hazard assessed by the CCS.

Installations of approved backflow preventers ONLY shall be performed to the standards published in the *Cross-Connection Control Manual, Accepted Procedure and Practice* by the Pacific Northwest Section, American Water Works Association, unless DOH or manufacturer requirements are more stringent. Under WAC 246-290, backflow prevention assemblies that appear on the USC-Approved Assemblies List are acceptable for protection of the public water system.

<u>Backflow preventer requirements</u>

1. The City 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 City. All high-hazard

connections of the type described in Table 9 of WAC 246-290-490 shall be isolated with an RPBA.

2. The City 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 required premises isolation DCVA or RPBA shall be:
   - Installed at the customer's expense immediately downstream of the water meter in accordance with the City's standards described hereinafter; and
   - Maintained, tested, and inspected in accordance with the City's standards described hereinafter.

   For new connections, the City will not turn on water (except for testing purposes) at the meter until the customer complies with the above requirements.
4. All backflow preventers relied upon by the City to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. The City will obtain and maintain a current list of assemblies approved for installation in Washington State from the DOH Office of Drinking Water.
5. 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.

   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 City 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 City's distribution system. The City will inform the customer that any action taken by the City shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. The City will not provide advice to the customer on the design and installation of plumbing other than by the normal building/plumbing permit/inspection process. Except for easements containing the City's distribution system, the City will not undertake work on the customer's premises.

Backflow Incident Response Plan

A. General

This Backflow Incident Response Plan supplemental to the City's Emergency Plan.

The City 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), the City 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 the City to notify DOH and Tacoma-Pierce County Health Department 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). A list of emergency contact telephone numbers is in the Water System Plan's O & M chapter.

A backflow incident investigation is a team effort. The investigation should be made by or initially led by the City's DOH-certified Cross-Connection Control Specialist. The investigation team may include state health (regional) staff, local health personnel and/or local plumbing inspectors.

More detailed guidance on how to respond to a backflow incident is in the manual, *Backflow Incident Investigation Procedures*, published by the Pacific Northwest Section, American Water Works Association (PNWS-AWWA

B. Short List of Tasks

The following short list of tasks is initial guidance for dealing with backflow incidents. The City 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.

<u>Records</u>

The City will keep all original records. Contractors may retain copies. Property-specific records will be kept in a CCC jacket file attached to the tap file. Records will be maintained per the retention schedules of the SOS Archives department.

Records of backflow preventers installed will include:

- description of exact location where installed
- description of hazard(s) isolated
- type, size, make, model, serial number, other pertinent details, and installation date

Records of inspections will include:

- name and certification number of the BAT performing each test or inspection
- test results (pass/fail and actual readings) or inspection results
- repair/re-plumbing history

Correspondence records will include:

- current service agreement, if applicable (permanent)
- notification to customer to install a backflow preventer(s) to protect the public water system from contamination (permanent)
- completed questionnaires
- current notifications of required inspections or other necessary actions
- educational information sent to multiple customers

Reports records will include:

- incident reports on DOH-acceptable form with accompanying supporting information (photos, lab analyses, etc.)
- annual summary reports
- complaints that could be related to backflow and their resolution, compiled with a view to inclusion in the next WSP update

Inventory records will include:

- Excel workbook with worksheets for each factor(s) tracked (assemblies/test reports/BAT's/etc.)
- Excel worksheets will be maintained to allow cross reference to property-specific records kept in CCC jacket files, and to allow sorting alphabetically, chronologically and geographically.

APPENDIX E

SEPA CHECKLIST AND DNS

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: [help]

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: [help]

Water System Plan

2. Name of applicant: [help]

City of Roy

3. Address and phone number of applicant and contact person: [help]

Debbie Dearinger, City Clerk-Treasurer
216 McNaught Rd S,
Roy, WA 98580
(253) 843-1113

4. Date checklist prepared: [help]

May 1, 2017

5. Agency requesting checklist: [help]

City of Roy

6. Proposed timing or schedule (including phasing, if applicable): [help]

Each project proposed in the Water System Plan will be completed on a project-specific basis. The recommendations will be proposed on the current six-year, ten-year, and future 20-year planning periods.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

This proposal is non-project action, therefore the question does not apply.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

Each capital project will be evaluated on a project specific basis.

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. [help]

None known.

10. List any government approvals or permits that will be needed for your proposal, if known. [help]

Washington State Department of Health and Pierce County will provide review, comment, and approval of the Plan.

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.) [help]

The proposed Water System Plan (Plan) is a planning document that meets the requirements of WAC 246-290.

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. [help]

The study area for this Plan covers approximately 709 acres, of which approximately 320 acres are within the City limits.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)? [help]

The terrain is mostly flat to rolling with elevations in the City of Roy water service area ranging from 310 to 438 feet. The highest ground elevation in the vicinity of the City's service area is 438 feet on a hilltop north of the Oakview Subdivision. The steepest slope is approximately 10%.

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. [help]

The soils in the area are classified by the Soil Conservation Service (SCS) as the Spanaway Association, consisting of nearly level, somewhat excessively drained soils that formed in glacial outwash. The most common soils types in the area, as classified by the SCS are Everett gravely sandy loam, Spanaway gravely sandy loam, Alderwood gravely sandy loam and Nisqually loamy sand.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

To be determined on a project specific basis.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

To be determined on a project specific basis.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

To be determined on a project specific basis.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

To be determined on a project specific basis.

3. **Water** [help]

a. Surface Water:

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. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

To be determined on a project specific basis.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

b. Ground Water:

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. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

To be determined on a project specific basis.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

To be determined on a project specific basis.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

To be determined on a project specific basis.

4. **Plants** [help]

a. Check the types of vegetation found on the site: [help]

____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

To be determined on a project specific basis.

b. What kind and amount of vegetation will be removed or altered? [help]

To be determined on a project specific basis.

c. List threatened and endangered species known to be on or near the site. [help]

To be determined on a project specific basis.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

To be determined on a project specific basis.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

To be determined on a project specific basis.

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. [help]

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

To be determined on a project specific basis.

b. List any threatened and endangered species known to be on or near the site. [help]

To be determined on a project specific basis.

c. Is the site part of a migration route? If so, explain. [help]

The entire Puget Sound basin is a part of the Pacific Flyway.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

To be determined on a project specific basis.

e. List any invasive animal species known to be on or near the site. [help]

To be determined on a project specific basis.

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. [help]

Not applicable.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

To be determined on a project specific basis.

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: [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

1) Describe any known or possible contamination at the site from present or past uses. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

4) Describe special emergency services that might be required. [help]

To be determined on a project specific basis.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None required.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

3) Proposed measures to reduce or control noise impacts, if any: [help]

None required.

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. [help]

The majority of the City's service area is single family. The City's service area also includes multi family, commercial, and industrial zoning. This Plan will not affect current land uses.

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? [help]

No.

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: [help]

No.

c. Describe any structures on the site. [help]

To be determined on a project specific basis.

d. Will any structures be demolished? If so, what? [help]

To be determined on a project specific basis.

e. What is the current zoning classification of the site? [help]

To be determined on a project specific basis.

f. What is the current comprehensive plan designation of the site? [help]

To be determined on a project specific basis.

g. If applicable, what is the current shoreline master program designation of the site? [help]

No shorelines are designated within the service area.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

To be determined on a project specific basis.

i. Approximately how many people would reside or work in the completed project? [help]

To be determined on a project specific basis. The City has a current service area population of approximately 948.

j. Approximately how many people would the completed project displace? [help]

None. The Plan identifies projects required to accommodate growth.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

Not applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

None.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

None.

9. **Housing** [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

The City's Plan will accommodate growth consistent with the current zoning and future land use.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

None.

c. Proposed measures to reduce or control housing impacts, if any: [help]

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? [help]

To be determined on a project specific basis.

b. What views in the immediate vicinity would be altered or obstructed? [help]

To be determined on a project specific basis.

b. Proposed measures to reduce or control aesthetic impacts, if any: [help]

To be determined on a project specific basis.

11. **Light and Glare** [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

To be determined on a project specific basis.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

To be determined on a project specific basis.

c. What existing off-site sources of light or glare may affect your proposal? [help]

To be determined on a project specific basis.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

None required.

12. **Recreation** [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

To be determined on a project specific basis.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

To be determined on a project specific basis.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

None required.

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. [help]

The H. L. Wolf Feed & Implement Warehouse located at 110 First Street East.

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. [help]

None found.

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. [help]

To be determined on a project specific basis.

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. [help]

None required.

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. [help]

To be determined on a project specific basis.

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? [help]

To be determined on a project specific basis.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

To be determined on a project specific basis.

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). [help]

To be determined on a project specific basis.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

To be determined on a project specific basis.

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? [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

h. Proposed measures to reduce or control transportation impacts, if any: [help]

To be determined on a project specific basis.

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. [help]

To be determined on a project specific basis.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

To be determined on a project specific basis.

16. **Utilities** [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas**, water, refuse service, telephone,** sanitary sewer, **septic system,** other _____

c. 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. [help]

To be determined on a project specific basis.

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: Debra Dearinger

Name of signee Debra Dearinger

Position and Agency/Organization City Clerk-Treasurer

Date Submitted: 5/4/17

D. Supplemental Sheet for Non-Project Actions

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?

City of Roy's Water System Plan recommends capital improvements such as replacement of existing piping. All proposed projects will be completed in compliance with all state and federal regulations and appropriate City and County ordinances. It is anticipated that these capital improvements will have no discharge to water, emissions to air, or production storage, or release of toxic or hazardous substances, and no production of noise, other than those produced temporarily by normal pipeline construction activities.

Proposed measures to avoid or reduce such increases are:

To be determined on a project specific basis.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

No work will be performed in streams, lakes, or marine waters, therefore, no impacts would result to or marine life. Any urban runoff or erosion would be controlled at project-specific construction sites. The capital improvements recommended in the Water System Plan will be implemented in an existing urban environment, thus producing no impacts to animals whose habitats typically reside in rural settings

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

For any construction project, individual SEPA documents will be prepared for each project. Impacts to plants, animals, fish, or marine life will be determined on a project-specific basis. Trenchless construction methods will also be considered to minimize environmental disturbance. Any rehabilitation plan associated with project-specific construction will take into account the protection or replacement of important plant species.

3. How would the proposal be likely to deplete energy or natural resources?

To be determined on a project specific basis.

Proposed measures to protect or conserve energy and natural resources are:

Specific project designs typically take into account energy-efficient pumps or pump stations, thereby reducing demand for energy resources.

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?

The siting of public facilities such as transmission and distribution piping or reservoirs takes into account environmentally sensitive areas during the planning and design phases. Therefore, environmentally sensitive areas can either be mitigated or avoided all together. A SEPA document will be provided for each specific project.

Proposed measures to protect such resources or to avoid or reduce impacts are:

To be determined on a project specific basis.

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?

Effects to land use will be determined on a project specific basis. However, it is not likely that any proposed projects will take place in and around shorelines. Each proposed project will be completed in compliance with all state, county, city, and federal regulations, including City resolutions.

Proposed measures to avoid or reduce shoreline and land use impacts are:

To be determined on a project specific basis.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

It is anticipated that the proposed projects will have minimal effects on transportation or public services and utilities. However, pipeline construction may have some temporary impacts on traffic flow, as transmission and distribution lines are typically within road rights-of-way.

Proposed measures to reduce or respond to such demand(s) are:

To be determined on a project-specific basis.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

All proposed projects will be completed in compliance with all state and federal regulations and City ordinances.

WAC 197-11-970 Determination of nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal **City of Roy Water System Plan**

Proponent **City of Roy**

Location of proposal, including street address, if any **The City's service area consists of the City limits and Urban Growth Area**

Lead agency **City of Roy**

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

☑ This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by . . . . . .

Responsible official **Debbie Dearinger**

Position/title **City Clerk-Treasurer** Phone. **(253) 843-1113**

Address **216 McNaught Rd S, Roy, WA 98580**

Date. 5/4/17 Signature Debra Dearinger

(OPTIONAL)

☐ You may appeal this determination to (name)
at (location)
no later than (date)
_____ by (method) .....

You should be prepared to make specific factual objections.
Contact _____ to read or ask about the procedures for SEPA appeals.

☐ There is no agency appeal.

APPENDIX F

EMERGENCY ACTION PLAN/CONSUMER CONFIDENCE REPORT

ROY WATER DEPARTMENT
ACTION PLAN

Table 1: Situation/Intelligence

The Water System is owned and operated by the City of Roy. While there is hope that nothing will go wrong, a plan must be in place to mitigate should something go wrong. This plan is created to address different scenarios that could occur with the Water System.

Table 2: Mission

This plan will discuss and outline needs should the Roy Water System have a power outage during any weather or other similar situation

Table 3: Concept and Execution

Date:	None Defined		**Date of Planned Activity:**	**None Defined**
Type of Activity: (search warrant, special event, arrest operation, enforcement operation, etc)	Water Failure due to Power Outage		**Time and Duration anticipated: None Defined**	
Location(s) anticipated:	Well 1 and Well 2 (use narrative for more detail or maps)		**Area(s) affected:**	Citywide
ROY PD Personnel to be deployed:	1 (include time/location of pre-action briefings)			
Personnel Assignments/Teams				
Communications Plan/Talk Group Assignments			**Bust Signals/Special Precautions:**	
Expanded ICS roles required? (Planning, Logistics, Finance, Safety, Information, etc)	☒	Depending on the situation ICS will be needed to ensure that completion of all reports for FEMA (if yes, utilize ICS forms to manage incident and attach forms to after-action report)		
Specialty Unit Utilization necessary? (SWAT, Bomb Squad, Canine, etc)	☐			
Outside Agencies to be utilized? (County, State, Federal, Schools, other municipalities)	☒	It may be necessary to contact Clearwater to respond depending on need to have the water system tested for contamination (utilize ICS forms to manage resources if necessary)		
Other City/County Departments to be utilized? (Fire/FMS, Public Works, etc)	☒	City PW personnel will be called to check the Water System and ensure that backup power is provided to the well sites during the power outage. PW personnel will also be needed to ensure that any alternate power that is used that sufficient fuel is kept available during the outages. (utilize ICS forms to manage resources if necessary)		
Traffic Control/Crowd Control/Other crime problems anticipated?	☐	(explain anticipated incident/action perimeter(s) and command post locations if applicable)		
Special Equipment/Resources to be utilized? (riot gear, command post, flexcuffs, shotguns, launchers, etc)	☒	PW personnel will be responsible for any specific equipment is available for the power outage, such as gas canisters to resupply the generator(s) at the well		
Vehicles to be utilized. (command post, prisoner transport vehicles, patrol cars, unmarked cars, bicycles, etc)	☒	PW City owned vehicle will be used. Other City vehicles could be used if necessary to transport personnel or equipment to the Well sites		
Other anticipated transportation requirements. (evidence van, evacuation via Pierce Transit, unusual wrecker requests)	☐			
Unusual hazards/special precautions	☒	Chlorine may be transported from the storage facility to the well sites	FD/Hazmat standby requested ☐	
Nearest trauma center?	Madigan Hospital			
Press Release Planned?	☐ ☐ PIO will be notified--☐ Before Action ☐ After-Action			
Evacuation of civilians likely?	☐			

De-escalation plans?	☒ Once power is restored then PW personnel will shut down any generator(s) and complete an assessment of the water systems.
Aftermath Duties	☒ PW will complete an after action report that will highlight the events as well as an assessment of this plan. Meeting with all personnel involved to provide feedback on what can be done better and amendment(s) to this plan.
County Prosecutor needs to be notified	☐
Mass Arrests anticipated? (more than ten arrests from single incident at the same time)	☐ (utilize mass arrest procedures in Critical Incident/Terrorism plan)

Table 4: Administration

Supervisor completing this action plan:	Darwin Armitage	**Division:**	Police	**Section:**	Chief's Office
Incident Commander(s):		**Division:**		**Section:**	
Overtime anticipated?	None				
Contact Telephone Numbers:					
Additional:					
After Action Report Due by:	Within 10 days after the event				

Table 5: Additional Information/Narrative

Should the Water System sustain a power outage it is important that the PW department receive notification so that this plan can be implemented. To ensure that PW is notified a selected customers should have access to the PW communications to advise PW of a power outage. Once a power outage is identified PW should respond to the water sites to check on the water system for service. Decisions to activate alternate (generator) power sources will be the responsibility of the PW personnel at the scene. PW personnel will determine if necessary to test the water system for service and consumption. If a decision to activate alternate power source is made, then PW will be responsible for ensuring that the power remains as long as necessary during the power outage. PW may request assistance from other City departments if necessary to maintain, secure or supply the alternate power sources. Once power has been restored, PW will secure the alternate power sources and re-supply if necessary in the event of further power outages. PW along with any other agency will check the water system if necessary for any contamination or need to further test the water system for consumption. PW as soon as practical will submit an after action report on the status of the water system to include any and all resources used during the outages. PW will also be responsible for completion of any reports necessary to file with FEMA, insurance or other agencies for reimbursement of assets used or lost during the event.

Table 6: Signatures/Approval

ROY WATER DEPARTMENT
ACTION PLAN

Table 1: Situation/Intelligence

The Water System is owned and operated by the City of Roy. While there is hope that nothing will go wrong, a plan must be in place to mitigate should something go wrong. This plan is created to address different scenarios that could occur with the Water System.

Table 2: Mission

This plan will discuss and outline needs should the Roy Water System have a outage such as a water contamination due to breakage during excavation or other similar situation

Table 3: Concept and Execution

Date:	None Defined	**Date of Planned Activity:**	**None Defined**
Type of Activity: (search warrant, special event, arrest operation, enforcement operation, etc)	Water Failure due to Outage (Water Main Break)	**Time and Duration anticipated:** **None Defined**	
Location(s) anticipated:	None Specified (use narrative for more detail or maps)	**Area(s) affected:**	Citywide
ROY PD Personnel to be deployed:	(include time/location of pre-action briefings)		
Personnel Assignments/Teams			
Communications Plan/Talk Group Assignments		**Bust Signals/Special Precautions:**	

Expanded ICS roles required? (Planning, Logistics, Finance, Safety, Information, etc)	☒	Depending on the situation ICS will be needed to ensure that completion of all reports for FEMA (if yes, utilize ICS forms to manage incident and attach forms to after-action report)
Specialty Unit Utilization necessary? (SWAT, Bomb Squad, Canine, etc)	☐	
Outside Agencies to be utilized? (County, State, Federal, Schools, other municipalities)	☒	It may be necessary to contact Clearwater to respond depending on need to have the water system tested for contamination (utilize ICS forms to manage resources if necessary)
Other City/County Departments to be utilized? (Fire/FMS, Public Works, etc)	☒	City PW personnel will be called to check the Water System and make notification of additional resources necessary to shut off, decontaminate and re-connect water service due to a contamination. (utilize ICS forms to manage resources if necessary)
Traffic Control/Crowd Control/Other crime problems anticipated?	☐	(explain anticipated incident/action perimeter(s) and command post locations if applicable)
Special Equipment/Resources to be utilized? (riot gear, command post, flexcuffs, shotguns, launchers, etc)	☒	PW personnel will be responsible for any specific equipment needed and is available for the event such as water shut off poles, barricades or other equipment to assist with excavation or repair of any water leak or break. PW will make notification for allocation of additional resources needed to repair the broken water main. PW can request for additional resources to assist in making notifications to customers of the shut off of the water system in the area of the water main break or contamination. PW may request alternate water sources (bottled drinking water) to be made available to customers affected during the water outage. PW can also request assistance in notification of water customers on the need to boil water for consumption.
Vehicles to be utilized. (command post, prisoner transport vehicles, patrol cars, unmarked cars, bicycles, etc)	☒	PW City owned vehicle will be used. Other City vehicles could be used if necessary to transport personnel or equipment to the Well sites
Other anticipated transportation requirements. (evidence van, evacuation via Pierce Transit,	☐	

unusual wrecker requests)			
Unusual hazards/special precautions	☒	Chlorine as well as other chemicals may be transported from the storage facility to the water sites	FD/Hazmat standby requested ☐
Nearest trauma center?	Madigan Hospital		
Press Release Planned?	☐ ☐ PIO will be notified--☐ Before Action ☐ After-Action		
Evacuation of civilians likely?	☐		
De-escalation plans?	☒ Once repaired PW will be responsible for checking the system for consumption. PW will utilize any other resources available to check the water for contaminants and to make ready the water for consumption.		
Aftermath Duties	☒ PW will complete an after action report that will highlight the events as well as an assessment of this plan. Meeting with all personnel involved to provide feedback on what can be done better and amendment(s) to this plan.		
County Prosecutor needs to be notified	☐		
Mass Arrests anticipated? (more than ten arrests from single incident at the same time)	☐ (utilize mass arrest procedures in Critical Incident/Terrorism plan)		

Table 4: Administration

Supervisor completing this action plan:	Darwin Armitage	**Division:**	Police	**Section:**	Chief's Office
Incident Commander(s):		**Division:**		**Section:**	
Overtime anticipated?	None				
Contact Telephone Numbers:					
Additional:					
After Action Report Due by:	Within 10 days after the event				

Table 5: Additional Information/Narrative

Should the Water System sustain a water outage (Water main break or leak) it is important that the PW department receive notification so that this plan can be implemented. To ensure that PW is notified a selected customers should have access to the PW communications to advise PW of a water outage due to contamination. Once a water outage due to contamination is identified PW should respond to the sites to check on the water system for service. PW will be responsible for shutting off any water in and around the affected area of the contamination due to possible break or leak. Decisions to contact additional resource to assist with excavation or repair will be the responsibility of the PW personnel at the scene. PW personnel will determine if necessary to test the water system for service and consumption. PW may request assistance from other City departments if necessary to make notifications, traffic control and distribution of information or bottled water to customers affected by the water outage. Once water has been restored, PW will secure any assets used and re-supply if necessary in the event of further outages. PW along with any other agency will check the water system if necessary for any contamination or need to further test the water system for consumption. PW as soon as practical will submit an after action report on the status of the water system to include any and all resources used during the outages. PW will also be responsible for completion of any reports necessary to file with FEMA, insurance or other agencies for reimbursement of assets used or lost during the event.

Table 6: Signatures/Approval

ROY WATER DEPARTMENT
ACTION PLAN

Table 1: Situation/Intelligence

The Water System is owned and operated by the City of Roy. While there is hope that nothing will go wrong, a plan must be in place to mitigate should something go wrong. This plan is created to address different scenarios that could occur with the Water System.

Table 2: Mission

This plan will discuss and outline needs should the Roy Water System have a outage such as a water main breakage due to excavation or other similar situation

Table 3: Concept and Execution

Date:	None Defined		**Date of Planned Activity:**	**None Defined**
Type of Activity: (search warrant, special event, arrest operation, enforcement operation, etc)	Water Failure due to Outage (Water Main Break)		**Time and Duration anticipated: None Defined**	
Location(s) anticipated:	None Specified (use narrative for more detail or maps)		**Area(s) affected:**	Citywide
ROY PD Personnel to be deployed:	(include time/location of pre-action briefings)			
Personnel Assignments/Teams				
Communications Plan/Talk Group Assignments			**Bust Signals/Special Precautions:**	
Expanded ICS roles required? (Planning, Logistics, Finance, Safety, Information, etc)	☒	Depending on the situation ICS will be needed to ensure that completion of all reports for FEMA (if yes, utilize ICS forms to manage incident and attach forms to after-action report)		
Specialty Unit Utilization necessary? (SWAT, Bomb Squad, Canine, etc)	☐			
Outside Agencies to be utilized? (County, State, Federal, Schools, other municipalities)	☒	It may be necessary to contact Clearwater to respond depending on need to have the water system tested for contamination (utilize ICS forms to manage resources if necessary)		
Other City/County Departments to be utilized? (Fire/FMS, Public Works, etc)	☒	City PW personnel will be called to check the Water System and make notification of additional resources necessary to shut off, repair and re-connect water service due to a water main break or leak. (utilize ICS forms to manage resources if necessary)		
Traffic Control/Crowd Control/Other crime problems anticipated?	☐	(explain anticipated incident/action perimeter(s) and command post locations if applicable)		
Special Equipment/Resources to be utilized? (riot gear, command post, flexcuffs, shotguns, launchers, etc)	☒	PW personnel will be responsible for any specific equipment needed and is available for the main break such as water shut off poles, barricades or other equipment to assist with excavation or repair of any water leak or break. PW will make notification for allocation of additional resources needed to repair the broken water main. PW can request for additional resources to assist in making notifications to customers of the shut off of the water system in the area of the water main break. PW may request alternate water sources (bottled drinking water) to be made available to customers affected during the water outage.		
Vehicles to be utilized. (command post, prisoner transport vehicles, patrol cars, unmarked cars, bicycles, etc)	☒	PW City owned vehicle will be used. Other City vehicles could be used if necessary to transport personnel or equipment to the Well sites		
Other anticipated transportation requirements. (evidence van, evacuation via Pierce Transit, unusual wrecker requests)	☐			

Unusual hazards/special precautions	☒	Chlorine may be transported from the storage facility to the well sites	FD/Hazmat standby requested ☐
Nearest trauma center?	Madigan Hospital		
Press Release Planned?	☐ ☐ PIO will be notified--☐ Before Action ☐ After-Action		
Evacuation of civilians likely?	☐		
De-escalation plans?	☒ Once repaired PW will be responsible for checking the system for consumption. PW will utilize any other resources available to check the water for contaminants and to make ready the water for consumption.		
Aftermath Duties	☒ PW will complete an after action report that will highlight the events as well as an assessment of this plan. Meeting with all personnel involved to provide feedback on what can be done better and amendment(s) to this plan.		
County Prosecutor needs to be notified	☐		
Mass Arrests anticipated? (more than ten arrests from single incident at the same time)	☐ (utilize mass arrest procedures in Critical Incident/Terrorism plan)		

Table 4: Administration

Supervisor completing this action plan:	Darwin Armitage	**Division:**	Police	**Section:**	Chief's Office
Incident Commander(s):		**Division:**		**Section:**	
Overtime anticipated?	None				
Contact Telephone Numbers:					
Additional:					
After Action Report Due by:	Within 10 days after the event				

Table 5: Additional Information/Narrative

Should the Water System sustain a water outage (Water main break or leak) it is important that the PW department receive notification so that this plan can be implemented. To ensure that PW is notified a selected customers should have access to the PW communications to advise PW of a water outage. Once a water outage is identified PW should respond to the sites to check on the water system for service. PW will be responsible for shutting off any water in and around the affected area of the break or leak. Decisions to contact additional resource to assist with excavation or repair will be the responsibility of the PW personnel at the scene. PW personnel will determine if necessary to test the water system for service and consumption. PW may request assistance from other City departments if necessary to make notifications, traffic control and distribution of information or bottled water to customers affected by the water outage. Once water has been restored, PW will secure any assets used and re-supply if necessary in the event of further outages. PW along with any other agency will check the water system if necessary for any contamination or need to further test the water system for consumption. PW as soon as practical will submit an after action report on the status of the water system to include any and all resources used during the outages. PW will also be responsible for completion of any reports necessary to file with FEMA, insurance or other agencies for reimbursement of assets used or lost during the event.

Table 6: Signatures/Approval

Lead and copper . . . Are you at risk?

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Clearwater Utility Services is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline, or at: *http:*//www.epa.gov/safewater/lead.

Ways to improve the taste of your water:

Even though your water is perfectly safe, it may contain naturally occuring minerals that affect the taste. Running cold water one to two minutes, refrigeration, and a slice of lemon will greatly improve the taste of the water. If your water is chlorinated, leaving a container of water uncovered and refrigerated will lessen the taste and odor of chlorine.

Is tap water safe to drink?

YES! Your water undergoes scheduled sampling and testing to make sure it is safe. Bottled water does not necessarily meet these high standards. In recent tests, ten popular brands of bottled water revealed a wide range of pollutants. such as bacteria, disinfection byproducts, heavy metals, pharmaceuticals, arsenic,radioactive isotopes, nitrates and solvents. And . . . the cost of one bottle of water equals about 1,000 gallons of tap water! Save money, stay healthy and reduce pollution by drinking water straight from your tap.

Water efficiency tips . . .

- Turn water off while brushing your teeth and rinsing your dishes.
- Cut the time per shower by a few minutes and save 150 gallons per month.
- Run full loads in your washing machine and dishwasher.
- Wash vegetables and fruits in a pan of water instead of running water. Then use the water for watering plants.
- Insulate hot water pipes to save water and energy.
- Mulch around plants to reduce watering.

Este informe contiene información muy importante sobre su agua potable. Si hay algo que no entienda, pidale a alguien que se lo traduzca.

For further information ...

To learn more about water quality or this report, please call Clearwater Utility Services 360-878-0214, or e-mail us at ttayne@clearwaterutility.com

Department of Health - www.doh.wa.gov
EPA - Safe Drinking Water Hotline 800-426-4791 www.epa.gov/safewater

Come on in . . . The Water's Fine!

Your water quality is our top concern!

Clearwater Utility Services takes pride in ensuring that the water you drink and use is safe and satisfying every day of the year!

You can help by using water more efficiently. There are many ways you can conserve water both inside and outside your home. Together we can protect this precious resource.

Clearwater Utility Services samples and conducts bacteriological, chemical, physical and radiological tests to ensure your water quality. This report will explain where your water comes from, what's in it and how it compares with standards set by the Washington State Department of Health and the Environmental Protection Agency (EPA).

2015 Annual Water Quality Report

Clearwater Utility Services, LLC

City of Roy Water System
Located at the City Hall of Roy Washington

Is my water safe?	How Much Water Did We Use Water Use Efficiency	
Last year, as in years past, your tap water met all U.S. Environmental Protection Agency (EPA) and state drinking water health standards. DOH, your water system manager and you safeguard City of Roy water supplies.	Water Usage	Gallons
	Produced	14,937,560
	Sold	18,247,427
	Water Loss flushing	2,500
	Percent Loss*	Source meter failure gave low source readings

Is my water safe?

Last year your tap water met all U.S. Environmental Protection Agency (EPA) and state drinking water health standards. The good news comes from the comprehensive testing for all required parameters, with very good results, listed below. Remember DOH, your water system manager, and you safeguard the City of Roy water supplies.

This report is a snapshot of last year's water quality; we completed over 120 separate tests over three years, and the last detection of other chemicals in previous years. This includes higher levels of iron and manganese, in well 2. Both of these elements are not health related, but can cause staining in household fixtures or clothing. Included are details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. We are committed to providing you with information because informed customers are our best allies.

Do I need to take special precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

Where does my water come from?

The City of Roy's water comes from two wells one drilled 80 feet into one of the counties major aquifers and the other 444 feet deep. Water for these aquifers comes locally from the approximately 40 inches of rainfall that fall on the land around you. This water travels through approximately 6 miles of pipes to your home or business.

.

Why are there contaminants in my drinking water?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

Water Quality Data Table

The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Important Drinking Water Definitions:

MCLG: Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow

Contaminants (units)	MCLG	MCL	Your water	Date	Violation	Typical Source
Inorganic Contaminants						
Nitrate [measured as Nitrogen]	10	10	<0.2 – 2.4	2014	No	Runoff from fertilizer use; Leaching from septic tanks, erosion of natural deposits
Iron	0.1	0.3	0.39	2010	Yes	naturally occurring in sediments
Manganese	0.01	0.05	0.11	2010	Yes	naturally occurring in sediments
Microbiological Contaminants						
Total Coliform (2 Monthly samples)	0	1	0 months positive for Total Coliform	2014	No	Naturally present in the environment
Lead (action level)		0.015 mg/L	0.003	2014	No	Plumbing or natural
Copper (action level)		1.30 mg/L	0.15	2014	No	Plumbing or natural

Organic Chemicals in the Distribution System

Contaminants (units)	MCLG	MCL	Your Water	Date		
* Total Trihalomethane	0	80 ppb	1.3-1.5	2014	No	Disinfection Interaction
*Haloacetic Acid (HAA)	0	60 ppb	1.4	2014	No	Disinfection Interaction

* HAA and Total Trihalomethane, is part of the reaction of chlorine with natural occurring organic chemicals

Volatile Organic Chemicals and Synthetic Organic Chemicals Herbicides and Pesticides 2012 (both wells)

These include solvents, pesticides, and petroleum products

Radionuclide						
Gross Alpha	0	15	Not Detected	2010	No	Erosion of natural ores and soils
Radium 228	0	15	Not Detected	2010	No	Erosion of natural ores and soils

Units Description:

NA: Not applicable
ND: Not detected
MNR: Monitoring not required, but recommended.
NR: Not reported
ppm: parts per million, or milligrams per liter (mg/l)
ppb: parts per billion, or micrograms per liter (µg/l)
% of monthly positive samples: Percent of samples taken monthly that were positive # of monthly positive samples.

DRINKING WATER WARNING
E. coli MCL Violation

The _____Water System, ID _____, located in _____ County is contaminated with *E. coli* bacteria.

E. coli bacteria were detected in the water supply on _____. These bacteria can make you sick and are a particular concern for people with compromised immune systems. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice. Boiling kills bacteria and other organisms in the water.

What should you do? **DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST**. Bring all water to a rolling boil, for 1 minute, and let it cool before using. Boiling kills bacteria and other organisms in the water.

E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.

The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We will consult with the State Department of Health about this incident. We will provide you notification when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information please contact:_____
(owner/operator) (phone #) (address) (email)

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____Water System on ____/____/_____

WARNING:
Do not drink tap water without boiling it first!

☐ **Fecal coliform**
☐ **E. coli bacteria**
☐ **Other: _____**

were detected in the water supply on:
(date) _____.

Boiling kills bacteria and other organisms in the water:

- **Bring water to a rolling boil for one minute**
- **Let water cool before using**

To avoid possible illness: use boiled or purchased bottled water for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice.

Contact your doctor, if you experience one or more of these symptoms: nausea, cramps, diarrhea, jaundice, headache and/or fatigue. People with chronic illnesses, infants and the elderly may be at higher risk and should seek medical advice.

Water System: _____
I.D.: _____
County: _____
Contact: _____
Telephone: _____
Date notice distributed: _____

What is fecal coliform and E. coli?

Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these waters can cause short-term effects, such as diarrhea, cramps, nausea, headaches or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

How long will this warning be in effect?

We will consult with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water.

Vea al reverso para la versión en Español.

October 2008

WARNING:
Do not drink tap water without boiling it first!

☐ **Fecal coliform**
☐ **E. coli bacteria**
☐ **Other: _____**

were detected in the water supply on:
(date) _____.

Boiling kills bacteria and other organisms in the water:

- **Bring water to a rolling boil for one minute**
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To avoid possible illness: use boiled or purchased bottled water for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice.

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Water System: _____
I.D.: _____
County: _____
Contact: _____
Telephone: _____
Date notice distributed: _____

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Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these waters can cause short-term effects, such as diarrhea, cramps, nausea, headaches or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

How long will this warning be in effect?

We will consult with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water.

Vea al reverso para la versión en Español.

October 2008

ADVERTENCIA:
¡No tome el agua de la llave sin antes hervirla!

☐ **Bacteria coliforme fecal**
☐ **Bacteria E. coli**
☐ **Otra: _____**

fueron encontradas en su sistema de agua:
(el día)_____.

Hervir el agua mata a las bacterias y otros organismos en el agua:

- **Ponga el agua en la estufa hasta que hierva y deje hervir el agua por un minuto**
- **Deje enfriar el agua antes de usarla**

Para evitar posibles enfermedades y hasta nuevo aviso: use agua hervida o agua potable embotellada para tomar, hacer hielo, limpiarse los dientes, lavar los platos y para preparar comidas.

Hable con su doctor si usted tiene uno o más de los siguientes síntomas: náusea, dolor estomacal, diarrea, ictericia, dolores de cabeza y/o cansancio. La gente con enfermedades crónicas, bebés y personas mayores de edad, pueden estar en situación de alto riesgo y deben consultar con su médico o proveedores de servicios médicos.

Sistema de agua: _____
I.D.: _____
Condado: _____
Contacto: _____
Teléfono: _____
Fecha de notificación: _____

¿Qué son las bacterias coliforme fecal y E. coli?

Coliformes fecales o E. coli son bacterias cuya presencia indica que el agua esta contaminada con desechos humanos o de animales. Microbios de esos desechos pueden causar diarrea, dolor estomacal, náusea, dolores de cabeza u otros síntomas. Pueden representar un peligro para la salud de bebés, niños y niñas de corta edad y personas con sistemas inmunológicos en alto riesgo.

¿Por cuánto tiempo va a estar en efecto esta advertencia?

Vamos a consultar con el Departamento de Salud del estado de Washington acerca de este incidente. Le vamos a notificar cuando ya no sea necesario hervir el agua.

See reverse side for English version.

ADVERTENCIA:
¡No tome el agua de la llave sin antes hervirla!

☐ **Bacteria coliforme fecal**
☐ **Bacteria E. coli**
☐ **Otra: _____**

fueron encontradas en su sistema de agua:
(el día)_____.

Hervir el agua mata a las bacterias y otros organismos en el agua:

- **Ponga el agua en la estufa hasta que hierva y deje hervir el agua por un minuto**
- **Deje enfriar el agua antes de usarla**

Para evitar posibles enfermedades y hasta nuevo aviso: use agua hervida o agua potable embotellada para tomar, hacer hielo, limpiarse los dientes, lavar los platos y para preparar comidas.

Hable con su doctor si usted tiene uno o más de los siguientes síntomas: náusea, dolor estomacal, diarrea, ictericia, dolores de cabeza y/o cansancio. La gente con enfermedades crónicas, bebés y personas mayores de edad, pueden estar en situación de alto riesgo y deben consultar con su médico o proveedores de servicios médicos.

Sistema de agua: _____
I.D.: _____
Condado: _____
Contacto: _____
Teléfono: _____
Fecha de notificación: _____

¿Qué son las bacterias coliforme fecal y E. coli?

Coliformes fecales o E. coli son bacterias cuya presencia indica que el agua esta contaminada con desechos humanos o de animales. Microbios de esos desechos pueden causar diarrea, dolor estomacal, náusea, dolores de cabeza u otros síntomas. Pueden representar un peligro para la salud de bebés, niños y niñas de corta edad y personas con sistemas inmunológicos en alto riesgo.

¿Por cuánto tiempo va a estar en efecto esta advertencia?

Vamos a consultar con el Departamento de Salud del estado de Washington acerca de este incidente. Le vamos a notificar cuando ya no sea necesario hervir el agua.

See reverse side for English version.

NOTICE TO WATER SYSTEM USERS

COLIFORM MAJOR MONITORING VIOLATION

We, _____ Water System, I.D. _____, located in _____ County are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During the month of _____ we did not monitor or test for coliform bacteria, and therefore cannot be sure of the quality of your drinking water during that time.

At this time:

☐ No action is required by the users.

☐ Our routine coliform sample required for the month of _____ has been collected and was found to show no presence of coliform bacteria.

☐ Samples will be collected in the future as required.

☐ Other information for customers:

For more information, contact _____ at ( )_____ or at _____.
(owner or operator) (phone number) (address)

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses.) You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is sent to you by _____ Water System on ____/____/____

Coliform Major Monitoring Public Notice Certification Form
The purpose of this form (below) is to provide documentation to the department that public notice was distributed. Please check the appropriate box and fill in the date that the notice was distributed:

☐ Notice was mailed to all water customers on ____ / ____/____.

☐ Notice was hand delivered to all water customers on ___ / ___ /___.

☐ Notice was posted (*with department approval*) at:
_____ on ___ / ___ /____.

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

_____ _____ _____
Signature of owner or operator Position Date

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Send copy of completed notification and certification to:

☐ Northwest Drinking Water
Department of Health
20425 72nd Ave S, Suite 310
Kent, WA 98032-2358
Phone: (253) 395-6750
Fax: (253) 395-6760

☐ Southwest Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: (360) 236-3030
Fax: (360) 664-8058

☐ Eastern Drinking Water
Department of Health
16201 E Indiana Ave, Suite 1500
Spokane Valley, WA 99216
Phone: (509) 329-2100
Fax: (509) 329-2104

Drinking Water Warning: Backflow Incident

Public Notification

The _____ Water System, ID_____, located in _____County may be contaminated because of a backflow incident in which _____ (describe the substance) flowed back into the drinking water system. You are located in the service area potentially affected by this backflow incident.

Do Not Use Tap Water for Drinking, Laundry, or Bathing Until Further Notice. Use only purchased bottled water for drinking, making ice, brushing teeth, washing dishes, food preparation, and hand washing.

When backflow occurs, microbial or chemical contamination can be drawn into the water system. These contaminants can cause severe injury or illness.

What caused the backflow incident?

What is the affected area?

What are we doing to correct the problem?

Where can customers get bottled water?

What should you do before you begin using your tap water?

We will notify you when the water is safe to use.

For more information, please call _____ at ( ) ___-_____ or email _____.

Please share this notice with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments and businesses). You can post it in a public place, share copies by hand, or mail it.

The _____ Water System sent this notice to you on ___/___/____

For Water Utility Use Only:

Backflow Incident Public Notice Certification Form

Within 10 days of notifying your customers, please complete this certification form and send a copy of each type of notice you distributed (hand-delivered notices, new releases, email, phone transcript, etc.) to our regional office. Call 1-800-521-0323 for the regional office address.

Distribution was completed on ___ / ___ /____. Were the water users notified within 24 hours? ☐ Yes ☐ No	Check all that apply: ☐ Hand delivery, ☐ News release (TV, radio, newspaper, etc.), ☐ Posting at_____ ☐ Other _____+_____

_____ Signature of owner or operator	_____ Position	_____ Date

DOH Form (331-495) 6/14

For people with disabilities, this form is available on request in other formats. To submit a request, please call 800-525-0127 (TDD/TTY 711).

APPENDIX G

WATER QUALITY REPORT

Water Quality Monitoring Schedule

System: ROY, CITY OF
Contact: Kimberly S Gubbe
SMA ID: 147

PWS ID: 45027 K
Group: A - Comm
SMA Name: PUD No.1 of Thurston County

Region: NORTHWEST
County: PIERCE

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

	May 2017	Jun 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018
Coliform Monitoring Population	1213	838	838	838	1213	1213	1213	1213	1213	1214	1213	1213
Number of Routine Samples Required	2	1	1	1	2	2	2	2	2	2	2	2

- 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	10	Jan 2015 - Dec 2017	standard - 3 year	09/26/2014	***Sep 2017***	
Asbestos	0	Jan 2011 - Dec 2019	waiver - 9 year			
Total Trihalomethane (THM)	1	Jan 2017 - Dec 2017	reduced - 1 year	08/15/2016	***Sep 2017***	
Halo-Acetic Acids (HAA5)	1	Jan 2017 - Dec 2017	reduced - 1 year	08/15/2016	***Sep 2017***	

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.

Water Quality Monitoring Schedule

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 *WELL #1 AEF351* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2017 - Dec 2017	standard - 1 year	09/14/2016	***Sep 2017***
Complete Inorganic (IOC)	1	Jan 2011 - Dec 2019	waiver - 9 year	06/07/2010	Jun 2019
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	06/03/2015	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/03/2015	
Pesticides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/03/2015	
Soil Fumigants	0	Jan 2017 - Dec 2019	waiver - 3 year		
Gross Alpha	1	Jan 2014 - Dec 2019	standard - 6 year	05/03/2016	
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	05/03/2016	

Source S02 *WELL #2 ABR133* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2017 - Dec 2017	standard - 1 year	06/16/2016	***Jun 2017***
Complete Inorganic (IOC)	1	Jan 2011 - Dec 2019	waiver - 9 year	06/07/2010	Jun 2019
Iron	1	Jan 2017 - Dec 2019	standard - 3 year	06/16/2016	Sep 2019
Manganese	1	Jan 2017 - Dec 2019	standard - 3 year	06/16/2016	Aug 2019
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	06/03/2015	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/03/2015	
Pesticides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/03/2015	
Soil Fumigants	0	Jan 2017 - Dec 2019	waiver - 3 year		
Gross Alpha	1	Jan 2014 - Dec 2019	standard - 6 year	06/16/2016	
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	06/16/2016	

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):	07/01/2017
Submit CCR certification form to ODW (Community systems only):	10/01/2017
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2017
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:	Carol Stuckey or Ingrid Salmon: (253) 395-6775: or carol.stuckey@doh.wa.gov 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.

APPENDIX H

COLIFORM MONITORING PLAN

COLIFORM MONITORING PLAN

City of Roy

Two wells – Precautionary Chlorination

System Information **Plan Date:05/2017**

Water System Name **City of Roy**	**County** **Pierce**	**System I.D. Number** **45027K**
Name of Plan Preparer Kim Gubbe Thurston PUD	**Position** DOC	**Daytime Phone #** (360) 357-8783
Source: DOH Source Number, Source Name, Well Depth, Pumping Capacity	**S01 –** Well #1 AEF351, 80 ft., 325 gpm **S02** – Well #2 ABR133, 444 ft., 400 gpm	
Storage: List and Describe	263,000.	
Pressure Zones: Number and name	One pressure zone	
Population by Pressure Zone	Population: 870 Connections – Active: 325 Approved: 481	
Number of Routine Samples Required Monthly by Regulation**: Two**	Number of Sample Sites Needed to Represent the Distribution System**: Four**	
Source Address / Location:		

Routine, Repeat, and Triggered Source Sample Locations

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat & Triggered Source Sample Sites**
X1. 8515 295th	**1-1.Sample site #1**
	1-2.8617 295th St S
	1-3.29428 85th Ave Ct S
	***RAW - S01 – well #1**
	***RAW – S02 – well #2**
X2. 406 Nixon St S.	**2-1. Sample Site #2**
	2-2. 325 Nixon St S
	2-3. 409 Ronge St S
	***RAW - S01 – well #1**
	***RAW – S02 – well #2**

X3. 8203 292nd St S	**3-1. Sample Site #3**
	3-2. 8219 292nd St S
	3-3. 8107 292nd St S
	***RAW - S01 – well #1**
	***RAW – S02 – well #2**
X4. 204 Cedar St W	**4-1. Sample Site #4**
	4-2. 110 Cedar St W
	4-3. 319 James St N
	***RAW - S01 – well #1**
	***RAW – S02 – well #2**

*You should mark the lab slip for the source sample "RAW" in type of sample and request an analysis for *E coli* count. **You must sample every groundwater source that was in use when the original routine sample was collected**

Important notes for sample collector:

_____
_____
_____
_____
_____
_____
_____

Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	X1 and X2	July	X1 and X2
February	X3 and X4	August	X3 and X4
March	X1 and X2	September	X1 and X2
April	X3 and X4	October	X3 and X4
May	X1 and X2	November	X1 and X2
June	X3 and X4	December	X3 and X4

Laboratory Information

Laboratory Name Water Management Laboratories Inc.	**Office Phone #** (253) 531-3121
Address 1515 80th St. E. Tacoma, WA 98404	**After Hours #** (253) 841-0732
Hours of Operation Monday – Friday 8a.m.- 5p.m. Saturday 9a.m. – 12p.m.	
Contact Name No specific contact	
Emergency Laboratory Name Same as above	**Office Phone #**

E. coli-Present Sample Response

Distribution System *E. coli* Response Plan
If we have *E. coli* in our distribution system, we will immediately: 1. Call DOH. 2. See attached plan : *What To Do When We Get A Positive Fecal Or E.Coli Sample* 3. 4. 5.

***E. coli* Present Triggered Source Sample Response Plan**
If we have *E. coli* in our source water, we will immediately: 1. Call DOH. 2. See attached plan : *What To Do When We Get A Positive Fecal Or E.Coli Sample* 3. 4. 5.

What To Do When We Get A Positive Fecal Or E-Coli Sample.

1. Call the agency that governs that system immediately of receiving the results.
   Group A's Pierce - NW Drinking Water, Carol Stuckey 253-395-6776

2. Work with agency, we could put the customers on boil water now or wait until the next tests come back. I usually put them on boil water now. Distribute door hangers at this time with a copy of the Acute mcl attached.
   K:\FORMS\Mandatory Language Forms\Acute Coliform MCL
   K:\FORMS\Mandatory Language Forms\Boil Water Advisory Door Hanger

3. Fax form and door hanger to agency after it has been hand delivered to the customers.

4. Take the repeat samples with in 24 hours and run a 24 hour test on them.

Group A's four samples – follow the Coliform Monitoring Plan. If more than 1 well was in operations then a raw sample from each will need to be taken, plus the four repeats (which should include one well).

5. Access the system; try to find where the contamination is coming from. Are there any bad tanks, what does the well head look like, what activity is going on around the well.

6. Call lab in 24 hours from time sample was taken if fax has not been received yet. Confirm that samples were good or bad.

7. If samples are negative take another round of samples, immediately. Run another 24 hour test. If next round are also negative lift the boil water notice.

8. If one of the samples comes back positive and we haven't found the problem then we should start continuous temporary chlorination of the system and notify the customers by door hanger of the chlorination.

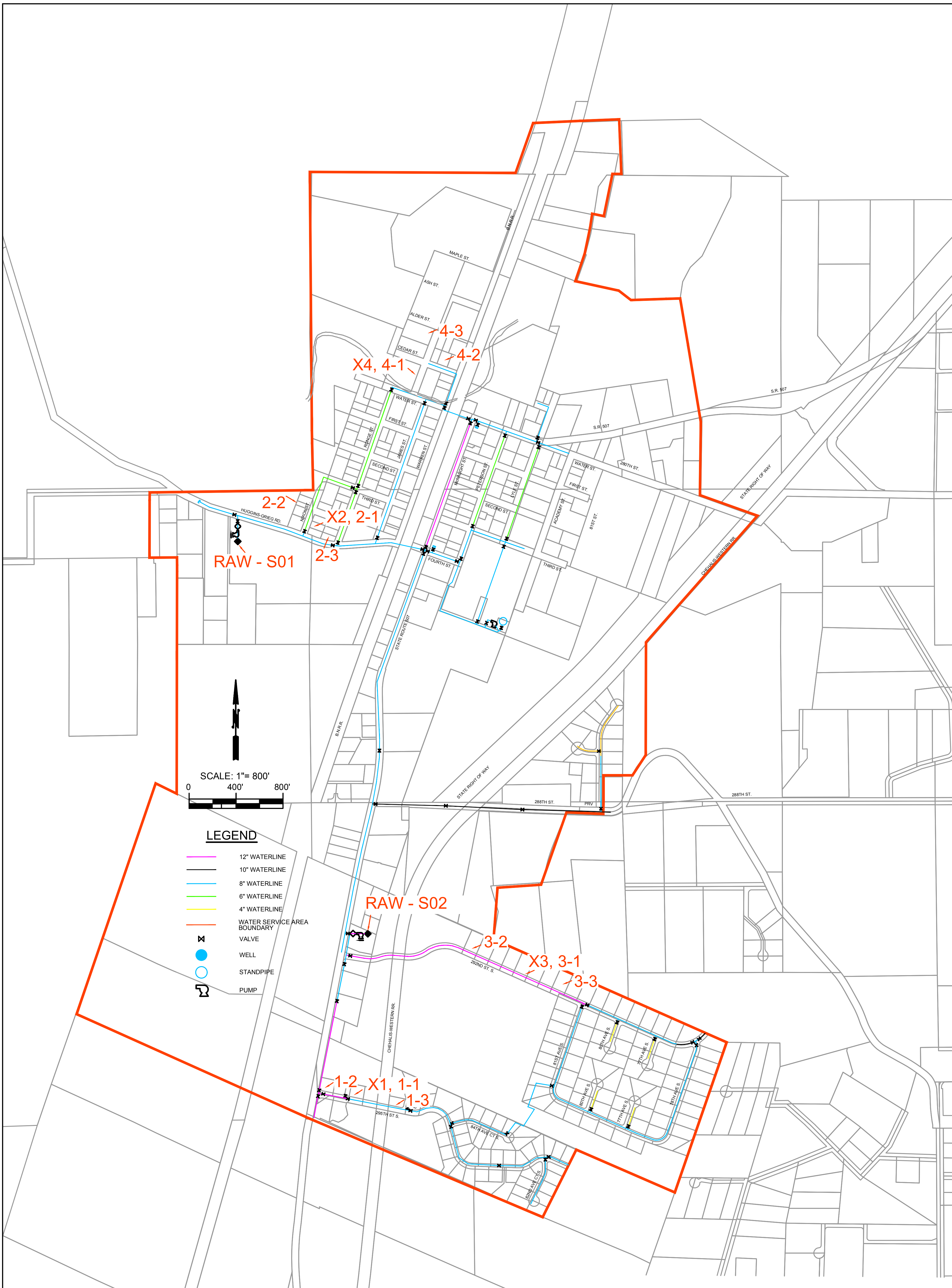
9. Once the chlorine is throughout the system then we need to take two rounds of repeat samples to lift the boil water.

City of Roy
Disinfection Byproducts

date	**haa5**	RAA HAA5	**THM**	**RAA thm**
8/6/2014	1.4	1.4	1.5	1.5
8/6/2014	nd		1.3	
8/10/2011	3.5	3.5	10.6	10.6
8/10/2011	3.2		8.8	
8/19/2008	3	3	7.1	7.1
8/19/2008	2.6		7.5	
9/13/2005	4.9	4.9	12.8	12.8
9/13/2005	nd		nd	
3/29/2004	nd	0	nd	0
3/29/2004	nd		nd	

City of Roy
Disinfection Byproducts

date	**haa5**	RAA HAA5	**THM**	**RAA thm**
8/6/2014	1.4	1.4	1.5	1.5
8/6/2014	nd		1.3	
8/10/2011	3.5	3.5	10.6	10.6
8/10/2011	3.2		8.8	
8/19/2008	3	3	7.1	7.1
8/19/2008	2.6		7.5	
9/13/2005	4.9	4.9	12.8	12.8
9/13/2005	nd		nd	
3/29/2004	nd	0	nd	0
3/29/2004	nd		nd	



CITY OF ROY

COLIFORM MONITORING PLAN

ROUTINE AND REPEAT SAMPLE SITES

Gray & Osborne, Inc.
CONSULTING ENGINEERS

APPENDIX I

WATER RIGHTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 15, 2016

Request Due:
May 16, 2016

Re: REQUEST FOR UPDATED INFORMATION AND STATEMENT OF INTENT REGARDING YOUR PENDING WATER RIGHT APPLICATION

Dear Applicant:

The purpose of this letter is to inform you about options regarding your pending water right application (enclosed) that is currently on file with the Department of Ecology (Ecology). Ecology is updating our database of 76 pending water right applications in the Nisqually Watershed, Water Resource Inventory Area 11 (WRIA 11) based on recent Washington State Supreme Court rulings regarding legal water availability for your proposed project and to determine if you are still interested in pursuing your application.

Your application requests withdrawals of water from a stream basin regulated under Chapter 173-511 Washington Administrative Code (WAC), *Instream Resources Protection Program—Nisqually River Basin, Water Resource Inventory Area (WRIA) 11*, adopted in 1981. Under this regulation, surface water and all hydraulically connected groundwater sources are closed to new appropriations of water. Your project, as proposed in your application, appears to be subject to this closure. As a result, if you do not take further action to demonstrate that your proposed water use would not have any effect on surface waters, or develop a plan to mitigate the effects on instream flows caused by your proposed water use, your application will likely be denied.

Special Notice Regarding Mitigation Plans

In October 2015, the Washington State Supreme Court issued a decision (Foster v. City of Yelm) which determined that only "water-for-water" mitigation that offsets 100% of your project's impacts to the affected surface waters may be approved. Furthermore, the Court reaffirmed that the State's water code does not allow even "*de minimus impairment*" of senior water rights. The WRIA 11 instream flow regulation adopted in 1981 is considered a water right senior to your application.

You must return a completed *Update and Statement of Intent* form in the enclosed, self-addressed envelope by **May 16, 2016, or we will assume that you are no longer interested**

and will reject your application. If you intend to pursue your application, you may be required to conduct studies needed to approve a water right and/or develop a mitigation plan that meets the required specifications. This can be costly and challenging and may not ultimately result in approval of a water right.

We currently do not have a timeline for processing applications in WRIA 11. If you intend to pursue your project, we will be contacting you for additional information when we are ready to evaluate your application. If you wish to have your application processed sooner, please refer to the enclosed information sheet on cost reimbursement options for processing water right applications. We appreciate your patience with the water right permitting process.

If you have any questions or would like to discuss your application, please contact Mike Gallagher at (360) 407-6058 or Matt Rakow at (360) 407-7669.

Enclosures: Form
Stamped Envelope
Cost Reimbursement Sheet
Water Right Application

CK # 12362
amt $10 –

WASHINGTON STATE DEPARTMENT OF ECOLOGY

APPLICATION FOR PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ SURFACE WATER ☒ GROUND WATER

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

RECEIVED '95 OCT 30 AM

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO. G2-29313 WRIA 11 COUNTY Pierce PRIORITY DATE 10/30/95 ACCEPTED SC

APPLICANT'S NAME — PLEASE PRINT: CITY OF ROY

Bus. Tel. 843-1113
Home Tel. 843-9161
Other Tel.

ADDRESS (STREET): 216 Mc Naught (CITY): Roy (STATE): WA (ZIP CODE): 98580

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION: 1908 Pierce Co

1. SOURCE OF SUPPLY

IF SURFACE WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE): Sepa Exempt
TRIBUTARY

IF GROUND WATER
SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.: SO1 Well #1
SIZE AND DEPTH: 6" 154 FT

2. USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.): Municipal ~~Domestic~~ Supply & Fire Protection

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF: CUBIC FEET PER SECOND (CFS) **OR** GALLONS PER MINUTE (GPM) 290 | ACRE FEET PER YEAR 148.0

TIMES DURING YEAR WATER WILL BE REQUIRED: Continuously as needed year round

IF IRRIGATION, NUMBER OF ACRES

IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME, 1-MOBILE HOME, 2-CAMPSITES, ETC. Homes 307

IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY 1,297

DATE PROJECT WAS OR WILL BE STARTED: 1987

DATE PROJECT WAS OR WILL BE COMPLETED: 1987

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE

ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION

3B. IF NOT IN PLATTED PROPERTY

ON ACCOMPANYING SECTION MAPS, ACCURATELY MARK AND IDENTIFY EACH POINT OF DIVERSION, SHOW NORTH AND EAST-WEST DISTANCES FROM NEAREST SECTION CORNER OR PROPERTY CORNER

ALSO, GIVE BELOW THE DISTANCES FROM THE NEAREST SECTION OR PROPERTY CORNER TO THE DIVERSION/WITHDRAWAL.

400' S + 600' W of the East Quarter Corner of Sec 33

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
~~NW¼/SE¼~~ NE¼ SE¼	33	18 N	02 E	Pierce

4. DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER

Yes – City of Roy

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

Area Served by the City of Roy

WHAT IS YOUR INTEREST IN THE PROPERTY ON W[illegible] THE WATER IS TO BE USED (PROPERTY OWNER, LESSEE, CONTRACT PURCHASER, ETC.)

PROPERTY OWNER

ARE THERE ANY EXISTING [illegible]TER RIGHTS REL[illegible] PROVIDED BY IRRIGATION DISTRICTS OR DITCH [illegible]HES.) THE LAND ON WHICH THE WATER IS TO BE USED (INCLUDING WAT[illegible] ☒ YES ☐ NO

IF YES, FROM WHAT SOURCE (i.e. SURFACE OR G[illegible] WATER) AND UNDER WHAT AUTHORITY

GROUND WATER CITY OF ROY

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" 6 STAGE 10 KK Bowl TYPE M IMPELLER

500 GPM 214 FT. T.D.H. 6" Discharge Pipe

40 H.P. 1770 R.P.M. 3 PHASE 60 Cyc 460 Volts

REMARKS

7.

8.

COMPLETE THIS SECTION ONLY IF THIS APPLICATION INCLUDES IRRIGATION AS A USE

IN ORDER TO IMPLEMENT THE PROVISIONS OF INITIATIVE MEASURE NUMBER 59, THE FAMILY FARM WATER ACT WHICH WAS PASSED BY THE VOTERS ON NOVEMBER 3, 1977, WE MUST ASK THE FOLLOWING QUESTIONS:

DOES THE TOTAL NUMBER OF [illegible]ES IN WHICH YOU HAVE CONTROLLING INTEREST IN THE STATE OF WASHINGTON EXCEED 2000 ACRES FOR THE FOLLOWING THREE CATEGORIES:

1. LANDS THAT ARE BEING IRRIGATED UNDER WATER RIGHTS ACQUIRED AFTER DECEMBER 8, 1977. YES ☐ NO ☐
2. LANDS THAT MAY BE IRRIGATED UNDER APPLICATIONS NOW ON FILE WITH THE DEPARTMENT OF ECOLOGY. YES ☐ NO ☐
3. LANDS THAT MAY BE IRRIGATED UNDER THIS APPLICATION. YES ☐ NO ☐

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

SIGNATURES

Steven L Wood WDM II.
APPLICANT'S SIGNATURE

CITY OF ROY
LEGAL LANDOWNER'S NAME (PLEASE PRINT)

City of Roy Steven L Wood
LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 5)

216 Mc NAUGHT ROY WA 98580
LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON
DEPARATMENT OF ECOLOGY } ss.

This is to certify that I have examined this application together with the accompanying maps and data, and am returning it for correction or completion as follows: .....

.....

.....

In order to retain its [illegible]ority date, this application [illegible] be returned to the Department of Ecology, with corrections, on or before ...., 19.....

Witnes[illegible] my hand th[illegible] .....day of..... ....., 19.....

.....

Department of Ecology - Southwest Regional Office
Update and Statement of Intent for Pending
Application of Water Right Permit No. G2-29313

APPLICANT INFORMATION		
APPLICANT/BUISNESS NAME City of Roy		
MAILING ADDRESS (Address, City, State, ZIP) 216 Mcnaught Roy WA 98580		
EMAIL ADDRESS	PHONE (WORK)	PHONE (HOME)
CONTACT NAME	CONTACT PHONE	CONTACT EMAIL
CONTACT MAILING ADDRESS (Address, City, State, ZIP)		

UPDATED INFORMATION		
APPLICANT/BUISNESS NAME		
MAILING ADDRESS (Address, City, State, ZIP)		
EMAIL ADDRESS	PHONE (WORK)	PHONE (HOME)
CONTACT NAME	CONTACT PHONE	CONTACT EMAIL
CONTACT MAILING ADDRESS (Address, City, State, ZIP)		

Statement of Intent: *(Check the Appropriate Box)*

☐ **Still Interested in Pursuing This Pending Application**
I am interested in pursuing the above pending water right application for permit.

☐ **No Longer Interested in Pursuing This Pending Application**
I am **NOT** intending to pursue the above pending water right application for permit, therefore; I authorize Ecology to remove my application from the permitting process.

Signature:

I certify that I am the holder or authorized representative of the above water right pending application.

PRINT NAME _____ SIGNATURE _____ DATE _____

PRINT NAME _____ SIGNATURE _____ DATE _____

Cost Reimbursement option for processing water right applications

In 2000, the state Legislature created Cost Reimbursement as an alternative for water right applicants to speed up the decision-making on their application. In 2010, changes were made to cost reimbursement in the state water code. This publication answers basic questions on how the cost reimbursement process currently works. (See also RCW 43.21A.690 and RCW 90.03.265.)

Q: What is cost reimbursement?

A: Cost reimbursement is a type of contract between a water right applicant and the Department of Ecology (Ecology). Under this contract, applicants assume the full cost of processing their water right application, with some or all of the work performed by Ecology's consultant. Presently, Ecology has eight consulting firms pre-approved to do this work.

The cost reimbursement option allows a private consultant to do the work that Ecology hydrogeologists and permit writers would ordinarily do. This helps free up Ecology staff to work with other applicants' on their water right applications.

The consultant conducts a site investigation, performs the environmental and hydrogeologic analyses, identifies whether the water is available or would impair other water users, prepares a report with his or her findings, and recommends whether to approve the application.

Ecology makes the final decision on the application.

Q: What is the advantage of using cost reimbursement?

A: Cost reimbursement generally results in a quicker decision because the resources of a consulting firm are dedicated to the investigation of a particular application. A decision may be obtained within a matter of months rather than a matter of years. The time will vary according to the complexity of the proposal and the number of competing applications that may need to be addressed.

WHY IT MATTERS

Water availability varies from one watershed to another, based on existing water rights, the physical and hydrologic characteristics of each watershed, and legal restrictions. There is currently a waiting list of approximately 7,000 pending water right and water right change applications statewide. A number of factors have come together to create this situation, in particular:

- limited staff and resources
- more complex decision-making process
- limited water availability

For applicants who want to speed up the decision-making process on their water right application, **cost reimbursement** is one important option.

For more information, contact your nearest Ecology office

Central Regional Office
509-575-2490

Eastern Regional Office
509-329-3400

Northwest Regional Office
425-649-7000

Southwest Regional Office
360-407-6300

Statewide water availability information
http://www.ecy.wa.gov/programs/wr/rights/wrpendapp.html

Special accommodations
If you need this document in a format for the visually impaired, call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Q: What are the disadvantages of cost reimbursement?

A: For an applicant, the key disadvantage is cost. The cost may be beyond the ability of many applicants to pay. Applicants who choose to wait for Ecology to process their application pay a minimum fee of $50 per application, plus the public notice costs. The actual costs of processing an application are significantly greater, but those additional costs are paid out of the agency's own budget, using tax dollars. No application fee is required if a party enters into a Cost Reimbursement Agreement.

An applicant who enters a Cost Reimbursement Agreement is expected to pay the full cost of processing the application, and in some cases, other senior applications – including the cost it takes to hire a consulting firm. (Applications for the same water body are usually processed in the order received. "Senior applications" are those with an earlier submittal date than the one in question.) In addition to the contracting costs, the applicant is expected to pay the costs of Ecology staff time spent reviewing the work of the consultant and managing the contract.

Q: How much does the cost reimbursement process cost?

A: The costs can range from a few thousand dollars to, in exceptional cases, hundreds of thousands of dollars. The cost will vary according to the number and complexity of applications, the fees charged by the consultant and the number of hours that Ecology must spend reviewing the work of the consultant.

It is important for applicants to understand that consultants are permitted to do only what it is provided for in their contracts as approved by Ecology. And applicants are expected to fully pay for those costs. To gather important data about the effects of a proposed withdrawal, a consultant may find it necessary to drill test wells and perform pump tests. This could add to the costs significantly.

In addition, as the investigation of a particular water right application proceeds, new issues may arise that were not identified during the initial scoping process. In such cases it may be necessary to develop amendments to the existing agreement to expand the scope, increase the budget, or extend deadlines.

Q: How does an applicant initiate the cost reimbursement process?

A: Ecology recommends that any applicant considering the cost reimbursement process first consult with Ecology regional staff. Regional staff will be able to give an applicant an idea of how many other applications are in the same watershed, share their knowledge of watershed issues and provide an initial impression of the likelihood that water will be available. Regional contact numbers are on the first page sidebar.

Ecology staff also will be able to discuss what type of costs the applicant must pay, such as:

- Consultant services
- Ecology time spent reviewing the consultant's work and managing the contract
- Certain legal costs.

Q: How does the cost reimbursement process work?

A: The cost reimbursement process is broken into two distinct phases. Phase One includes a thorough analysis of the water source boundaries and other existing applications. This can be done by an applicant and his or her consultant, or by Ecology's consultant.

Phase Two consists of preparing technical reports supporting the decision on the water right request, and must be done by Ecology's consultant.

Phase One

In Phase One, the application is evaluated to identify the boundaries of the source of water. This is the area that could be affected by a proposed water withdrawal. In the case of groundwater applications, this requires a preliminary delineation of the affected aquifer.

A Phase One analysis includes looking at whether there are other prior applications requesting water from the same source. It will also identify likely issues that require further evaluation, and may provide a scope and cost estimate for completing Phase Two of the evaluation.

Applicant can choose consultant, to work with directly or through Ecology

If the applicant wishes to have Ecology manage the Phase One work, he or she may formally request Ecology to enter into a Cost Reimbursement Agreement. (For applicants using their own consultant to prepare a Phase One report, skip down to the section on Phase Two.) Ecology will choose a consulting firm from a preapproved list, ensure there is no conflict of interest, and ask the firm to submit a proposal and cost estimate for performing a Phase One analysis. (Note: the applicant has the option of choosing the consultant from Ecology's preapproved list.)

Applicant has opportunities to stop the process at several junctures

A Phase One analysis typically costs between $5,000 and $10,000. If the applicant accepts the proposal, a written contract is developed and signed by the applicant and Ecology. Ecology's consultant is then assigned the task of performing a Phase One analysis. If the costs are too high, the applicant may choose not to pursue the process any further.

THE COST REIMBURSEMENT PROCESS

Applicant may enter into a Cost Reimbursement Agreement with Ecology either before Phase One or Phase Two.

↓

Phase One

Identify competing applicants.

Define the boundaries of the water source.

Make initial assessment of water right issues.

Develop Phase Two scope and budget.

↓

Phase Two

Consultant analyzes issues of water availability and the potential for impairment to other users.

Consultant prepares Reports of Examination.

↓

Ecology approves or denies application.

Upon completion of the Phase One analysis, an applicant once again has the option to stop the process.

Phase Two

In Phase Two, Ecology's consultant prepares a Report of Examination (Ecology's decision) for the application(s). The Report of Examination consists of technical reports which investigate the issues of water availability and the potential for impairment to other water right holders.

If the applicant had Ecology contract with a pre-approved consultant to conduct Phase One, a report will be provided to the applicant with scope and a cost estimate for Phase Two. If the applicant used his or her own consultant in Phase One, the report will be forwarded to Ecology's consultant (chosen by the applicant from Ecology's pre-approved list). With the report will be a request to provide a scope and cost estimate for Phase Two.

Q: What kinds of payment options are available?

A: In general there are two payment options for a cost reimbursement agreement. The first is a full pre-payment of the costs identified in the agreement. The second is to provide Ecology with a $5,000 security deposit and the applicant will be billed as Ecology receives invoices from our consultant.

Under the first option, any funds that are not used at the completion of the project would be refunded. Under the second option, the security deposit is refunded at the completion of the project.

Q: Does entering into a Cost Reimbursement Agreement allow me to jump to the head of the line?

A: In some cases, yes. Under usual circumstances, Ecology must process applications for the same source of water in the order they are received. (The oldest, or most senior, are processed first.) However there is more flexibility under the new laws (RCW 90.03.265). If your water request won't reduce the water available for senior applicants, you can have your application handled under a Cost Reimbursement Agreement without processing the senior applications.

Q: Does entering a Cost Reimbursement Agreement automatically mean my application will be approved?

A: No. A Cost Reimbursement Agreement only provides that a decision may be made. That decision could be approval or denial of the application(s). If it looks like the decision will be a denial, you will be so notified and will have the option of ending the agreement to save on costs.

Q: Can I appeal a decision on my water-right application? Who pays for the appeal?

A: You may appeal a decision if you disagree. In such cases, you are responsible for paying for the legal costs of your own appeal. Ecology's decisions on water rights are defended by the state Attorney General Office. If a third party appeals a decision, you may be responsible for reimbursing the state for the cost of defending the decision before the Pollution Control Hearings Board (PCHB). Ecology may negotiate further reimbursement if the decision is appealed beyond the PCHB.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 15, 2016

Request Due:
May 16, 2016

Re: REQUEST FOR UPDATED INFORMATION AND STATEMENT OF INTENT REGARDING YOUR PENDING WATER RIGHT APPLICATION

Dear Applicant:

The purpose of this letter is to inform you about options regarding your pending water right application (enclosed) that is currently on file with the Department of Ecology (Ecology). Ecology is updating our database of 76 pending water right applications in the Nisqually Watershed, Water Resource Inventory Area 11 (WRIA 11) based on recent Washington State Supreme Court rulings regarding legal water availability for your proposed project and to determine if you are still interested in pursuing your application.

Your application requests withdrawals of water from a stream basin regulated under Chapter 173-511 Washington Administrative Code (WAC), *Instream Resources Protection Program—Nisqually River Basin, Water Resource Inventory Area (WRIA) 11*, adopted in 1981. Under this regulation, surface water and all hydraulically connected groundwater sources are closed to new appropriations of water. Your project, as proposed in your application, appears to be subject to this closure. As a result, if you do not take further action to demonstrate that your proposed water use would not have any effect on surface waters, or develop a plan to mitigate the effects on instream flows caused by your proposed water use, your application will likely be denied.

Special Notice Regarding Mitigation Plans

In October 2015, the Washington State Supreme Court issued a decision (Foster v. City of Yelm) which determined that only "water-for-water" mitigation that offsets 100% of your project's impacts to the affected surface waters may be approved. Furthermore, the Court reaffirmed that the State's water code does not allow even "*de minimus impairment*" of senior water rights. The WRIA 11 instream flow regulation adopted in 1981 is considered a water right senior to your application.

You must return a completed *Update and Statement of Intent* form in the enclosed, self-addressed envelope by **May 16, 2016, or we will assume that you are no longer interested**

and will reject your application. If you intend to pursue your application, you may be required to conduct studies needed to approve a water right and/or develop a mitigation plan that meets the required specifications. This can be costly and challenging and may not ultimately result in approval of a water right.

We currently do not have a timeline for processing applications in WRIA 11. If you intend to pursue your project, we will be contacting you for additional information when we are ready to evaluate your application. If you wish to have your application processed sooner, please refer to the enclosed information sheet on cost reimbursement options for processing water right applications. We appreciate your patience with the water right permitting process.

If you have any questions or would like to discuss your application, please contact Mike Gallagher at (360) 407-6058 or Matt Rakow at (360) 407-7669.

Enclosures: Form
Stamped Envelope
Cost Reimbursement Sheet
Water Right Application

CR A 12342
A 10 —

WASHINGTON STATE DEPARTMENT OF ECOLOGY

APPLICATION FOR PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

RECEIVED

☐ SURFACE WATER ☒ GROUND WATER

'95 OCT 30

$10.00 MINIMUM STATUTORY EXAMINATION FEE REQUIRED WITH APPLICATION

SW REGIONAL

(GRAY BOXES FOR OFFICE USE ONLY)

APPLICATION NO.	PRIOR	COUNTY	PRIORITY DATE	FEE	ACCEPTED
G2-29312	1	Pierce	10/30/95		

APPLICANT'S NAME — PLEASE PRINT

City of Roy

Bus. Tel. 843-1113
Home Tel. 843-9161
Other Tel.

ADDRESS (STREET): 216 Mc Naught | (CITY): Roy | (STATE): WA | (ZIP CODE): 98580

DATE & PLACE OF INCORPORATION IF APPLICANT IS A CORPORATION: 1908 Pierce Co

1. SOURCE OF SUPPLY

IF SURFACE WATER	IF GROUND WATER
SOURCE (NAME OF STREAM, LAKE, SPRING, ETC.) (IF UNNAMED, SO STATE)	SOURCE (WELL, TUNNEL, INFILTRATION TRENCH, ETC.) S02 Well #2
TRIBUTARY	SIZE AND DEPTH 6" 594 FT

2. DATE 11/9/95 SIGNATURE — USE

USE TO WHICH WATER IS TO BE APPLIED (DOMESTIC SUPPLY, IRRIGATION, MINING, MANUFACTURING, ETC.)

Municipal Domestic Supply & Fire Protection

ENTER QUANTITY OF WATER REQUESTED USING UNITS OF:	CUBIC FEET PER SECOND (CFS)	OR	GALLONS PER MINUTE (GPM)	ACRE FEET PER YEAR
			500	148.0

TIMES DURING YEAR WATER WILL BE REQUIRED

Continuously as needed year round

IF IRRIGATION, NUMBER OF ACRES	IF DOMESTIC USE, NUMBER OF UNITS BY TYPE, E.G. 1-HOME, 1-MOBILE HOME, 2-CAMPSITES, ETC. Homes 307	IF MUNICIPAL USE, ESTIMATED POPULATION 20 YEARS FROM TODAY 1297
DATE PROJECT WAS OR WILL BE STARTED: 1987	DATE PROJECT WAS OR WILL BE COMPLETED: 1987	

3. LOCATION OF POINT OF DIVERSION/WITHDRAWAL

3A. IF IN PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)	SECTION	TOWN	RANGE	ALSO, PLEASE ENCLOSE A COPY OF THE PLAT AND MARK THE POINT(S) OF WITHDRAWAL OR DIVERSION
			03	17N	02E	

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.

1176'S & 390' E of NE Northwest Corner of Sec 3

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	COUNTY
SE¼ NW¼ Within Roy	03	17N	02E	Pierce

4. DO YOU OWN THE LAND ON WHICH THIS SOURCE IS LOCATED. IF NOT, INSERT NAME & ADDRESS OF OWNER

Yes - City of Roy

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.

Area Served by the City of Roy

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

GROUND WATER CITY OF ROY

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" 6 STAGE 10KK Bowl Type H Impeller

500 GPM 6" Discharge Pipe

50 H.P. 1765 R.P.M. 3 Phase 60 Cyc. 460 Volts

REMARKS

7.

8.

COMPLETE THIS SECTION ONLY IF THIS APPLICATION INCLUDES IRRIGATION AS A USE

IN ORDER TO IMPLEMENT THE PROVISIONS OF INITIATIVE MEASURE NUMBER 59, THE FAMILY FARM WATER ACT WHICH WAS PASSED BY THE VOTERS ON NOVEMBER 3, 1977, WE MUST ASK THE FOLLOWING QUESTIONS:

DOES THE TOTAL NUMBER OF ACRES IN WHICH YOU HAVE CONTROLLING INTEREST IN THE STATE OF WASHINGTON EXCEED 2000 ACRES FOR THE FOLLOWING THREE CATEGORIES:

1. LANDS THAT ARE BEING IRRIGATED UNDER WATER RIGHTS ACQUIRED AFTER DECEMBER 8, 1977. YES ☐ NO ☐
2. LANDS THAT MAY BE IRRIGATED UNDER APPLICATIONS NOW ON FILE WITH THE DEPARTMENT OF ECOLOGY. YES ☐ NO ☐
3. LANDS THAT MAY BE IRRIGATED UNDER THIS APPLICATION. YES ☐ NO ☐

IF 10 ACRE-FEET OR MORE OF WATER IS TO BE STORED AND/OR IF THE WATER DEPTH WILL BE 10 FEET OR MORE AT THE DEEPEST POINT, A STORAGE PERMIT MUST BE FILED IN ADDITION TO THIS PERMIT. THESE FORMS CAN BE SECURED, TOGETHER WITH INSTRUCTIONS, FROM THE DEPARTMENT OF ECOLOGY.

SIGNATURES

Steven L Wood
APPLICANT'S SIGNATURE

CITY OF ROY
LEGAL LANDOWNERS NAME (PLEASE PRINT)

City of Roy Steven L Wood
LEGAL LANDOWNER'S SIGNATURE (OWNER OF PROPERTY DESCRIBED IN ITEM NUMBER 5)

216 Mc Naught Roy WA 98580
LEGAL LANDOWNER'S ADDRESS

FOR OFFICE USE ONLY

STATE OF WASHINGTON
DEPARATMENT OF ECOLOGY } ss.

This is to certify that I have examined this application together with the accompanying maps and data, and am returning it for correction or completion as follows: .....

.....

.....

In order to retain its priority date, this application must be returned to the Department of Ecology, with corrections, on or before ....., 19.....

Witness my hand this .....*day of* ....., 19.....

.....
Department of Ecology

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 **G2-26452C**	**S01**	**300**		**137.5**		**490**	**(190)**	**77**	**60**	**490**	**(190)**	**92**	**46**	**490**	**(190)**	**102**	**36**
2 **G2-26633C**	**S02**	**300**		**137.5**	**137.5**	**450**	**(150)**	**77**	**60**	**450**	**(150)**	**92**	**46**	**450**	**(150)**	**102**	**36**
3																	
4																	
5																	
6																	
	TOTALS =	**600**		**137.5**		**940**	**(340)**	**77**	**60**	**940**	**(340)**	**92**	**46**	**940**	**(340)**	**102**	**36**
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
G2-29313A	**New**	**10/30/95**	**490**	**300**	**148**	**0**
G2-29312A	**New**	**10/30/95**	**500**	**300**	**148**	**0**

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:

APPENDIX J

HYDRAULIC ANALYSIS RESULTS

ID	Static Demand (gpm)	Limiting Node	Available Flow (gpm)
J-1	4.26	J-1	1,828
J-11	4.26	J-49	2,552
J-12	4.26	J-49	2,564
J-13	4.26	J-49	2,577
J-14	4.26	J-14	2,283
J-16	4.26	J-49	2,563
J-19	4.26	J-49	2,984
J-20	4.26	J-49	3,096
J-21	4.26	J-21	2,767
J-23	4.26	J-23	2,853
J-24	4.26	J-24	2,756
J-25	4.26	J-49	2,794
J-28	4.26	J-28	2,387
J-29	4.26	J-29	2,421
J-3	4.26	J-49	2,551
J-33	4.26	J-49	1,764
J-34	4.26	J-49	1,478
J-35	4.26	J-49	1,304
J-38	4.26	J-49	1,161
J-39	4.26	J-49	1,255
J-40	4.26	J-49	1,255
J-43	4.26	J-49	1,052
J-44	4.26	J-45	1,031
J-45	4.26	J-45	1,021
J-46	4.26	J-49	1,021
J-47	4.26	J-49	1,021
J-48	4.26	J-49	1,026
J-5	4.26	J-5	2,442
J-51	4.26	J-49	1,026
J-52	4.26	J-49	1,024
J-53	4.26	J-49	1,023
J-54	4.26	J-49	1,022
J-56	4.26	J-49	1,037
J-57	4.26	J-49	1,041
J-58	4.26	J-61	1,041
J-59	4.26	J-61	1,008
J-60	4.26	J-61	985
J-62	4.26	J-49	1,045
J-63	4.26	J-49	1,050
J-7	4.26	J-49	2,550
J-8	4.26	J-49	2,555

SCENARIO A
2010 Maximum Day Demands
Including Fire Flow
Booster Station ON
Well No. 1 OFF
Well No. 2 ON

ID	Static Demand (gpm)	Limiting Node	Available Flow (gpm)
J-1	6.64	J-1	1,794
J-11	6.64	J-49	2,353
J-12	6.64	J-49	2,364
J-13	6.64	J-49	2,375
J-14	6.64	J-14	2,234
J-16	6.64	J-49	2,363
J-19	6.64	J-49	2,754
J-20	6.64	J-49	2,866
J-21	6.64	J-49	2,669
J-23	6.64	J-23	2,783
J-24	6.64	J-24	2,706
J-25	6.64	J-49	2,571
J-28	6.64	J-28	2,341
J-29	6.64	J-49	2,369
J-3	6.64	J-49	2,353
J-33	6.64	J-49	1,630
J-34	6.64	J-49	1,367
J-35	6.64	J-49	1,207
J-38	6.64	J-49	1,077
J-39	6.64	J-49	1,162
J-40	6.64	J-49	1,162
J-43	6.64	J-49	977
J-44	6.64	J-45	958
J-45	6.64	J-45	949
J-46	6.64	J-49	949
J-47	6.64	J-49	949
J-48	6.64	J-49	953
J-5	6.64	J-49	2,354
J-51	6.64	J-49	953
J-52	6.64	J-49	952
J-53	6.64	J-49	951
J-54	6.64	J-49	950
J-56	6.64	J-49	963
J-57	6.64	J-49	967
J-58	6.64	J-61	967
J-59	6.64	J-61	955
J-60	6.64	J-61	933
J-62	6.64	J-49	971
J-63	6.64	J-49	975
J-7	6.64	J-49	2,351
J-8	6.64	J-49	2,356

SCENARIO B
2025 Maximum Day Demands
Including Fire Flow
Booster Station ON
Well No. 1 OFF
Well No. 2 ON

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-1	9.15	310	482	74.5
J-3	9.15	311	482	74.0
J-4	9.15	311	482	74.0
J-5	9.15	310	482	74.5
J-6	9.15	310	482	74.5
J-7	9.15	311	482	74.0
J-8	9.15	310	482	74.5
J-9	9.15	313	482	73.2
J-11	9.15	310	482	74.5
J-12	9.15	310	482	74.5
J-13	9.15	310	482	74.5
J-14	9.15	310	482	74.5
J-15	9.15	310	482	74.5
J-16	9.15	311	482	74.0
J-17	9.15	311	482	74.1
J-18	9.15	314	482	72.8
J-19	9.15	324	483	68.8
J-20	9.15	320	483	70.5
J-21	9.15	310	482	74.7
J-22	9.15	340	483	61.9
J-23	9.15	360	483	53.3
J-24	9.15	310	482	74.8
J-25	9.15	319	482	70.7
J-26	9.15	316	482	72.0
J-27	9.15	328	482	66.8
J-28	9.15	314	482	72.8
J-29	9.15	310	482	74.5
J-33	9.15	318	481	70.5
J-34	9.15	320	479	69.1
J-35	9.15	320	478	68.7
J-36	9.15	320	478	68.5
J-37	9.15	345	478	57.7
J-38	9.15	321	477	67.8
J-39	9.15	345	478	57.7
J-40	9.15	345	478	57.7
J-42	9.15	325	477	65.8
J-43	9.15	325	477	65.8
J-44	9.15	310	477	72.3
J-45	9.15	400	477	33.2
J-46	9.15	387	477	38.9
J-47	9.15	387	477	38.9

SCENARIO C
2010 Peak Hour Demands
Booster Station OFF
Well No. 1 OFF
Well No. 2 OFF

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-48	9.15	375	477	44.1
J-49	9.15	400	477	33.2
J-50	9.15	375	477	44.1
J-51	9.15	380	477	41.9
J-52	9.15	365	477	48.4
J-53	9.15	380	477	41.9
J-54	9.15	380	477	41.9
J-55	9.15	385	477	39.7
J-56	9.15	352	477	54.0
J-57	9.15	335	477	61.4
J-58	9.15	340	477	59.2
J-59	9.15	363	477	49.2
J-60	9.15	370	477	46.2
J-61	9.15	376	477	43.6
J-62	9.15	334	477	61.8
J-63	9.15	333	477	62.3
J-64	9.15	334	477	61.9

SCENARIO C

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-1	13.05	310	478	72.8
J-3	13.05	311	478	72.3
J-4	13.05	311	478	72.3
J-5	13.05	310	478	72.8
J-6	13.05	310	478	72.8
J-7	13.05	311	478	72.4
J-8	13.05	310	478	72.8
J-9	13.05	313	478	71.5
J-11	13.05	310	478	72.8
J-12	13.05	310	478	72.8
J-13	13.05	310	478	72.8
J-14	13.05	310	478	72.8
J-15	13.05	310	478	72.8
J-16	13.05	311	478	72.4
J-17	13.05	311	478	72.4
J-18	13.05	314	478	71.1
J-19	13.05	324	480	67.4
J-20	13.05	320	480	69.2
J-21	13.05	310	479	73.1
J-22	13.05	340	480	60.7
J-23	13.05	360	480	52.0
J-24	13.05	310	479	73.3
J-25	13.05	319	478	69.1
J-26	13.05	316	478	70.3
J-27	13.05	328	478	65.2
J-28	13.05	314	478	71.2
J-29	13.05	310	478	72.8
J-33	13.05	318	475	68.3
J-34	13.05	320	473	66.5
J-35	13.05	320	471	65.6
J-36	13.05	320	471	65.4
J-37	13.05	345	471	54.5
J-38	13.05	321	470	64.4
J-39	13.05	345	471	54.5
J-40	13.05	345	471	54.5
J-42	13.05	325	468	62.1
J-43	13.05	325	468	62.0
J-44	13.05	310	468	68.5
J-45	13.05	400	468	29.5
J-46	13.05	387	468	35.1
J-47	13.05	387	468	35.1

SCENARIO D
2025 Peak Hour Demands
Booster Station OFF
Well No. 1 OFF
Well No. 2 OFF

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-48	13.05	375	468	40.3
J-49	13.05	400	468	29.5
J-50	13.05	375	468	40.3
J-51	13.05	380	468	38.1
J-52	13.05	365	468	44.6
J-53	13.05	380	468	38.1
J-54	13.05	380	468	38.1
J-55	13.05	385	468	35.9
J-56	13.05	352	468	50.2
J-57	13.05	335	468	57.6
J-58	13.05	340	468	55.4
J-59	13.05	363	468	45.4
J-60	13.05	370	468	42.4
J-61	13.05	376	468	39.8
J-62	13.05	334	468	58.1
J-63	13.05	333	468	58.5
J-64	13.05	334	468	58.1

SCENARIO D

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-1	14.75	310	476	71.9
J-11	14.75	310	476	71.9
J-12	14.75	310	476	72.0
J-13	14.75	310	476	72.0
J-14	14.75	310	476	71.9
J-15	14.75	310	476	71.9
J-16	14.75	311	476	71.5
J-17	14.75	311	476	71.5
J-18	14.75	314	476	70.2
J-19	14.75	324	478	66.7
J-20	14.75	320	478	68.5
J-21	14.75	310	477	72.3
J-22	14.75	340	478	60.0
J-23	14.75	360	478	51.3
J-24	14.75	310	477	72.6
J-25	14.75	319	476	68.2
J-26	14.75	316	476	69.5
J-27	14.75	328	476	64.3
J-28	14.75	314	476	70.4
J-29	14.75	310	476	71.9
J-3	14.75	311	476	71.4
J-33	14.75	318	473	67.1
J-34	14.75	320	470	65.1
J-35	14.75	320	468	64.0
J-36	14.75	320	467	63.7
J-37	14.75	345	467	52.8
J-38	14.75	321	465	62.6
J-39	14.75	345	467	52.8
J-4	14.75	311	476	71.4
J-40	14.75	345	467	52.8
J-42	14.75	325	464	60.1
J-43	14.75	325	464	60.0
J-44	14.75	310	463	66.5
J-45	14.75	400	463	27.5
J-46	14.75	387	463	33.1
J-47	14.75	387	463	33.1
J-48	14.75	375	463	38.3
J-49	14.75	400	463	27.5
J-5	14.75	310	476	71.9
J-50	14.75	375	463	38.3
J-51	14.75	380	463	36.1

SCENARIO E
Buildout Peak Hour Demands
Booster Station OFF
Well No. 1 OFF
Well No. 2 OFF

SCENARIO E

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
J-52	14.75	365	463	42.6
J-53	14.75	380	463	36.1
J-54	14.75	380	463	36.1
J-55	14.75	385	463	33.9
J-56	14.75	352	463	48.2
J-57	14.75	335	463	55.6
J-58	14.75	340	463	53.4
J-59	14.75	363	463	43.4
J-6	14.75	310	476	71.9
J-60	14.75	370	463	40.4
J-61	14.75	376	463	37.8
J-62	14.75	334	463	56.1
J-63	14.75	333	463	56.6
J-64	14.75	334	463	56.1
J-7	14.75	311	476	71.5
J-8	14.75	310	476	71.9
J-9	14.75	313	476	70.6

ID	Static Demand (gpm)	Limiting Node	Available Flow (gpm)
J-1	7.70	J-1	1,779
J-11	7.70	J-49	2,268
J-12	7.70	J-49	2,278
J-13	7.70	J-49	2,289
J-14	7.70	J-14	2,212
J-16	7.70	J-49	2,277
J-19	7.70	J-49	2,657
J-20	7.70	J-49	2,767
J-21	7.70	J-49	2,570
J-23	7.70	J-23	2,751
J-24	7.70	J-24	2,683
J-25	7.70	J-49	2,475
J-28	7.70	J-28	2,320
J-29	7.70	J-49	2,282
J-3	7.70	J-49	2,267
J-33	7.70	J-49	1,572
J-34	7.70	J-49	1,318
J-35	7.70	J-49	1,164
J-38	7.70	J-49	1,040
J-39	7.70	J-49	1,120
J-40	7.70	J-49	1,120
J-43	7.70	J-49	943
J-44	7.70	J-45	925
J-45	7.70	J-45	916
J-46	7.70	J-49	916
J-47	7.70	J-49	917
J-48	7.70	J-49	921
J-5	7.70	J-49	2,269
J-51	7.70	J-49	920
J-52	7.70	J-49	919
J-53	7.70	J-49	918
J-54	7.70	J-49	917
J-56	7.70	J-49	930
J-57	7.70	J-49	933
J-58	7.70	J-61	933
J-59	7.70	J-61	930
J-60	7.70	J-61	910
J-62	7.70	J-49	937
J-63	7.70	J-49	941
J-7	7.70	J-49	2,266
J-8	7.70	J-49	2,270

SCENARIO F
Buildout Maximum Day Demar
Including Fire Flow
Booster Station ON
Well No. 1 OFF
Well No. 2 ON

APPENDIX K

RESOLUTIONS

City of Roy Fee Schedule

Administration

$0.15 per copy	**Public Records Request**. City may require a deposit not to exceed 10% of estimated cost (RCC 1-8-9)

Finances & Taxation

$30.00 handling fee plus any resulting costs incurred by the city	**Dishonored check** (RCC 3-2-2, Resolution 758)
$1.00 plus $.75/page	**Scan & send electronically a printed page or image** (RCC 3-2-3, Resolution 758)
to be set	**DUI, Electronic Home Monitoring** (RCC 3-2-4)
to be set	**Civil Service Application Filing fee** (RCC 3-2-5)
no fee	**Library Card issuance fee** (RCC 3-2-6, Resolution 758)
$1.00	**Library Card replacement** (RCC 3-2-6, Resolution 758)
$1.00 annually	**Library Card renewal fee** (RCC 3-2-6, Resolution 758)
$0.15 per page	**Library printer, black and white** (RCC 3-2-6, Resolution 758)
$0.40 per page	**Library printer, color** (RCC 3-2-6, Resolution 758)
$0.15 per item per day*	**Late Return Fines** (RCC 3-2-6, Resolution 758)

*up to one month late, then replacement value of item

$0.15	**Copy, black and white** (RCC 3-2-7, Resolution 758)
$0.40	**Copy, color** (RCC 3-2-7, Resolution 758)
$1.00 per page	**Fax, incoming** (RCC 3-2-8, Resolution 758)
$1.75 for first page, $0.75/each additional page	**Fax, outgoing, to Washington State or toll-free number** (RCC 3-2-8, Resolution 758)
$2.25 for first page, $1.75/each additional page	**Fax, outgoing, to out of state number** (RCC 3-2-8, Resolution 758)
$10.00 per stamp	**Notary Fee** (RCC 3-2-9, Resolution 758)
$903.00	**Parks Impact fee** (RCC 3-5-2, Resolution 794)

This page is current as of 06/09/2015.

Business & License Regulations

Tax rates and penalties are found in RCC Title 4.

$45.00	**Annual Business License** (RCC 4-1A-5)
$15.00	**Special Limited Business License** (RCC 4-1A-5)
$50.00	**Administrative Appeal filing fee** (RCC 4-1A-17)
$500.00/yr	**Adult Entertainment License** (RCC 4-3-2)
$75.00/yr	**Adult Entertainment Manager or Entertainer License** (RCC 4-3-2)
$50.00	**Hearing on suspended/revoked Adult Entertainment License** (RCC 4-3-16)
$480.00/yr	**Cabaret License** (RCC 4-4-5)
$120.00/qtr	**Cabaret License** (RCC 4-4-5)
$25.00/single event	**Cabaret License** (RCC 4-4-5)
$480.00/yr	**Dance Hall License** (RCC 4-5-2)
$25.00	**Single Dance License** (RCC 4-5-2)
$45.00	**Solicit or Peddle License** (RCC 4-7-2)
$10.00/yr	**Sale of Fireworks License** (RCC 4-8-2)
$5.00	**Garage Sale Permit** – up to 3 consecutive days (RCC 4-9-2)
$50.00	**Special Event Permit** - requiring street closure (RCC 4-10-3)
$25.00	**Special Event Permit** - not requiring street closure (RCC 4-10-3)

Health, Sanitation & Environment

$50.00 fee	**SEPA Threshold Determination** (RCC 5-3-10)
Fee for costs	**SEPA Environmental Checklist** (RCC 5-3-10)
$200.00 deposit	**SEPA Environmental Checklist** (RCC 5-3-10)

Public Safety

$60.00/calendar year	**Sound Amplification Permit** (RCC 6-2-7)
$40.00/calendar quarter	**Sound Amplification Permit** (RCC 6-2-7)
$20.00 single day event	**Sound Amplification Permit** (RCC 6-2-7)
$30.00/response	**2nd-5th Emergency Service Agency response** to a false alarm within a calendar year (RCC 6-5-5)
$60.00/response	**6th-12th Emergency Service Agency response** to a false alarm within a calendar year (RCC 6-5-5)
$90.00/response	**13th-20th Emergency Service Agency response** to a false alarm within a calendar year (RCC 6-5-5)
$200.00/ea	**After the 20th Emergency Service Agency response** to a false alarm within a calendar year (RCC 6-5-5)
$30.00 Redemption fee	**1st Impound of any animal** (RCC 6-7-18)
$60.00 Redemption fee	**2nd Impound of same animal** (RCC 6-7-18)
$90.00 Redemption fee	**3rd Impound of same animal** (RCC 6-7-18)
$20.00/day	**Impounding Fee** (RCC 6-7-18)
$20.00/dog	**Unaltered Dog License** (RCC 6-7-19)
$10.00/dog	**Fixed, Neutered, Spayed Dog License** (RCC 6-7-19)
20% Discount	**Microchip or Registered Tattoo** (RCC 6-7-19)
$2.50	**Replacement Dog Tag** (RCC 6-7-19)
$3.00	**Cat Registration** (RCC 6-7-19)
$30.00 late fee	**Failure to License Dog** by January 31 each year. (Does not apply to new residents and newly obtained dogs if purchasing license within 30 days, or to dogs under 6 months old) (RCC 6-7-19)

Motor Vehicles & Traffic

$100.00 Administrative Fee	**Impounded Vehicle, Redemption** (RCC 7-5A-5)

Public Ways & Property

$50.00/first 100 lineal feet, $ 0.20/additional foot	**Excavation Permit** (RCC 8-3-3)
$25.00/day	**Delay of Written Notice** to the city upon completion of acts or work done under permit (RCC 8-3-4)
$20.00/hr	**Inspection of Work Completed** if needed/required (1hr min) (RCC 8-3-5)
$25.00 up to 4 hours, $40.00 more than 4 hours of a day	**City Park** nonrefundable reservation fee (RCC 8-4-2, Resolution 752)
$50.00	**Park Deposit** for cleaning and repairing damages if needed. Any portion not used will be refunded to applicant (RCC 8-4-2, Resolution 752)
$15.00 per hour	**Community Center Building** rental fee (RCC 8-5-4)
$25.00	**Community Center Building** reservation deposit (RCC 8-5-4)
$75.00	**Community Center Building** damage deposit (RCC 8-5-4)

Public Utilities

WATER SERVICE RATES AND CHARGES Effective January 1, 2015 (Resolutions No. 778, 784):

Meter Size	Monthly Charge	Water Rate
Less than 1"	$29.89	$0.00512 per gallon used
1"	37.89	0.00512 per gallon used
1 1/2"	56.61	0.00512 per gallon used
2" and greater	72.80	0.00512 per gallon used

For water supplied through meters to users outside the city limits, or for purposes of building sprinkler fire protection, there shall be an additional surcharge of fifty percent (50%) of rates, fees and charges for water service and usage.

$50.00	**Permit for New Water Service Connection** (RCC 9-2-4B)
$25.00	**Establishment of Service Account Fee** (RCC 9-2-4E)
$10.00, or 10% of the total delinquent, whichever is greater	**Late Payment Penalty** (RCC 9-2-6A)
$10.00	**Second/Final Notice of Delinquency** (RCC 9-2-7A.3 and B.4)
$25.00	**Trip Fee to Shut Off Water** (RCC 9-2-7B.1 and 9-2-21)
$25.00	**Reconnect Fee to Turn on Water** (RCC 9-2-7A.1.d, B.1 and 9-2-21)
$50.00	**Surcharge for Reconnect After Hours** (RCC 9-2-7B.2)
$250.00 plus the cost of any Damages incurred	**Reconnect Service for Unauthorized Turn On** (RCC 9-2-7B.3)
$25.00	**Temporary Reconnect Fee,** initial trip (RCC 9-2-7C)
$25.00	**Temporary Reconnect Fee,** each trip thereafter to turn off or reconnect (RCC 9-2-7C)
$35.00	**Administrative Fee to Assign Account to Collections Agency,** in addition to actual costs of doing so (RCC 9-2-7D)
$35.00	**Administrative Fee to Assign or Record Lien,** in addition to actual costs of doing so, such as lien processing and court proceedings, as permitted by law (RCC 9-2-7B.5 and D)
$25.00	**Extra Meter Reading** at end of service or upon request (RCC 9-2-8E.1)
$190.00	**Permanently Remove a Metered Connection** (RCC 9-2-8E.2
$20.00	**Posting Notice at Service Location** (RCC 9-2-8E.3 and 4)
$25.00	**Trip Charge** (RCC 9-2-8E.5)
$20.00	**Certificate of Availability or Non-availability** (RCC 9-2-8E.6)

$50.00	**Replacement of Lock** (RCC 9-2-8E.7)	
	Monthly Fire Sprinkler Standby Charges, by service size:	
$2.00	2” or less	
$4.00	3”	
$6.00	4”	
$8.00	6”	
By contract with city council	greater than 6”	(RCC 9-2-9A)
	System Development Charges (SDC), by meter size:	
$2900.00	¾” and less	
$4843.00	1”	
$9657.00	1 ½”	
$15457.00	2”	
To be determined by the city prior to site plan approval, based on the site’s proportionate share of the city’s distribution, storage, and transmission facilities	Larger than 2”	(RCC 9-2-13A)

$45.00	**Fee to Inspect Installation Connection** (RCC 9-2-13B and G)
$6.00	**Installation Charge per Linear Foot** (RCC 9-2-13C)
$35.00 plus actual cost of consulting engineer fees	**Water Main Extension Plan Review Fee** (RCC 9-2-14A)
$35.00 plus actual cost of inspector fees	**Water Main Extension Field Inspection Fee** (RCC 9-2-14B)
$50.00	**Meter Check** with meter found to be correct (RCC 9-2-18B.2)
$50.00	**Hydrant Use** connection/alteration fee (RCC 9-2-19A.1)
Actual cost of operator, $30.00 minimum	**Hydrant Connection Operator** (RCC 9-2-19C.2)
$700.00	**Hydrant Meter Operated by Applicant,** deposit (RCC 9-2-19E)
$25.00 per week or portion thereof	**Hydrant Meter Operated by Applicant,** rental fee (RCC 9-2-19E)
$300.00	**Meter Tampering** administrative fee, in addition to any fines, penalties, water charges, or other fees or costs (RCC 9-2-20C)

PLANNING SERVICES (Resolution No. 616)

No application or request authorized by the Roy Municipal Code shall be examined or considered by the City until the applicable intake fee and deposit fees have been paid in full by an applicant:

A. Payment of Application Fees

Permit Application	Intake Fee	Deposit
Variance	$200	$1,500
Conditional Use Permit	$200	$1,500
Administrative Use Permit	$100	$600
Site Plan Review (Preliminary) – Small[1]	$200	$1,200
Site Plan Review (Preliminary) – Large[2]	$200	$2,400
Site Plan Review (Final) – Small[1]	$100	$600
Site Plan Review (Final) – Large[2]	$100	$1,200
Planned Unit Development (Preliminary) – Small[1]	$200	$2,000
Planned Unit Development (Preliminary) – Large[2]	$300	$4,000
Planned Unit Development (Final) – Small[1]	$100	$800
Planned Unit Development (Final) – Large[2]	$100	$1,600
Permit Application Amendment	$100	50% of original fee

Plats			
Preliminary Plat	$300	$4,000	+$50 per lot
Final Plat	$200	$2,000	+$25 per lot
Short Plat	$200	$1,500	+$50 per lot
Binding Site Plan	$200	$1,500	+$50 per lot

Lot Line Adjustment	$100	$600	
Lot Combination	$100	$600	
Plat Alteration or Vacation	$200	$1,000	+$25 per lot
Plat Amendment (Major)	$200	50% of original fee	
Plat Amendment (Minor)	$100	50% of original fee	
Right of Way Vacation	$200	$1,000	

Development Regulations/Comprehensive Plan	**Intake Fee**	**Deposit**
Zoning Map Amendment	$200	$2,000
Zoning Text Amendment	$200	$2,000
Comprehensive Plan Text Amendment	$200	$2,000
Comprehensive Plan Map Amendment	$200	$2,000
Planning Commission Action (Appeal to Council)	$200	$1,000
Administrative Decision (Appeal to Examiner)	$200	$1,000
SEPA Appeal	$200	$1,000
Reconsideration	$100	$500

Environmental Review		
SEPA Checklist	$200	$800
Environmental Impact Statement (EIS)	$300	$3,000
Critical Areas Initial Study	$100	$500
Critical Areas Reasonable Use Exception	$200	$1,500
Critical Areas Technical Study Review	$100	$500
Shoreline Management Permit	$200	$1,000

Miscellaneous Permits, Requests and Services		
Annexation Petition (unless waived by Council)	$200	$1,000
Home Occupation Permit	$50	$50
Sign Permit	$50	$25 per sign
Time Extension	$100	$600
Continuation Request in Advance of Hearing	$100	$100
Revocation	$200	$800
Technical Review Committee	$100	$500
Engineering Services -- Inspections	Actual Cost	
Other Permits and Services Not Specified Above	Initial intake fee and deposit will be based on most similar permit category in fee resolution	

[1]Small: Five or fewer dwelling units or 10,000 square feet or less of gross floor area in new commercial, industrial or mixed use construction

[2]Large: Six or more dwelling units or more than 10,000 square feet of gross floor area in new commercial, industrial or mixed use construction

B. Calculation of Total Fees
   1. The total fee for which the applicant shall be responsible for shall include the actual costs incurred by the City in processing the application or the request referred to in subsection A, as follows:
      a) All services provided by City staff shall be charged at a rate equal to currently hourly wages and benefits, plus 15% overhead;
      b) All services as provided by the City Attorney and Hearing Examiner shall be charged at the same standard hourly rate charged to the City for his or her services;
      c) The actual costs of mailing, publishing and posting required legal notices;
      d) The actual costs of reproducing maps or other graphics;
      e) Recording fees paid by the City of Roy; and
      f) Planning, Engineering, or other consultant services as required in the review and or processing of the application.
   2. The total fee referred to in subsection B.1 shall be reduced by the amount of the deposit paid pursuant to subsection A. The applicant shall remit to the City the amount by which the City's actual costs exceed the deposit fee within 30 days of final City approval. Failure on the part of the applicant to remit this amount

within the 30-day period may, at the City's discretion, cause the final approval to be revoked. If the deposit fee exceeds the City's actual costs, the balance shall be refunded within 30 days of final approval.

C. Consultant Costs and Guarantee of Payment

If the City contracts directly with a consultant to prepare required studies or documentation, the City shall advise the applicant of the projected costs of the study prior to actual preparation. The applicant shall post a cash deposit, bond or otherwise ensure payment of such costs and the City's anticipated actual costs associated with engagement of the consultant, prior to commencement of work on the studies or documentation.

D. Cancellation, Withdrawal or Denial of Application or Request

If any application or request is withdrawn or canceled, the applicant shall remain responsible for payment of the City's actual costs incurred prior to its receipt of a written cancellation or withdrawal notification. If City action on any such application or request is denied, the applicant shall remain responsible for payment of the City's actual costs incurred prior to the denial. If an application or request is withdrawn, canceled or denied, the actual costs incurred by the City for which the applicant is responsible shall be calculated pursuant to subsection B.

Building Regulations

$250.00	**Singlewide Manufactured or Mobile Home** installation/relocation permit fee (RCC 10-3-1)
$500.00	**Doublewide Manufactured or Mobile Home** installation/relocation permit fee (RCC 10-3-1)
$750.00	**Triplewide Manufactured or Mobile Home** installation/relocation permit fee (RCC 10-3-1)
$100.00	**Additional Inspection Fee** if more than 3 needed (RCC 10-3-1)
$45.00	**Annual License fee** for the operation of any manufactured or mobile home park (RCC 10-4-3, Resolution 760)
Equal to the applicable fee(s) for Planning Services, Building Regulations and Building Permits	**Application fee** for a permit to construct, substantially reconstruct or enlarge a manufactured or mobile home park (RCC 10-1-1, Resolution 760)
$250.00	**Singlewide Manufactured or Mobile Home** placement fee (RCC 10-4-10)
$500.00	**Doublewide Manufactured or Mobile Home** placement fee (RCC 10-4-10)
$750.00	**Triplewide Manufactured or Mobile Home** placement fee (RCC 10-4-10)
$1.00 per sign	**Wetland Boundaries** sign permits (RCC 10-5A-3)

BUILDING PERMITS (Resolution No. 731)

Section 1. The City Council of the City of Roy hereby directs that the following fees for building permits be designated in the City of Roy Fee Schedule, and that the additional fee for plan review shall be 65% of the building permit fee. Inspections outside of normal business hours; additional plan review required by changes, additions or revisions to plans; and use of outside consultants shall be charged at the total cost to the City, including administrative and overhead costs.

TOTAL VALUATION	FEE
$1.00 to $500.00	$35.00
$501.00 to $2,000.00	$35.00 for the first $500.00 plus $3.05 for each additional $100.00, or fraction thereof, to and including $2,000.00
$2,001.00 to $25,000.00	$80.75 for the first $2,000.00 plus $14.00 for each additional $1,000.00, or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00	$402.75 for the first $25,000.00 plus $10.50 for each additional $1,000.00, or fraction thereof, to and including $50,000.00
$50,001.00 to $100,000.00	$665.25 for the first $50,000.00 plus $7.20 for each additional $1,000.00, or fraction thereof, to and including $100,000.00

$100,001.00 to $500,000.00	$1,025.25 for the first $100,000.00 plus $5.75 for each additional $1,000.00, or fraction thereof, to and including $500,000.00
$500,001.00 to $1,000,000.00	$3,325.25 for the first $500,000.00 plus $4.75 for each additional $1,000.00, or fraction thereof, to and including $1,000,000.00
$1,000,001.00 and up	$5,700.25 for the first $1,000,000.00 plus $3.65 for each additional $1,000.00, or fraction thereof

Demolish a structure **$75.00** (Resolution 761)

Section 2. The City Council of the City of Roy hereby directs that the following fees for mechanical permits be designated in the City of Roy Fee Schedule. Inspections outside of normal business hours; additional plan review required by changes, additions or revisions to plans; and use of outside consultants shall be charged at the total cost to the City, including administrative and overhead costs.

PERMIT ISSUANCE AND HEATERS

1. For the issuance of each mechanical permit	$30.00
2. For issuing each supplemental permit for which the original permit has not expired, been canceled or finaled	$8.00

UNIT FEE SCHEDULE (Note: The following do not include permit-issuing fee.)

1. Furnaces:	
For the installation or relocation of each forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance, up to and including 100,000 Btu/h (29.3 kW)	$15.00
For the installation or relocation of each forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance over 100,000 Btu/h (29.3 kW)	$18.20
For the installation or relocation of each floor furnace, including vent	$14.80
For the installation or relocation of each suspended heater, recessed wall heater or floor-mounted unit heater	$14.80
2. Appliance Vents:	
For the installation, relocation or replacement of each appliance vent installed and not included in an appliance permit	$7.25
3. Repairs or Additions:	
For the repair of, alteration of, or addition to each heating appliance, refrigeration unit, cooling unit, absorption unit, or each heating, cooling, absorption or evaporative cooling system, including installation of controls regulated by the Mechanical Code	$13.70
4. Boilers, Compressors and Absorption Systems:	
For the installation or relocation of each boiler or compressor to and including 3 horsepower	

(10.6 kW), or each absorption system to and including 100,000 Btu/h (29.3 kW) $14.70

For the installation or relocation of each boiler or compressor over three horsepower (10.6 kW) to and including 15 horsepower (52.7 kW), or each absorption system over 100,000 Btu/h (29.3 kW) to and including 500,000 Btu/h (146.6 kW) $27.15

For the installation or relocation of each boiler or compressor over 15 horsepower (52.7 kW) to and including 30 horsepower (105.5 kW), or each absorption system over 500,000 Btu/h (146.6 kW) to and including 1,000,000 Btu/h (293.1 kW) $37.25

For the installation or relocation of each boiler or compressor over 30 horsepower (105.5 kW) to and including 50 horsepower (176 kW), or each absorption system over 1,000,000 Btu/h (293.1 kW) to and including 1,750,000 Btu/h (512.9 kW) $55.45

For the installation or relocation of each boiler or compressor over 50 horsepower (176 kW), or each absorption system over 1,750,000 Btu/h (512.9 kW) $92.65

5. Air Handlers:

For each air-handling unit to and including 10,000 cubic feet per minute (cfm) (4719 L/s), including ducts attached thereto $10.65

Note: This fee does not apply to an air-handling unit which is a portion of a factory-assembled appliance, cooling unit, evaporative cooler or absorption unit for which a permit is required elsewhere in the Mechanical Code.

For each air-handling unit over 10,000 cfm (4719 L/s) $18.10

6. Evaporative Coolers:

For each evaporative cooler other than portable type $10.65

7. Ventilation and Exhaust:

For each ventilation fan connected to a single duct $7.25

For each ventilation system which is not a portion of any heating or air-conditioning system authorized by a permit $10.65

For the installation of each hood which is served by mechanical exhaust, including the ducts for such hood $10.65

8. Incinerators:

For the installation or relocation of each domestic-type incinerator $18.20

For the installation or relocation of each commercial or industrial-type incinerator $14.50

9. Miscellaneous:

For each appliance or piece of equipment regulated by the Mechanical Code but not classed in

other appliance categories, or for which no other fee is listed in the table	$10.65

Section 3. The City Council of the City of Roy hereby directs that the following fees for the issuance of plumbing permits, the purchase of plumbing units and the review of plumbing plans be designated in the City of Roy Fee Schedule. Inspections outside of normal business hours; additional plan review required by changes, additions or revisions to plans; and use of outside consultants shall be charged at the total cost to the City, including administrative and overhead costs.

PERMIT ISSUANCE

a. For issuing each permit	$30.00
b. For issuing each supplemental permit	15.00

UNIT FEE SCHEDULE (in addition to permit issuance fee):

a. For each plumbing fixture on one trap (including water, drainage piping and backflow protection therefor)	$ 9 .00
b. For each building sewer and each trailer park sewer	19 .00
c. Rainwater systems, per drain (inside building)	9 .00
d. For each cesspool (where permitted)	31 .00
e. For each private sewage disposal system	50 .00
f. For each water heater and/or vent	9 .00
g. For each gas piping system of 1 to 5 outlets	7 .00
h. For each additional gas piping system outlet	2 .00 per outlet
i. For each industrial waste pretreatment interceptor, including its trap and vent, except kitchen type grease interceptors functioning as fixture traps	9 .00
j. For each installation, alteration or repair of water piping and/or water treating equipment	9 .00 each
k.For each repair or alteration of drainage or vent piping fixture	9 .00 each
l. For each lawn sprinkler system on any 1 meter including backflow protection devices therefor	9 .00
m. For atmospheric type vacuum breakers not included in subsection C2l of this section:	
1 to 5	7 .00
Over 5	2 .00 each
n. For each backflow protective device other than atmospheric type vacuum breakers:	
2 inch (51 mm) diameter and smaller	9 .00
Over 2 inch (51 mm) diameter	19 .00
o. For each graywater system	50 .00

p. For initial installation and testing for a reclaimed water system	38 .00
q. For each annual cross connection testing of a reclaimed water system (excluding initial test)	38 .00
r. For each medical gas piping system serving:	
1 to 5 inlets/outlets for a specific gas	62 .00
Over 5	7 .00 each

INITIAL PLAN REVIEW Fees for the initial review of plans shall be sixty five percent (65%) of the fee for the appropriate permit issued. This initial plan review fee shall be paid at the time of applying for the appropriate permit.

ORDINANCE NO. 687

CITY OF ROY, WASHINGTON

AN ORDINANCE adopting by reference the City of Roy Cross-Connection Control Program regulating the use of cross connections to the City's public water system.

WHEREAS, the City of Roy's Public Works Department has established a proposed Cross Connection Control Program designed to identify and regulate actual and potential cross connections to the City of Roy water system, which may permit contaminants or pollutants to enter the City's drinking water supply by means of backflow;

WHEREAS, in order to protect the public health, safety and property of the citizens of the City, it is now necessary to adopt the proposed Cross Connection Control Program; now, therefore,

THE CITY COUNCIL OF THE CITY OF ROY, WASHINGTON

DO ORDAIN AS FOLLOWS:

Section 1. The City hereby adopts by reference the City of Roy Cross-Connection Control Program.

Section 2. Effective Date. This ordinance shall become effective five (5) days from and after its passage, approval and publication as provided by law.

Passed by the City Council and approved by the Mayor of the City of Roy, Washington, at a regular meeting thereof this 11 day of October, 2004.

Ray C. Bourne
MAYOR RAY BOURNE

ATTEST:

Betty J. Garrison
BETTY J. GARRISON, CMC
City Clerk/Treasurer

Approved as to Form:

HARRY R. BOESCHE, JR., WSBA #29893
City Attorney

1st Reading 9-13-04
2nd Reading 9-27-04
3rd Reading 10-11-04

CITY OF ROY, WASHINGTON
RESOLUTION NO. 778

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROY, PIERCE COUNTY, WASHINGTON, SETTING FEES AND CHARGES RELATING TO WATER USER SERVICES ON THE CITY OF ROY FEE SCHEDULE.

WHEREAS, by Ordinance No. 921, the Roy City Council amended, clarified and established fees for services provided to users of the city water system; and

WHEREAS, the Roy City Council desires to set such fees in the City of Roy Fee Schedule;

NOW THEREFORE, be it resolved by the City Council of the City of Roy, Washington:

Section 1. The City Council of the City of Roy hereby adopts the fees and charges as set forth below and directs that they be set forth in the City of Roy Fee Schedule, unless otherwise provided by law, to be effective pursuant to law:

Permit for new water service connection (RCC 9-2-4B)	$50.00
Establishment of service account fee (RCC 9-2-4E)	$25.00
Late payment penalty (RCC 9-2-6A)	$5.00, or 10% of the total delinquent, whichever is greater
Second/final notice of delinquency (RCC 9-2-7A.3 and B.4)	(charge takes effect 1/1/15)
Trip fee to shut off water (RCC 9-2-7B.1 and 9-2-21)	$30.00
Reconnect fee to turn on water (RCC 9-2-7A.1.d, B.1 and 9-2-21)	(charge takes effect 1/1/15)
Surcharge for reconnect after hours (RCC 9-2-7B.2)	$50.00
Reconnect service for unauthorized turn on (RCC 9-2-7B.3)	$250.00 plus the cost of any damages incurred

Temporary reconnect fee, initial trip	$25.00
Temporary reconnect fee, each trip thereafter to turn off or reconnect (RCC 9-2-7C)	$25.00
Administrative fee to assign account to collections agency, in addition to actual costs of doing so (RCC 9-2-7D)	$35.00
Administrative fee to assign or record lien, in addition to actual costs of doing so, such as lien processing and court proceedings, as permitted by law (RCC 9-2-7B.5 and D)	$35.00
Extra meter reading at end of service or upon request (RCC 9-2-8E.1)	$25.00
Permanently remove a metered connection (RCC 9-2-8E.2)	$190.00
Posting notice at service location (RCC 9-2-8E.3 and 4)	$20.00
Trip charge (RCC 9-2-8E.5)	$25.00
Certificate of availability or non-availability (RCC 9-2-8E.6)	$20.00
Replacement of lock (RCC 9-2-8E.7)	$50.00
Monthly fire sprinkler standby charges, by service size:	
2" or less	$2.00
3"	$4.00
4"	$6.00
6"	$8.00
greater than 6" (RCC 9-2-9A)	by contract with city council
System Development Charges (SDC), by meter size:	
3/4" and less	$2,900.00
1"	$4,843.00
1 ½"	$9,657.00
2"	$15,457.00
Larger than 2" (RCC 9-2-13A)	To be determined by the city prior to site plan approval, based on the site's proportionate share of the city's distribution, storage, and transmission facilities
Fee to inspect installation connection (RCC 9-2-13B and G)	$45.00

Installation charge per linear foot (RCC 9-2-13C)	$6.00
Water main extension plan review fee (RCC 9-2-14A)	$35.00 plus actual cost of consulting engineer fees
Water main extension field inspection fee (RCC 9-2-14B)	$35.00 plus actual cost of inspector fees
Meter check with meter found to be correct (RCC 9-2-18B.2)	$50.00
Hydrant use connection/alteration fee (RCC 9-2-19A.1)	$50.00
Hydrant connection operator (RCC 9-2-19C.2)	actual cost of operator, $30.00 minimum
Hydrant meter operated by applicant, deposit Hydrant meter operated by applicant, rental fee (RCC 9-2-19E)	$700.00 $25.00 per week or portion thereof
Meter tampering administrative fee, in addition to any fines, penalties, water charges, or other fees or costs (RCC 9-2-20C)	$300.00

Section 2. The City Council of the City of Roy hereby adopts the fees and charges as set forth below and directs that they be set forth in the City of Roy Fee Schedule effective January 1, 2015, unless otherwise provided by law:

Late payment penalty (RCC 9-2-6A)	$10.00, or 10% of the total delinquent, whichever is greater
Second/final notice of delinquency (RCC 9-2-7A.3 and B.4)	$10.00
Trip fee to shut off water (RCC 9-2-7B.1 and 9-2-21)	$25.00
Reconnect fee to turn on water (RCC 9-2-7A.1.d, B.1 and 9-2-21)	$25.00
Monthly base rate, by meter size:	
Less than 1"	$29.89
1"	$37.89
1 ½"	$56.61
2" and greater	$72.80
Charge per gallon (RCC 9-2-8A)	$.005129

Section 3. Severability. If any section, sentence, clause or phrase of this resolution should be held to be unconstitutional or unlawful by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause or phrase of this resolution.

Section 4. All acts consistent with this resolution are hereby authorized.

Adopted this 8th day of December, 2014.

KAREN YATES, Mayor

ATTEST:

DEBRA DEARINGER
City Clerk-Treasurer

APPROVED AS TO FORM:

CATHY PARKER, CITY ATTORNEY
WSBA#16406

CITY OF ROY, WASHINGTON
RESOLUTION NO. 784

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROY, PIERCE COUNTY, WASHINGTON, AMENDING CHARGES RELATING TO WATER USAGE ON THE CITY OF ROY FEE SCHEDULE.

WHEREAS, by Resolution No. 778, the Roy City Council set forth fees for services provided to users of the city water system; and

WHEREAS, the City's accounting software does not accommodate the charge per gallon to six decimal places as set forth;

NOW THEREFORE, be it resolved by the City Council of the City of Roy, Washington:

Section 1. The City Council of the City of Roy hereby amends the charge per gallon of water effective January 1, 2015, from $0.005129 to $0.00512 and directs that it be set forth in the City of Roy Fee Schedule.

Section 2. Severability. If any section, sentence, clause or phrase of this resolution should be held to be unconstitutional or unlawful by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause or phrase of this resolution.

Section 3. All acts consistent with this resolution are hereby authorized.

Adopted this ~~26th~~ 29th day of January, 2015.

KAREN YATES, Mayor

ATTEST:

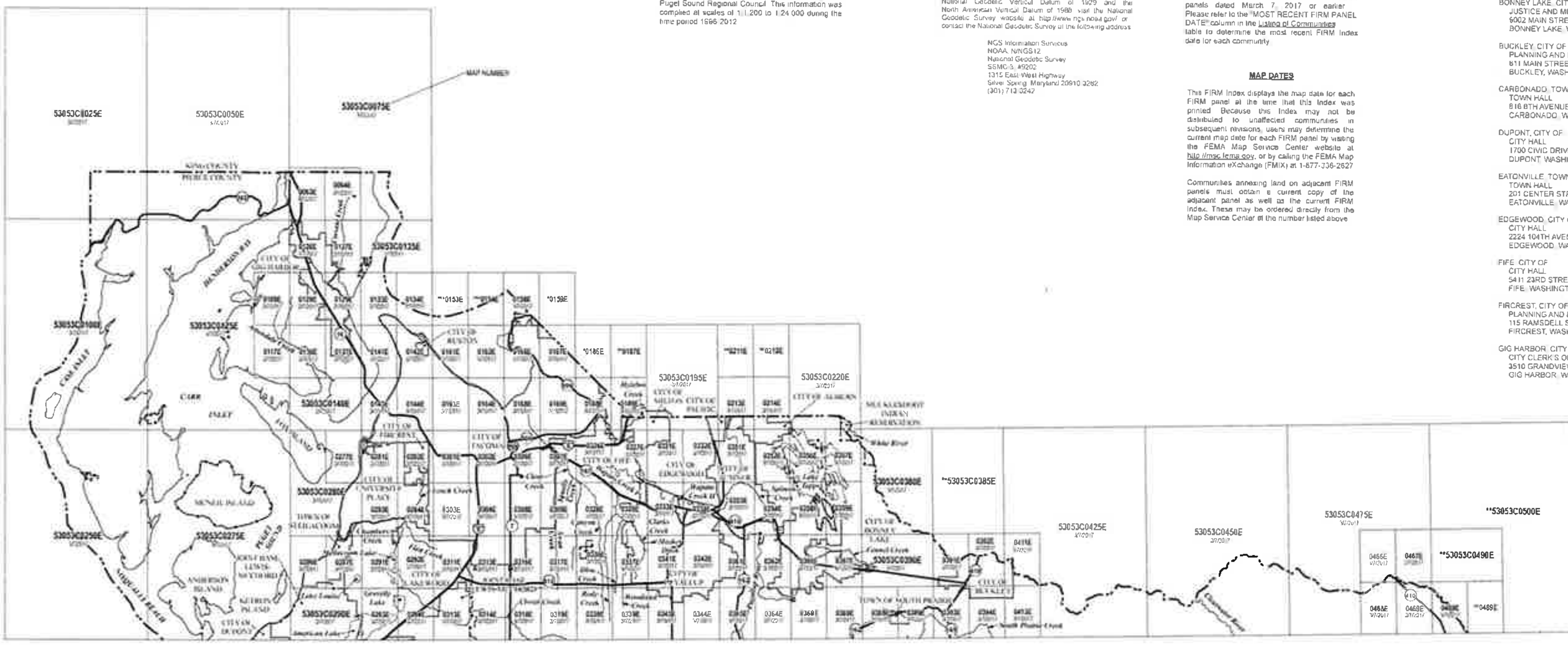
DEBRA DEARINGER
City Clerk-Treasurer

APPROVED AS TO FORM:

R. TYE GRAHAM, CITY ATTORNEY
WSBA#44037

APPENDIX L

MAPS OF POTENTIAL SOURCES OF CONTAMINATION IN WELLHEAD AREA



*PANEL NOT PRINTED (NO SPECIAL FLOOD HAZARD AREAS)
**PANEL NOT PRINTED (AREA OUTSIDE COUNTY BOUNDARY)
***PANEL NOT PRINTED (OPEN WATER AREA)

BASE MAP SOURCE

Base Map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Pierce County GIS, WA DNR, WSDOT, USFWS, Washington State Department of Ecology, and Puget Sound Regional Council. This information was compiled at scales of 1:1,200 to 1:24,000 during the time period 1996-2012.

ELEVATION DATUM

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

NOTE TO USER

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Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

MAP REPOSITORIES

(Maps available for reference only, not for distribution.)

BONNEY LAKE, CITY OF
JUSTICE AND MUNICIPAL CENTER
9002 MAIN STREET EAST, SUITE 300
BONNEY LAKE, WASHINGTON 98391

BUCKLEY, CITY OF
PLANNING AND BUILDING DEPARTMENT
811 MAIN STREET
BUCKLEY, WASHINGTON 98321

CARBONADO, TOWN OF
TOWN HALL
816 8TH AVENUE
CARBONADO, WASHINGTON 98323

DUPONT, CITY OF
CITY HALL
1700 CIVIC DRIVE
DUPONT, WASHINGTON 98327

EATONVILLE, TOWN OF
TOWN HALL
201 CENTER STREET WEST
EATONVILLE, WASHINGTON 98328

EDGEWOOD, CITY OF
CITY HALL
2224 104TH AVENUE EAST
EDGEWOOD, WASHINGTON 98372

FIFE, CITY OF
CITY HALL
5411 23RD STREET EAST
FIFE, WASHINGTON 98424

FIRCREST, CITY OF
PLANNING AND BUILDING DEPARTMENT
115 RAMSDELL STREET
FIRCREST, WASHINGTON 98466

GIG HARBOR, CITY OF
CITY CLERK'S OFFICE
3510 GRANDVIEW STREET
GIG HARBOR, WASHINGTON 98335

LAKEWOOD, CITY OF
CITY HALL
6000 MAIN STREET SW
LAKEWOOD, WASHINGTON 98499

MILTON, CITY OF
PUBLIC WORKS DEPARTMENT
1000 LAUREL STREET
MILTON, WASHINGTON 98354

ORTING, CITY OF
CITY HALL
110 TRAIN STREET SE
ORTING, WASHINGTON 98360

PIERCE COUNTY
(UNINCORPORATED AREAS)
PIERCE COUNTY ANNEX
2401 SOUTH 35TH STREET
TACOMA, WASHINGTON 98409

PUYALLUP, CITY OF
CITY HALL
333 SOUTH MERIDIAN
PUYALLUP, WASHINGTON 98371

ROY, CITY OF
CITY HALL
216 MCNAUGHT STREET SOUTH
ROY, WASHINGTON 98580

RUSTON, CITY OF
CITY HALL
5117 N WINNIFRED STREET
RUSTON, WASHINGTON 98407

SOUTH PRAIRIE, TOWN OF
TOWN HALL
121 NW WASHINGTON STREET
SOUTH PRAIRIE, WASHINGTON 98385

STEILACOOM, TOWN OF
PUBLIC WORKS BUILDING
1030 ROE STREET
STEILACOOM, WASHINGTON 98388

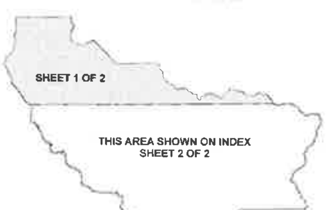
SUMNER, CITY OF
CITY HALL, PUBLIC WORKS COUNTER
1104 MAPLE STREET
SUMNER, WASHINGTON 98390

TACOMA, CITY OF
MUNICIPAL BUILDING
747 MARKET STREET
TACOMA, WASHINGTON 98402

UNIVERSITY PLACE, CITY OF
CITY HALL
3715 BRIDGEPORT WAY WEST
SUITE B-1
UNIVERSITY PLACE, WASHINGTON 98466

WILKESON, TOWN OF
TOWN HALL
540 CHURCH STREET
WILKESON, WASHINGTON 98396

PIERCE COUNTY, WA
INDEX LOCATOR DIAGRAM



LISTING OF COMMUNITIES

COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANEL(S)	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
BONNEY LAKE, CITY OF	530074	[illegible]	OCTOBER 29, 1976	MAY 1, 1985	MARCH 7, 2017
BUCKLEY, CITY OF	530129	[illegible]	AUGUST 16, 1974	MAY 1, 1985	MARCH 7, 2017
*CARBONADO, TOWN OF	530042	[illegible]	MARCH 7, 2017	MARCH 7, 2017	MARCH 7, 2017
DUPONT, CITY OF	530045	[illegible]	SEPTEMBER 7, 1982	SEPTEMBER 15, 1983	MARCH 7, 2017
EATONVILLE, TOWN OF	530306	[illegible]	OCTOBER 22, 1976	JULY 3, 1986	MARCH 7, 2017
**EDGEWOOD, CITY OF	530325	[illegible]	OCTOBER 25, 1977	AUGUST 19, 1987	MARCH 7, 2017
FIFE, CITY OF	530140	[illegible]	MAY 24, 1974	NOVEMBER 5, 1980	MARCH 7, 2017
FIRCREST, CITY OF	530141	[illegible]	JUNE 28, 1974	FEBRUARY 2, 1982	MARCH 7, 2017
GIG HARBOR, CITY OF	530142	[illegible]	JUNE 28, 1974	SEPTEMBER 2, 1981	MARCH 7, 2017
**LAKEWOOD, CITY OF	530332	[illegible]	OCTOBER 25, 1977	AUGUST 19, 1987	MARCH 7, 2017
MILTON, CITY OF	530254	[illegible]	DECEMBER 3, 1976	FEBRUARY 17, 1982	MARCH 7, 2017
ORTING, CITY OF	530143	[illegible]	DECEMBER 28, 1973	SEPTEMBER 27, 1985	MARCH 7, 2017
PIERCE COUNTY (UNINCORPORATED AREAS)	530138	0025, 0050, 0063, 0064, 0075, 0100, 0108, 0117, 0125, 0126, 0127, 0128, 0129, 0133, 0134, 0135, 0136, 0137, 0140, 0141, 0142, 0143, 0144, **0153, **0154, 0158, **0159, 0161, 0162, 0163, 0164, 0166, 0167, 0168, 0188, 0189, 0195, 0213, 0214, 0220, 0250, 0275, 0277, 0280, 0281, 0282, 0284, 0286, 0287, 0290, 0307, 0308, 0309, 0311, 0312, 0314, 0316, 0317, 0318, 0319, 0326, 0327, 0328, 0329, 0332, 0333, 0334, 0336, 0337, 0338, 0339, 0342, 0343, 0344, 0352, 0353, 0354, 0356, 0357, 0358, 0359, 0361, 0362, 0363, 0364, 0366, 0367, 0368, 0369, 0380, 0388, 0389, 0390, 0391, 0393, 0394, 0411, 0413, 0425, 0450, 0466, 0467, 0468, 0469, 0475, 0488, 0504, 0505, 0506, 0508, 0512, 0516, 0517, 0518, 0519, 0540, 0543, 0544, 0545, 0552, 0556, 0557, 0575, 0576, 0577, 0586, 0587, 0588, 0589, 0593, 0600, 0601, 0602, 0603, 0604, 0606, 0607, 0608, 0609, 0612, 0614, 0615, 0620, 0625, 0630, 0631, 0650, 0675, 0700, 0725, 0726, 0730, 0750, **0775, **0800, 0807, 0826, 0827, 0828, 0829, 0831, 0832, 0835, 0837, 0841, 0842, 0851, 0852, 0853, 0854, 0856, 0860, 0861, 0862, 0863, 0864, 0869, 0870, 0876, 0877, 0878, 0879, 0881, 0882, 0883, 0884, 0886, 0887, 0888, 0889, 0891, 0892, 0893, 0894, 0901, 0902, 0903, 0904, 0906, 0910, 0915, 0920, 0950, 0975, 1000, 1025, 1050, **1075, 1076, 1077, 1081, 1082, 1084, 1101, 1102, 1103, 1104, 1106, 1107, 1110, 1120, 1126, 1150, 1175, 1180, 1185, 1189, 1190, 1195, 1225, 1250, **1275, **1300, 1325, 1326, 1327, 1331, 1335, 1375	OCTOBER 25, 1977	AUGUST 19, 1987	MARCH 7, 2017
PUYALLUP, CITY OF	530144	0329, 0333, 0334, 0337, [illegible]	MAY 24, 1974	AUGUST 15, 1980	MARCH 7, 2017
ROY, CITY OF	530262	[illegible]	JULY 18, 1975	MARCH 15, 1982	MARCH 7, 2017
RUSTON, CITY OF	530300	[illegible]	DECEMBER 3, 1976	JULY 3, 1986	MARCH 7, 2017
SOUTH PRAIRIE, TOWN OF	530145	[illegible]	NOVEMBER 19, 1976	DECEMBER 15, 1981	MARCH 7, 2017
STEILACOOM, TOWN OF	530146	[illegible]	AUGUST 9, 1974	JULY 19, 1982	MARCH 7, 2017
SUMNER, CITY OF	530147	[illegible]	JULY 26, 1974	DECEMBER 16, 1980	MARCH 7, 2017
TACOMA, CITY OF	530148	[illegible]	OCTOBER 18, 1974	DECEMBER 1, 1983	MARCH 7, 2017
**UNIVERSITY PLACE, CITY OF	[illegible]	[illegible]	OCTOBER 25, 1977	AUGUST 19, 1987	MARCH 7, 2017
WILKESON, TOWN OF	[illegible]	[illegible]	AUGUST 29, 1975	MARCH 1, 1982	MARCH 7, 2017

*NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED
**PANEL NOT PRINTED
**DATES FOR THIS COMMUNITY WERE TAKEN FROM PIERCE COUNTY (UNINCORPORATED AREAS)

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

MAP INDEX

FIRM

FLOOD INSURANCE RATE MAP

PIERCE COUNTY, WASHINGTON
AND INCORPORATED AREAS
(SEE LISTING OF COMMUNITIES TABLE)

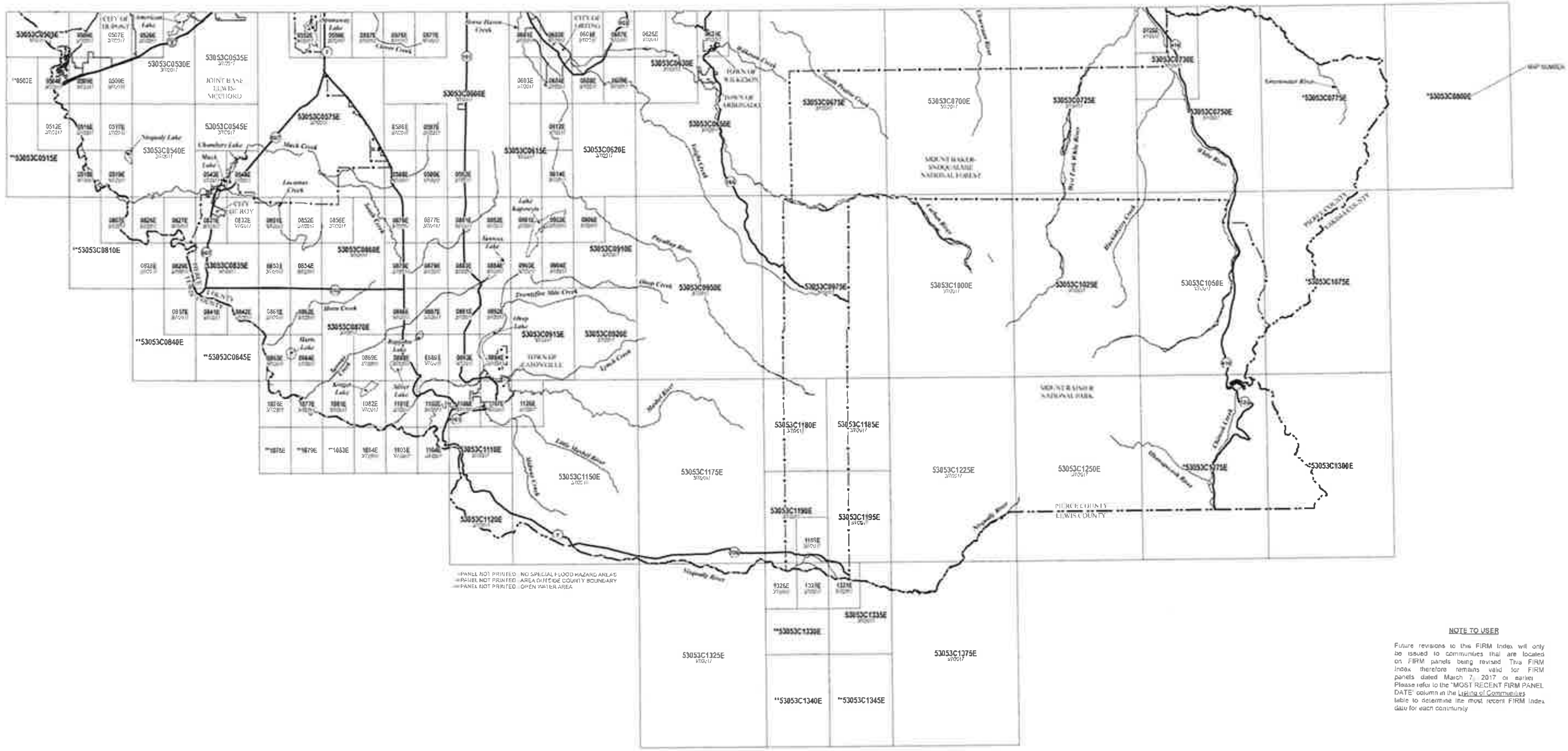
MAP INDEX

PANELS PRINTED: [illegible]

MAP NUMBER
53053CIND1A

EFFECTIVE DATE
MARCH 7, 2017

Federal Emergency Management Agency



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ELEVATION DATUM

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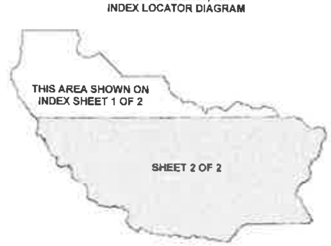
NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

PIERCE COUNTY, WA
INDEX LOCATOR DIAGRAM



See Sheet 1 of 2 for
MAP REPOSITORY LISTING

See Sheet 1 of 2 for
LISTING OF COMMUNITIES

BASE MAP SOURCE

Base Map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Pierce County GIS, WA DNR, WSDOT, USFWS, Washington State Department of Ecology, and Puget Sound Regional Council. This information was compiled at scales of 1:1,200 to 1:24,000 during the time period 1996-2012.

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM
FLOOD INSURANCE RATE MAP

PIERCE COUNTY,
WASHINGTON
AND INCORPORATED AREAS
(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

PANELS PRINTED: [illegible]

MAP NUMBER
53053CIND2A

EFFECTIVE DATE
MARCH 7, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Pierce County GIS, WA DNR, WSDOT, USFWS, Washington State Department of Ecology, and Puget Sound Regional Council. This information was compiled at scales of 1:1,200 to 1:24,000 during the time period 1996-2012.

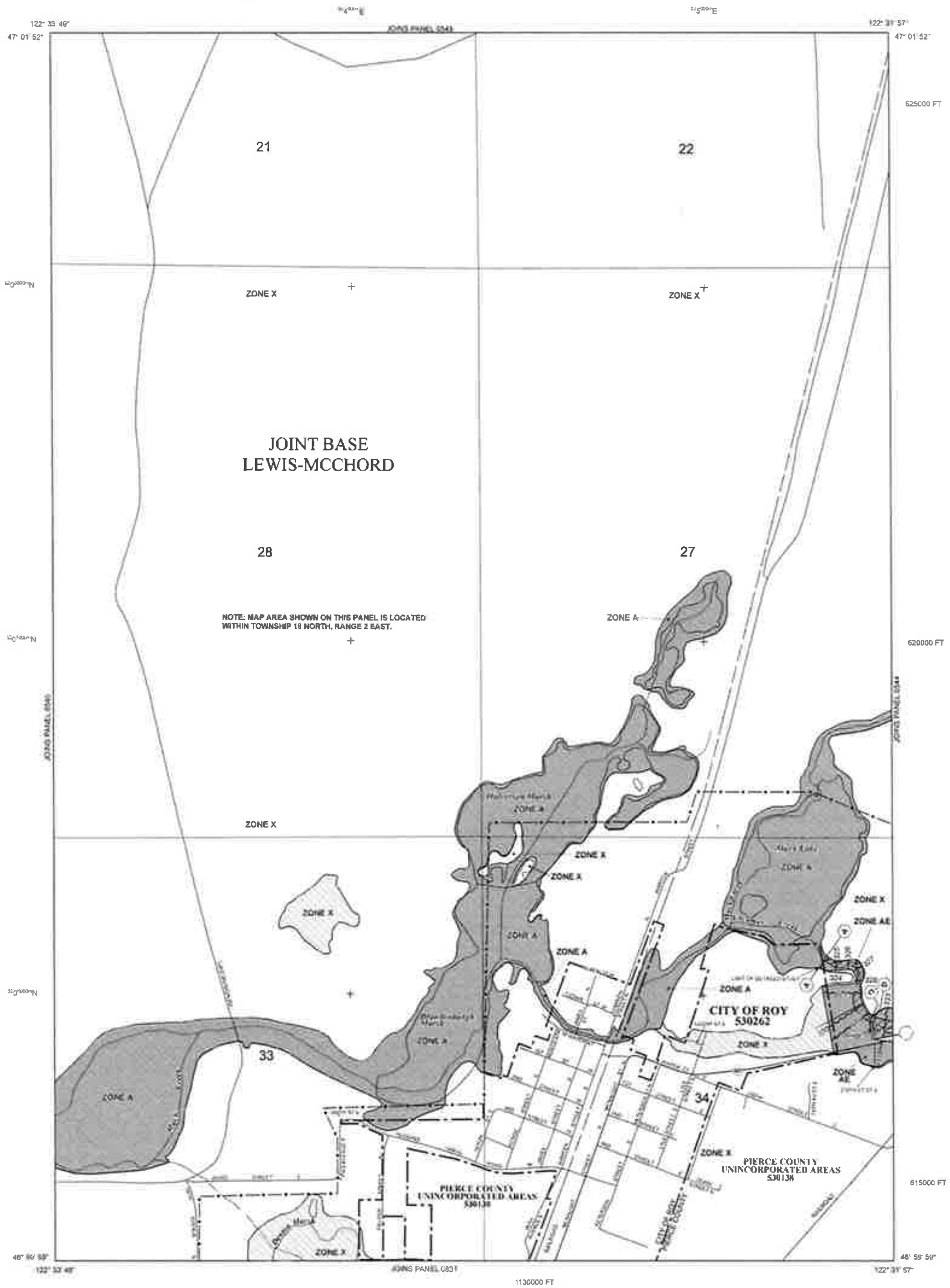
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance Floodplain Boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)——(A)	Cross section line
(23) - - - - (23)	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
N	1000-meter Universal Transverse Mercator grid values, zone 10
DX5510 X	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
March 7, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0543E

FIRM

FLOOD INSURANCE RATE MAP

PIERCE COUNTY, WASHINGTON AND INCORPORATED AREAS

PANEL 543 OF 1375
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PIERCE COUNTY	530138	0543	E
ROY, CITY OF	530262	0543	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
53053C0543E

EFFECTIVE DATE
MARCH 7, 2017

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10. The horizontal **datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Pierce County GIS, WA DNR, WSDOT, USFWS, Washington State Department of Ecology, and Puget Sound Regional Council. This information was compiled at scales of 1:1,200 to 1:24,000 during the time period 1986-2012.

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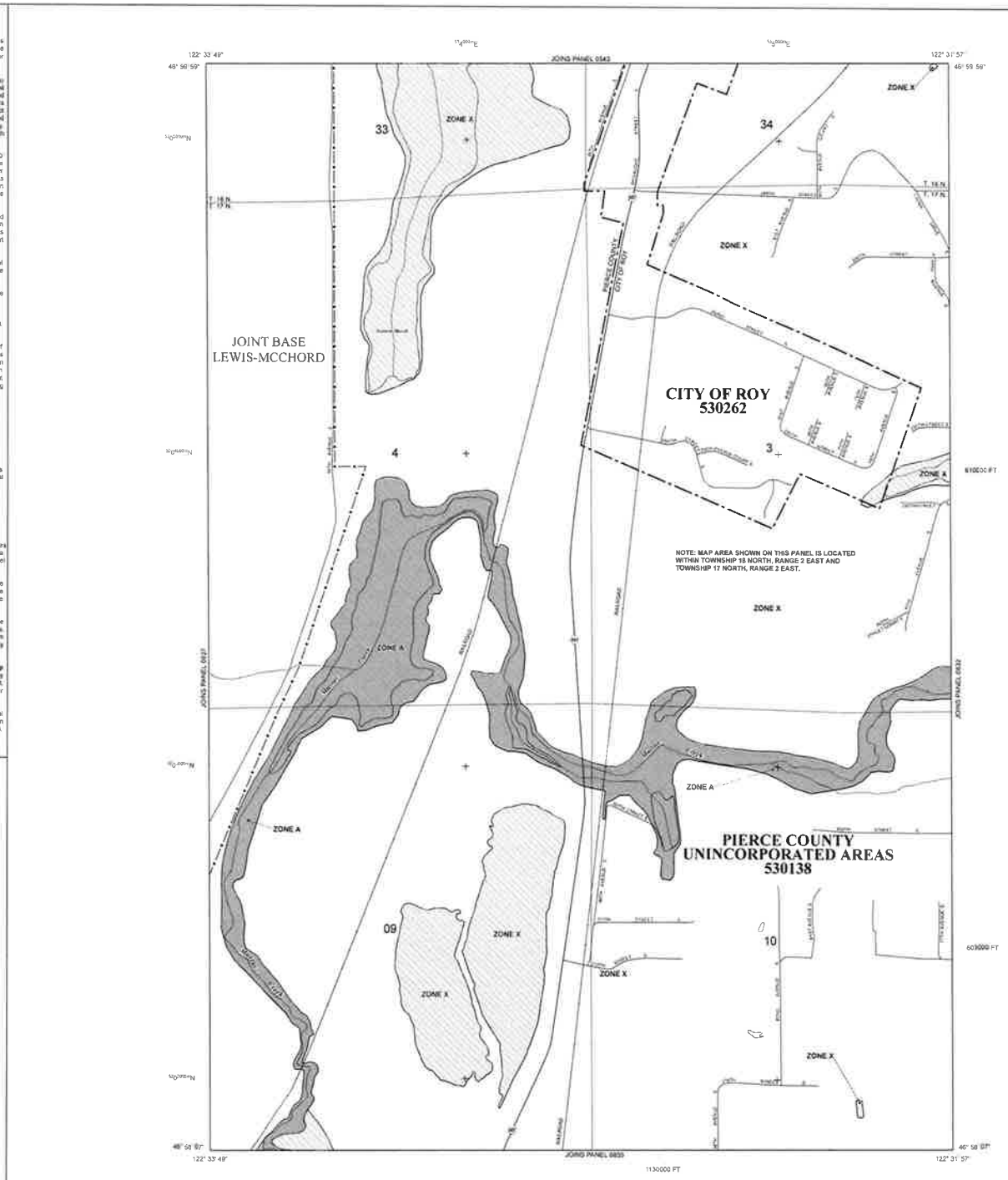

LEGEND

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FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

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OTHER AREAS

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OTHERWISE PROTECTED AREAS (OPAs)

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- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A) — (A) — Cross section line
- (23) — (23) — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 10" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4927000 m N — 1000-meter Universal Transverse Mercator grid values, zone 15
- 5000 FT X — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
March 7, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 600'
300 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0831E

FIRM

FLOOD INSURANCE RATE MAP

PIERCE COUNTY, WASHINGTON AND INCORPORATED AREAS

PANEL 831 OF 1375
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PIERCE COUNTY	530138	0831	E
ROY, CITY OF	530262	0831	E

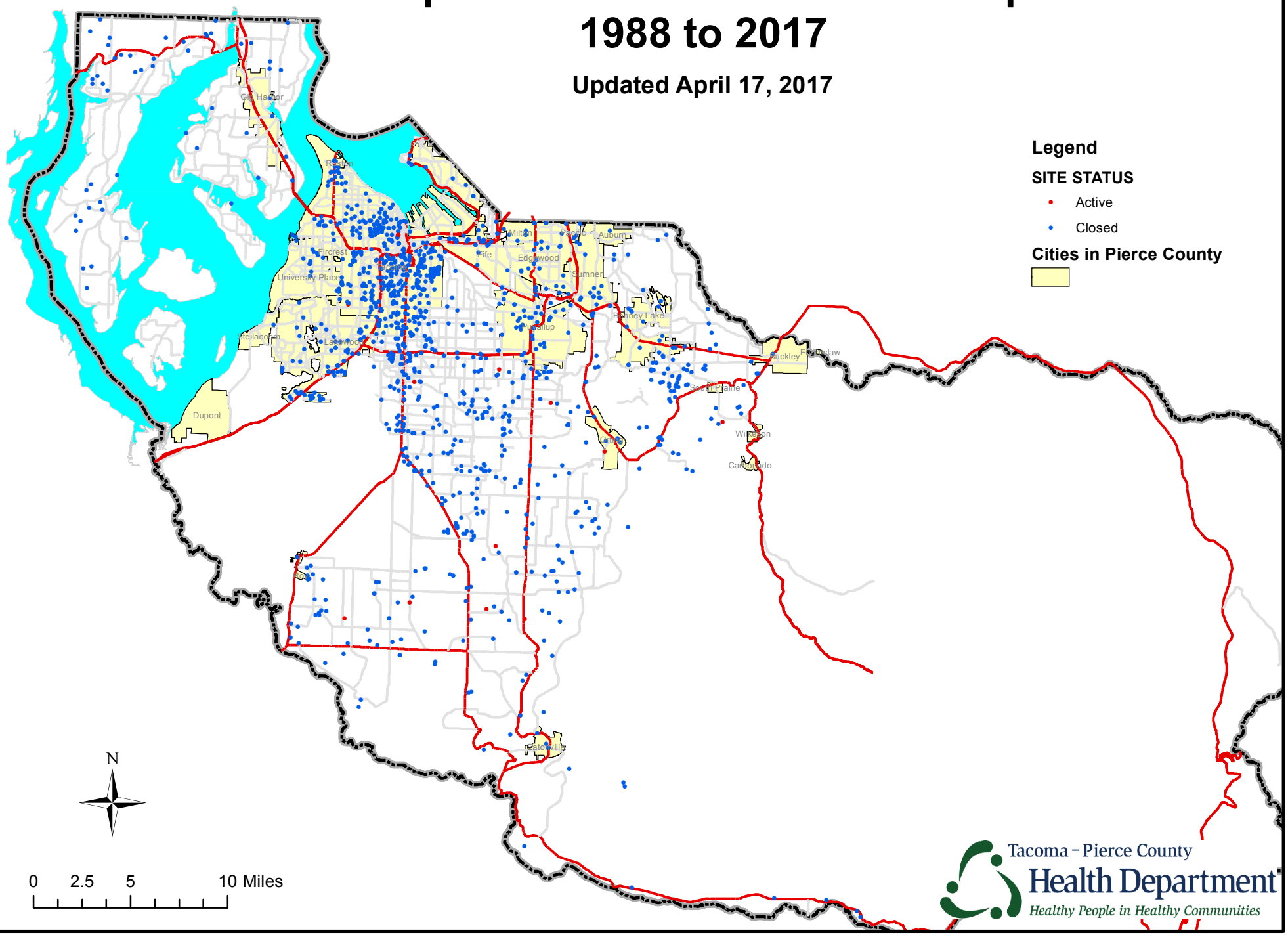
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
53053C0831E
EFFECTIVE DATE
MARCH 7, 2017

Federal Emergency Management Agency

Methamphetamine Contaminated Properties
1988 to 2017

Updated April 17, 2017



Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
4433 S 73RD ST , Tacoma	**09/16/1999**		**Open - Unresolved**	
602 S Wright ST ,Unit 116 , Tacoma , 98404	**04/05/2016**	**03/10/2014**	**Open**	
607 133rd ST , Tacoma , 98445	**04/09/2014**		**Open** ***Unfit For Use***	
713 314th ST SE , Roy , 98580	**05/09/2016**		**Open** ***Unfit For Use***	
907 Orting Kapowsin HWY E , Orting , 98360	**10/27/2014**		**Open** ***Unfit For Use***	
3004 West Valley HWY E , Edgewood , 98372	**09/09/2015**		**Open** ***Unfit For Use***	
4453 E R ST , Tacoma , 98404	**04/05/2016**		**Open**	
14608 117th AVCT E , Puyallup , 98374	**06/10/2012**		**Open** ***Unfit For Use***	
16008 260th AVE E , Buckley , 98321	**04/30/2004**		**Open** ***Unfit For Use***	YES
20914 106th ST E , Bonney Lake , 98391-5906	**01/26/2016**		**Open** ***Unfit For Use***	
26615 76TH AVE E , Graham , 98338	**09/15/2006**		**Open** ***Unfit For Use***	
31708 73rd AVE E , Eatonville , 98328	**03/04/2014**		**Open** ***Unfit For Use***	
32411 Meridian AVE E , Graham , 98338	**09/18/2009**		**Open** ***Unfit For Use***	
33017 48th AVE S , Roy , 98580	**09/20/2013**		**Open** ***Unfit For Use***	
0 N 37th & Vassault , Tacoma , 98407	07/01/2004	09/17/2004	Closed	
0 Pioneer WAY E , Unincorporated	10/29/2009	02/03/2010	Closed	
2 110TH , Edgewood	10/02/1998	01/20/1999	Closed	
2 110th AVE E , Edgewood , 98372	10/02/1998	01/20/1999	Closed	
4 Rips LN SW , LAKEWOOD	08/22/2000	11/17/2000	Closed	
7 West Valley HWY , Sumner , 98390	04/08/1991	05/03/1991	Closed	
12 Meridian E ,Unit 235 , Edgewood , 98372	02/02/2001	01/16/2002	Closed	
12 Meridian AVE E , Edgewood , 98372	01/22/2002	07/05/2002	Closed	
12 Meridian E ,Unit 237 , Puyallup , 98372	12/17/1995	02/05/1996	Closed	
12 Meridian E ,Unit 340 , Puyallup , 98372	02/19/1997	05/29/2002	Closed	
21 Cornwall RD KN , Lakebay , 98349	10/10/2003	07/17/2006	Closed	
61 S Idaho ST , TACOMA	01/31/2000	05/30/2000	Closed	
68 Oregon AVE , Tacoma , 98409	02/11/2013	07/16/2013	Closed	
101 138th ST S , Tacoma , 98444	05/16/1993		Closed	
101 358th ST E , Roy , 98580	01/09/2004	07/28/2004	Closed	
101 358th ST E , Roy , 98580	09/27/2005	03/06/2007	Closed	
102 Whitley ST NW , Orting , 98360	05/20/2004	09/13/2004	Closed	
102 S 72nd ST , Tacoma , 98408	08/07/2008	03/17/2009	Closed	
105 E Harrison ST , Tacoma , 98404	11/29/2007	03/19/2008	Closed	
107 S 38TH ST , Tacoma	03/23/1999	02/14/2000	Closed	
110 162nd ST S , Spanaway , 98387	04/07/2003	11/14/2003	Closed	
110 E 34th ST ,# 4 , Tacoma , 98404	08/21/2003	10/09/2003	Closed	
114 115TH ST E , Tacoma , 98445	06/07/1999	08/02/1999	Closed	
115 Rainier AVE S ,Unit A , Eatonville , 98328	01/16/2006	02/28/2006	Closed	
115 Rainier AVE S ,Unit A , Eatonville , 98328	01/16/2006	02/28/2006	Closed	
116 173rd ST S 12 , Spanaway , 98387	02/22/2002	07/03/2002	Closed	
121 VIEW RD , Steilacoom	07/06/1999	10/08/1999	Closed	
121 345th ST E , Roy , 98580	01/27/2002	09/10/2002	Closed	
121 S 168th ST , Spanaway , 98387	11/09/1993	03/18/1998	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
122 Orchard AVE N , Eatonville , 98328	12/13/1988	04/13/1989	Closed	
125 170th ST S , Spanaway , 98387	03/15/2005	06/06/2005	Closed	
128 18th ST SE , Puyallup , 98372	02/08/2011	06/02/2011	Closed	
151 S 46th ST , Tacoma , 98418	05/16/2001	09/13/2005	Closed	
176 Tule Lake RD E , Tacoma , 98445	07/15/2002	05/20/2003	Closed	
206 3rd ST S , Roy , 98580	01/26/1996		Closed	
209 21st AVE SW ,Apt C302 , Puyallup	05/15/2001	07/18/2001	Closed	
210 184th AVCT KN , Lakebay , 98349	05/30/2003	07/08/2004	Closed	
210 E 65th ST , Tacoma , 98404	05/01/2007	10/16/2007	Closed	
213 Berkeley AVE , Fircrest , 98466	10/06/2003	12/30/2003	Closed	
215 S 36th ST , Tacoma , 98408	01/07/1997	01/23/1997	Closed	
216 S 52nd ST , Tacoma , 98408	03/08/2002	01/22/2003	Closed	
219 115th ST E , Tacoma , 98445	02/12/2002	06/12/2002	Closed	
219 125th ST S ,Unit 225A , Tacoma , 98444	03/04/2005	04/14/2005	Closed	
220 112TH ST E , Tacoma , 98445	10/11/1999	09/23/1999	Closed	
220 112th ST E , Tacoma , 98445	01/04/1992	01/24/1992	Closed	
233 174TH ST E , SPANAWAY	02/02/2000	01/09/2001	Closed	
242 173rd ST S , Spanaway , 98387	01/26/1994	09/22/2006	Closed	
244 166th ST S , Spanaway , 98387	02/06/1995	03/22/1995	Closed	
301 Groff AVE NW , Orting , 98360	01/09/2014	05/07/2014	Closed	
303 S 9th ST ,Apt F , Tacoma , 98402	02/27/2003	05/05/2003	Closed	
304 Field RD E A106 , Spanaway , 98387	04/26/1994	08/16/1994	Closed	
306 River RD SE , Orting , 98360	04/27/2004	11/14/2006	Closed	
313 96th ST E , Tacoma , 98445		09/26/1994	Closed	
316 E 136th ST , Tacoma , 98445	03/04/2005	06/19/2008	Closed	
319 119th ST , Parkland , 98444	07/31/2003	09/30/2003	Closed	
321 10th AVE SE ,# B , Puyallup , 98374	11/14/2003	02/11/2004	Closed	
324 3rd ST SE , Puyallup , 98372	02/12/2008	06/25/2008	Closed	
324 N 4TH ST , Tacoma , 98403	06/09/2014	08/04/2014	Closed	
325 112th ST S , Tacoma	09/18/2001	12/05/2001	Closed	
332 7th ST SE , Puyallup , 98371	08/18/2003	10/20/2003	Closed	
391 7th LN FI , FOX ISLAND	06/06/2000	08/25/2000	Closed	
401 N G ST ,Unit 313 , Tacoma , 98403	05/20/2013	05/05/2014	Closed	
401 N G ST ,Unit 314 , Tacoma , 98403	05/20/2013	04/17/2014	Closed	
401 S 72nd ST , Tacoma , 98408	07/02/2013	07/02/2013	Closed	
401 N G ST ,Unit 214 , Tacoma , 98403	05/20/2013	04/17/2014	Closed	
401 N G ST ,# 100 , Tacoma , 98403	04/23/2015		Closed	
401 N G ST ,# 109 , Tacoma , 98403	02/27/2015	03/17/2015	Closed	
402 Factory ST SE , Orting , 98360	11/17/2005	11/14/2006	Closed	
404 S 30th ST , Tacoma , 98402	02/25/2004	06/15/2006	Closed	
407 195th AVE KS , Lakebay , 98349	05/02/2001	12/18/2003	Closed	
407 4th ST NE , Puyallup , 98372	07/26/2003	12/30/2003	Closed	
409 Division LN , Tacoma	07/14/1994	04/18/2001	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
409 S Division LN , Tacoma , 98408	07/14/1994		Closed	
410 S 72nd ST , Tacoma , 98408	05/14/2008	12/08/2008	Closed	
410 N G ST ,# 309 , Tacoma , 98403	05/14/2015		Closed	
416 1/2 118th ST S , Tacoma , 98444	03/04/2004	08/03/2004	Closed	
421 E 64th ST , Tacoma , 98404	05/29/2002	10/23/2002	Closed	
421 161st ST S , Spanaway , 98387	11/21/2004	07/18/2005	Closed	
423 E 63rd ST , Tacoma , 98404	01/29/2003	06/30/2003	Closed	
425 E 80th ST , Tacoma , 98404	10/16/1992	10/08/1992	Closed	
427 S 55th ST , Tacoma , 98408	09/30/2008	06/25/2009	Closed	
466 Main ST W , Buckley , 98321	10/28/2003	08/23/2004	Closed	
511 141st ST S , Tacoma , 98444	08/02/2005	12/30/2005	Closed	
520 E 84TH ST , Tacoma	06/22/1999	08/16/1999	Closed	
520 E 72nd ST , Tacoma , 98404	02/10/2004	03/11/2005	Closed	
528 S 50TH ST , TACOMA	01/13/2000	04/18/2000	Closed	
529 S 58TH ST , TACOMA	11/07/2000	01/26/2001	Closed	
602 S Wright AVE ,Unit 402 , Tacoma , 98418	11/25/2004	01/21/2005	Closed	
602 S Wright ST ,Unit 308 , Tacoma , 98404	04/08/2013	02/12/2014	Closed	
602 S Wright ST ,Unit 119 , Tacoma , 98404	04/08/2013	02/27/2014	Closed	
602 S Wright AVE ,Unit 216 , Tacoma , 98418	05/23/2013	02/13/2014	Closed	
602 S Wright AVE ,Unit 210 , Tacoma , 98418	06/10/2013	03/06/2014	Closed	
602 S Wright ST ,Unit 118 , Tacoma , 98404	08/27/2013	03/10/2014	Closed	
602 S Wright ST ,Unit 206 , Tacoma , 98404	08/27/2013	03/10/2014	Closed	
602 S Wright ST ,Unit 310 , Tacoma , 98404	08/27/2013	03/04/2014	Closed	
602 S Wright ST ,Unit 404 , Tacoma , 98404	08/27/2013	01/13/2014	Closed	
602 S Wright ST ,Unit 407 , Tacoma , 98404	08/27/2013	01/13/2014	Closed	
602 S Wright ST ,Unit 408 , Tacoma , 98404	08/27/2013	01/13/2014	Closed	
602 S Wright ST ,Unit 204 , Tacoma , 98404	09/19/2013	03/10/2014	Closed	
602 S Wright ST ,Unit 218 , Tacoma , 98404	12/19/2013	03/10/2014	Closed	
609 14TH ST SE , Puyallup	02/03/1998		Closed	
609 14th ST SE , Puyallup , 98372	02/03/1998		Closed	
614 Upper Park ST #4 , Tacoma	04/10/2001	06/27/2001	Closed	
614 162nd ST S , Spanaway , 98387	01/05/2004	05/27/2004	Closed	
614 S Adams ST , Tacoma , 98405	04/08/2004	10/21/2004	Closed	
614 S Ainsworth AVE , Tacoma , 98405	09/06/2004	11/09/2004	Closed	
615 S 133rd ST , Tacoma , 98444	06/25/2001	07/31/2002	Closed	
615 S 7th ST ,# 308 , Tacoma , 98405	12/21/2004	06/14/2005	Closed	
617 1/2 N Cedar ST , Tacoma , 98406	05/25/2002	07/25/2002	Closed	
617 5th ST SW , Puyallup , 98371	12/09/2004	02/17/2005	Closed	
617 Martin Luther King Jr WAY , Tacoma , 98405	02/25/2010	07/13/2010	Closed	
620 S 34th ST , Tacoma , 98418	09/27/2004	09/12/2005	Closed	
623 S 174TH ST , SPANAWAY	02/17/2000	01/16/2007	Closed	
623 134th ST S , Parkland , 98444	12/04/2004	01/06/2005	Closed	
628 S Hawthorne ST , Tacoma , 98465	01/20/2006	03/20/2006	Closed	

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662 N ROCHESTER ST , TACOMA	01/29/2001	02/27/2001	Closed	
701 E 52nd ST , Tacoma , 98404	08/30/2001	10/05/2001	Closed	
703 3RD ST SW , Puyallup	09/15/1999	03/10/2000	Closed	
703 5th AVE , Milton , 98354	12/02/1996	06/01/1997	Closed	
703 E 54th ST , Tacoma , 98404	10/04/2004	12/07/2004	Closed	
704 CHERRY AVE , Sumner	06/30/1999	03/30/2000	Closed	
707 S CUSHMAN AVE , Tacoma	11/17/1998	03/17/1999	Closed	
707 S Cushman AVE 2 & 4 , Tacoma , 98405	11/20/1998	03/17/1999	Closed	
711 112TH ST E ,# A9 , Tacoma , 98445	06/03/2000	10/19/2000	Closed	
712 1/2 98TH ST S , TACOMA	12/27/2000	04/12/2001	Closed	
713 54th AVE E , Fife , 98424	04/27/2004	03/11/2005	Closed	
715 104TH ST S , Tacoma , 98444	05/11/1999		Closed	
715 E 50th ST , Tacoma , 98404	11/15/2001	03/11/2005	Closed	
718 S 52ND ST , Tacoma	04/22/1999	07/07/1999	Closed	
718 6th AVE SW , Puyallup , 98371	06/23/2004	11/12/2004	Closed	
721 N STEVENS ST , Tacoma	09/16/1999	11/24/1999	Closed	
756 78th ST , Tacoma , 984085327	11/05/2008	02/09/2009	Closed	
802 S HOWARD ST , TACOMA	01/05/2001	03/28/2001	Closed	
808 W Main , Puyallup , 98371	11/30/2001	05/10/2002	Closed	
809 S Prospect ST , Tacoma , 98405	07/08/1989	09/20/1989	Closed	
810 98th ST S , Tacoma , 98444	06/30/2006	12/19/2006	Closed	
811 E 56th ST , Tacoma , 98404	02/21/2002	06/20/2002	Closed	
812 S Hill Park DR ,Room 422/6 , Puyallup , 98373	08/05/2003	08/25/2003	Closed	
815 Pacific AVE S ,# 613 , Tacoma	07/02/2001	09/26/2001	Closed	
815 140th ST S , Tacoma , 98444	08/27/2002	01/07/2003	Closed	
815 Cherry AVE , Sumner , 98390	03/17/2003	10/09/2003	Closed	
816 WEBB RD KS , Gig Harbor , 98349	04/30/1999	11/02/1999	Closed	
817 122nd AVE E , Edgewood , 98372	06/25/2002	01/29/2003	Closed	
817 S 40th ST , Tacoma , 98418	10/13/2004	12/22/2004	Closed	
821 S Oakes ST , Tacoma , 98405	03/06/2002	04/10/2003	Closed	
821 E Dock ST ,Unit 45 , Tacoma , 98402	06/24/2002	09/10/2002	Closed	
825 13TH ST SE , Puyallup	09/17/1999	02/26/2003	Closed	
825 S State ST , Tacoma	06/14/2001	11/02/2001	Closed	
829 E 46th ST , Tacoma , 98404	06/27/2007	03/03/2008	Closed	
848 S OXFORD ST , TACOMA	03/04/2001	04/17/2001	Closed	
860 45th ST S , Tacoma , 98418	07/23/2009	09/01/2009	Closed	
861 S 40th ST , Tacoma , 98418	10/27/2008	10/29/2008	Closed	
861 S 40th ST , Tacoma , 98418	11/12/2008	11/19/2008	Closed	
902 S FAWCETT AVE #30 , Tacoma , 984	04/20/2001	07/31/2001	Closed	
903 23rd AVE , Milton , 98424		09/17/2004	Closed	
909 Violet Meadow ST S , Tacoma , 98444	09/08/1994	12/03/1996	Closed	
911 Lafayette ST S , Tacoma , 98444	01/28/2004	05/18/2004	Closed	
911 N K ST ,# 202 , Tacoma , 98403	01/14/2013	03/31/2014	Closed	

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911 N K ST ,# 107 , Tacoma , 98403	06/06/2013	03/31/2014	Closed	
911 N K ST ,Unit 112 , Tacoma , 98403	07/30/2013	03/31/2014	Closed	
912 74th ST E ,Apt A , Tacoma , 98404	09/01/2003	11/17/2003	Closed	
913 70TH AVE E , MILTON	03/11/1996	10/19/2000	Closed	
913 70th AVE E , Milton , 98354	03/11/1996	10/20/2000	Closed	
916 POLK ST , Tacoma , 98444	09/11/2000	01/03/2002	Closed	
918 85TH ST E , Tacoma	02/27/1998	08/08/2000	Closed	
918 N M ST #4 , Tacoma , 98403	04/05/2001	07/13/2001	Closed	
918 85th ST E , Tacoma , 98445	02/27/1998	08/08/2000	Closed	
920 E 61ST ST , TACOMA	09/11/2000	12/11/2001	Closed	
920 S Fawcett AVE , Tacoma , 98402	04/10/1995		Closed	
920 E 31st ST , Tacoma , 98404	03/25/1997		Closed	
920 E 61ST ST , Tacoma , 98404	06/02/2006	09/06/2007	Closed	
921 13th ST SW , Puyallup , 98371	08/23/1995	04/18/1996	Closed	
922 S Shirley ST , Tacoma , 98465	04/25/2004	06/09/2004	Closed	
924 124TH ST E , Tacoma , 98445	10/04/1996	01/06/2000	Closed	
924 124th STCT E , Tacoma , 98445	10/04/1995		Closed	
1001 N TACOMA AVE , Tacoma	08/25/1999	01/11/2000	Closed	
1001 N Oakes ST , Tacoma , 98406	08/07/2002	03/07/2003	Closed	
1001 S Mildred ST ,Apt 1 , Tacoma , 98465	05/04/2005	06/22/2005	Closed	
1002 137th STCT S ,Sp #1 , Tacoma	05/21/2001	12/03/2002	Closed	
1004 116th ST S , Tacoma , 98444	09/03/2002	11/25/2008	Closed	
1005 S Ferry ST , Tacoma , 98405	03/07/2004	09/09/2004	Closed	
1011 15TH AVE SW , PUYALLUP	02/26/2000	07/11/2000	Closed	
1012 137th STCT S ,Sp 6 , Tacoma	05/15/2001	11/22/2002	Closed	
1015 S OXFORD ST , Tacoma , 98465	08/16/1999	10/21/1999	Closed	
1016 S 68th ST , Tacoma , 98408	10/09/1992	07/30/1993	Closed	
1016 E 57th ST , Tacoma , 98404	08/09/2003	12/21/2004	Closed	
1022 113th ST S , Tacoma , 98444	10/14/2004	03/21/2005	Closed	
1029 S 61st ST , Tacoma , 98408	07/03/2008	05/19/2009	Closed	
1036 110th ST S , Tacoma , 98444	04/20/2003	06/13/2005	Closed	
1041 S 88th ST , Tacoma , 98444	09/23/2003	01/23/2004	Closed	
1043 S State ST , Tacoma , 98405	04/04/2002	06/09/2003	Closed	
1102 E 57TH ST , TACOMA	05/19/2000	10/03/2000	Closed	
1102 1/2 E 57TH ST , TACOMA	05/15/2000	10/03/2000	Closed	
1108 S Grant AVE , Tacoma , 98405	11/15/2010	11/15/2010	Closed	
1111 TACOMA AVE S , TACOMA	03/14/2001	04/25/2001	Closed	
1114 S Tyler , Tacoma	06/26/2001	12/10/2001	Closed	
1115 132ND AVE E , Pacific , 98047	01/27/2000		Closed	
1116 7th AVE SW , Puyallup , 98371	05/19/2001	08/23/2001	Closed	
1116 S 80th ST , Tacoma , 98408	01/09/2002	03/28/2002	Closed	
1117 S 80TH ST , Tacoma	09/25/1999	07/03/2000	Closed	
1117 N 6th ST , Tacoma , 98403		05/03/2004	Closed	

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1120 S 63rd ST , Tacoma , 98408	03/29/2006	09/18/2006	Closed	
1122 E 57TH ST , Tacoma	09/02/1998	01/20/1999	Closed	
1122 E 57th ST , Tacoma , 98404	09/22/1998	01/20/1999	Closed	
1123 S 35th ST , Tacoma , 98418	06/28/2001	09/05/2001	Closed	
1123 S 62nd ST , Tacoma , 98408	03/13/2008	08/26/2010	Closed	
1124 E 35th ST , Tacoma , 98404	01/31/1996		Closed	
1201 Alexander ST E , Tacoma , 98424	09/12/2002	03/16/2006	Closed	
1202 9th ST SW , Puyallup , 98371	02/22/2002	04/17/2003	Closed	
1202 S Tyler ST , Tacoma , 98405	01/02/1990		Closed	
1202 S M ST ,# 213 , Tacoma , 98405	01/14/2013	12/02/2013	Closed	
1202 S M ST ,# 306 , Tacoma , 98405	01/14/2013	12/03/2013	Closed	
1202 S M ST ,# 213 , Tacoma , 98405	01/14/2013	12/03/2013	Closed	
1202 S M ST ,Unit 409 , Tacoma , 98405	12/09/2014	01/08/2015	Closed	
1207 S J ST , TACOMA	04/26/2000	06/01/2000	Closed	
1207 S 41st ST , Tacoma , 98418	01/14/2002	10/02/2002	Closed	
1207 S J ST ,Apt A , Tacoma	10/04/2002	10/28/2002	Closed	
1208 N Union AVE , Tacoma , 98406	03/26/2003	11/15/2005	Closed	
1210 S 45th ST , Tacoma	05/10/2001	07/18/2001	Closed	
1211 S Trafton ST , Tacoma , 98405	12/17/2012	05/10/2013	Closed	
1216 N 6TH ST #3 , Tacoma	10/20/1999	06/01/2000	Closed	
1218 95TH ST E , Tacoma , 98445	10/01/1999	10/19/1999	Closed	
1218 N Union AVE , Tacoma , 98406	01/14/2003	11/15/2005	Closed	
1218 95th ST E , Tacoma , 98445	03/11/2005	08/18/2005	Closed	
1219 S Trafton , Tacoma , 98405	10/30/2012		Closed	
1219 S Trafton , Tacoma , 98405	10/30/2012	02/19/2013	Closed	
1225 S Trafton ST , Tacoma , 98405	12/17/2012	05/13/2013	Closed	
1226 S RIDGEWOOD AVE , Tacoma	03/23/1999	04/20/2000	Closed	
1235 S SPRAGUE AVE , TACOMA	12/22/1999	02/15/2000	Closed	
1264 Valentine AVE SE ,Unit 374 , Pacific , 98047	08/07/2003	06/03/2004	Closed	
1301 E 46th ST , Tacoma , 98404	02/27/1995	03/03/1995	Closed	
1301 112th ST S #8 , Tacoma , 98444	11/29/2007	03/04/2008	Closed	
1303 23rd AVE , Milton , 98354	06/03/1988	04/24/1991	Closed	
1303 23rd AVE , Milton , 98534	08/12/1988	04/24/1991	Closed	
1307 10th AVE ,Unit #7 , Milton , 98354	10/03/2002	12/20/2002	Closed	
1308 208th ST E , Spanaway , 98387	07/05/2002	10/01/2001	Closed	
1310 E 62nd ST , Tacoma , 98404	03/09/2002	04/18/2002	Closed	
1312 203rd AVE E , SUMNER	01/20/2000	03/30/2000	Closed	
1312 S 4TH ST , TACOMA , 98405	11/02/2000	05/03/2001	Closed	
1313 11th STPL SW , Puyallup , 983717316	08/28/2005	02/16/2006	Closed	
1315 104th ST E , Tacoma , 98445	08/29/2001	10/23/2001	Closed	
1315 104th ST E , Tacoma , 98445	01/30/2002	04/03/2002	Closed	
1401 N Meridian E419 , Puyallup , 98371	10/19/1990		Closed	
1401 S Sprague ST ,Unit 602 , Tacoma , 98405	10/16/2003	11/17/2003	Closed	

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1401 N Meridian E419 , Puyallup , 98371	01/18/2006	01/20/2006	Closed	
1402 S MASON AVE , TACOMA	02/29/2000	04/20/2000	Closed	
1407 S Madison ST , Tacoma , 98405	12/21/2004	06/27/2005	Closed	
1407 156th STCT E , Tacoma , 98445	05/13/2005	06/09/2006	Closed	
1409 14th ST SW , Puyallup , 98371	10/01/1997		Closed	
1409 S Meridian ,Room 128 , Puyallup , 98371	05/29/2003	07/01/2003	Closed	
1409 S Meridian ,Room 328 , Puyallup , 98371	12/20/2003	01/16/2004	Closed	
1422 S 54TH ST , Tacoma	02/12/1999		Closed	
1422 S 54th ST , Tacoma , 98408	02/12/1999	06/08/1999	Closed	
1423 S 58th ST , Tacoma , 98408	12/26/2003	01/27/2004	Closed	
1425 E 27th ST , Tacoma , 98421	11/01/1994		Closed	
1429 E 46TH ST 69 , TACOMA	01/11/2001	04/26/2001	Closed	
1429 E 34th ST , Tacoma , 98404	07/24/2008	09/19/2008	Closed	
1500 W Stewart AVE , Puyallup , 98371	12/18/2003	11/19/2004	Closed	
1501 N STEVENS , Tacoma , 98406	03/29/2001	07/18/2001	Closed	
1501 S 43rd ST , Tacoma , 98418	08/13/2007	08/20/2007	Closed	
1506 85th ST E , Tacoma , 98445	06/28/2002	08/02/2002	Closed	
1507 S G ST ,Unit 177 , Tacoma , 98405	09/13/2013	10/21/2013	Closed	
1512 Court F ,Unit 184 , Tacoma , 98405	10/13/2012	02/21/2013	Closed	
1512 F CT ,Unit 184 , Tacoma , 98405	01/23/2014	02/27/2014	Closed	
1516 6th AVE , Tacoma , 98405	01/02/2014	01/07/2014	Closed	
1524 106th AVCT E , Edgewood , 98372	11/16/2001	03/14/2002	Closed	
1532 S Prospect ST , Tacoma , 98405	08/17/1994	10/05/1995	Closed	
1535 4th AVE NW , Puyallup , 98371	12/18/2003	11/19/2004	Closed	
1601 S WRIGHT AVE , Tacoma	01/04/1999		Closed	
1601 S Wright AVE , Tacoma , 98408	01/04/1999	03/29/1999	Closed	
1602 Taylor ST , Milton , 98354	10/02/2003	11/03/2003	Closed	
1606 S Adams ST , Tacoma , 98405	07/09/2005	08/08/2007	Closed	
1611 S Pearl ST , Tacoma , 98465	02/11/2003	04/10/2003	Closed	
1615 E Fairbanks , Tacoma , 98404	10/30/2001	12/05/2002	Closed	
1615 E 34th ST , Tacoma , 984044802	02/14/2002	01/16/2003	Closed	
1616 E D ST , TACOMA	03/21/2001	05/22/2001	Closed	
1617 5th AVE SW , Puyallup , 98371	04/10/1989	09/20/1989	Closed	
1618 59th AVCT E ,Room 10 , Fife , 98424	05/23/1997		Closed	
1620 S 8TH ST #UP , Tacoma	12/10/1999	01/13/2000	Closed	
1620 S Cushman AVE , TACOMA , 98405	12/18/2000	01/25/2002	Closed	
1622 N 8th ST , Tacoma , 98403	05/07/2009	01/21/2010	Closed	
1623 65th AVE E ,# 213 , Fife	08/03/2001	10/19/2001	Closed	
1625 E 32nd ST , Tacoma , 98404	09/16/2005	06/14/2006	Closed	
1653 E 32ND ST , TACOMA	01/19/2001	03/28/2001	Closed	
1666 S 55th ST , Tacoma , 98408	06/05/2003	07/16/2003	Closed	
1701 S L ST S , Tacoma , 98405	03/31/2008	03/31/2008	Closed	
1702 194th AVE KS , Lakebay , 98349	09/16/2005	03/21/2006	Closed	

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1704 186th AVE KN , Lakebay , 98349	11/07/2008	11/19/2008	Closed	
1709 S Mason AVE , Tacoma , 98405	09/13/2002	11/22/2002	Closed	
1711 Washington ST , Sumner	04/29/1999	10/06/1999	Closed	
1711 102nd ST S , Tacoma , 98444	04/20/2005	09/28/2005	Closed	
1715 Valley AVE 44 , Sumner , 98390	04/13/1996	09/01/1996	Closed	
1715 S 53rd ST , Tacoma , 98408	11/26/2002	02/25/2003	Closed	
1715 S 53rd ST , Tacoma , 98409	05/07/2008	10/28/2008	Closed	
1717 137TH AVE E , Sumner , 98390	06/16/1999	08/08/2000	Closed	
1718 S 37TH ST , TACOMA	12/04/2000	05/30/2001	Closed	
1718 E 46th ST , Tacoma , 98404	01/31/2013	05/23/2013	Closed	
1719 S 58th ST , Tacoma , 98408	04/25/2002	10/02/2002	Closed	
1719 E 46th ST , Tacoma , 98404	03/20/2013	06/03/2013	Closed	
1719 E 51st ST , Tacoma , 98404	08/27/2013	10/15/2013	Closed	
1720 S 23RD ST #A , Tacoma	03/24/1999		Closed	
1720 S 23rd ST , Tacoma , 98405	02/23/1999	06/16/1999	Closed	
1721 286th ST E , Roy , 98580	11/01/2002	01/12/2004	Closed	
1722 S Anderson ST , Tacoma	06/28/1999	11/02/1999	Closed	
1722 E Harper ST , Tacoma , 98404	01/31/2013	09/30/2013	Closed	
1723 E 46th , Tacoma , 98404	09/21/2012	01/02/2013	Closed	
1725 Meridian E , EDGEWOOD	08/04/2000	11/22/2000	Closed	
1729 E 46th ST , Tacoma , 98404	04/04/2013	06/13/2013	Closed	
1731 E 46th ST , Tacoma , 98404	04/04/2013	06/27/2013	Closed	
1743 E 43rd ST , Tacoma , 98404	10/19/2003	01/09/2004	Closed	
1754 S 53rd ST , Tacoma , 98408		04/28/2004	Closed	
1780 S 41st ST , Tacoma	05/24/2001	11/21/2001	Closed	
1783 S 41st ST , Tacoma	07/06/2001	02/14/2002	Closed	
1807 286th ST E , Roy , 98580	07/31/1990	08/03/1990	Closed	
1809 338th ST E , Roy , 98580	10/26/2001	02/20/2002	Closed	
1811 S 76TH ST , Tacoma	03/24/1999		Closed	
1811 S 76TH ST ,Room 227 , Tacoma	09/23/1999	12/13/1999	Closed	
1811 S 76TH ,Room 129 , Tacoma	04/18/2001	05/30/2001	Closed	
1811 S 76th ST ,Room 247 , Tacoma , 98408	02/28/1999	04/15/1999	Closed	
1811 S 76th ST ,Room 108 , Tacoma , 98408	05/31/1990	08/01/1990	Closed	
1811 S 76th ST ,Room 246 , Tacoma , 98408	09/09/2004	10/26/2004	Closed	
1814 S G ST , Tacoma , 98405	07/09/2013	02/19/2014	Closed	
1816 E Wright AVE , Tacoma , 98404	03/19/2009	03/11/2013	Closed	
1817 192nd ST E , Spanaway , 98387	11/19/1991	02/11/1992	Closed	
1823 E Harper ST , Tacoma , 98404	11/13/2014	12/03/2014	Closed	
1824 E 43rd ST , Tacoma , 98404	04/04/2013	06/17/2013	Closed	
1829 S Adams ST , Tacoma , 98405	08/28/2002	10/30/2002	Closed	
1829 S Adams ST , Tacoma , 98405	08/28/2002	10/30/2002	Closed	
1830 Harper ST , Tacoma , 98404	02/22/2013	08/05/2013	Closed	
1836 E Wright ST , Tacoma , 98404	05/14/2008	01/20/2009	Closed	

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1849 E 34th ST , Tacoma , 98404	05/19/2008	01/12/2009	Closed	
1901 121st ST E , Spanaway , 98445	12/11/2003	04/07/2004	Closed	
1904 122ND AVE E , EDGEWOOD	02/24/2000	05/16/2000	Closed	
1915 N Madison ST , Yelm , 98406	07/10/2002	11/14/2002	Closed	
1919 S YAKIMA AVE , TACOMA	12/02/1998		Closed	
1919 S Yakima AVE , Tacoma , 98405	12/02/1998	03/17/1999	Closed	
1921 208th ST E ,# 58 , Spanaway , 98387	11/30/2003	06/09/2005	Closed	
1924 S Sheridan AVE , TACOMA	02/05/2001	12/11/2001	Closed	
1928 E 56th ST ,Apt 5 , Tacoma , 98404	04/13/2006	08/10/2006	Closed	
1954 S L ST , Tacoma , 98405	09/25/2002	11/23/2004	Closed	
2004 E 41st ST , Tacoma , 98404	07/19/2013	10/23/2013	Closed	
2005 E 44th ST , Tacoma , 98404	10/11/2013	10/31/2013	Closed	
2010 112TH AVE E , EDGEWOOD	02/13/2001	05/23/2001	Closed	
2010 E 43rd ST , Tacoma , 98404	01/28/2013	04/18/2013	Closed	
2012 E 41st , Tacoma , 98404	09/21/2012	01/14/2013	Closed	
2015 352ND ST S , Eatonville , 98328	12/11/2000	03/14/2001	Closed	
2021 E 44th ST , Tacoma , 98404	04/28/2014	05/29/2014	Closed	
2038 E 43rd ST , Tacoma , 98404	08/27/2013	10/15/2013	Closed	
2045 E 44th ST , Tacoma , 98404	01/31/2013	04/22/2013	Closed	
2047 E 44th ST , Tacoma , 98404	01/31/2013	04/25/2013	Closed	
2055 E 44th ST , Tacoma , 98404	05/16/2013	08/05/2013	Closed	
2101 N Meridian , Puyallup , 98372	02/11/2003	03/20/2003	Closed	
2101 N Meridian ,Room 113 , Puyallup , 98371	08/18/2004	10/15/2004	Closed	
2101 N Meridian ,Room 137 , Puyallup , 98371	03/12/2006	05/08/2006	Closed	
2101 N Meridian Rm 100 , Puyallup , 98371	09/11/2009	09/29/2009	Closed	
2111 106TH AVCT E , EDGEWOOD	02/01/2000	08/25/2000	Closed	
2112 307TH ST S , Roy , 98580	08/31/1999	08/02/2006	Closed	
2112 307TH ST S , Roy , 98580	08/27/1999		Closed	
2120 S 48th ,Room #420 , Tacoma , 98409	10/31/2001	01/18/2002	Closed	
2130 S L ST , Tacoma , 98405	04/28/2014		Closed	
2204 S MERIDIAN ,Unit G-104 , Puyallup	05/09/2000	07/05/2000	Closed	
2205 S 74th ST ,# 46 , Tacoma , 98409	03/30/2005	05/19/2005	Closed	
2211 96th ST S 25 , Tacoma , 98444	09/04/1996		Closed	
2211 S 15th ST , Tacoma , 98405	01/24/2008	01/31/2008	Closed	
2220 WESTRIDGE AVE W , Tacoma	10/18/1999	12/14/1999	Closed	
2221 Pacific HWY E ,Room #8 , Fife , 98424	07/20/2001	09/18/2001	Closed	
2222 Meridian AVE E ,Unit 318 , Edgewood , 98371	11/05/2001	03/11/2002	Closed	
2239 E Division LN ,Apt B , Tacoma , 98404	01/03/2002	09/12/2002	Closed	
2245 E FAIRBANKS , Tacoma , 98404	04/18/2001	09/26/2001	Closed	
2246 E FAIRBANKS ST , Tacoma , 98404	04/18/2001	09/10/2002	Closed	
2302 6th AVE 209 , Tacoma , 98403	05/21/2013	04/21/2014	Closed	
2302 6th AVE ,Unit 221 , Tacoma , 98403	10/28/2013	04/21/2014	Closed	
2302 6TH AVE ,# 120 , Tacoma , 98403	05/14/2015	05/29/2015	Closed	

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2302 6th AVE ,Unit 117 , Tacoma , 98403	10/21/2015		Closed	
2302 6th AVE #212 , Tacoma , 98403	07/30/2014	09/09/2014	Closed	
2311 48TH ST NW , GIG HARBOR	06/01/1999	06/29/1999	Closed	
2317 102nd ST S ,Stor 115 , Tacoma , 98445	04/14/2001	02/28/2002	Closed	
2322 Tacoma RD E 7	06/26/2007	06/29/2007	Closed	
2324 S G ST 199 , Tacoma , 98405	10/05/2012	03/06/2013	Closed	
2324 S G ST ,Unit 203 , Tacoma , 98405	09/20/2012	03/06/2013	Closed	
2324 S G ST ,APT 201 , Tacoma , 98405	10/31/2014	11/21/2014	Closed	
2327 Court G 220 , Tacoma , 98405	12/05/2012	03/08/2013	Closed	
2341 G CT ,Unit 230 , Tacoma , 98404	04/08/2013	07/18/2013	Closed	
2351 Court G 236 , Tacoma , 98405	12/05/2012	03/08/2013	Closed	
2351 G CT ,Unit 238 , Tacoma , 98418	07/19/2013	09/13/2013	Closed	
2365 S Wilkeson , Tacoma , 98405	07/24/2001	01/17/2003	Closed	
2409 W Stewart AVE , Puyallup , 98371	07/14/2004	02/04/2005	Closed	
2417 166TH AVCT E , SUMNER	02/20/2001	04/11/2001	Closed	
2501 142nd AVE E , Sumner , 98390	10/20/2003	04/28/2004	Closed	
2502 S 54TH ST , Tacoma	09/16/1999	07/28/2000	Closed	
2505 E MAIN AVE , Puyallup , 98372	01/31/2001	06/20/2002	Closed	
2507 54th AVE E , Fife , 98424	09/17/2001	07/03/2003	Closed	
2509 Crater Lake CT S , Puyallup , 98374	08/19/2001	02/20/2002	Closed	
2509 179th AVE E , Sumner , 98390	04/07/1995		Closed	
2512 S MELROSE ST , TACOMA	08/21/2000	05/31/2001	Closed	
2515 S 13th ST , Tacoma , 98405	07/01/2003	07/31/2003	Closed	
2520 S 12TH ST , Tacoma	09/07/2000	01/22/2002	Closed	
2521 E L ST , TACOMA	03/17/1998	06/10/1998	Closed	
2604 7th ST SE , Puyallup , 98374	05/11/2003	06/27/2003	Closed	
2611 E E ST , Tacoma	02/01/1999		Closed	
2611 E E ST 528 , Tacoma , 98421	02/01/1999		Closed	
2724 Melrose ST , Tacoma , 98465	01/24/2003	02/19/2003	Closed	
2747 S Center ST , Tacoma , 98409	08/26/1993	09/22/1995	Closed	
2802 River RD E , Tacoma , 98404	10/14/2003	02/14/2006	Closed	
2814 S D ST , Tacoma , 98402	12/24/2002	02/04/2003	Closed	
2817 Jahn AVE NW , Gig Harbor , 98335	02/07/2003	04/29/2003	Closed	
2824 S Ainsworth AVE , Tacoma , 98409	08/09/2002	12/23/2003	Closed	
2825 Delin ST ,Apt B101 , Tacoma , 984021129	06/25/2002	08/20/2002	Closed	
2902 Bridgeport WY SW , Tacoma , 98438	03/29/1996	10/18/1996	Closed	
2903 166TH AVE E 19 , TACOMA	08/06/1998		Closed	
2903 10th STCT SE , Puyallup , 98374	02/16/2015		Closed	
2910 N 7th ST ,Unit 1 , Tacoma , 98406	07/01/2004	08/24/2004	Closed	
2910 S 17th ST , Tacoma , 98405	11/18/2010	03/15/2012	Closed	
2916 E N ST , Tacoma , 98404	03/01/1997		Closed	
2919 S 15th ST , Tacoma , 98405	03/26/2009	06/11/2009	Closed	
2923 S Meridian , Puyallup , 98373	01/02/2003	02/20/2003	Closed	

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2932 57th WAY NE , Tacoma , 98422	07/06/2003	06/30/2004	Closed	
3002 S 12th ST ,Apt A , Tacoma , 98405	11/27/2002	12/20/2002	Closed	
3008 S 13th ST , Tacoma , 98405	10/05/2012	11/21/2012	Closed	
3010 McEwan RD KN , Lakebay , 98349	09/18/2002	01/22/2003	Closed	
3010 232nd ST E ,Sp 1 , Spanaway , 98387	05/21/1991	08/06/1991	Closed	
3014 227TH ST E , SPANAWAY	01/27/2000	11/07/2001	Closed	
3014 S 45th ST , Tacoma , 98409	11/15/1997		Closed	
3021 PACIFIC HWY E , Fife	01/21/1999	05/12/1999	Closed	
3021 Pacific HWY E 259 , Fife , 98424	01/21/1999	05/12/1999	Closed	
3023 E MAIN ST ,APT G-11 , Puyallup	04/20/2001	07/20/2001	Closed	
3024 E Bay DR NW , Gig Harbor , 98335	05/27/1992	01/06/1993	Closed	
3101 S Monroe ST , Tacoma , 98405	05/13/1997		Closed	
3102 N 26TH ST , TACOMA	04/14/2000	09/26/2000	Closed	
3108 S Union AVE , Tacoma , 98409	11/10/2003	12/18/2003	Closed	
3109 BROOKDALE RD E , TACOMA	12/11/2000	03/15/2001	Closed	
3109 E MAIN ST ,APT L-6 , RIVERSIDE PARK APARTMENTS , Puyallup	04/01/2001	07/20/2001	Closed	
3123 D Bridgeport WAY W , University Place , 98466	11/17/2005	12/30/2005	Closed	
3124 84TH ST E , Tacoma , 98446	02/28/2000	01/18/2002	Closed	
3137 Huson ST , Tacoma , 98407	04/14/2003	09/30/2003	Closed	
3201 90th ST S , Lakewood , 98499	07/08/2003	09/17/2003	Closed	
3201 S Fawcett ,Unit 337 , Tacoma , 98418	10/29/2012	03/18/2013	Closed	
3201 S Tyler ST ,UNIT 1 , Tacoma , 98405	09/03/2013	09/30/2013	Closed	
3201 S Fawcett AVE #227 , Tacoma , 98418	03/09/2015		Closed	
3211 S Tyler ST ,Unit 17 , Tacoma , 98409	06/10/2013	09/10/2013	Closed	
3211 S Tyler ST 25 , Tacoma , 98409	05/21/2013	09/10/2013	Closed	
3214 96TH ST S ,Sp 33 , Lakewood , 98499	07/13/1999		Closed	
3214 S 96th ST ,# A10 , Lakewood , 98499	09/01/2001	08/29/2008	Closed	
3214 96th ST S A10 , Lakewood , 98499	03/26/2002	08/29/2008	Closed	
3214 96th ST S ,Sp 33 , Lakewood , 98499	01/09/2003	08/29/2008	Closed	
3214 96th ST S ,Sp A17 , Lakewood , 98499	12/22/2003	08/29/2008	Closed	
3218 S Monroe ST ,Unit 55 , Tacoma , 98409	10/05/2012	02/11/2013	Closed	
3218 S Monroe ST ,Unit 48 , Tacoma , 98409	10/30/2012	02/11/2013	Closed	
3218 S Monroe ST ,# 45 , Tacoma , 98409	01/14/2013	05/16/2013	Closed	
3221 S Tyler ST ,Unit 31 , Tacoma , 98409	10/05/2012	02/11/2013	Closed	
3226 S Monroe ST ,Unit 43 , Tacoma , 98409	10/30/2012	02/11/2013	Closed	
3228 S Union AVE ,Apt 219 , Tacoma , 98409	12/05/2003	02/17/2004	Closed	
3302 72nd AVCT W ,Apt 103 , University Place , 98466	04/21/2004	07/13/2004	Closed	
3318 S 7th ST , Tacoma , 98406	09/21/2001	11/07/2001	Closed	
3318 S 7th ST , Tacoma , 98406	01/30/2008	02/05/2008	Closed	
3319 N 31ST , Tacoma	08/08/2000	05/08/2001	Closed	
3322 229th STCT E , Spanaway , 98387	02/23/2002	12/09/2003	Closed	
3339 S Ainsworth ,Apt #4 , Tacoma , 98418	05/24/2001	06/27/2002	Closed	

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3401 Pacific HWY E ,Room 12 , Fife , 98424	08/17/1989		Closed	
3405 McKinley AVE , Tacoma , 98418	04/26/2005	07/26/2005	Closed	
3416 70th AVCT W , Tacoma , 98387	05/27/1992	02/04/1994	Closed	
3421 E 64th ST , Tacoma , 98404	05/04/2001	08/23/2001	Closed	
3423 S Monroe , Tacoma	07/05/2001	10/24/2001	Closed	
3501 Pacific HWY E ,Room 231 , Fife , 98424	06/08/2003	07/23/2003	Closed	
3502 92ND ST S ,Unit 8B3 , Lakewood , 98499	01/30/2004	09/22/2004	Closed	
3504 Ross AVE , Gig Harbor , 98332	07/14/2004	04/25/2005	Closed	
3505 6th AVE , Tacoma , 98406	02/15/2002	07/17/2002	Closed	
3511 S M ST , Tacoma , 98418	05/08/2008	12/03/2008	Closed	
3515 S Orchard ,Apt E-7 , Tacoma	06/21/2001	07/30/2001	Closed	
3515 S Hosmer ST , Tacoma , 98418	11/16/2002	12/30/2002	Closed	
3515 S Hosmer ST , Tacoma , 98418	11/16/2002		Closed	
3518 Pacific HWY E , Fife , 98424	12/15/1989	12/28/1989	Closed	
3518 Pacific HWY E ,Unit 224 , Fife , 98424	06/06/2005	08/19/2005	Closed	
3520 PACIFIC HWY E , Fife	03/24/1999		Closed	
3520 Pacific HWY E ,Room 133 , Fife , 98424	02/15/1997	10/01/1997	Closed	
3520 Pacific HWY E 115 , Fife , 98424	02/15/1997		Closed	
3522 S Sheridan AVE , Tacoma , 98418		04/28/2004	Closed	
3523 E Roosevelt AVE , Tacoma , 98404	09/04/2001	10/30/2002	Closed	
3525 253rd STCT E , Spanaway , 98387	11/07/2001	10/10/2002	Closed	
3529 67th AVE W , University Place , 98466	04/15/2003	05/29/2003	Closed	
3568 E Howe ST , Tacoma , 98404	06/23/2002	10/09/2002	Closed	
3569 E I ST , Tacoma , 98404	07/30/2003	12/26/2003	Closed	
3586 E Howe ST , Tacoma , 98404	05/09/2005	06/28/2006	Closed	
3595 E J ST , TACOMA	02/07/2001	07/31/2001	Closed	
3597 A ST , TACOMA	05/12/1998	07/20/1998	Closed	
3599 E K ST , Tacoma , 98404	10/16/2001	12/20/2001	Closed	
3601 112th ST SW #N-29 , Tacoma , 98438	06/06/2001	07/18/2001	Closed	
3610 S ASOTIN ST , TACOMA	11/16/2000	07/12/2001	Closed	
3612 S J ST , Tacoma	11/29/1999	04/28/2000	Closed	
3617 Crystal Springs RD W , University Place , 98466	11/11/2002	01/17/2003	Closed	
3618 E PIONEER WY , TACOMA	08/10/1998		Closed	
3619 S Tyler , Tacoma , 98409	10/23/2001	01/16/2002	Closed	
3632 E I ST , Tacoma , 98404	08/22/2008	02/26/2009	Closed	
3635 S K ST , Tacoma , 98418	06/27/2001	01/25/2002	Closed	
3643 S Gunnison ST , TACOMA	09/29/2000	12/19/2000	Closed	
3643 S Gunnison ST , Tacoma , 98409	05/17/2001	07/18/2001	Closed	
3646 S Monroe ST , Tacoma , 98409		03/25/2005	Closed	
3702 S ALASKA ST , Tacoma	01/02/1999	08/28/2000	Closed	
3711 1/2 S TACOMA AVE , Tacoma	01/14/1999		Closed	
3715 S Wilkeson ST , Tacoma , 98418	02/06/2004	05/07/2004	Closed	
3715 S 12th ST , Tacoma , 98405	04/25/2014	09/22/2014	Closed	

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3718 105th AVCT E , Edgewood , 98372	02/22/2004	05/25/2004	Closed	
3718 E J ST , Tacoma , 98404	11/02/2005	11/07/2005	Closed	
3726 S M ST , Tacoma , 98418	02/03/2004	04/23/2004	Closed	
3727 N Baltimore ST , Tacoma , 98407	09/17/2001	01/28/2003	Closed	
3727 McKinley AVE , Tacoma , 98404	04/17/2008	05/30/2008	Closed	
3737 McKinley AVE ,Unit 3 , Tacoma , 98404	04/24/2008	06/20/2008	Closed	
3801 S 31ST ST , TACOMA	02/22/2001	05/10/2001	Closed	
3805 N Whitman , Tacoma , 98407	07/11/2001	10/12/2001	Closed	
3806 E L ST , Tacoma	06/08/2001	07/31/2002	Closed	
3809 119th STCT NW , Gig Harbor , 98332	01/20/2005	03/10/2005	Closed	
3812 289th ST E , Graham , 98338	11/24/2010	06/30/2014	Closed	
3817 E L ST , Tacoma , 98404	11/14/2007	02/25/2008	Closed	
3818 Firdrona DR NW , Gig Harbor , 98332	08/07/2003	01/14/2004	Closed	
3824 1/2 S PARK AVE , TACOMA	11/25/1998	03/21/2000	Closed	
3825 E G ST , Tacoma	09/27/1999	11/29/1999	Closed	
3835 E SPOKANE ST , TACOMA	01/24/2000	07/05/2000	Closed	
3837 S JUNETT ST 9 , TACOMA	01/08/2001	02/28/2001	Closed	
3838 E HOWE ST , TACOMA	07/25/2000	10/03/2000	Closed	
3842 Pacific AVE , Tacoma , 98418	02/04/2005	05/19/2005	Closed	
3903 Salishan BLVD , Tacoma , 98404	10/21/2014	11/07/2014	Closed	
3905 CENTER ST , TACOMA	09/12/2000	02/16/2001	Closed	
3909 E Roosevelt AVE , Tacoma , 98404	01/28/2013	05/16/2013	Closed	
3910 Everett AVE , Tacoma , 98404	04/04/2013	08/05/2013	Closed	
3912 Everett AVE , Tacoma , 98404	08/06/2013	10/30/2013	Closed	
3917 112TH ST E , Tacoma , 98446	11/29/2010	12/02/2010	Closed	
3921 E Everett , Tacoma , 98404	10/30/2012	03/15/2013	Closed	
3922 Roosevelt AVE , Tacoma , 98404	03/21/2013	06/03/2013	Closed	
3923 E Everett , Tacoma , 98404	07/19/2013	10/11/2013	Closed	
3931 S MASON LOOP RD C , TACOMA	05/19/1998		Closed	
3931 S Mason Loop RD A , Tacoma , 98409	04/06/1997		Closed	
3931 S Mason Loop RD C , Tacoma , 98409	07/20/1998	07/01/1998	Closed	
3932 E Roosevelt AVE , Tacoma , 98404	05/16/2013	08/05/2013	Closed	
3935 E Everett ST , Tacoma , 98404	06/12/2012	08/21/2012	Closed	
3938 E Roosevelt AVE , Tacoma , 98404	08/12/2014	11/07/2014	Closed	
3950 Roosevelt AVE , Tacoma , 98404	04/08/2013	07/02/2013	Closed	
3958 E Roosevelt AVE , Tacoma , 98404	04/28/2014	06/12/2014	Closed	
3960 Roosevelt AVE , Tacoma , 98404	04/08/2013	07/02/2013	Closed	
4001 112TH ST SW 3 , LAKEWOOD	02/09/1998		Closed	
4001 112th ST SW 3 , Lakewood , 98499	02/09/1998	09/21/1998	Closed	
4002 S WRIGHT AVE , TACOMA	11/15/2000	01/02/2001	Closed	
4002 S Warner ST ,Apt. 18 , Tacoma , 98409	12/21/2003	03/22/2004	Closed	
4005 E R ST , Tacoma , 98404	03/17/2003	06/11/2003	Closed	
4014 E Q ST , Tacoma , 98404	06/24/2013	08/20/2013	Closed	

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4016 7th ST SW A102 , Puyallup , 98373	04/03/2007	06/14/2007	Closed	
4029 S FAWCETT AVE , Tacoma	04/12/1999	04/04/1999	Closed	
4032 E Q ST , Tacoma , 98404	03/23/2015	04/27/2015	Closed	
4039 E G ST , TACOMA	06/27/2000	09/01/2000	Closed	
4046 E B ST , Tacoma , 98404	11/19/1998		Closed	
4065 E McKinley AVE , Tacoma , 98404	02/26/1996		Closed	
4101 291ST ST E , GRAHAM	07/13/1998		Closed	
4101 291ST ST E , GRAHAM , 98338	11/02/2000	04/19/2006	Closed	
4101 E T ST , Tacoma , 98404	03/21/2013	06/18/2013	Closed	
4101 Everett AVE , Tacoma , 98404	07/11/2014	11/07/2014	Closed	
4105 N 9th ST , Tacoma , 98406	01/03/2009	01/13/2009	Closed	
4108 E Q ST , Tacoma , 98404	07/30/2014	10/08/2014	Closed	
4110 S M ST , Tacoma , 98418	03/18/2004	10/28/2004	Closed	
4110 E Q ST , Tacoma , 98404	07/26/2014	10/08/2014	Closed	
4112 E Q ST , Tacoma , 98404	07/17/2007	07/17/2007	Closed	
4114 Salishan BLVD , Tacoma , 98404	06/24/2013	08/19/2013	Closed	
4115 S Thompson AVE , Tacoma , 98408	10/01/2001	02/20/2002	Closed	
4119 90th AVE E , Puyallup , 98372	07/25/2001	05/15/2002	Closed	
4128 E Q ST , Tacoma , 98404	10/21/2013	10/31/2013	Closed	
4130 E T ST , Tacoma , 98404	04/08/2013	07/16/2013	Closed	
4132 E Q ST , Tacoma , 98404	01/10/2013	03/22/2013	Closed	
4132 E T ST , Tacoma , 98404	07/16/2013	09/10/2013	Closed	
4142 E T ST , Tacoma , 98404	03/28/2013	07/16/2013	Closed	
4202 E T ST , Tacoma , 98404	07/25/2013	09/20/2013	Closed	
4203 Salishan BLVD , Tacoma , 98404	07/16/2013	09/03/2013	Closed	
4203 Everett AVE , Tacoma , 98404	01/23/2014	02/10/2014	Closed	
4204 E T ST , Tacoma , 98404	07/19/2013	09/13/2013	Closed	
4208 Salishan BLVD , Tacoma , 98404	03/29/2013	07/22/2013	Closed	
4209 250TH STCT E , SPANAWAY	05/03/2000	09/14/2001	Closed	
4209 Salishan BLVD , Tacoma , 98404	10/07/2013	10/31/2013	Closed	
4212 247TH ST E , Spanaway , 98387	06/04/1999		Closed	
4214 N Baltimore ST , Tacoma , 98407	06/08/2004	09/03/2004	Closed	
4222 Caldwell RD E , Edgewood , 98372	11/06/2006	05/23/2007	Closed	
4228 E Q ST , Tacoma , 98404	01/02/2013	04/08/2013	Closed	
4261 Everett AVE , Tacoma , 98404	02/22/2013	04/30/2013	Closed	
4263 Everett ST , Tacoma , 98404	01/28/2013	05/06/2013	Closed	
4268 E Everett , Tacoma , 98404	10/30/2012	12/21/2012	Closed	
4301 E Everett , Tacoma , 98404	10/30/2012	04/12/2013	Closed	
4301 Salishan BLVD , Tacoma , 98404	03/11/2013	06/17/2013	Closed	
4303 E Q ST , Tacoma , 98404	01/22/2013		Closed	
4303 Everett ST , Tacoma , 98404	02/15/2013	04/12/2013	Closed	
4303 Salishan BLVD , Tacoma , 98404	04/08/2013	06/27/2013	Closed	
4304 E Q ST , Tacoma , 98404	01/02/2013	04/08/2013	Closed	

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4307 Salishan BLVD , Tacoma , 98404	03/20/2013	08/05/2013	Closed	
4307 Salishan BLVD , Tacoma , 98404	09/18/2014	10/30/2014	Closed	
4325 E Q ST , Tacoma , 98404	09/12/2012	11/30/2012	Closed	
4326 S WARNER ST , Tacoma	08/26/1999	01/11/2000	Closed	
4328 E R ST , Tacoma , 98404	01/28/2013	05/28/2013	Closed	
4330 E R ST , Tacoma , 98404	10/13/2012	01/31/2013	Closed	
4341 E R ST , Tacoma , 98404	05/30/2013	08/19/2013	Closed	
4347 Salishan BLVD , Tacoma , 98405	06/24/2013	09/03/2013	Closed	
4350 E R ST , Tacoma , 98404	07/07/2015		Closed	
4356 E R ST , Tacoma , 98404	07/19/2013	09/30/2013	Closed	
4362 E Q ST , Tacoma , 98404	03/20/2013	07/22/2013	Closed	
4366 E Q ST , Tacoma , 98404	01/31/2013	04/12/2013	Closed	
4402 110th ST SW 4 , Lakewood , 98499	11/30/2002	12/19/2002	Closed	
4410 E Q ST , Tacoma , 98404	07/16/2013	08/30/2013	Closed	
4421 76TH AVE W ,Apt 4 , University Place , 98466	07/28/1999	10/05/1999	Closed	
4440 E Q ST , Tacoma , 98404	07/30/2014	10/03/2014	Closed	
4451 E Q ST , Tacoma , 98404	03/28/2013	06/06/2013	Closed	
4455 E Q ST , Tacoma , 98404	04/09/2013	06/13/2013	Closed	
4462 E Q ST , Tacoma , 98404	01/10/2013	03/28/2013	Closed	
4464 E Q ST , Tacoma , 98404	01/10/2013	03/29/2013	Closed	
4472 E Q ST , Tacoma , 98404	12/06/2012	03/18/2013	Closed	
4488 E Q ST , Tacoma , 98404	09/21/2012	01/31/2013	Closed	
4492 E Q ST , Tacoma , 98404	09/10/2015	10/14/2015	Closed	
4510 1/2 E F ST , TACOMA	12/08/2000	08/15/2001	Closed	
4512 180th KS , Longbranch , 98351	08/03/2001	06/20/2003	Closed	
4515 PACIFIC AVE , TACOMA	02/02/2000	04/25/2000	Closed	
4516 KENNEDY RD NE , TACOMA	10/04/1999	01/24/2000	Closed	
4516 N Bristol ST , Tacoma , 984072003	02/07/2002	05/20/2002	Closed	
4518 KENNEDY RD NE , TACOMA	10/06/1999	01/10/2000	Closed	
4518 S M ST , Tacoma , 98418	05/06/2003	06/30/2003	Closed	
4524 S Fawcett AVE , Tacoma	07/24/2001	03/06/2003	Closed	
4525 E E ST , Tacoma , 98349	01/24/1992	02/10/1992	Closed	
4527 S D ST , Tacoma , 98418	02/13/2008	06/18/2008	Closed	
4529 35TH ST NE , TACOMA	02/24/2000	05/02/2000	Closed	
4540 S WASHINGTON ST , TACOMA	03/07/2001	04/26/2001	Closed	
4600 16th ST E ,Unit P208 , Fife , 98424	05/28/2013	08/19/2013	Closed	
4601 Pacific HWY E ,Room #12 , Fife , 98424	09/21/2001	12/20/2001	Closed	
4601 Pacific HWY E 23 , Fife , 98424	11/28/1995		Closed	
4601 Pacific HWY E , Fife , 98424	08/14/2007	03/10/2008	Closed	
4602 E Q ST , Tacoma , 98404	08/08/2012	10/23/2012	Closed	
4611 N Pearl ST , Tacoma , 98407	05/26/2003	07/21/2003	Closed	
4611 S M ST , Tacoma , 98408	04/04/2004	08/20/2004	Closed	
4612 N DEFIANCE ST , TACOMA	08/23/2000	10/25/2000	Closed	

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4617 N 18TH ST , TACOMA	05/15/2000	12/01/2000	Closed	
4617 E R ST , Tacoma , 98404	01/28/2013	05/20/2013	Closed	
4619 S Reade ST , Tacoma , 98409	03/05/2002	06/26/2002	Closed	
4621 Foster PL NE , Tacoma , 98422	02/21/2004	06/22/2004	Closed	
4672 Q CT , Tacoma , 98404	03/20/2013	06/17/2013	Closed	
4703 Whiteman RD KS , Lakebay , 98351	04/09/1993	04/19/1993	Closed	
4808 Q CT , Tacoma , 98404	05/16/2013	10/11/2013	Closed	
4810 S Wilkeson ST , Tacoma , 98405		04/22/1993	Closed	
4816 S Asotin , Tacoma , 98408	11/14/2001	05/02/2002	Closed	
4818 N 12TH ST , Tacoma	11/19/1999	03/14/2001	Closed	
4824 6th AVE , Tacoma , 98406	07/24/2008	01/21/2009	Closed	
4850 6TH AVE , Tacoma	09/16/1999	05/30/2002	Closed	
4901 S Orchard ST W , University Place , 98467	05/16/1994	05/01/1994	Closed	
4905 N McBride ST , Tacoma , 98407	01/05/2006	07/31/2006	Closed	
4917 Brookdale RD E , Tacoma , 98446	02/11/2005	04/26/2005	Closed	
4925 N Pearl ST ,# C , Ruston , 98407	08/14/2003	04/23/2004	Closed	
5001 E L ST , Tacoma , 98404	05/08/2002	11/13/2002	Closed	
5015 E McKinley AVE , Tacoma , 98404	01/01/2002	02/20/2002	Closed	
5017 N Levee RD , Puyallup , 98443	02/04/1997	05/20/1997	Closed	
5034 S L ST , Tacoma , 98408	08/14/2004	10/28/2004	Closed	
5113 85th ST E , Tacoma , 98445	07/19/2001	01/08/2002	Closed	
5115 Filbert LN SW , Lakewood , 98499	08/04/2004	05/26/2005	Closed	
5128 N HIGHLAND ST , Ruston	04/19/1999	06/14/1999	Closed	
5128 N Highland ST , Ruston , 98407	06/18/2004	08/11/2004	Closed	
5136 N Pearl ST ,# 3 , Ruston , 98407	06/07/2004	08/05/2004	Closed	
5136 N Pearl ST ,# 4 , Ruston , 98407	06/07/2004	08/05/2004	Closed	
5138 N Pearl ST ,# 12A , Ruston , 98407	06/07/2004	08/05/2004	Closed	
5138 N Pearl ST ,# 18 , Ruston , 98407	06/06/2004	08/05/2004	Closed	
5138 N Pearl ST ,# 12 , Ruston , 98407	06/07/2004	08/05/2004	Closed	
5201 20th ST E ,Rm 119 , Fife	05/22/2001	07/18/2001	Closed	
5201 20th ST E 132 , Fife , 98424	12/24/1988	01/18/1989	Closed	
5202 S M ST , Tacoma , 98408	03/01/2002	09/10/2002	Closed	
5205 Sumner Heights DR , Edgewood , 98372	01/13/2005	05/03/2006	Closed	
5208 S Pine ST , Tacoma , 98409	06/25/2004	01/06/2005	Closed	
5215 301st ST E , Graham , 98338	11/21/2002	02/20/2003	Closed	
5225 S 9th ST , Tacoma	09/20/2001	08/16/2002	Closed	
5227 204th STCT E , Spanaway , 98387	08/05/2004	01/07/2005	Closed	
5237 S Yakima AVE , Tacoma , 98408	01/10/2007	02/16/2007	Closed	
5238 S Birmingham ST , Tacoma , 98409	02/25/2002	07/09/2002	Closed	
5301 S Orchard ST 2 , Tacoma , 98466	10/21/2013	10/31/2013	Closed	
5302 146th ST E , Tacoma , 98446	02/25/2005	08/04/2009	Closed	
5303 S Orchard ST ,# 14 , Tacoma , 98467	12/17/2012	05/20/2013	Closed	
5311 S Orchard ST , University Place , 98409	06/03/2014	06/30/2014	Closed	

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5313 S Orchard ,Unit 61 , Tacoma , 98467	12/02/2013	12/23/2013	Closed	
5315 S Orchard ,Unit 72 , Tacoma , 98467	10/28/2013	12/03/2013	Closed	
5318 Ray Nash DR NW , Gig Harbor , 98335	02/23/2006	05/31/2006	Closed	
5411 S Warner ST , Tacoma , 98409	10/13/2003	02/06/2004	Closed	
5411 S K ST , Tacoma , 98408	03/08/2004	08/03/2004	Closed	
5411 S Stevens ST , Tacoma , 98409	01/04/2013	05/28/2013	Closed	
5414 112TH AVE E , PUYALLUP	01/16/2001	06/03/2004	Closed	
5415 S ORCHARD ST , UNIVERSITY PLACE	03/26/2001	06/13/2001	Closed	
5415 S Orchard ST ,# A-082 , University Place , 98467	09/05/2001	12/11/2001	Closed	
5415 E McKinley AVE , Tacoma , 98404	05/23/2002	06/20/2002	Closed	
5415 140th ST NW , Gig Harbor , 98332	04/07/2003	08/29/2003	Closed	
5417 15TH ST E , FIFE	08/01/2000	11/15/2002	Closed	
5417 Rainier DR E , Bonney Lake , 98390	02/24/2002	10/31/2002	Closed	
5419 S M ST , Tacoma , 98408	06/17/2008	12/05/2008	Closed	
5421 Marine View DR , Tacoma , 98422	07/14/2004	01/27/2005	Closed	
5422 S Warner ST , Tacoma , 98409	01/01/2002	04/10/2002	Closed	
5423 S Sheridan , Tacoma , 98408	07/09/2001	09/20/2001	Closed	
5424 N 46th ST , Tacoma , 98407	07/26/2003	03/18/2004	Closed	
5425 S Lawrence ST ,# 104 , Tacoma , 98409	02/12/2013	12/03/2013	Closed	
5425 Lawrence ST ,Unit 313 , Tacoma , 98409	06/10/2013	12/06/2013	Closed	
5425 S Lawrence ST ,Unit 314 , Tacoma , 98409	08/27/2013	12/06/2013	Closed	
5425 S Lawrence ST ,Unit 207 , Tacoma , 98409	02/19/2014	05/05/2014	Closed	
5425 S Lawrence ST ,# 104 , Tacoma , 98409	01/02/2015	02/10/2015	Closed	
5430 N 49TH ST , Ruston	09/14/1999	01/13/2000	Closed	
5434 1/2 S Birmingham ST , Tacoma , 984095418	01/02/2002	03/13/2002	Closed	
5436 S WARNER ST , TACOMA	03/14/2000	10/04/2001	Closed	
5443 Clarkston ST , Tacoma , 98404	04/23/2003	06/03/2003	Closed	
5503 S Stevens ST , Tacoma , 98409	09/20/2005	01/03/2006	Closed	
5509 BOSTON AVE SW , Lakewood	10/04/1999	12/09/1999	Closed	
5510 McKinley AVE , Tacoma , 98404	12/05/2002	12/16/2003	Closed	
5514 S Sheridan AVE , Tacoma , 98418	12/01/2005	02/24/2006	Closed	
5532 N SEAVIEW ST , Tacoma	03/24/1999	10/25/1999	Closed	
5601 N 37th ST ,Apt #CC8 , Tacoma	07/27/2001	09/14/2001	Closed	
5607 Boston AVE SW B6 , Lakewood , 98499	07/29/1996		Closed	
5607 Boston AVE SW A16 , Lakewood , 98499	12/17/1996		Closed	
5608 Seeley Lake DR SW , Lakewood , 98499	07/19/2006	12/14/2006	Closed	
5613 262ND ST E , GRAHAM	10/23/2000	10/25/2001	Closed	
5673 S J ST , Tacoma , 98408	05/13/2005	09/28/2005	Closed	
5700 Pacific HWY E ,Room 432 , Fife , 98424	07/02/2005	07/11/2005	Closed	
5709 4th ST E , Fife	06/14/2001	11/02/2001	Closed	
5709 N 42nd ST , Tacoma , 98407	06/24/1989	11/01/1989	Closed	
5710 384th ST E , Spanaway , 98328	07/28/1992	12/19/2006	Closed	

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5710 122nd ST E , Spanaway , 98373	01/30/2003	04/01/2003	Closed	
5711 161st STCT E ,Unit C-60 , Puyallup , 98375	05/30/2003	08/07/2003	Closed	
5734 51ST AVCT W , UNIVERSITY PLACE	12/04/1998		Closed	
5801 77th AVCT E ,# 9 , Puyallup , 98371	02/03/2004	08/31/2004	Closed	
5805 Pacific HWY E ,Room 127 , Fife , 98424	11/20/2001	01/11/2002	Closed	
5807 257th ST E , Graham , 98338	05/19/2005	03/15/2006	Closed	
5815 112th ST E , Puyallup , 98373	06/15/2001	10/03/2002	Closed	
5819 77th AVCT E ,# 6 , Puyallup TPO #93 , Puyallup , 98371	02/02/2004	03/15/2006	Closed	
5832 S Fife ST , Tacoma , 98409	10/01/2004	11/18/2004	Closed	
5834 S Fife ST , Tacoma , 98409	05/07/2002	07/17/2002	Closed	
5915 S YAKIMA AVE , Tacoma	07/06/1999	09/03/1999	Closed	
5915 212TH ST E , SPANAWAY	08/04/2000	12/19/2000	Closed	
5930 6TH AVE B-18 , Tacoma	08/22/2000	01/12/2001	Closed	
6009 Hillcrest DR SW , Lakewood , 98499	08/31/2010	12/27/2010	Closed	
6014 Hannah Pierce RD B , UNIVERSITY PLACE	02/24/2001	04/05/2001	Closed	
6014 S J ST , Tacoma , 984083443	01/01/2002	03/22/2002	Closed	
6016 S MASON AVE , TACOMA	09/29/2000	12/14/2000	Closed	
6021 Orchard ST W , University Place , 98467	10/24/2004	04/13/2005	Closed	
6024 S Oakes ST , Tacoma , 98409	01/02/2005	08/31/2005	Closed	
6034 S Montgomery ST , Tacoma , 98409	03/28/2004	06/09/2004	Closed	
6108 N 40th ST , Tacoma , 98407	09/16/1995		Closed	
6111 324th STCT S , Roy , 98580	07/28/2005	08/08/2005	Closed	
6111 84th ST , Puyallup , 98371	12/20/2012	08/16/2013	Closed	
6112 Knoble RD E , Spanaway , 98387	12/26/2001	08/07/2003	Closed	
6120 160th ST E , Puyallup , 98375	10/02/1998		Closed	
6138 S Park AVE , Tacoma , 98408	06/09/2004	01/26/2005	Closed	
6138 Community PL SW , Lakewood , 98499	03/16/2011	03/28/2011	Closed	
6209 20th ST E , Fife , 98424	04/18/2005	07/18/2005	Closed	
6210 Lindsay AVE SE ,Unit A , Auburn , 98390	04/05/2004	09/02/2004	Closed	
6224 84TH ST E , PUYALLUP	08/15/1998	09/27/2000	Closed	
6224 84TH ST E , PUYALLUP	02/14/2000	09/27/2000	Closed	
6224 84th ST E , Puyallup , 98371	08/15/1998	09/27/2000	Closed	
6229 S Fife ST , Tacoma , 98409	05/12/2003	09/12/2003	Closed	
6300 21st ST NE ,Apt 301 , Tacoma , 98422	04/25/2005	07/27/2005	Closed	
6300 21st ST NE ,# 101 , Tacoma , 98422	03/24/2009	06/18/2009	Closed	
6303 112TH ST E , PUYALLUP	04/14/2000	09/15/2000	Closed	
6304 155TH STCT E , Puyallup , 98375	12/01/1999	04/20/2000	Closed	
6312 S I ST , Tacoma , 98404	01/05/2006	11/06/2006	Closed	
6316 18TH ST E , FIFE	04/25/2000	06/14/2001	Closed	
6316 183rd AVE KS , Longbranch , 98351	05/22/2011	04/29/2016	Closed	
6402 203rd STCT E , Spanaway , 98387	04/11/1998		Closed	
6411 150TH ST SW , Lakewood , 98439	11/05/2010	07/07/2011	Closed	

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6414 S 10th ST ,Unit 909 , Tacoma , 98465	11/30/2003	02/02/2004	Closed	
6415 205th ST E , Spanaway , 98387	11/05/2003	02/20/2004	Closed	
6415 S Oakes ST , Tacoma , 98409	10/02/2003	11/19/2003	Closed	
6428 S LAWRENCE ST , TACOMA	12/21/2000	07/12/2001	Closed	
6511 S D ST , TACOMA	03/29/2000	06/30/2003	Closed	
6513 205th ST E , Spanaway , 98387	01/27/2003	06/17/2003	Closed	
6601 114th AVCT E , Unit J001, 4, 6 , Puyallup , 98372	03/16/2005	08/08/2005	Closed	
6610 88th ST SW ,Unit 3 , Lakewood , 98499	04/09/2004	06/25/2004	Closed	
6615 150th ST SW 145 , Lakewood , 98438	05/15/1996	03/17/1999	Closed	
6615 S Puget Sound AVE , Tacoma , 98409	05/13/2014	06/16/2014	Closed	
6616 150TH ST SW ,Sp 9 , LAKEWOOD	08/18/2000	09/05/2001	Closed	
6617 S MONTGOMERY ST , ROY	02/24/2001	05/04/2001	Closed	
6618 325th STCT S , Roy , 98580	03/23/2006	10/03/2007	Closed	
6622 146th ST SW ,Sp 24 , Lakewood , 98439	03/14/2003	06/20/2003	Closed	
6627 S Oakes ST , Tacoma , 98409	03/29/2004	07/20/2004	Closed	
6630 52ND AVE W , TACOMA	01/03/2001	07/03/2001	Closed	
6701 277TH ST E , GRAHAM , 98338	05/18/2000	03/09/2004	Closed	
6704 S J ST , Tacoma	01/28/2005	03/30/2005	Closed	
6706 88th ST E , Puyallup , 98371	03/03/1995	03/11/1996	Closed	
6708 54th AVE NW , Gig Harbor , 98335	07/12/2005	10/19/2005	Closed	
6715 152ND ST E , Puyallup , 98375	08/27/1999		Closed	
6721 325TH STCT S , ROY	04/28/2000	12/07/2000	Closed	
6802 Tacoma Mall BLVD ,Room 181 , Tacoma	05/13/2001	06/12/2001	Closed	
6802 Tacoma Mall BLVD 155 , Tacoma , 98409	02/19/2002	03/29/2002	Closed	
6802 Tacoma Mall BLVD ,Room 177 , Tacoma , 98409	05/15/2002	06/20/2002	Closed	
6802 Portland AVE , Tacoma , 98404	03/19/2008	02/05/2009	Closed	
6808 203rd STCT E , Spanaway , 98387		08/19/2004	Closed	
6809 E I ST , TACOMA	05/08/2000	05/17/2002	Closed	
6810 245th AVE E , Buckley , 98321	03/17/2010	01/14/2013	Closed	
6818 S WAPATO ST , Tacoma , 98409	01/31/2001	05/30/2001	Closed	
6833 S THOMPSON AVE , TACOMA	02/15/2001	04/05/2001	Closed	
6843 S K ST , Tacoma , 98408	09/05/2004	09/09/2004	Closed	
6923 S Cheyenne ST , Tacoma , 98409	05/31/2003	08/06/2003	Closed	
6954 E I ST , TACOMA	10/13/2000	10/26/2001	Closed	
7004 325th STCT S , Roy , 98580	07/18/2001	05/23/2002	Closed	
7007 Waller RD , Tacoma , 98443	05/02/2004	02/25/2005	Closed	
7010 181st AVE E , Bonney Lake , 98390	02/24/2005	04/20/2005	Closed	
7020 FOSTER ST SW , LAKEWOOD	07/16/1998		Closed	
7020 Foster ST SW , Lakewood , 98499	07/16/1998		Closed	
7031 PACIFIC AVE ,Room 1 , Tacoma	04/05/1999	07/06/1999	Closed	
7031 S Trafton ST , Tacoma , 98409	01/10/2005		Closed	
7105 150TH ST SW , Lakewood , 98439	08/22/2000	10/27/2000	Closed	

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7109 146th ST SW ,Sp 12 , Lakewood , 98439	04/06/2005	09/27/2005	Closed	
7111 East Side DR , Federal Way , 98422	02/06/2012	02/16/2012	Closed	
7211 126TH ST E , PUYALLUP	03/06/1998	07/22/1998	Closed	
7211 S Oakes ST , Tacoma , 98409	02/06/2003	09/04/2003	Closed	
7219 SR 162 , SUMNER	12/06/2000	01/09/2001	Closed	
7303 VICKERY AVE E , Tacoma , 98443	01/28/2000	01/28/2003	Closed	
7308 104th ST E , Puyallup , 98373	10/21/1997	09/21/1998	Closed	
7310 124th ST E , Puyallup , 98373	11/06/2002	04/29/2010	Closed	
7315 437th ST E , Eatonville , 98328	09/15/2001	05/21/2002	Closed	
7324 104TH ST E , PUYALLUP	01/10/1998	09/19/2000	Closed	
7330 146th ST SW ,Unit 7302A , Lakewood , 98439	02/18/2014	02/26/2014	Closed	
7333 6TH AVE ,Apt 6 , Tacoma	07/12/1999	10/20/1999	Closed	
7405 288th ST S #N , Roy , 98	06/20/2001	02/05/2003	Closed	
7406 ORTING HWY E , SUMNER	09/15/2000	03/26/2003	Closed	
7411 150TH ST SW , LAKEWOOD	09/14/2000	01/31/2001	Closed	
7414 Eustis Hunt RD E , Spanaway , 98387	07/18/2001	02/11/2002	Closed	
7414 S Hosmer ,Room #441 , Tacoma	09/17/2001	11/21/2001	Closed	
7414 S Hosmer ST ,Room 205 , Tacoma , 98408	03/03/1995	03/29/1995	Closed	
7417 12th AVE E , Tacoma , 98404	02/24/2003	06/06/2003	Closed	
7426 S FIFE ST , Tacoma	06/11/1999	07/30/1999	Closed	
7515 E 12th AVE , Tacoma , 98404	01/31/2002	07/24/2002	Closed	
7522 10th AVCT E ,Unit B , Tacoma , 98408	10/29/2008	02/26/2009	Closed	
7606 297th ST S , Roy , 98580	08/15/2013	08/16/2013	Closed	
7612 37th ST W ,Unit B , University Place , 98466	12/29/2002	03/28/2003	Closed	
7614 340TH ST E , Eatonville , 98328	08/16/2000	03/28/2001	Closed	
7615 S Yakima ST , Tacoma , 98408	01/05/2007	04/20/2007	Closed	
7617 S PINE ST , Tacoma	08/02/1999	06/02/2000	Closed	
7622 S J ST , Tacoma , 98408	06/05/2008	01/25/2011	Closed	
7623 S PARK AVE , Tacoma	05/14/1999		Closed	
7624 Pacific AVE , Tacoma , 98408	02/11/2013	08/09/2013	Closed	
7644 1/2 S A ST , Tacoma , 98408	09/17/2002	12/20/2002	Closed	
7701 40th ST W ,# 903 , University Place	07/12/2001	08/23/2001	Closed	
7701 40th ST W ,Unit 742 , University Place , 98466	03/13/2003	04/25/2003	Closed	
7702 River RD S5 , Tacoma , 98371	11/29/1995		Closed	
7702 River RD S8 , Tacoma , 98371	01/10/1996		Closed	
7708 CIRQUE DR W C , UNIVERSITY PLACE	01/03/2001	03/12/2001	Closed	
7710 313th STCT E , Eatonville , 98328	03/10/2005	08/31/2015	Closed	
7711 S 295TH ST , ROY	03/18/1998		Closed	
7711 295th ST S , Roy , 98580	03/08/1998		Closed	
7714 19th STCT W , Tacoma , 98465	12/19/2002	03/18/2003	Closed	
7806 182ND STCT E , Puyallup , 98375	10/04/1999	02/08/2001	Closed	
7809 192nd AVE E , Bonney Lake , 98390	02/07/2002	07/24/2002	Closed	

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7810 S Yakima AVE , Tacoma , 98408	08/22/2001	04/09/2003	Closed	
7815 290TH ST S , ROY	12/20/1999	10/16/2000	Closed	
7821 174th STCT E , Puyallup , 983752326	12/06/2001	08/19/2002	Closed	
7902 GOLDEN GIVEN RD E , Tacoma , 98404	03/24/1999		Closed	
7902 Golden Given RD E , Tacoma , 98404	02/25/1999		Closed	
7909 Pacific HWY E ,Room 14 , Milton , 98354	09/25/2003	11/17/2003	Closed	
7910 150th ST E , Puyallup , 98375	05/14/2005	07/13/2005	Closed	
7920 270TH ST E , GRAHAM	02/18/1998	12/30/1998	Closed	
7922 12th AVE E , Tacoma , 98404	08/26/2002	11/13/2002	Closed	
7927 E F ST , Tacoma , 98404	07/17/2002	04/16/2003	Closed	
7927 E F ST , Tacoma , 98404	04/30/2004	07/08/2004	Closed	
7930 Valley AVE , Fife , 98424	02/12/2001	12/18/2001	Closed	
8001 MCKINLEY AVE , TACOMA	01/22/2001	06/12/2001	Closed	
8003 186th STCT E , Puyallup , 98375	11/01/2001	03/13/2002	Closed	
8005 156th STCT E , Puyallup , 98375	07/17/2005	06/14/2007	Closed	
8011 E D ST , Tacoma , 98404	11/08/2004	07/01/2005	Closed	
8052 S Ainsworth AVE , Tacoma , 98408	03/13/2002	02/02/2004	Closed	
8100 Tacoma Mall BLVD , Tacoma , 98499	04/02/2002	06/13/2002	Closed	
8101 83rd AVCT SW #H-68 , Lakewood , 98498	02/13/2007	03/23/2007	Closed	
8106 Pine ST S , Tacoma , 98409	04/19/1999	08/29/2003	Closed	
8211 123RD ST E , PUYALLUP , 98373	04/12/2000	02/02/2004	Closed	
8232 S D ST , Tacoma , 98408	02/27/2002	05/17/2002	Closed	
8233 E SHERWOOD ST , Tacoma , 98404	01/30/1999	03/29/2002	Closed	
8233 S HOSMER ST , Tacoma	02/13/1999		Closed	
8233 S Hosmer ST F-17 , Tacoma , 98408	11/18/2001	02/20/2002	Closed	
8233 S Hosmer ,Bldg F , B-12 , Tacoma , 98408	02/13/1999	08/04/1999	Closed	
8307 350th STCT S , Roy , 98580	11/30/2005	04/19/2006	Closed	
8312 238TH ST E , Graham , 98338	11/19/1999	08/24/2000	Closed	
8313 MYERS RD E , Bonney Lake	09/20/1999		Closed	
8317 19th AVCT E , Tacoma , 98404	10/09/2003	10/23/2003	Closed	
8401 44th AVCT E , Tacoma , 98443	06/08/2004	06/30/2004	Closed	
8416 87TH STCT NW , Gig Harbor	08/16/1999	11/08/1999	Closed	
8418 97th ST SW , Lakewood , 98498	07/08/2003	08/26/2003	Closed	
8419 320th ST E , Eatonville , 98328	03/04/2006	02/02/2007	Closed	
8425 S Thompson AVE , Tacoma , 98444	09/07/2004	09/22/2004	Closed	
8447 S PARK AVE , TACOMA	06/07/2000	08/11/2000	Closed	
8537 Zircon DR SW ,Unit 72 , Lakewood , 98498	01/16/2002	04/21/2003	Closed	
8601 S Hosmer ST ,Room 106 , Tacoma , 98444	08/19/2002	09/12/2002	Closed	
8602 S Hosmer ST 204 , Tacoma , 98444	03/14/2002	05/02/2002	Closed	
8602 146th ST E , Puyallup , 98445	10/27/1998		Closed	
8602 146th STCT E , Tacoma , 98375	10/27/1998	10/11/1999	Closed	
8610 Nixon AVE SW , Lakewood , 98498	03/27/2007	09/07/2007	Closed	
8645 S D ST , Tacoma , 98444	11/03/2003	07/20/2005	Closed	

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8702 S Hosmer ST ,Unit 168 , Tacoma , 98444	06/18/2003	08/07/2003	Closed	
8705 246TH AVE E , BUCKLEY	03/14/2000	03/09/2001	Closed	
8801 S HOSMER ST ,Room 314 , TACOMA	12/30/1999	02/14/2000	Closed	
8801 S Hosmer ST ,Room 336 , Tacoma , 98444	07/31/2002	10/24/2002	Closed	
8805 S AINSWORTH AVE , Tacoma	08/25/1999	10/01/1999	Closed	
8821 PACIFIC AVE ,Room 14 , Tacoma	01/29/1999	07/21/1999	Closed	
8821 Pacific AVE ,Room 16 , Tacoma , 98444	03/14/2003	04/11/2003	Closed	
8832 S G ST , Tacoma	05/29/2001	04/09/2002	Closed	
8833 S YAKIMA AVE , Tacoma	11/02/1999	03/07/2000	Closed	
8906 Wildwood AVE SW , Lakewood , 98498	12/05/1991		Closed	
8923 345th STCT S , Roy , 98580	04/07/2008	06/11/2008	Closed	
8930 S 19th ST , Tacoma , 98466	11/22/2002	12/30/2002	Closed	
9006 E McKinley AVE , Tacoma , 98445	02/12/2002	05/02/2002	Closed	
9008 47th AVE E , Tacoma , 98446	03/31/2004	06/08/2004	Closed	
9009 144th ST E , Puyallup , 98375	03/16/2003	11/03/2003	Closed	
9010 324TH ST E , Eatonville	12/10/1999	09/05/2001	Closed	
9015 38th CT E , Edgewood , 98371	03/23/2005	05/17/2005	Closed	
9016 146th ST NW , Gig Harbor , 98329	08/16/2007	12/21/2007	Closed	
9021 SOUTH TACOMA WY ,Room 18 , Lakewood , 98499	08/23/2000	10/20/2000	Closed	
9021 South Tacoma WY ,Room 6 , Tacoma , 98409	12/23/1988		Closed	
9023 S 19th ST , Tacoma , 98466	05/27/2004	07/06/2004	Closed	
9024 216th STCT E , Graham , 98338	02/24/2006	10/17/2006	Closed	
9027 S FAWCETT , TACOMA	07/17/2000	10/05/2001	Closed	
9109 109th ST E ,Unit E150 , Puyallup , 98373	09/03/1993		Closed	
9109 109th ST E ,Unit 1 , Puyallup , 98373	06/06/1989		Closed	
9213 147th STCT NW , Gig Harbor , 98329	10/28/2004	11/03/2006	Closed	
9223 288TH ST E , Graham , 98338	08/24/2000	11/08/2000	Closed	
9223 288th ST E , Graham , 98338	04/24/2008	10/06/2008	Closed	
9228 Fruitland AVE E , Puyallup , 983717354	05/15/2002	10/02/2002	Closed	
9238 S D ST , Tacoma , 98444	04/16/2002	06/07/2002	Closed	
9305 E B ST , Tacoma , 98445	02/08/2007	02/29/2008	Closed	
9307 S Alaska ST , Tacoma , 98444	08/10/2004	09/27/2004	Closed	
9307 E B ST , Tacoma , 98445	02/08/2007	02/29/2008	Closed	
9309 E B ST , Tacoma , 98445	02/08/2007	02/29/2008	Closed	
9311 E B ST , Tacoma , 98445	02/08/2007	02/29/2008	Closed	
9313 Ohop Valley Ext RD , Eatonville , 98328	02/27/2002	05/02/2002	Closed	
9324 South Tacoma WAY , Lakewood , 98499	04/11/2003	08/01/2003	Closed	
9325 South Tacoma WAY ,Unit 112 , Lakewood , 98499	01/25/2005	11/15/2005	Closed	
9402 213th ST E , Graham , 98338	12/28/2004	05/09/2006	Closed	
9410 124th STCT E ,Sp 12 , Puyallup , 98373	09/09/2002	12/03/2002	Closed	
9424 E E ST , Tacoma , 98445	08/10/2003	02/26/2004	Closed	
9426 S D ST , Tacoma , 98444	05/08/2001	01/18/2002	Closed	

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9509 Peacock Hill AVE E , Gig Harbor , 98332	05/11/2007	10/16/2007	Closed	
9512 205TH AVE E , Bonney Lake , 98390	09/05/2002	02/20/2003	Closed	
9622 38th ST E , Edgewood , 98371	01/03/1996	02/12/1996	Closed	
9700 Wright Bliss RD KN , Gig Harbor , 98329	07/30/2002	11/07/2002	Closed	
9714 198th ST E , Graham , 98338	06/11/2002	01/26/2005	Closed	
9716 17th AVE E , Tacoma , 98445	02/10/2006	02/22/2006	Closed	
9716 17th AVE E , Tacoma , 98445	06/23/2007	06/29/2007	Closed	
9807 14TH AVE E , Tacoma , 98445	03/29/1999	07/14/1999	Closed	
9822 Veterans DR SW , Lakewood , 98498	02/14/1997		Closed	
9911 PORTLAND AVE E , Tacoma , 98445	02/17/2000	01/11/2001	Closed	
9915 SOUTH TACOMA WY ,Rm 105 , LAKEWOOD	03/20/2001	08/21/2001	Closed	
9915 South Tacoma WY ,Room #125 , Lakewood	08/24/2001	02/28/2002	Closed	
9920 192nd AVE E , Bonney Lake , 98390	05/01/2005	11/21/2005	Closed	
10005 SOUTH TACOMA WY ,Room 14 , Lakewood , 98499	09/14/1999	07/31/2001	Closed	
10005 South Tacoma WY ,Room 16B , Lakewood , 98499	03/27/2001	07/31/2001	Closed	
10017 251st ST E , Graham , 98338	06/05/2003	07/18/2005	Closed	
10106 33rd STCT E ,Unit B , Edgewood , 98372	06/27/2001	12/20/2002	Closed	
10106 33rd STCT E , Puyallup , 98371	01/20/2003	11/21/2003	Closed	
10127 376th ST E , Eatonville , 98328	11/30/2001	04/10/2002	Closed	
10137 39 Patterson ST S , Tacoma , 98444	10/17/2001	10/19/2001	Closed	
10137 Patterson ST S , Parkland , 98444	06/12/2003	10/17/2003	Closed	
10204 Villa LN SW , Lakewood , 98499	07/13/1995	04/01/1996	Closed	
10205 13th AVCT E , Tacoma , 98445	07/15/2002	11/22/2002	Closed	
10215 404th ST E , Eatonville , 98328	08/06/1997		Closed	
10219 Meadow RD SW , Lakewood , 98499	07/18/2003	07/24/2003	Closed	
10308 16th ST E , Edgewood , 98372	05/11/2007	03/30/2015	Closed	
10316 31st ST E , Edgewood , 98372	11/30/2002	01/28/2003	Closed	
10325 Pacific AVE S , Tacoma , 98444	11/07/2001	01/25/2002	Closed	
10340 Kopachuck DR NW , Gig Harbor , 98335	08/12/2003	12/15/2003	Closed	
10411 Pilgram RD , Pierce County , 00000	11/01/1989	04/15/1992	Closed	
10424 19th AVCT E , Tacoma , 98404	02/28/1996	02/27/1997	Closed	
10510 22nd AVE E , Tacoma , 98445	01/10/2002	04/09/2002	Closed	
10604 Park AVE S , Tacoma , 98444	11/08/1996	06/26/1997	Closed	
10607 288TH ST E , GRAHAM , 98338	03/14/2001	03/04/2004	Closed	
10608 247th ST E , Graham , 98338	05/24/2002	06/27/2003	Closed	
10610 132ND STCT NW , Gig Harbor , 98329	03/24/1999	02/28/2002	Closed	
10610 132nd STCT NW , Gig Harbor , 98329	03/11/1999	03/11/1999	Closed	
10701 186th ST KN , Gig Harbor , 98329	03/04/2003	04/13/2005	Closed	
10705 -09 CEMETERY RD , EATONVILLE	03/07/2000	02/25/2002	Closed	
10706 Douglas DR SW , Lakewood , 98499	10/16/2001	01/18/2002	Closed	
10706 Douglas DR SW , Lakewood , 98499	02/05/2004	05/27/2004	Closed	

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10707 209th AVE E , Bonney Lake , 98390	12/02/2004	12/01/2005	Closed	
10710 40th AVE E , Spanaway , 98446	07/14/2004	09/29/2004	Closed	
10722 59th AVE E , Puyallup , 98373	12/22/2003	04/14/2004	Closed	
10729 123rd CT E ,Apt D-4 , Tacoma	04/24/2001	06/12/2001	Closed	
10804 LAKEVIEW AVE SW , Lakewood , 98499	02/19/1999		Closed	
10804 Lakeview AVE SW ,Room 32 , Lakewood , 98499	02/19/1999	06/23/1999	Closed	
10811 144TH ST E , PUYALLUP	03/15/2001	02/25/2003	Closed	
10812 Park AVE S , Tacoma , 98444	02/26/2002	06/08/2005	Closed	
10815 BROADWAY AVE S , PARKLAND	02/29/2000	02/13/2001	Closed	
10821 Idlewild RD SW , Lakewood , 98498	12/04/2004	07/18/2005	Closed	
10903 BRIAR RD SW , LAKEWOOD	03/31/2000	05/30/2000	Closed	
10906 Golden Given RD , Tacoma , 98445	01/18/2005	07/13/2005	Closed	
10924 Kendrick ST SW ,Apt 1 , Lakewood	05/11/2001	08/15/2001	Closed	
10925 AQUEDUCT DR E , Tacoma , 98445	06/16/1999	05/29/2001	Closed	
10925 Bliss-Cochrane RD KN , Gig Harbor , 98329	06/22/2003	08/26/2003	Closed	
11004 224th ST E , Graham , 98338	04/16/2002	06/21/2002	Closed	
11007 A ST S , Tacoma , 98444	12/07/1999	08/21/2000	Closed	
11007 A ST S , Tacoma , 98444	01/19/2002	08/14/2007	Closed	
11012 Canyon RD E , Puyallup , 98373	11/11/2002	12/26/2002	Closed	
11016 Waller RD E , Tacoma , 98446	05/02/2002	05/22/2002	Closed	
11016 Waller RD E ,Unit J-201 , Tacoma , 98446	09/23/2004	10/08/2004	Closed	
11101 122nd ST E , Puyallup , 983742809	03/19/2008	09/29/2009	Closed	
11320 149th AVE KN , Gig Harbor , 98329	08/14/2002	06/17/2003	Closed	
11321 C ST S , Parkland , 98444	07/20/2004	09/28/2004	Closed	
11405 122nd ST E , Puyallup , 98374	12/14/1994	10/22/1996	Closed	
11408 ANGELINE RD , BONNEY LAKE	07/29/1998		Closed	
11408 ANGELINE RD , BONNEY LAKE	11/21/2000	11/29/2000	Closed	
11408 243rd AVCT E	10/30/2006	09/20/2007	Closed	
11415 12th AVE S , Tacoma , 98444	01/06/2005	03/01/2005	Closed	
11513 A ST S , Tacoma , 98445	10/12/2004	11/03/2005	Closed	
11515 142nd AVCT KN , Gig Harbor , 98329	02/19/2009	11/13/2009	Closed	
11607 1/2 122ND ST E , Puyallup , 98374	02/10/2000	03/23/2001	Closed	
11612 213th AVCT E , Sumner , 98390	07/07/2006	10/03/2006	Closed	
11613 Crescent Valley DR NW , Gig Harbor , 983329343	08/15/2006	11/03/2006	Closed	
11701 PACIFIC HWY SW , LAKEWOOD	03/13/1998	09/22/1998	Closed	
11701 Pacific HWY SW , Lakewood , 98499	12/11/2002	03/17/2004	Closed	
11704 288TH ST E , Graham , 98338	09/20/1999	04/11/2002	Closed	
11717 241st AVCT E , Buckley , 98321	06/03/2004	12/20/2004	Closed	
11720 112th AVCT E #4 , Puyallup , 98374	08/30/2001	09/10/2001	Closed	
11722 Bingham AVE E , Tacoma , 98446	12/16/2001	01/18/2002	Closed	
11815 200th AVE E , Sumner , 98390	05/08/2003	06/20/2007	Closed	

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11901 100th AVE E , Puyallup , 98373	09/05/2003	11/26/2003	Closed	
11906 83rd AVE SW , Lakewood , 98498	01/07/1994	01/01/1994	Closed	
11915 S Steele ST #4 , AKA 12211 S. Steele St. , Tacoma	06/06/2001	09/21/2001	Closed	
11920 134th AVE KN , Gig Harbor , 98335	06/13/2003	08/26/2003	Closed	
12013 53RD STCT E , Edgewood	10/25/1999	12/14/1999	Closed	
12039 Pacific HWY SW 21 , Lakewood , 98499	03/04/1997		Closed	
12039 Pacific HWY SW ,Unit 21 , Lakewood , 98499	12/11/2004	02/15/2005	Closed	
12101 59th AVE E , Puyallup , 98373	07/28/2003	09/12/2003	Closed	
12102 19TH STCT E , EDGEWOOD	09/30/2000	10/24/2002	Closed	
12113 105th AVCT E ,Unit B , Puyallup , 98374	04/02/2004	07/22/2004	Closed	
12117 PACIFIC HWY SW ,Unit 32 , LAKEWOOD	03/29/2000	04/28/2000	Closed	
12117 PACIFIC HWY SW , LAKEWOOD	10/29/1998		Closed	
12117 Pacific HWY SW ,Room 34 , Lakewood , 98499	11/23/2002	01/27/2003	Closed	
12117 Pacific HWY SW ,Room 35 , Lakewood , 98499	03/16/2007	04/27/2007	Closed	
12124 SR 165 E , Buckley , 98321	04/13/2007	07/03/2012	Closed	
12124 SR 165 E , Buckley , 98321	04/13/2007	03/08/2012	Closed	
12131 6th AVE E , Parkland , 98447	05/24/2004	07/08/2004	Closed	
12205 147TH ST E , Graham , 98338	10/07/1999	10/20/2000	Closed	
12207 CANYON RD E , Puyallup , 98373	11/01/1999	06/12/2000	Closed	
12209 Prairie Ridge DR E , Bonney Lake , 98390	06/10/1992	04/12/1993	Closed	
12215 Valley AVE E , Puyallup , 98372	07/01/2004	02/17/2005	Closed	
12218 Kapowsin Highland DR E , Graham , 98338	02/23/2010	05/13/2010	Closed	
12312 206th ST E , Graham , 98338	12/06/2005	06/12/2008	Closed	
12317 6th AVE E , Tacoma , 98445	08/18/2004	02/04/2005	Closed	
12506 98th AVCT SW ,Apt 20 , Lakewood , 98498	09/22/2002	11/22/2002	Closed	
12511 98TH AVCT SW , LAKEWOOD	05/03/2000	07/28/2000	Closed	
12511 Prairie Ridge DR E , Sumner , 98390	12/12/2001	03/31/2004	Closed	
12518 Addison AVE SW , Lakewood , 98499	06/12/1996		Closed	
12521 200th AVE E , Bonney Lake , 98390	11/24/1998	08/22/1999	Closed	
12621 94th AVE E , Puyallup , 98373	05/08/2001	01/22/2002	Closed	
12623 BRIDGEPORT WY SW ,Sp 54 , Lakewood , 98498	07/14/2004	07/13/2010	Closed	
12635 LINCOLN AVE SW ,APT #5 , Lakewood	04/11/2001	06/21/2001	Closed	
12701 Pacific HWY SW ,Unit #39 , Lakewood , 98499	01/03/2008	02/25/2008	Closed	
12701 47th ST SW D4 B2 , Lakewood , 98499	01/03/2012	02/17/2012	Closed	
12704 PACIFIC HWY SW , LAKEWOOD	06/26/1998		Closed	
12704 Pacific HWY S 18 , Tacoma , 98444	06/26/1998		Closed	
12706 94TH AVE E , PUYALLUP	05/12/2000	05/23/2002	Closed	
12710 112th AVE E ,Sp 22 , Puyallup , 98374	06/24/2004	11/16/2004	Closed	

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12715 PACIFIC AVE S , TACOMA	01/16/1998	05/15/1998	Closed	
12715 Pacific AVE ,Rm #8 , Tacoma	05/16/2001	09/14/2001	Closed	
12715 Pacific AVE S ,Room 2 , Tacoma , 98444	03/15/2002	05/01/2002	Closed	
12716 A ST ,Unit 2 , Parkland , 98444	01/13/2005	02/24/2005	Closed	
12717 264th ST E , Graham , 98338	06/24/1991	07/17/1991	Closed	
12724 104TH AVCT E M303 , PUYALLUP	10/31/2000	02/15/2001	Closed	
12724 104TH AVCT E E101 , PUYALLUP , 98374	01/05/2006	02/14/2006	Closed	
12802 &10 Prairie Circle DR E , Sumner , 98390	08/07/2001	12/30/2002	Closed	
12809 207th AVE E , Sumner , 98390	06/08/2001	07/23/2002	Closed	
12809 47th AVE SW B2 , Tacoma , 98499	08/01/1995	03/24/2011	Closed	
12813 198TH ST E , GRAHAM	03/01/2000	08/25/2000	Closed	
12925 Valley AVE E , Sumner , 98390	07/22/2004	09/27/2004	Closed	
13022 86TH AVE E , Puyallup , 98375	06/10/1999	10/19/1999	Closed	
13102 Kapowsin HWY E , Graham , 98338	12/02/2009	10/19/2010	Closed	
13208 Prairie Ridge DR E , Sumner , 98390	03/26/1997	08/03/1998	Closed	
13208 Golden Given RD E , Tacoma , 98445	01/19/2010	03/10/2010	Closed	
13209 278th ST E , Graham , 98338	07/22/2011	07/29/2011	Closed	
13210 11th AVCT E , Tacoma , 98445	12/18/2002	08/27/2004	Closed	
13313 154TH ST E , PUYALLUP	07/31/2000	01/25/2001	Closed	
13418 Cedar CIR E , Sumner , 98390	02/27/2004	06/08/2004	Closed	
13515 16th ST E , Pacific , 98047	01/03/2005	02/07/2005	Closed	
13714 57th AVE E , Puyallup , 98373	12/12/1996	10/21/1997	Closed	
13720 County Line RD E , Pacific , 98047	09/17/2005	12/12/2006	Closed	
13801 Scott-Turner RD E , Eatonville , 98328	08/24/2006	08/25/2006	Closed	
13812 Kapowsin HWY , Graham , 98338	05/10/2002	10/03/2002	Closed	
13916 /13918 Bingham AVE E , Tacoma , 98446	03/25/1998	02/22/2011	Closed	
13918 BINGHAM AVE E , Tacoma , 98446	03/25/1998		Closed	
13919 112th AVE NW , Gig Harbor , 98329	09/16/2004	04/10/2006	Closed	
14017 Bingham AVE E , Tacoma , 98446	04/27/2003	06/25/2003	Closed	
14017 Bingham AVE E , Tacoma , 98446	06/04/2010	08/26/2010	Closed	
14110 Prairie Ridge DR E , Sumner , 98390	01/17/2003	06/09/2003	Closed	
14205 Pioneer WAY E , Puyallup , 98372	03/09/2004	06/08/2004	Closed	
14209 Pacific AVE ,Apt. 18 , Tacoma , 98444	12/18/2007	12/20/2007	Closed	
14214 234th ST E #C , Puyallup	06/15/2001	02/26/2003	Closed	
14218 124th AVE KN , Gig Harbor , 98329	09/30/2003	11/14/2003	Closed	
14317 Prairie Ridge DR E , Bonney Lake , 98390	08/14/2004	09/24/2004	Closed	
14401 Kapowsin HWY E , Kapowsin , 98344	05/25/2004	10/22/2004	Closed	
14402 11th AVE E , Tacoma , 98445	08/28/1989	10/31/1996	Closed	
14405 Union AVE SW ,Apt #13 , Lakewood , 98498	11/03/2001	07/01/2002	Closed	
14405 Union AVE SW ,# A , Lakewood , 98498	07/29/2003	04/05/2004	Closed	
14405 Union AVE SW ,Unit B , Lakewood , 98498	08/20/2003	04/05/2004	Closed	

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14405 Union AVE SW ,Unit C , Lakewood , 98498	08/20/2003	04/05/2004	Closed	
14405 Union AVE SW ,Unit D , Lakewood , 98498	08/20/2003	04/05/2004	Closed	
14409 Union AVE SW ,# A , Lakewood , 98498	07/29/2003	04/05/2004	Closed	
14409 Union AVE SW ,# B , Lakewood , 98498	07/29/2003	04/05/2004	Closed	
14409 Union AVE SW ,# C , Lakewood , 98498	07/29/2003	04/05/2004	Closed	
14409 Union AVE SW ,# D , Lakewood , 98498	07/08/2003	04/05/2004	Closed	
14410 11th AVE E , Tacoma , 98445	08/28/1989	10/31/1996	Closed	
14413 UNION AVE SW ,# A , Lakewood	01/10/1999	10/12/2000	Closed	
14417 Union AVE SW D , Lakewood	01/11/2002	07/01/2002	Closed	
14417 Union AVE SW ,Unit B , Lakewood , 98498	09/04/2003	04/05/2004	Closed	
14417 Union AVE SW ,Unit A , Lakewood , 98498		04/05/2004	Closed	
14510 128th ST E , Puyallup , 98374	05/13/2004	07/18/2005	Closed	
14514 66TH AVE E , PUYALLUP	05/01/1998	08/30/2001	Closed	
14514 66th AVE E , Puyallup , 98375	07/16/2001	08/30/2001	Closed	
14514 Washington AVE SW , prev parcel #: 2200002000 , Lakewood , 98498	04/25/2004	06/28/2007	Closed	
14514 Canyon RD E , Puyallup , 98375	05/23/2005	01/26/2006	Closed	
14516 Union AVE SW , Lakewood , 98498	06/30/2001	08/21/2001	Closed	
14528 128th ST E , Puyallup , 98374	05/13/2004	08/12/2004	Closed	
14607 MURRAY RD SW , LAKEWOOD	09/27/2000	01/17/2001	Closed	
14607 Portland AVE SW , Lakewood , 98498	09/29/2006	09/18/2007	Closed	
14610 246TH ST E , GRAHAM	10/18/2000	10/12/2001	Closed	
14615 9th AVCT E , Tacoma , 98445	02/19/2005	09/16/2005	Closed	
14709 SPRING ST SW , LAKEWOOD	04/29/2000	10/11/2000	Closed	
14711 88TH AVE NW , Gig Harbor	04/16/1999	07/25/2000	Closed	
14715 Pacific AVE S , Tacoma , 98444	07/01/1992	09/16/1993	Closed	
14715 Pacific AVE S ,Unit R-10 , Tacoma , 98444		12/05/2002	Closed	
14717 272nd AVE E , Buckley , 98321	09/06/2007	07/30/2008	Closed	
14719 South Fork RD E , Puyallup , 98360	12/31/1998		Closed	
14812 272nd AVE E , Buckley , 98321	10/30/2003	03/24/2004	Closed	
14817 BINGHAM AVE E , Tacoma , 98446	07/19/2001	10/04/2002	Closed	
14901 SPANAWAY LOOP RD S , SPANAWAY	06/27/1998	01/31/2002	Closed	
14909 42nd AVE E , Tacoma , 98446	09/13/2001	02/20/2002	Closed	
14918 75TH STCT E , SUMNER	06/22/2000	01/10/2001	Closed	
15007 MAIN ST ,Room 2 , Sumner	06/16/1999	08/30/1999	Closed	
15007 W Thorne LN SW ,4plx , Lakewood , 98498	12/12/2001	07/01/2002	Closed	
15007 Main ST E ,Room 5 , Sumner , 98390	02/10/2004	04/05/2004	Closed	
15007 Main ST E ,Room 4 , Sumner , 98390	05/16/2004	06/16/2004	Closed	
15014 Canyon RD E , Puyallup , 98375	08/10/2003	11/26/2003	Closed	
15202 25th AVE E , Tacoma , 98445	12/30/2003	02/23/2004	Closed	

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15209 Portland AVE SW , Lakewood , 98498	01/26/2004	12/12/2005	Closed	
15220 22nd AVE E , Tacoma , 98445	03/22/2002	06/26/2002	Closed	
15302 Meade McCumber RD E , Sumner , 98390	01/29/2008	06/10/2008	Closed	
15307 273rd AVCT E , Buckley , 98321	10/30/2003	03/25/2005	Closed	
15308 116th ST E , Puyallup , 98374	01/14/2006	03/15/2006	Closed	
15309 147th AVE E , Orting , 98360	04/28/2003	05/30/2003	Closed	
15402 106TH ST E , Puyallup , 98374	01/31/2001	06/07/2001	Closed	
15411 Washington ST ,Apt D , Sumner , 98390	11/04/2001	02/20/2002	Closed	
15412 128th ST KN , Gig Harbor , 98329	01/26/1988	01/04/1989	Closed	
15419 24th ST KS , Lakebay , 98349	01/16/2003	02/23/2004	Closed	
15421 50th AVE E , Tacoma , 98446	03/02/2004	06/02/2004	Closed	
15506 E MAIN ST 103 , SUMNER	10/14/1998	12/28/1998	Closed	
15510 66th AVE E , Puyallup , 98375	12/23/2002	02/06/2003	Closed	
15511 Larson Loss RD , Buckley , 98321	03/24/2003	10/04/2005	Closed	
15515 Canyon RD E , Puyallup , 98375	02/19/2004	04/20/2004	Closed	
15532 E Main ST , Sumner , 98390	05/29/2009	08/10/2009	Closed	
15611 182nd AVE KN , Gig Harbor , 98329	10/13/2006	08/04/2009	Closed	
15612 116th ST E , Puyallup , 98374	03/16/2003	04/21/2003	Closed	
15620 82nd AVE NW , Gig Harbor , 98329	02/20/2007	07/23/2007	Closed	
15705 253rd ST E , Graham , 98338	11/16/2002	03/06/2003	Closed	
15714 50th STCT E 17&18 , Sumner , 98390	05/29/1996	10/28/2011	Closed	
15718 240TH ST E , GRAHAM	02/13/2001	05/24/2002	Closed	
15720 Crescent Valley DR NW , Gig Harbor , 98332	06/01/2001	01/18/2002	Closed	
15720 62nd AVE E , Puyallup , 98375	02/15/2006	08/14/2006	Closed	
15801 83rd AVE E , Puyallup , 98375	02/10/2003	05/07/2003	Closed	
15802 84th AVE E , Puyallup , 98375	01/13/2008	07/01/2010	Closed	
15902 78th AVCT E , Puyallup , 98375	07/01/1989	09/20/1989	Closed	
16020 70th AVE E , Puyallup , 98375	07/12/1989	08/09/1989	Closed	
16114 128th ST KN , Gig Harbor , 98329	05/24/2002	11/14/2002	Closed	
16205 83RD AVE E , PUYALLUP	08/20/1998		Closed	
16205 83RD AVE E , SPANAWAY	12/04/2000	03/13/2002	Closed	
16209 83RD AVE E , PUYALLUP , 98375	12/04/2000	06/05/2001	Closed	
16218 25th AVCT E , Tacoma , 98445	05/25/2004	07/12/2007	Closed	
16306 132nd AVE E , Puyallup , 98374	09/26/2001	02/20/2002	Closed	
16404 66th ST E , Sumner , 98390	08/26/2003	11/21/2003	Closed	
16415 131st AVE E , Puyallup , 98374	02/15/2002	05/25/2005	Closed	
16415 131st AVE E , Puyallup , 98374	08/28/1996	11/01/1996	Closed	
16415 131st AVE E , Puyallup , 98374	07/25/2002	05/25/2005	Closed	
16415 131st AVE E , Puyallup , 98374	03/04/2003	05/25/2005	Closed	
16521 191ST AVE E , Sumner , 98390	06/17/1999		Closed	
16614 SR 302 , Gig Harbor , 98329	06/27/2003	11/29/2005	Closed	
16620 27th AVE E , Tacoma , 98445	01/08/2002	12/04/2002	Closed	
16715 230th ST E , Graham , 98338	07/03/2004	11/03/2005	Closed	

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16719 78th AVCT E , Puyallup , 98375	10/08/2002	06/14/2006	Closed	
16807 14th AVE S , Spanaway , 98387	10/07/1994	09/19/2008	Closed	
16816 79th AVE E , Puyallup , 98375	09/18/2005	09/23/2005	Closed	
16820 Park AVE S , Spanaway , 98387	07/29/1994	07/26/2007	Closed	
16919 79th AVE E , Puyallup , 98375	12/04/2002	03/28/2003	Closed	
16923 21ST AVCT E , SPANAWAY	02/05/2000	03/26/2003	Closed	
17113 84th AVCT E , Puyallup , 98375	04/21/2005	06/01/2005	Closed	
17117 141st ST KN , Gig Harbor , 983294643	02/26/2009	10/29/2014	Closed	
17207 134th ST KN , Gig Harbor , 98329	07/10/2003	09/16/2003	Closed	
17214 32nd AVE E , Tacoma , 98446	05/03/2002	09/10/2002	Closed	
17302 S 10TH AVE ,Apt A1 , SPANAWAY , 98387	05/31/2000	08/07/2003	Closed	
17318 Pioneer WAY E , Orting , 98360	10/29/2009	11/02/2009	Closed	
17320 82nd AVE E , Puyallup , 98375	01/20/2006	10/24/2006	Closed	
17409 103RD STCT KN , Gig Harbor , 98329	02/15/2001	06/15/2001	Closed	
17417 13TH AVCT E , Spanaway , 98387	03/29/1999	05/29/2001	Closed	
17421 Spanaway LN , Spanaway , 98387	01/14/2005	03/27/2005	Closed	
17424 6th AVCT E , Spanaway , 98387	06/02/2009	08/12/2009	Closed	
17508 8th ST KN , Lakebay , 98349	05/19/2004	07/20/2007	Closed	
17716 147TH AVE E , Orting	05/28/1999		Closed	
17810 70th ST E , Bonney Lake , 98390		02/02/2005	Closed	
17816 40TH AVE E , Tacoma , 98446	05/04/2000	05/17/2001	Closed	
17906 45th AVE E , Tacoma , 98443	11/14/1992	04/23/1999	Closed	
17913 Pioneer WAY E , Orting , 98360	05/09/2003	09/19/2003	Closed	
18206 Bonney Lake BLVD , Bonney Lake , 98391	07/08/2014	07/02/2015	Closed	
18215 38TH AVE E , Tacoma , 98466	10/02/1999	12/15/2000	Closed	
18227 113th AVE E , Puyallup , 98374	06/05/2014	01/27/2016	Closed	
18317 21st ST KN , Gig Harbor , 98349	11/14/2002	03/14/2003	Closed	
18420 104th ST KN , Gig Harbor , 98329	05/07/2003	03/17/2004	Closed	
18502 144th ST KN , Lakebay , 98329	08/22/2004	02/15/2005	Closed	
18512 247th ST E , Orting , 98360	02/13/2003	01/27/2004	Closed	
18517 223rd AVE E , Orting , 98360	05/20/2001	02/13/2002	Closed	
18701 SCOTT TURNER RD E , EATONVILLE	08/05/2000	11/21/2000	Closed	
18701 Scott Turner RD E , Eatonville , 98328	11/06/1997		Closed	
18710 2ND AVE E , SPANAWAY	12/17/1999	01/09/2001	Closed	
18820 38th AVE E , Tacoma , 98446	10/28/2005	03/30/2006	Closed	
18829 Pacific AVE S 15 , Tacoma , 98433	03/22/2002	04/09/2003	Closed	
18829 Pacific AVE S ,Sp 14 , Spanaway , 98387	08/25/2003	05/17/2005	Closed	
18925 30th AVE E , Tacoma , 98446	05/05/2005	07/08/2005	Closed	
19009 34th AVCT E , Tacoma , 98446	08/16/2005	12/16/2005	Closed	
19010 78TH AVCT E , GRAHAM	09/01/2000	10/25/2000	Closed	
19201 54th ST E , Sumner , 98390	02/12/2004	04/21/2004	Closed	
19208 200th ST E , (19208 - 197th St E. according to owner) , Orting	08/29/2001	10/05/2001	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
19306 MOUNTAIN HWY E ,Sp 10 , Spanaway , 98387	10/31/2000	02/23/2001	Closed	
19412 E B ST , TACOMA	03/21/2000	08/22/2000	Closed	
19413 CRESCENT DR , Spanaway , 98387	08/25/2000	10/27/2000	Closed	
19505 SR-706E , Elbe , 98330	07/19/2006	04/18/2007	Closed	
19717 166TH ST E , SUMNER	02/22/2000	03/21/2000	Closed	
19810 63rd AVCT E , Spanaway , 98387	11/09/2001	09/25/2002	Closed	
19818 PIRNIE RD , SPANAWAY , 98387	01/20/2000	02/22/2011	Closed	
19824 63rd AVCT E , Spanaway , 98387	09/30/2001	04/16/2002	Closed	
19902 Field RD , Lake Park , 98387	05/09/2003	01/09/2004	Closed	
19912 231ST AVCT E , Orting , 98360	01/05/1999	11/07/2000	Closed	
19914 117th ST E , Sumner , 98390	02/09/2004	12/20/2004	Closed	
19916 Mt Highway , Spanaway , 98387	07/18/2001	10/17/2005	Closed	
20018 117th ST E , Sumner , 98391	06/05/2006	04/03/2007	Closed	
20022 45TH AVCT E , ROY	06/12/2000	09/29/2000	Closed	
20114 58th AVE E , Spanaway , 98387	06/01/1990	08/09/1990	Closed	
20211 Patterson RD E , Orting , 98360	05/11/1992	04/09/1993	Closed	
20213 113th ST E , Sumner , 98390	12/13/2001	04/07/2004	Closed	
20213 113th ST E , Sumner , 98390	12/13/2001		Closed	
20254 42nd AVE E , Spanaway , 98387		02/11/2005	Closed	
20314 Church Lake DR E , Bonney Lake , 98391	02/27/2006	04/13/2006	Closed	
20418 46th AVE E , Spanaway , 983876711	12/09/2001	07/03/2002	Closed	
20504 13th AVE E ,Sp 9 , Spanaway , 98387	10/30/2002	08/19/2003	Closed	
20506 135TH AVE E 13 , GRAHAM	09/11/2000	02/14/2001	Closed	
20519 La Paloma DR E , Sumner , 98390	09/08/2001	08/18/2004	Closed	
20606 8th AVCT E ,Sp 3 , Spanaway , 98387	11/03/2002	04/09/2003	Closed	
20620 Mountain HWY E , Spanaway , 98433	06/05/1997		Closed	
20709 91st ST E , Bonney Lake , 98390	09/17/2004	05/12/2005	Closed	
20715 8th AVE E , Spanaway , 98387	09/01/1994		Closed	
20803 180TH ST E , ORTING	12/08/2000	12/05/2002	Closed	
20906 Edwards RD E , Lake Tapps , 98391	04/17/2008	05/30/2008	Closed	
20913 175th STCT E , Orting , 98360	04/12/2004	08/25/2004	Closed	
20916 127th ST E , Bonney Lake , 98390	09/19/1995		Closed	
21005 81st AVCT E , Spanaway , 98387	11/25/2014	03/04/2015	Closed	
21010 120th STCT E , Sumner , 98390	08/29/2002	10/02/2002	Closed	
21015 94th AVE E , Graham	11/11/1998	08/23/2001	Closed	
21406 109th AVE E , Graham , 98338	02/13/1996	03/09/2004	Closed	
21412 131st ST E , Sumner , 98391	08/02/2007	01/24/2008	Closed	
21511 22nd AVE E , Spanaway , 98387	08/15/2003	11/20/2003	Closed	
21604 185th ST E , Orting , 98360	01/22/2013	03/06/2014	Closed	
21614 135th ST E , Sumner , 98390	10/11/2006	10/17/2006	Closed	
21616 SR 410 E , Bonney Lake , 98390	09/01/2004	11/10/2004	Closed	
21618 122ND STCT E , Sumner	01/27/1999	10/19/1999	Closed	
21621 SOUTH PRAIRIE RD E , Buckley , 98321	08/29/2000	11/19/2001	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
21712 Mountain HWY E , Graham	07/29/2001	09/27/2001	Closed	
21805 58th AVE E , Spanaway , 98387	08/31/2004	12/02/2004	Closed	
21916 HWY 410 323 , Bonney Lake , 98390	11/29/2001	02/01/2002	Closed	
22009 131st STCT E , Sumner , 98390	04/11/2003	08/20/2003	Closed	
22105 129th ST E , Sumner , 98391	07/19/2007	11/07/2013	Closed	
22109 125TH ST E , Sumner , 983917612	09/21/2006	03/02/2007	Closed	
22120 Kaperak RD , Orting , 98360	05/10/2010	11/03/2010	Closed	
22203 133rd ST E , Sumner , 98390	11/07/2001	06/28/2005	Closed	
22203 54th AVCT E , Spanaway , 98387	09/27/2007	12/21/2007	Closed	
22206 45th AVE E , Spanaway , 98387	01/02/2002	03/01/2002	Closed	
22422 -24 40th AVE E , Spanaway , 98387	04/01/2005	06/07/2005	Closed	
22523 SR 410 E , Buckley , 98321	09/11/2001	01/23/2003	Closed	
22603 S PRAIRIE RD E , Bonney Lake , 98321	11/09/1999	03/11/2005	Closed	
22605 59th AVE E , Spanaway , 98387	02/26/2002	12/09/2002	Closed	
22611 South Prairie RD , Bonney Lake , 98390	01/15/2003	03/11/2005	Closed	
22706 CEDARVIEW DR E , Sumner	04/11/2001	06/12/2001	Closed	
22717 149th AVE E , Graham , 98338	10/09/1997	04/14/1999	Closed	
22902 129th ST E , Sumner , 98390	05/16/2001	05/03/2002	Closed	
22906 112th ST E , Buckley , 98321	01/11/2006	07/17/2006	Closed	
23015 South Prairie RD E , Bonney Lake , 98390	01/24/2002	03/11/2005	Closed	
23117 152ND AVE E , Graham , 98338	04/06/1999	10/01/1999	Closed	
23408 60TH AVE E , GRAHAM	02/28/2000	09/27/2001	Closed	
23615 140th AVE E , Graham , 98338	05/19/2001	08/26/2002	Closed	
23711 64th CT E , Graham , 98338	03/27/2002	05/22/2002	Closed	
23803 101st AVE E ,# 9 , Graham , 98338	08/28/2003	01/14/2004	Closed	
23814 65th AVCT E , Graham , 98387	03/12/2003	05/30/2003	Closed	
23909 60TH AVE E , GRAHAM	02/28/2000	08/21/2000	Closed	
24123 177th ST E , Orting , 98360	05/16/2003	07/29/2003	Closed	
24215 154th AVE E , Graham , 98338	07/12/2006	09/11/2007	Closed	
24219 46th AVE E , Spanaway , 98387	09/29/2004	01/25/2005	Closed	
24316 117th ST E , Buckley , 98321	04/13/2007	03/04/2008	Closed	
24519 SUMNER BUCKLEY HWY E , BUCKLEY	05/12/1998		Closed	
24705 Highway 410 E , Buckley , 98321	05/11/2004	01/21/2010	Closed	
24818 160th AVCT E , Graham , 98338	05/02/2005	10/25/2006	Closed	
24917 43rd AVE E , Spanaway , 98387	10/11/2003	05/05/2008	Closed	
25109 43rd AVCT E , Spanaway , 98387	07/26/2005	11/04/2005	Closed	
25201 149th ST E , Buckley , 98324	04/30/2004	09/30/2004	Closed	
25206 96th ST E , Buckley , 983219293	04/14/2009	08/12/2011	Closed	
25313 51st AVE E , Graham , 98338	06/16/2004	05/17/2005	Closed	
25321 54th AVE E , Graham , 98338	09/01/2004	03/27/2006	Closed	
25401 36TH AVE E , SPANAWAY , 98387	12/03/2000	05/10/2001	Closed	
25409 35th AVE E , Spanaway , 98387	05/02/2004	05/24/2006	Closed	
25414 33rd AVE E , Spanaway , 98387	01/10/2006	05/31/2006	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
25509 36th AVE E , Spanaway , 98387	09/25/2003	01/09/2004	Closed	
25509 50th AVE E , Graham , 98338	01/19/2005	05/26/2005	Closed	
25509 162nd STCT E , Buckley , 98321	02/09/2007	06/02/2009	Closed	
25523 48th AVE E , Graham , 98338	11/12/2004	02/17/2005	Closed	
25713 58TH AVCT E , Graham , 98338	12/01/1999	05/10/2002	Closed	
25807 Meridian AVE E , Graham , 98338	07/21/2002	11/22/2002	Closed	
26407 Orting Kapowsin HWY , Graham , 98338	03/29/1994	04/26/1994	Closed	
26514 Meridian AVE E , Graham , 98338	07/01/2002	11/14/2002	Closed	
27511 128TH AVCT E , GRAHAM	07/20/2000	07/12/2001	Closed	
27513 Lower Burnett RD E , Buckley , 98321	10/18/2001	08/22/2002	Closed	
28004 HWY 410 436-B , Buckley , 98321	05/02/1996		Closed	
28409 122nd AVE E , Graham , 98338	08/02/2004	07/01/2005	Closed	
28416 126th AVE E , Graham , 98338	01/10/2003	03/06/2003	Closed	
28519 Orting Kapowsin HWY E , Graham , 98338	08/22/2001	03/01/2002	Closed	
28715 11th AVE E , Roy , 98580	08/25/2002	12/09/2002	Closed	
29219 Lyons DR S , Roy , 98580	05/01/2003		Closed	
29314 129th AVCT E , Graham , 98338	05/31/2006	06/23/2008	Closed	
29712 64th AVE S , Roy , 98580	10/07/2004	02/07/2005	Closed	
29805 SCHUDY RD S , Roy , 98580	06/18/1999	04/07/2000	Closed	
29817 20TH AVE S , Roy , 98580	12/16/1999	04/27/2001	Closed	
29819 20TH AVE S , ROY	12/14/1999		Closed	
29820 77TH AVE S , Roy , 98580	11/25/2000	01/25/2002	Closed	
29917 Mountain HWY , Graham , 98338	08/15/2001	03/13/2002	Closed	
30501 SR 706 E , Ashford , 98304	01/07/2005	08/30/2005	Closed	
30907 8th AVE E , Roy , 98580	12/01/2003	06/07/2004	Closed	
31110 Mountain HWY E , Eatonville , 98328	06/08/1995	07/10/1999	Closed	
31317 71st AVCT S ,Sp 19 , Roy , 98580	01/07/2003	03/19/2003	Closed	
31418 S 62ND AVE , ROY	05/17/2000	01/09/2001	Closed	
31521 8th AVE S , Roy , 98580	05/23/2001	10/05/2001	Closed	
31717 116th AVE E , Graham , 98338	01/30/2006	05/24/2006	Closed	
32218 65th AVCT S , Roy , 98580	11/09/2003	01/27/2004	Closed	
32613 58th AVE E , Eatonville , 98328	08/01/2002	01/30/2003	Closed	
32621 Whitman Lake DR , Graham , 98338	10/14/1998	06/18/1999	Closed	
32707 10th AVE S , Roy , 98580	01/22/2001	02/20/2002	Closed	
32707 10th AVE S , Roy , 98580	10/17/2002	04/01/2003	Closed	
33404 89th AVCT S , McKenna , 98580	04/02/2001	05/06/2004	Closed	
33710 S 25TH AVCT , ROY	02/23/2000	02/28/2001	Closed	
33717 85th AVE S , Roy , 98580	01/09/2004	03/09/2004	Closed	
34217 Tanwax DR E 7 , Eatonville , 98328	11/25/1997		Closed	
34312 51st AVE E , Eatonville , 98328	07/12/2012	03/05/2013	Closed	
34603 8th AVE S , Roy , 98580	10/03/2002	12/26/2002	Closed	
34615 25th AVCT S , Roy , 98580	05/13/2004	09/28/2004	Closed	
34910 42ND AVE S , ROY	06/26/2000	12/01/2000	Closed	

Methamphetamine Contaminated Properties List as of 5/16/2016

Site Address	Received Date	Resolved Date	Status	Work Plan Submitted and Approved?
35411 125th AVCT E , Eatonville , 98328	05/14/1993	07/15/1999	Closed	
35609 SR 706 E , Ashford , 98304	07/12/2001	12/07/2001	Closed	
35807 48th AVE S , Roy , 98580	04/01/2004	05/27/2004	Closed	
36118 28TH AVE E , ROY	08/29/1998		Closed	
36306 28TH AVE E , Roy , 98580	09/14/1999	12/07/2010	Closed	
36517 62nd AVE S , Roy , 98580	01/20/2005	11/03/2009	Closed	
37021 103RD AVCT E , EATONVILLE	10/13/2000	07/31/2002	Closed	
38210 SR 706 E , Ashford , 98304	11/21/2003	12/30/2003	Closed	
38512 60th AVCT E , Eatonville , 98328	04/29/2002	06/05/2002	Closed	
38608 SR 706 ,Unit 4 , Ashford , 98304	09/29/1999	10/01/1999	Closed	
40016 122nd AVE E , Eatonville , 98328	12/31/2003	08/15/2008	Closed	
40113 32nd AVE S , Roy , 98580	02/21/2008	07/21/2008	Closed	
41923 SR 161; Unit 2 , Eatonville , 98328	08/27/2009	09/02/2009	Closed	

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 M

MAINTENANCE REPORTING FORMS

Maintenance for Well Houses and Water Tower

Well 1 and 2

Daily Schedule:

Listen to well pumps run and aeration tower for any issues with failure or air locking. Take residuals daily and source meter read. Check oil level in pump motor, also telemetry to see if there are any issues. Check water system properties for general security issues and make sure access to all is clear. Makes sure chlorinator pumps are not air locking.

Weekly Schedule:

Grease well pump motor bearings if dry, check oil level. Well 1 check aeration tower blower belts, float level and test to make sure shut off occurs at set points. Wash down floors of well houses and chlorination room. Check that all exterior vents close as should when well houses is shut down and heat is working during winter months.

Monthly Schedule:

Run generator at Well 2 at operating temperature and on full load for a minimum of twenty minutes. Check all fluid levels, battery charge, oil pressure, fuel level and RPM speed of motor. Same process goes for running Booster Generator at Water Tower. Work all shut off valves at wells and drain aeration tower at least a foot of water for any sediment in tank. Watch and listen to booster pumps at Well1 run a full cycle for any issues with overheating.

Yearly Schedule:

Maintenance Generators at Well House 2 and Water Tower. Change oil, antifreeze check fuel filter, air filter. If in winter months put fuel stabilizer in fuel tanks to prevent sludge. Test and check all shut off valves going to clay valves and blow off valves. Check floats at water tower, and overflow valve shutoff. Pressure wash all buildings roofs, concrete pads, and floors.

Washington State Department of Health
SWTR Disinfection Monthly Report

Water System Name:	City of Roy		Month/Year:
County:	Pierce		Report Submitted By:
Water System I.D. #:	45027-K		WTPO Certification #:
Source Name:	Well No. 1	Source #: 1	Signature:
			Telephone #: (253) 843-1113

Inactivation Ratio Determination Overall log treatment required: Filtration log removal credit:									Disinfectant Residual at Distribution Entry Point				Residual in Distribution System	
Date	Peak Hour Flow (gpm)	Water Temp (°C.)	pH	Chlorine Residual {C} (mg/L)	Contact Time {T} (mins.)	Calculated CT {= C x T}	Required CT {from tables}	Inact Ratio {= CTcalc / CT req}	# Samples Collected	Lowest Daily Residual (mg/L)	Duration less than 0.2 mg/L (hours)	DOH Notified? (Name & Time)	# Sites Sampled	#Samps Residual Not Detected
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
Total														
Min.														
Max.														
Avg.														

Washington State Department of Health
SWTR Disinfection Monthly Report

Water System Name:	City of Roy		Month/Year:
County:	Pierce		Report Submitted By:
Water System I.D. #:	45027-K		WTPO Certification #:
Source Name:	Well No. 2	Source #: 2	Signature:
			Telephone #: (253) 843-1113

Inactivation Ratio Determination Overall log treatment required: Filtration log removal credit:									Disinfectant Residual at Distribution Entry Point				Residual in Distribution System	
Date	Peak Hour Flow (gpm)	Water Temp (°C.)	pH	Chlorine Residual {C} (mg/L)	Contact Time {T} (mins.)	Calculated CT {= C x T}	Required CT {from tables}	Inact Ratio {= CTcalc / CT req}	# Samples Collected	Lowest Daily Residual (mg/L)	Duration less than 0.2 mg/L (hours)	DOH Notified? (Name & Time)	# Sites Sampled	#Samps Residual Not Detected
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
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21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
Total														
Min.														
Max.														
Avg.														

DISTRIBUTION SYSTEM VALVE MAINTENANCE

Good preventative maintenance dictates that all valves be exercised once each year. Valves that do not close tightly should be removed, repaired or replaced. An important aspect of distribution system valve maintenance is to ensure distribution valves are completely open. A partially closed valve can seriously reduce peak day operation and fire flow supply. Records should be kept of every time a distribution system valve is opened and closed.

HYDRANT MAINTENANCE

Fire hydrants in the system should be flushed periodically. Hydrants should be inspected once each year and repaired if necessary. It is important to maintain good records of hydrant maintenance. The following recommended procedure for testing fire hydrants has been adapted from the American Water Works Association (AWWA), 1989:

Maintenance Procedure

- Check appearance of hydrants for visible damage or leaks. Check for residue stains on the hydrant.
- Remove an outlet-nozzle cap and sound for leakage.
- Check for presence of water or ice in the hydrant body with a plumb bob.
- Replace the outlet-nozzle cap. Open the hydrant a few turns and allow air to vent. Tighten the cap.
- Open the hydrant fully.
- Check for leakage at flanges and around outlet nozzles, packing, and seals.
- Partially close the hydrant so the drains open and water flows through under pressure for about 10 seconds, flushing the drain outlets.
- Close the hydrant completely.
- Remove an outlet-nozzle cap and attach a fire hose or some other deflector
- Open the hydrant and flush.
- Close the hydrant and check operation of the drain valve.
- Check the main valve for leakage.
- Remove all outlet-nozzle caps, clean and lubricate the threads.
- Check chains and cables for free action.
- Replace caps and tighten.
- Check lubrication of operating nut threads.
- Locate and exercise auxiliary valve. Leave open.

WATER MAIN FLUSHING

The entire water system should be systematically flushed every two years. This should be accomplished by using directional flushing procedures.

Flushing Procedures

The following procedures are adapted from guidance provided by the AWWA, 1986:

- Determine the initial clean source of flushing water, sections of mains to be flushed at a given time, the valves to be used in each case, and the order in which the sections

will be flushed. Start at or near one of the interties and work outward so as not to disturb sediments in unflushed portions of the system. If possible, schedule work so that each zone can be completed by the end of the day or so that a natural stopping point is reached. If this is not done, fire protection may be severely restricted. Ensure that all flushing water used comes from areas previously cleaned or from mains large enough to resist sediments being stirred up by the flow. Keep the length of main being flushed as short as possible, especially on small pipe. This will minimize pressure losses in the system and the length of time each customer may be delivered dirty water.

- Assure that an adequate amount of flushing water at sufficiently high pressure is available and that it can be disposed of safely. Use a rate of flow required to produce a velocity of 2.5 fps in pipes as followings:

Pipe Diameter, inches	2	3	4	6	8	10	12
Flow Rate for 2.5 fps, gpm	25	56	98	221	392	612	882

- Do not flush a large main supplied by a single smaller main; the volume available is usually inadequate for flushing. Hydrant pressure or pitot gauges are useful in determining flushing rates.
- Prior to flushing, notify the following parties:
  A. Fire department and water utility billing office
  B. Other utilities, such as gas, electric, and telephone companies, who may have underground facilities in the area
  C. Those customers who may be inconvenienced by reduced pressure or dirty water, including
  -food service establishments
  -hospitals, nursing homes, and other health facilities
  -customers with special medical needs, such as home dialysis
- Isolate the section to be flushed from the system. Close valves slowly to prevent water hammer.
- Open the fire hydrant or blowoff valve slowly until the desired flow rate is obtained. When flushing from a dry-barrel fire hydrant, use the gate valve upstream of the hydrant for throttling purposes. Open the hydrant valve fully to prevent water from escaping into the ground through the fire hydrant barrel drain.
- Direct flushing water away from traffic, pedestrians, and private land. Ensure that flushing water drains to an appropriate storm sewer or watercourse without causing excessive flooding of streets, underground utility vaults, or private property; the utility may be held responsible for any accidents or damage related to the released water.
- Prevent heavily contaminated water from discharging to sensitive natural watercourses. Check with the local sewer department for conditions of disposal to the sanitary sewer. If sewer disposal is unavailable, flushing into a tanker truck may be necessary.
- If water contains chlorine, dechlorinate waters discharging to sensitive natural streams. Following are the steps of dechlorination:

A. Estimate the rate of flushing. This may be estimated from previous hydrant flow tests or flushing data. If no data if available, open flushing valve just long enough to take a pitot gauge measurement. Calculate the flushing rate using a formula from the AWWA guidance manual
B. Determine the chlorine residual in the main using a suitable field test kit
C. Prepare a dechlorinating agent solution to be pumped into the flushing discharge using a positive displacement chemical feed pump
D. Simultaneously flush main and pump dechlorinating agent into the discharge

- Check system pressure at a nearby hose bib. If pressure is less than 20 psi, throttle the flow through the hydrant. When possible, check system pressures in higher or remote areas of the pressure zone to ensure that pressures do not drop below 20 psi. This may necessitate a two-man crew with radios.
- Record the date, time, location, pressure zone, size and length of main; and estimate the flushing flow rate and velocity, and time required to clear. Take samples noting the water's odor, color, turbidity, and the presence of any visible objects or organisms.
- When the flushing water is clear, close the hydrant or blowoff valves slowly.
- Immediately mark closed valves on a map and erase the marks when the valves are reopened. Do not depend on memory. If, at the end of a day's work, valves normally open are closed, alert the fire department.
- Proceed to the next section to be flushed and repeat these procedures.

FIRE HYDRANT MAINTENANCE RECORD

Hydrant Location	Date	Maintenance Performed

FIRE HYDRANT FLOW RECORD

Hydrant Location	Date	Pitot Pressure	Flow Rate	System Pressure	Duration	Gallons

DISTRIBUTION SYSTEM VALVE RECORD

Valve Location ⇩ \ Date ⇨	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /

Valve Position Indications: C = Closed, O = Open, P = Partially Opened or Partially Closed

DISTRIBUTION SYSTEM VALVE RECORD

Valve Location ⇩ \ Date ⇨	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /

Valve Position Indications: C = Closed, O = Open, P = Partially Opened or Partially Closed

GENERAL DESCRIPTION AND OPERATION

DESCRIPTION AND LAYOUT

The City of Roy Water System is an automatic, remotely-controlled gravity-fed water system. Although the transmission/distribution system contains some looped lines, the nature of the service area the system serves dictates that it contains several branching lines. These branching lines require special attention which will be discussed in Chapter IV, SYSTEM MAINTENANCE. The water system is designed to provide peak domestic demands and some fire flow while maintaining at least 20 psi pressure in all parts of the system. A schematic of the system is shown in Figure 3.1. The system is divided into six sub-systems for ease of description, design, operation, and maintenance. The six sub-systems are:

1. Source
2. Treatment
3. Storage
4. Telemetry
5. Transmission/Distribution
6. Service

Following is a brief description of each sub-system:

1. Source:

   The source consists of two wells. Well #1 is located on Huggins-Greig Road west of the rodeo grounds and well #2 is located on the east side of the highway south of 288th Street. The source includes the associated pumps and motors, control circuits, alternator circuits and miscellaneous buildings and electrical systems. The primary function of the source is to replenish the storage tank.

   * **NOTE! As of March, 1987 the transmission main connecting Source #2 to the rest of the water system has not been constructed.**

2. Treatment:

   The treatment subsystem consists of two chlorination systems. One at Well Site #1 and the other at Well Site #2. The chlorination systems include V-notch gas chlorinators, automatic switch over regulators, dual cylinder scales, booster pumps, chlorine leak detectors, six 150# cylinders of chlorine and electrical controls, piping and appurtenances. The treatment system provides a means for eliminating the sources of water borne diseases and undesirable tastes and odors.

3. Storage:

Storage consists of the 263,000 gallon steel storage reservoir and associated internal piping for filling, draining, and overflow. The reservoir is at the highest elevation in the system and is the determining factor for pressures in the transmission/distribution system. The tank provides equalizing storage (18,600 gal.) for domestic service and standby storage (244,400 gal.) for fire fighting and for emergency domestic service.

4. Telemetry:

This sub system consists of the storage tank level probes and relays; alarm site siren, strobe and relays; and well site relays and interfaces. The telemetry system serves two functions: 1) it controls when the pumps come on and turn off based on the water level in the storage tank, and 2) it transmits an alarm signal to activate the strobe and siren whenever (a) the water level in the storage tank is too high or too low; (b) there is a power or phone line failure; (c) there is any problem with the pumping system causing failure; (d) or there is a chlorine gas leak.

Note! Because as of March, 1987 the 8" transmission main connecting Source #2 to the rest of the system has not been constructed, certain operating constraints must be applied to the telemetry system.

5. Transmission/Distribution:

The transmission/distribution system consists of the buried pipelines, steel pipe cased highway and railroad undercrossings, the insulated pipe bridge crossing and associated appurtenances. This sub-system conveys water from the source to the storage tank and from the storage tank to the customer and fire hydrants.

Note! As of March, 1987 the 8" transmission main connecting source #2 to the rest of the system has not been constructed.

6. Service:

This sub-system contains the outlets for all water pumped and stored. The system consists of individual water services and fire hydrants. Blow-off assemblies may also be considered a part of the service sub-system.

* **NOTE! As of March, 1987 no water services have been installed.**

The operation and interfacing of these sub-systems is described in the next section. A summary of equipment in each sub-system is contained in Appendix C.

OPERATION

Stated simply, the City's Water System Operates as follows:

1. Water level in storage tank falls to the level of the "pump-on" set point (probe level);

2. A signal is transmitted over the telemetry system to well site #1.

3. Telemetry signal received at well site initiates a "pump-start" sequence, and through closure of auxilary contacts on the pump motor starter initiates a "chlorinator start" sequence;

4. Well pump and chlorinator booster pump run until water level in storage tank rises to the "pump-stop" set point (probe level);

5. A signal is sent via the telemetry system to well site #1.

6. Telemetry signal received at well site initiates a "pump-stop" sequence and through opening of auxilary contacts on the pump motor starter initiates a "chlorinator stop" sequence.

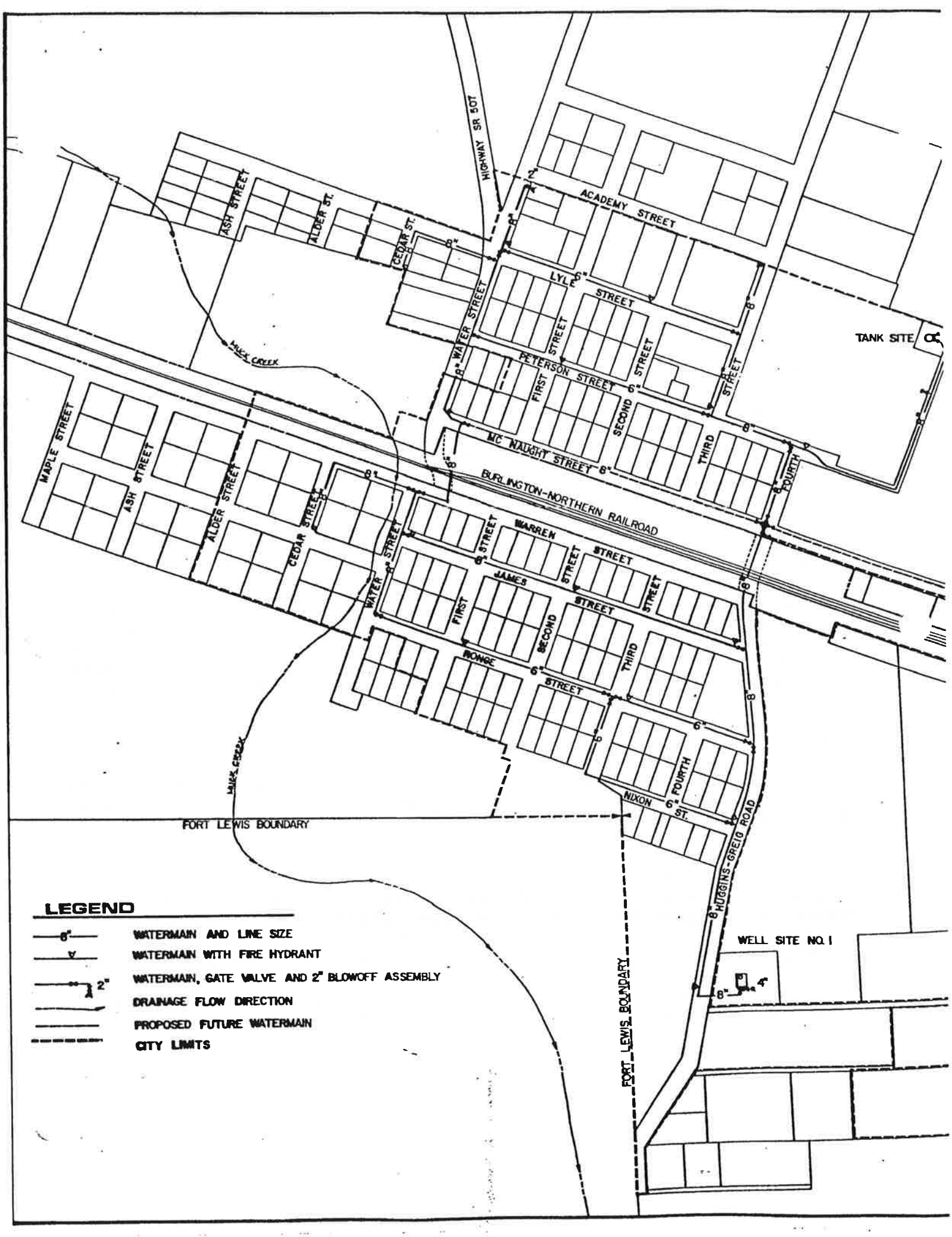
7. As customers use water the process is repeated from Step 1.

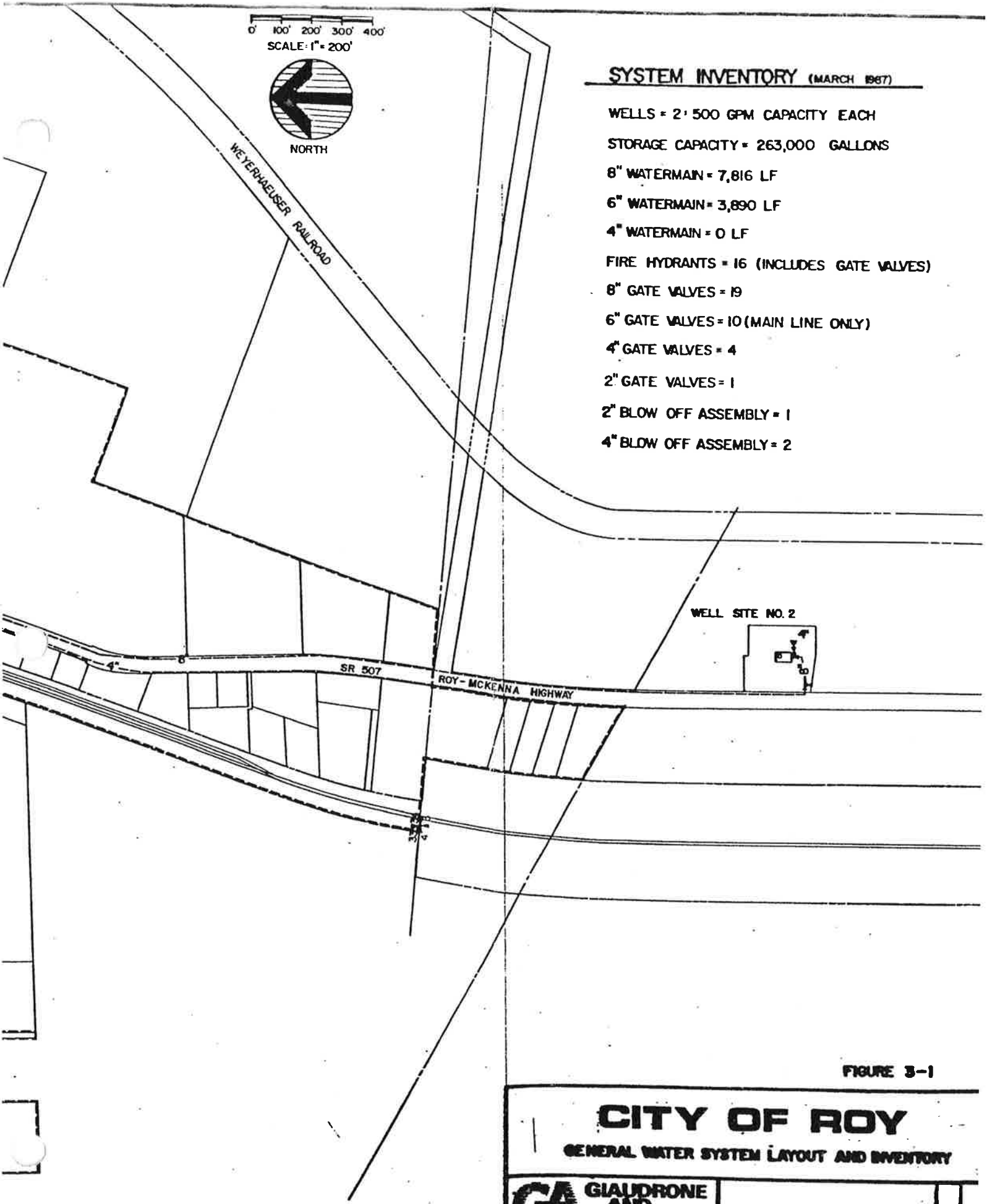
The description above is generally how the system operates under normal conditions. A number of conditions will cause a signal to be transmitted via the telemetry system to the alarm site causing the warning siren and strobe to start and run. These conditions and a more detailed description of operations is contained in the paragraphs below.

Storage:

The storage reservoir is designed such that water enters and discharges through the same pipe in the bottom of the tank. An 8" diameter gate valve is located on the inlet-discharge line at the tank site.

The storage tank water level determines when the well pump starts and stops. This is done with the water level probes in the tank. There are five probes: (1) low level alarm; (2) lag pump on; (3) lead pump on (4) pump off; (5) overflow alarm. Water contacting each probe sends the appropriate signal to either the alarm site or the well site. The level of the probes are adjustable. The "overflow" probe should not be set higher than 12 inches below the underside of the tank roof as this is the level of the overflow funnel.


HIGHWAY SR 507
ACADEMY STREET
ASH STREET
ALDER ST.
CEDAR ST.
LYLE STREET
WATER STREET
PETERSON STREET
FIRST STREET
SECOND STREET
THIRD STREET
FOURTH STREET
TANK SITE
MUCK CREEK
MAPLE STREET
ASH STREET
ALDER STREET
CEDAR STREET
MC NAUGHT STREET
BURLINGTON-NORTHERN RAILROAD
WARREN STREET
JAMES STREET
RONGE STREET
NIXON ST.
FORT LEWIS BOUNDARY
HUGGINS-GREIG ROAD
WELL SITE NO. 1
LEGEND
WATERMAIN AND LINE SIZE
WATERMAIN WITH FIRE HYDRANT
WATERMAIN, GATE VALVE AND 2" BLOWOFF ASSEMBLY
DRAINAGE FLOW DIRECTION
PROPOSED FUTURE WATERMAIN
CITY LIMITS



SYSTEM INVENTORY (MARCH 1967)

WELLS = 2 - 500 GPM CAPACITY EACH

STORAGE CAPACITY = 263,000 GALLONS

8" WATERMAIN = 7,816 LF

6" WATERMAIN = 3,890 LF

4" WATERMAIN = 0 LF

FIRE HYDRANTS = 16 (INCLUDES GATE VALVES)

8" GATE VALVES = 19

6" GATE VALVES = 10 (MAIN LINE ONLY)

4" GATE VALVES = 4

2" GATE VALVES = 1

2" BLOW OFF ASSEMBLY = 1

4" BLOW OFF ASSEMBLY = 2

FIGURE 3-1

CITY OF ROY

GENERAL WATER SYSTEM LAYOUT AND INVENTORY

GIAUDRONE AND ASSOCIATES
CONSULTING ENGINEERS
Kirkland, Washington 206/822-8294

revision

drawn CLG date 4/5/67 scale 1" = 800'

drawing no. _____ sheet no. _____

Alarm Site:

An alarm will sound and the following lights will burn at the alarm site at City Hall for the following reasons:

1. High Reservoir Alarm - Caused by reservoir water level contacting high level probe prior to an overflow condition. Well pumps need to be shut off.

2. Low Reservoir Alarm - Caused by reservoir water level dropping below the low level probe. Well pumps need to be turned on.

3. Communication Fail Alarm - Caused by failure of telephone circuits between City Hall and the reservoir or well sites. Pumps must be run manually to maintain reservoir operating levels.

4. Reservoir Power Fail Alarm - Caused by the loss of 120 volt AC power at reservoir site. Pumps must be run manually.

5. Well #1 Fail To Command Alarm - Caused by alarm condition at well site. Well site should be visited and local telemetry panel observed for more detailed information. A power failure, chlorine leak, valve failure or low system pressure at well site can cause this alarm condition. A pump started and left in the HAND mode at the well for 10 minutes or longer will also cause this alarm.

6. Well #2 Fail To Command Alarm - Caused by an alarm condition at well site. Well site should be visited and local telemetry panel observed for more detailed information. A power failure, chlorine leak, valve failure or low system pressure at well site can cause this alarm condition. A pump started and left in the HAND mode at the well for 10 minutes or longer will also cause this alarm.

Red alarm condition lights located at the well sites in the Telemetry/Well control panels are described in the source section.

NOTE!
Because the source at Well Site #2 is not connected to the rest of the water system; the "lag pump on" command is currently being suppressed in the telemetry system by a wire jumper between the "lag pump on" and the "common" probe relay in the control panel at the tank site. The Off-Auto switch on the pump starter panel at WS #2 is set in the "off" position. Also the telemetry/well control panel H.-O.-R. switch at WS #2 is set in the "off" position and the heavy duty safety switch for power to the well pump is in the "off" position. The pump sequence selector switch is currently set in the 1-2 position on the system control panel at City Hall. This position of the selector switch makes Well #1 the lead pump and Well #2 the lag pump. Under these conditions the pump at Well #2 will not be called to run and will create no alarm conditions.

Source:

The source consists of two well pumps, motors, discharge piping, and control circuits. These two systems are essentially identical and operate in the same manner. The two pumping systems are set up to run with the pump at W.S. #1 as the lead pump and the pump at W.S. #2 as the lag pump on a "pump-start" command received from the storage tank.

The pump control system is not designed to have both pumps start simultaneously. However, the control system is designed for both pumps to run simultaneously; as in the case where replacement of fire flow cannot be accomplished by one pump. In this case the lag pump comes on when the lead pump is unable to sustain the liquid level above the lag pump-on probe. Both pumps run until the liquid level reaches the pump off probe. **The current state of the system does not allow the lag pump to be run as noted above.**

The two pumping systems can be operated alternately with each pump running every other time a "pump-start" signal is received. This is done by use of an automatic alternator that directs the incoming telemetry signal to one pumping system or the other depending on which pump last ran. The alternator alternates the "pump start" signal between the pump director panels. The alternator is located in the control panel at City Hall.

When a "pump-start" signal is received it is directed to whichever pump is currently in the "lead" position and a normal pump start sequence as described below is initiated. The pump will continue to run until a "pump-stop" signal is received at which time a normal pump stop sequence (also described below) is initiated. When the pump is stopped the alternator position switches and the second pump becomes the "lead" pump.

NOTE!

The alternator function is currently being bypassed by setting the pump sequence selector switch on the system control panel at City Hall to the 1-2 pump sequence and not on the ALT or 2-1 pump sequence selection. Also the H.-O.-R. switch in the Telemetry/Well Control panel at Well Site #2 is set in the off position. Main power to the pumps at W.S. #2 is shut off and the "lag pump on" probe relay is by-passed in the tank site control panel.

Normal Pump Start:

A normal start sequence occurs when a "pump-start" signal is received by the pump starter panel from the telemetry system, via the alternator, with the H.O.R. switch on the Telemetry/Well Control panel in the remote position or by switching the H.O.R. switch to the "Hand" position. When the "pump-start" signal is received the following will occur:

1. After a programmed telemetry well call delay of 10 seconds, the pump motor starter circuit is energized and a steady blue (Pre-lube Solenoid Required) light is displayed. The pre-lubrication solenoid valve is opened to allow wetting down of the pump line shaft bearings. The pre-lube valve remains open for a programmed time of 1 minute. At the expiration of this time the pump motor is started and continues to run and a steady green (Pumping) light is displayed. At the same time as the pump motor is started a chlorinator start signal is sent to the chlorine booster pump panel. The pre-lube solenoid valve is a normally closed valve that must be energized to open. Should the pre-lube solenoid valve fail, the motor starter will not engage and the pump will not run. This will cause failure of the pump to produce pressure.

2. When adequate pump pressure develops to actuate the pressure switch, located near the intake side of the check valve, the check valve solenoid is energized and a steady green (Valve Open Required) light is displayed. Failure of the pump to develop pressure within the programmed time of 3 minutes will result in a pump shut down and the steady red (Valve Failure Shutdown) light will be displayed.

3. When the check valve solenoid is energized with the green (Valve Open Required) light on, the check valve begins to open slowly, gradually increasing line pressure to full pumping head. Flow control valves in the check valve pilot control system are set so the check valve opens in 45 seconds. If the check valve fails to open within the programmed time of 2 minutes when the green (Valve Open Required) light is displayed the pump motor is de-energized and the red (Valve Failure Shutdown) light is displayed. Check valve failure to open can be detected by noting that the micro switch is not being tripped because the stem in the top center of the check valve is not rising.

4. A normal opening of the check valve shall result in a steady green indicated for the duration of the pumping operation.

5. A loss of pump discharge pressure during a normal pumping operation shall result in a pump and check valve emergency shutdown with a "red" indication. A premature valve closure shall also result in a similar pump shutdown.

6. Whenever a red light begins, a signal will also be sent to the telemetry system so as to activate the alarm site and a manual reset of the pump will be required.

Normal Pump Stop:

A normal pump stop sequence occurs when a "pump stop" signal is received by the pump starter panel from the telemetry system with the H.O.R. switch on the Telemetry/Well Control panel in the "Remote" position or by switching the H.O.R. switch to the "off" position. When the "pump stop" signal is received, the following will occur:

1. The check valve solenoid control valve is de-energized permitting a normal, controlled check valve closure. The check valve flow control valves are set so the check valve closes in 45 seconds.

2. When the check valve is closed the limit switch which serves as an electrical interlock between the valve and the pump, de-energizes the pump starter circuit and pump stops. At the same time the auxilary contact in the pump starter opens and a "chlorinator stop" signal is sent to the chlorine booster pump panel. The exact instant that the pump is called to stop can be adjusted by changing the position of the collar on the rising stem in the top center of the check valve. The collar is pre-set and marked and adjustment of the collar should not be necessary unless the check valve remains open after the pumps shut off. This situation allows reverse flow of water back through the check valve and is a source of water hammer and pump reverse spinning. Failure of the check valve to close is cause for cleaning the valve or checking for other malfunctions.

3. All lights on the Telemetry/Well Control panel will be extinguished.

Well Site Alarms:

The following red lights will burn and a signal will be sent to the alarm site at City Hall from the Telemetry/Well Control panel at each well site for the following reasons:

1. Valve Failure Shut Down Alarm - Caused by a control valve failure to open or close within the time allowed the programmed time delays. Also can be caused by a loss of pump/system pressure due to mechanical problems, power failure, waterline break or water being wasted too rapidly to maintain adequate pressure. The pump will not restart until this button is pushed to reset.

2. Communication Fail Alarm - Caused by a failure in the telephone circuit between the well and City hall.

Power Failure:

An electrical power failure to the pump, of any duration, shall result in an emergency closure of the check valve. The pump will not restart for a minimum of 5 minutes after such an outage. This delay is programmed into an integrated circuit chip in the Telemetry/Well control panel (Stead & Baggerly) which delays the pump restart after a power failure.

Treatment:

Treatment consists of two chlorination systems, one at each well site. The chlorination systems include a V-notch gas chlorinator, automatic switch over regulators, dual cylinder scales, booster pumps, chlorine leak detectors, size 150 pound cylinders of chlorine, electrical controls, piping and chlorine gas safety equipment. The two systems are identical and operate in the same manner. Following is a brief description of the function of the parts of the chlorination system:

1. The chlorine booster pump intakes water from the discharge string up stream from the chlorine injector and discharges water through the chlorine injector and solution tube back into the discharge string.

2. The chlorine injector mixes the booster pump water with chlorine gas that has been metered by the V-notch gas chlorinator.

3. The V-notch gas chlorinator meters the flow of chlorine gas from the chlorine gas cylinders to the chlorine injector. The metered flow can be adjusted from zero to 30 pounds of chlorine per day by manual settings on the chlorinator.

4. The chlorine gas is stored in 2 chlorine cylinders which have automatic switch over regulators attached which allow automatic switch over from an empty to a full cylinder.

5. A dual cylinder scale which weighs 2 cylinders independently is provided to let the operator know when cylinder replacement is necessary.

6. A chlorine gas detector with alarm telemetry and exhaust fans are installed in the chlorine room.

7. A chlorine gas mask and spare filter canister are provided in enclosures in the pump house main equipment room.

Each chlorination system is set up to run on a "chlorinator start" signal received upon closure of an auxilary contact on its associated pump motor starter. When a "chlorinator start" signal is received a normal chlorinator start sequence is initiated. This sequence is described below. The chlorinator will continue to run until a "chlorinator stop" signal is received and a normal chlorinator stop sequence (also described below) is initiated.

Normal Chlorinator Start:

A normal chlorinator start sequence occurs when a "chlorinator start" signal (originated by the closing of the auxilary contact on the well pump motor starter) is received by the chlorinator panel with the HOA switch in the "Automatic" position or by switching the HOA switch to the "Hand" position. When the "chlorinator start" signal is received the following will occur:

1. The time delay relay in the chlorinator booster pump motor starter and water supply solenoid valve circuitry is energized and runs for a pre-set adjustable time.

2. At the expiration of this time, the booster pump motor is started and the normally closed water supply solenoid valve is opened. The booster pump continues to run and the solenoid valve remains open.

Normal Chlorinator Stop:

A normal chlorinator stop sequence occurs when a "chlorinator stop" signal (originated by the opening of the auxilary contact on the well pump motor starter) is received by the chlorinator panel with the HOA switch on the chlorinator panel in the "Automatic" position or by switching the HOA switch to the "Off" position. When the "Chlorinator stop" signal is received, the following will occur:

The chlorinator booster pump motor starter and water supply solenoid valve are de-energized. The booster pump stops and the solenoid valve closes.

Power Failure:

An electrical power failure to the well pump motor, the chlorinator booster pump or the water supply solenoid will cause an immediate shut down of the booster pump and solenoid valve as described under normal chlorinator stop.

The chlorine detector alarm shall function as follows:

An alarm condition sequence occurs when the chlorine detector senses a chlorine level above the acceptable level and activates the alarm contacts. A signal is received by the booster pump panel with the HOA switch on the booster pump panel in the "Automatic" position or the "Hand" position. The booster pump stops and the solenoid valve closes.

At the same time and under the same conditions that the booster pump is shut down and the solenoid valve is closed, the louver mounted exhaust fan and motorized wall louver are activated.

Also under the same conditions an alarm signal is sent by means of the telemetry controls to the "alarm controller" at City Hall.

Telemetry System:

The telemetry system transmits operation and alarm signals between the tank, wells, and alarm site via dedicated telephone lines. The "pump-start" and "pump-stop" signals and "chlorinator start" and "chlorinator stop" signals have been discussed above.

Alarm signals are transmitted to the alarm site at City Hall via the telemetry system from either the tank or the well sites. When an alarm signal is received at the alarm site the appropriate light on the alarm panel ("high reservoir, low reservoir, communication fail, reservoir power fail, Well #1 fail to command or Well #2 fail to command) will burn and the warning siren and strobe light will start and run. (The well fail alarms include the chlorine leak detector alarm.)

The siren can be stopped by pushing the "silence" button in the alarm site panel. The alarm location indicator lights on the alarm panel will continue to burn until the condition causing the alarm is corrected.

The strobe and siren are operated from a 12-volt D.C. battery. A power or power line failure or interruption will cause the siren to sound. A break or interruption in the telephone lines used by the telemetry system will also cause the siren to start and run.

A built-in battery charger continuously charges the battery. The battery is designed for a three-year life.

Transmission/Distribution:

The operation of this sub-system is very simple. The transmission/distribution system transmits water from the well site to the storage tank and distributes water to the customer. The system consists mainly of valves and pipe. **This subsystem is not complete as of March, 1987. The 8" transmission main from Well #2 to the rest of the system and the 4" distribution main on the West side of Highway 507 South of 4th Street is not constructed.**

Service:

NOTE!

As of March, 1987 this subsystem is not complete because no individual water services have been installed.

The service sub-system consisting of fire hydrants and individual water meters is the delivery arm of the water system. Water delivered to individual residences and businesses always flows through a water meter.

For many commercial and residential services, the meter valve on the meter setter serves as the main shut-off valve for the building. This is not generally desirable and the Water District should implement a program to encourage property owners to install shut-off valves downstream of the water meter.

Water meters are not designed for use with hot water. The Water District should, therefore, encourage property owners to install in-line check valves downstream of the water meter to prevent possible backflow of hot water through the meters.

GENERAL INSTRUCTIONS

Detailed explanations and descriptions of operation and adjustments are contained in the manufacturer's literature in Chapter IX. The water District managers and operators are urged to review that chapter thoroughly.

There are some general instructions that apply to the operation and operating of the water system. These instructions are listed in the appropriate paragraphs below.

General:

1. Operate all gate valves and fire hydrants at least twice per year. When valves and ports remain in one position too long they may "freeze" in that position and may break when an attempt is made to free them.

2. Blow off dead end lines on a regular (monthly) basis to avoid build-up of "stale" water in the extremities of the system.

3. Operate gate valves and hydrants slowly - especially when closing. Opening and closing valves too quickly creates a "water hammer" in the pipeline which could possibly cause rupture of the pipe.

4. Adjust, lubricate, dismantle, and repair equipment only after thoroughly reviewing the manufacturer's instructions to insure that special tools and spare parts required to complete the job are on site and to be informed of dangerous conditions that may exist.

5. Encourage customers to conserve water. Conservation saves more than money for the customer - it also saves pumping cost for the Water District and less demand puts less strain on facilities, thus preventing breakdowns and associated repair costs. Water is a valuable resource and should not be wasted. Conserving water also conserves money, time and energy.

6. Keep accurate, timely records. This will: indicate trends; help avoid trouble spots; provide valuable design information; and help the Water District keep track of its product.

Source:

1. Each well and its associated discharge piping and control circuits is treated as an individual system. The only interface between the two is the telemetry signal alternator. Beyond the telemetry signal alternator the two systems are separate and identical.

2. Each pump control system includes one adjustable time delay switch in the pump panel and five programmed time delays in the motor control center. There is also an adjustable time delay switch in the chlorine booster pump panel which is described in the treatment section. The time delays are as follows:

   In The Pump Starter Panel (40/50 HP Pump Panel by ELPAC)

   a. Start Time Delay (STD) - adjustable from 0.2 to 60 seconds. Time delay for part wind motor between start windings and run (full load) windings being energized. Currently set at 10-12 seconds. This timer should be adjusted only by an electrician who has meters available to measure the current draw on motor legs and can compute the current draw that is not detrimental to Puget Sound Power & Light Company's other customers.

   In The Telemetry/Well Control Panel
   (Stead & Baggerly control panel)

   b. Telemetry well call delay of 10 seconds - Delay programmed onto PROM computer chip in programmable controller. Amount of time that passes when pump is called to operate either in the "Automatic" or "Hand" position. Purpose of 10 seconds time delay is to allow for possible over ride of command before pump start sequence begins, prevent rapid start/stop in case of telephone or electric power problems.

   c. Prelube time delay of one minute - Delay programmed onto PROM computer chip in programmable controller, Time indicated by blue (prelube solenoid required) light. Sets time that pre-lube solenoid is open to allow wet down of pump line shaft bearings prior to starting pump motor.

   d. Pump Fail delay of 3 minutes - Programmed in controller chip. Time indicated by first 3 minutes of green (pumping) light. Pump must run and produce enough line pressure to trip pressure switch on upstream side of check valve or pump fail occurs. Some possible causes for failure of pump to produce pressure are over load relays trip caused by worn pump impellers or bad pump bearings, pump fell off pump line

   e. Valve fail delay of 2 minutes - Programmed in controller computer chip. Time indicated by green (Valve Open Required) light. Pump run must be established by pressure switch prior to valve opening. Valve must open within 2 minutes of pressure switch confirming pump run.

f. Recall well after power fail delay of 5 minutes - Programmed in controller computer chip. An electrical power failure to the pump shall result in an emergency closure of the check valve. The pump will not restart for a minimum of 5 minutes after such an outage. This time delay is installed to prevent the pump from restarting before the motor has come to a complete stop which could occur during rapid intermittent power outages.

The time delays programmed on the controller computer chips may be revised by changing the program. The telemetry and controls system supplier (Stead & Baggerly of Bellevue, Washington 98005) should be contacted if it becomes necessary to change these time delays.

3. Electric check valve operation and adjustments are adequately described in Chapter IX.

4. The surge relief Bermad valve works to relieve excessive mainline pressure in the event of a "water hammer" effect. The valve should be adjusted to relieve all pressure above 25 pounds over static system pressure. The valve should also be set to relieve this pressure quickly.

5. If one pump system is to be out of service for an extended period the in-line gate valve downstream of the mainline meter for that pump should be closed tight to prevent backflow into the well.

6. NEVER turn the water off to the pre-lube assembly for any pump in service. Repeated pump starts without proper wetting down of the line shaft will ruin the pump. This will not be merely inconvenient - it will be expensive, time-consuming and dangerous.

7. NEVER re-start a pump unless or until the motor has come to a complete stop.

8. Never work on a piece of electrical equipment until the power to that piece has been shut off.

9. Keep pumphouse buildings warm - not hot and never below freezing.

10. Louvered vents should be boarded up with insulated materials during winter months to avoid cold temperatures inside and thus excessive power consumption by unit heaters.

Treatment:

1. The chlorination system at each well is treated as an individual system. Each system is operated by a signal from its associated well pump motor starter. Treatment of the pumped water is accomplished by injecting chlorine gas into the water downstream of the main line water meter and 6 inch gate valve in the discharge string.

2. Chlorine gas is a respiratory irritant of the mucous membranes, the respiratory system and the skin. In extreme cases, suffocation and death can occur. To avoid possible severe personal injury operation and maintenance of chlorine equipment is restricted to trained qualified personnel who are completely familiar with the instructions in the manufacturer's literature in Chapter IX and in the "Chlorine Manual" 4th edition 1969. The plant operator should also refer to the WPCF manual of practice No. 1 - Safety in Waste Water Treatment Plants.

3. Chlorine cylinders 150 lb. are used to ship and store chlorine gas. 6 cylinders are provided at each well site. The "Chlorine Manual" contains a descriptions of these cylinders and their attached valves. The Vacuum Regulator Instruction Book WAC 910.200 7-87 describes changing cylinders on pages 3 and 4.

4. Chlorine cylinders must be handled with care. Valve protective caps should be in place when moving cylinders. Cylinders should not be dropped or struck by other objects. Cylinders must be secured to prevent their being knocked over.

5. Two cylinder scale operation and adjustments are adequately described in Chapter IX.

6. The automatic switchover vacuum regulator with trap and filter reduces the high pressure gas from the cylinder to less than atmospheric pressure. The regulator also allows gas to flow when it senses vacuum on one side of its operating diaphragm. The installation, operation, maintenance and adjustment of the regulator is adequately described in Section IX. Vacuum Regulator Instruction Book No. WAC 910-200 7-86.

7. Never re-use old gaskets or washers when re-installing chlorine equipment or changing gas cylinders.

8. Always check for chlorine gas leaks after connecting chlorine equipment and cylinders. Use only cotton swabs or a rag on a stick soaked in aqua ammonia to detect chlorine gas at joints, valves, etc.

9. The V-Notch Master Control Unit is designed to control and indicate the rate of flow of chlorine and to provide a means of manually setting the chlorine feed rate. The installation, operation, maintenance and adjustment of the V-Notch Master Control Unit is adequately described in Section IX. Series V-500 Remote Vacuum V-Notch Chlorinator Instruction Book No. WDA 25.140 11-84.

10. Never tolerate a chlorine leak. Take immediate steps to correct any chlorine leak.

11. Do not open chlorine gas supply tank valve more than one full turn. This will permit maximum flow and allow quick shut off in case of a gas leak.

12. Never use water on a chlorine leak.

13. The 3/4 inch fixed throat injector functions to produce vacuum to draw chlorine gas from the V-Notch chlorinator and to mix this gas with the water flowing through the injector. The injector installation, operation and maintenance are described in the V-500 Instruction Book in Section IX of this manual.

14. Never work on chlorination equipment until the chlorine gas supply has been shut off at the tank valve and the chlorine gas has been exhausted from the system. Except in the cases of leak detection or calibration adjustment when chlorine gas flow is required.

15. The plant operator should familiarize himself with use of the cannister type chlorine gas mask. Always have the chlorine gas mask available when working on a chlorine leak. NOTE! No oxygen supply is provided by the cannister type gas mask which is stored in the chlorine gas mask enclosure in the pump house. This limits use of the mask to gas concentrations of 10,000 parts per million (PPM) by volume. By contrast the chlorine detector in the chlorine room can be set to detect chlorine in concentrations of 0.5, 1.0 or 3.0 PPM.

16. Never enter the chlorine room until the motorized louver has opened and the vent fan is running and chlorine gas has been evacuated from the building.

17. Whenever possible, no person should work on a chlorine leak alone.

18. The chlorine booster pump functions to provide high pressure water flow through the injector in order to produce adequate vacuum to allow chlorination equipment to operate throughout its entire design range. Check the operation of the booster pump solenoid valve on a daily basis. This valve must open when the booster pump starts. If the chlorination system is to be shut off for long periods of time check the pump manufacturers recommendations for care.

19. The chlorine booster pump panel contains an adjustable time delay switch currently set at 90 seconds. This is the delay time between the chlorinator start signal and the instant when the booster pump starts and the normally closed water supply solenoid valve is open. This delay allows time for the well pump to build pressure and for the pump control check valve to open to allow full water flow before chlorination begins. This time delay should not require adjustment. If the pump control valve opening time increases beyond the 90 second delay, this timer may be adjusted; but, the pump control valve should be examined and maintained as required.

20. In general make up plastic connections by hand tightening. Do not use tools, as this may result in overtightening and splitting of threaded parts.

21. The chlorine leak detector is a device to detect the presence of chlorine gas in ambient air. When the presence of chlorine gas in concentrations of 1.0 to 3.0 PPM is indicated the circuitry, in the leak detector sends an alarm signal to the alarm center at City Hall and also starts the chlorine room exhaust fan, opens the motorized louver and shuts off the chlorine booster pump and solenoid valve on the booster pump intake line. The chlorine leak detector installation, adjustment and operations are adequately described in Chapter IX in Series 50-125 Chlorine Detector Instruction Book No. WCC 50.125 6-85.

22. Periodic performance checks, periodic cleaning and preventive maintenance should be done as recommended in the manufacturer's manuals. NOTE! Before starting any work ensure that the appropriate replacement parts, cleaning solutions and test solutions are available. Also before starting preventive maintenance ensure that the appropriate kits and special tools are on hand.

Storage:

1. Operation of the storage reservoir is mainly a monitoring and maintenance problem. Refer to Chapters IV and V for this information.

Telemetry:

1. "Lead Pump On" probe in storage tank should be lowered when demand for water increases to the point where the pump cycles more than four times per day. The "Low-Level" alarm probe is set 3 inches below the "Lag Pump Start" probe but may be set lower if demand warrants it.

2. "Pump-Stop" and "Overflow Alarm" probes should not be adjusted.

3. Never place "Overflow Alarm" probe below "Pump-Stop" probe or above overflow funnel.

4. The Telemetry subsystem contains programmed time delays in the PROM computer chip in the panel at City hall. The time delays are as follows:

   a. 5 second delay on Reservoir Communication Fail Alarm, High Level Alarm, Low Level Alarm, and Reservoir Power Fail Alarm to allow for noise or short duration disruption of telephone communication.

   b. 1 minute delay before well pumps can be called afer all alarms have been cleared.

   c. 10 minute delay on Well Fail Alarm when well pump is manually called to run from City Hall. If pump does not run within 10 minutes Well Fail Alarm will sound. This delay allows operator to go to well sites.

   d. 10 minute delay on Well Fail Alarm when well pump is started at the well site but has not been called to run from the control panel at City Hall. After the pump has run 10 minutes the Well Fail Alarm will sound. This delay prevents the operator from manually starting pump and inadvertently leaving well site with pump still running.

Transmission/Distribution:

1. Operate valves regularly. Open and close valves slowly.

2. Blow-off dead-end lines on a regular basis.

3. Make no cross-connections. See Chapter VI.

4. Do not allow water lines to empty. Lines that have emptied must be refilled slowly with proper precautions taken to blow-off any trapped air.

Service

1. Fire hydrants should be operated on a regular basis.

2. If, for any reason, a fire hydrant is unusable, it should be physically removed and the fire department notified. This will prevent wasting of valuable time in the event of a fire. At the least the hydrant should be covered.

3. Make sure hydrant operating valves are closed tightly to prevent water leaking out through drain ports.

4. When installing new services - always install a service clamp or 2-banded service saddle on PVC mainlines.

5. Always install water meters provided with frost protection covers. These covers will break if water freezes in the meter. The covers are easily replaceable.

EMERGENCY PLANS AND PROCEDURES

All Water District operating and management personnel must be familiar with potential emergency situations and the correct response to them. An adequate response plan will minimize the expense to the Water District and the inconvenience to the customer.

Generally, there are two conditions requiring the prompt response of Water District personnel. These can generally be described as emergency conditions and system malfunctions. These two conditions are described below.

Emergency Conditions and Response Procedures

An emergency condition is any situation when the quantity or quality of water available to the customer is seriously threatened. Causes of these emergencies include: natural disasters of a magnitude such that all or part of the physical plant is rendered unusable; power outages for an extended duration of time; sabotage; or any contamination of water supply.

For any emergency condition, action must be taken immediately to mitigate the damage caused. In the case of contamination or other serious threat to water quality, the source and extent of the contamination must be established; customers must be instructed to take proper precautions, and the cause must be eliminated. Temporary adjustments to the chlorination feed system may be required.

In the event of a natural disaster rendering any portion of the physical plant unusable the problem will affect one or all of the three major subsystems: source, storage, and transmission/ distribution.

Damage to the source is serious but if at least one pumping system is intact and operable there will be no immediate danger. The undamaged equipment will be sufficient to supply the District's needs. The damaged equipment must be repaired or replaced as soon as possible.

NOTE! Because as of March 1987 the 8" transmission main connecting Source #2 to the rest of the system has not been constructed, any damage to Source #1 will cause immediate danger to the system. Under present conditions there will be no way to replenish the storage tank if Source #1 is damaged. Therefore, if source #1 is damaged it must be repaired immediately on an emergency basis.

If the storage reservoir is rendered unusable there will be no water available for fire fighting. As long as one source and the transmission line are operable there will be sufficient water for domestic consumption.

A rupture to the transmission/distribution system generally is not a critical problem but there are exceptions to this. For the most part a ruptured water main will create an inconvenience to some customers who will be without water until the rupture is fixed. Water will continue to flow in the looped portions of the system provided the correct valves are closed. A break in the transmission main from the storage tank to the 8" tee at the corner of Peterson and fourth will render the pumped storage system inoperable. Also a break in the 8" transmission main between Well Site #1 and the 8 x 6 tee at Nixon and Huggins-Greig Road will also render the pumped storage system inoperable, if this happens in conjunction with a break in the 8" T-main from Well Site #2 to the cross at McNaught and fourth street.

If these conditions persist for an extended amount of time, it will seriously affect the ability of the District to supply water for domestic and fire use. A break of this manner must be repaired immediately.

NOTE!

As of March 1987 the 8" transmission main connecting Well Site #2 to the rest of the system has not been constructed.

A power failure for an extended time period will eliminate the two well pumps from the system and thus there will be no way to replenish the storage tank. Although there is water available in the storage tank to supply the town for some time, a fire will seriously deplete this volume. It is important, therefore, to have some way to replenish the storage volume. If a power outage is to last for some time (say over 12 hours) the District should make arrangements for a generator to run the source equipment. Refer to the latter part of this chapter for more discussion concerning these arrangements.

Malfunctions and Troubleshooting

A system malfunction is generally a failure of some piece of equipment causing temporary shutdown of the pumping plant, treatment facilities, telemetry or distribution system. Usually the problem can be located and remedied within a short amount of time and does not cause serious inconvenience to the customer or water quality. Malfunctions that are not corrected reasonably quickly however may lead to an emergency condition. Malfunctions include such things as phone line break, stuck valves, most water main breaks or leaks, power surges or low voltage. Malfunctions are generally caused by worn equipment, faulty maintenance, negligent operation, or accidents. The best way to avoid system malfunctions is through a program of regular inspections and preventive maintenance as discussed in Chapter IV.

It is important to keep a record of each and every malfunction of the system regardless of how minor the problem appears to the operator. Recording each malfunction will help planners, designers, and operators spot and correct trouble before it causes major damage. A suggested form for recording malfunctions is contained in Appendix A. This form will also aid the operator in trouble-shooting the problem.

A malfunction (or emergency condition) must be located and corrected as soon as possible. Most conditions will cause the alarm to start and run, thus indicating a problem. Once the alarm sounds, the next step is to identify and locate the problem that needs to be corrected. This is most efficiently done by a methodical approach to trouble-shooting --- tracking down the problem step-by-step. Guides to locating the trouble spot are provided at the end of this chapter (Figures 8.1 & 8.2). A complete understanding of the system operation and characteristics is essential to quickly locate and correct trouble spots.

Emergency Service Plan

In the event of any emergency, regardless of its severity, the Water District must have a plan for dealing with the situation. This plan will detail the division of responsibility for each person connected with the Water System operation, what actions are to be taken in the event of an emergency condition, what personnel and equipment are available and where, and what other measures must be taken. An emergency operation plan, developed after performing a vulnerability analysis, should indicate priorities of repair of the system and alternate provisions in case of light or severe damage.

A vulnerability analysis of a water system (mains, pump stations, and plant) is an estimation of how much a system is adversely affected by an emergency condition in relation to how it must continue to perform. An analysis for the Roy system should include power supply, telemetry, communications, equipment, material, supplies, personnel, security, and emergency procedures.

The following steps should be followed in making a vulnerability analysis:

1. List components of system.

2. Select emergency condition to be investigated.

3. Estimate effects of emergency condition on each component of system.

4. Estimate system's ability to perform its intended function during the emergency.

5. Identify key system components responsible for the failure when a system fails to perform.

An analysis of this sort need not be overwhelming. It need only cover major emergency conditions and what needs to be done to prevent them or minimize the damage and inconvenience.

An inventory should be made of equipment and materials that are available within the county system. Using this inventory and the results of the system vulnerability analysis, additional emergency equipment and supplies may be purchased or stockpiled. Arrangements can also be made to obtain these items through mutual aid agreements or outside contracts. Stockpile emergency equipment/supplies should include:

1. Repair clamps and couplings
2. Portable pumps
3. 2", 4", 6", and 8" pipe and fittings
4. Mobile chlorinator and chlorine
5. Quick set concrete mix.

There are agencies and businesses within the county which can be very helpful during emergencies. Mutual aid agreements should be made with such agencies and businesses to help during emergencies. Some examples of groups with whom mutual aid agreements should be developed are as follows:

1. Water utilities from nearby cities or districts.
2. Fire and police departments
3. Rescue squads
4. Electric and telephone utilities
5. Health departments
6. Industrial firms
7. Construction companies
8. Civil defense organizations
9. United States Army Civilian Assistance Group

Mutual assistance programs with the above organizations provide emergency equipment and supplies, spare parts, specialized maintenance skills, auxiliary operating personnel, chemists, and/or sanitary engineers. The Department of Social and Health Services must be contacted in the event of any compromise in the quality of water served.

A response plan to emergencies is necessary to ensure continued effective operation of the total water system.

There are four basic elements to any sound emergency response plan:

1. Rapid and positive detection system

2. Response procedure with predetermined patterns of action

3. Backup capability in the event the local response capability proves insufficient

4. Warning system to alert the next level of responsibility that an emergency exists.

The following items are recommended for development by the Water District to deal with emergency situations:

1. Perform a vulnerability analysis of the system.

2. Inventory the emergency equipment and materials available within the system and county.

3. Prepare a list of potential mutual aid agreements.

4. Develop a program for the protection of essential records, maps, and inventories.

5. Establish a program for local fire and police departments to periodically review the system for adequacy of fire prevention methods and security measures.

6. Prepare emergency response cards for all system personnel. These cards outline each individual's emergency duties for various emergencies.

7. Develop the procedures to be followed when reporting damages to the District's insurance company.

8. Develop the requirements for auxiliary personnel when conditions exceed capability of existing staff or when staff members are unable to reach their assigned emergency positions.

9. Prepare an emergency condition checklist. This should list likely emergency conditions and give response plan actions and prevention recommendations for that particular system.

10. Establish and implement a program for training personnel in emergency operating procedures.

11. Prepare a list of local contractors and repair services. This list can be used in selecting firms from which to request services during emergencies.

12. Coordinate with local utility companies. Determine the probability of power failures that would affect the system. List key personnel at utility companies to be contacted during emergencies.

13. Periodically review the alarm system that is installed at the tank, alarm and pump station.

14. Set up a program for placing emergency standby equipment into service periodically.

15. Establish priorities for repairing facilities after a disaster.

A copy of the Emergency Service Plan should be filed with the Pierce County Office of Emergency Management. This office provides emergency assistance to organizations in rural Pierce County and to cities subscribing to its services. The office of Emergency Management has assisted in providing potable water when a water utility was no longer able to serve its customers. Therefore, they are a back-up source of information on provisioning water barrels and contractors licensed to deliver potable water.

EMERGENCY PHONE NUMBERS

1.	Department of Social & Health Services Northwest Regional Office Seattle	1-464-7671 1-464-7670
2.	Pacific Northwest Bell Telephone Co. Tacoma	
	Repair Service	752-3736
	Cable Location	1-800-424-5555
	Business Office	Billing 272-7629
		Service & Sales 272-5506
3.	Puget Sound Power & Light Co.	1-800-562-0934
	Roy - Yelm	1-458-7731
4.	Roy Fire Department	
	Emergency	911
	Business	843-2226 or 843-2424
5.	Roy Police Department	
	Emergencies	911
	Business	843-2286
6.	Pierce County Sheriff	
	Emergencies	911
	Business	593-4721
7.	Pierce County Office of Emergency Service	591-7470
8.	Burlington Northern Railroad Co. (Mr. M.S. Linn, Roadmaster)	591-2562

TABLE 8.1
GUIDE TO LOCATING A WATER SYSTEM PROBLEM
(AT CITY HALL ALARM SITE)

HIGH RESERVOIR LIGHT ON

1. Silence horn.
2. Check other panel lights and note other alarm conditions.
3. If pump run light ON, go immediately to pump and shut off.
4. If both pump run lights OFF, go immediately to both pumphouses and shut off pump(s) if running. (Run lights may be malfunctioning).
5. Go to reservoir and check for overflow and/or damage. Check for:
   a. Water running into pond.
   b. Gage board level indicated.
   c. Climb Tank if required and check water level visually from top access hole.
6. If overflow and pump running determine cause for pump not shutting off. Possible causes:
   a. Communication failure in telephone lines or telemetry equipment.
   b. Reservoir power failure.
   c. Well fail to command.
7. If no overflow, determine cause of false alarm. Possible causes:
   a. Communication or telemetry system component failure.
   b. Alarm system component failure.

LOW RESERVOIR LIGHT ON

1. Silence horn
2. Check other panel lights and note alarm conditions.
3. If no pump run light ON, go to tank verify low water level on pump. Determine cause for pump not starting. Possible causes:
   a. Communication failure in telephone lines or telemetry equipment.
   b. Reservoir power failure.
   c. Well fail to command.
4. If pump run light ON for either or both pumps, go to reservoir verify low water level. Go to pump house verify pumps are producing water then check water system for excessive water use/loss. Possible causes:
   a. Water line break. Isolate break by closing gate valves and repair break immediately.
   b. Excessive water use for fire flow. If alarm occurs often, lower the low water alarm probe or develop additional storage.
5. If water level is not low (climb tank to verify if required), determine cause of false alarm. Possible causes:
   a. Communication failure in telephone lines or telemetry equipment.
   b. Alarm system component failure.

TABLE 8.1
GUIDE TO LOCATING A WATER SYSTEM PROBLEM
(AT CITY HALL ALARM SITE)

COMMUNICATION FAIL LIGHT ON

1. Silence horn.
2. Check other panel lights and note other alarm conditions.
3. Check pumphouse Telemetry Well control panels for Red Communication Fail light ON. If light is ON at pumphouse a telephone line or telemetry equipment failure exists between the pumphouse and City Hall.
4. Check inside City Hall panel for light emitting diode (LED) indicating communication failure to reservoir. If LED is lit then a telephone line or telemetry equipment failure is indicated between the reservoir and City Hall.
5. If telephone line failure, then check line connections in system panels for good electrical contact. Call telephone company to restore service if telephone service is out.
6. If telephone service is o.k., then call Stead & Baggerly (206) 644-1700 in Bellevue, Washington for help in locating telemetry equipment failure.
7. Pump will have to be cycled manually until telemetry/telephone system is restored.
8. If the telemetry system is operating normally then a false alarm condition exists. Possible causes are discussed under High Reservoir Item 7.

RESERVOIR POWER FAIL LIGHT ON

1. Silence horn.
2. Check other panel lights and note other alarm conditions.
3. Go to reservoir; check light on convenience outlet inside telemetry panel. If light is off there is no power in telemetry panel. Loss of power in panel results in loss of liquid level controls.
4. Check all fuses and circuit breakers. Contact an electrician if power is out to a specific component only. Contact Puget Power if power is out at pole.
5. System can be operated manually until 120V AC power is restored to the reservoir site if there is power to the well pumps.
6. If there is power at the reservoir site then a false alarm condition exists. Possible causes are discussed under High Reservoir Item 7.

TABLE 8.1
GUIDE TO LOCATING A WATER SYSTEM PROBLEM
(AT CITY HALL ALARM SITE)

WELL NO 1 FAIL TO COMMAND LIGHT ON
AND/OR
WELL NO 2 FAIL TO COMMAND LIGHT ON

1. Silence horn.
2. Check other panel lights and note other alarm conditions.
3. If pump run light ON, go to pumphouse. If pump is running check for chlorine leak by noting if chlorine room exhaust fan is on and if booster pump is off with well pump running. Check for alarm light on chlorine detector. If chlorine leak alarm is ON, locate and repair leak immediately.
4. If pump run light is OFF, go to pumphouse check for the following:
   a. Power at well site? Call power company if necessary.
   b. Heavy duty safety switches handles in "make" circuit position.
   c. Heavy duty safety switch fused disconnect - fuses o.k.?
   d. Pump starter panel overload relays tripped? Push to reset.
   e. Pump Starter Panel Phase Failure/Loss Light ON. Check inside panel for red LED glowing on Phase Failure relay if all phases are correct. If LED is out it will come back on if condition is corrected. If condition persists call the power company.
   f. If power out to specific component call electrician.
   g. Make provisions for emergency power if power is out to pumphouse for extended period.
5. Pump starts in HAND position but not in AUTO, call Stead & Baggerly to fix possible alternator problem at City Hall.
6. Start pump in HAND position and observe sequence of lights on Telemetry/Well Control Panel then consult guide to trouble shooting a pumping system problem in table 8.2.
7. If pump run light is ON, pump is running, and there is no chlorine leak and the pumping system is operating o.k., there may be an alarm system component failure.

FIGURE 8.2

GUIDE TO TROUBLESHOOTING A PUMPING SYSTEM PROBLEM

(TELEMETRY/WELL CONTROL PANEL AT WELL SITES)

Once it is established that the situation causing the alarm to go off is some problem with one of the pumping systems it is necessary to determine which part of that system is responsible. The table below is intended to assist the system operator in locating the problem. This table will not cover every circumstance but will cover the problems more likely to occur. The table is to be used after it is determined which pumping system has failed and at what point. This can be done by starting the pump in the "Hand" position and observing the sequence of lights on the control box and the operation of the pump, motor, and valve. Once it is determined which element is not operating properly the operator should refer to the manufacturers literature for further information on trouble shooting and repair/replacement. If the problem is determined to be in the electrical system a qualified electrician should be called in to further locate and repair the troublespot.

Numbers in the table below refer to possible trouble spots identified in the table at the right.

	Telemetry/Well Control Panel was Displaying					
	BLUE Prelube Solenoid Required	GREEN Pumping	GREEN Valve Open Required	RED Valve Open Required	RED Communi-cation Fail	NO LIGHTS
PUMP DOES NOT START (HAND)	1,3,4, 15,21	1,3,4,5,6, 7,8,10,11, 12,15,22	—	—	—	1,3,4
PUMP DOES NOT START (AUTO)	1,2,3,4, 15,21	1,2,3,4,5,6 7,8,10,11, 12,15,22	—	—	2,4	1,2,3,4
PUMP STARTS THEN SHUTS DOWN	—	1,2,3,4,6,7, 8,9,10,11, 12,13,14, 15,16,17,18	1,2,3,4,6 7,8,9,10, 12,13,14, 15,16,17,18	16,17,19	2,4	1,2,3,4,
PREMATURE VALVE CLOSURE	—	2,3,4,16,17	—	2,3,4,16,17	2,4	—
VALVE FAILS TO SHUT DOWN PUMP	—	3,4,20	—	3,4,20,	4	—
VALVE FAILS TO CLOSE	—	2,4,20	—	20	2,4	—
VALVE FAILS TO OPEN	—	—	19	19	—	—
PUMP & VALVE SHUT DOWN TOGETHER	—	1,3,22	—	—	—	1,2,3,4
PUMP SHUTS DOWN WHILE RUNNING	—	1,2,3,4, 6,7,8,9, 10,11,12, 13,14,15, 16,17,18	—	—	2,4	1,2,3,4

GUIDE TO TROUBLESHOOTING A PUMPING SYSTEM PROBLEM

NO.	PROBLEM
1.	Power failure
2.	Faulty telemetry signal or phone line failure
3.	Faulty wiring
4.	Component failure in Telemetry/Well Control Panel
5.	Motor starter problem
6.	Phase failure relay contacts open in pump starter panel
7.	Overload relays tripped in pump starter panel
8.	Defective pump motor
9.	Pump failing to produce pressure
10.	Pump mechanical failure
11.	Excess voltage drop or current draw when starting pump
12.	Pump plugged, worn bearings, worn impeller, pump binding, etc.
13.	Pump not submerged
14.	Impellers loose on shaft or need clearance adjustment
15.	Severe electrical transients
16.	Loss of pressure in system during pumping
17.	Pressure switch fault
18.	Pump shut down after 10 minutes HAND operation a well site
19.	Failure of check valve to open due to following possible causes: a. Solenoid coil burn-out or no power to coil b. Opening speed to slow (clean speed control valves & piping) c. Insufficient pump pressure to operate opening controls d. Stem stuck in closed or semi-open position e. Seat obstructed f. Cover chamber pressure not being released g. Power unit chamber not getting operating pressure h. Control piping is clogged
20.	Failure of check valve to close due to possible causes: a. Closing speed too slow (clean speed control valves & piping) b. Insufficient system pressure to operate closing controls c. Stem stuck in open position d. Worn diaphragm or loose upper stem nut e. Seat obstructed f. Power unit chamber pressure not being released g. Valve cover not getting operating pressure h. Control piping is clogged
21.	Prelube solenoid coil burned out or no power to solenoid
22.	Component failure in pump starter panel

APPENDIX N

PRELIMINARY PROJECT COST ESTIMATES

ASSUMPTIONS FOR COST ESTIMATES

Tax rate	8	%						
Contingency	20	%						
Engineering and Administrative Costs	30	%						
Mobilization, Cleanup and Demobilization	8%	of subtotal without tax and contingency (round to $1000)						
4-inch DI Water Main, Including Fittings	N/A	=UNIT PRICE						
6-inch DI Water Main, Including Fittings	$ 80	=UNIT PRICE						
8-inch DI Water Main, Including Fittings	$ 100	=UNIT PRICE						
12-inch DI Water Main, Including Fittings	$ 120	=UNIT PRICE						
16-inch DI Water Main, Including Fittings	$ 150	=UNIT PRICE						
Locate Existing Utilities	2%	of subtotal without mobilization, tax and contingency (round to $1000)						
Erosion Control	2%	of subtotal without mobilization, tax and contingency (round to $1000)						
Additional Fittings (LBS)	4	-inch	0.08	* Pipe Length=LBS (Round to 50 LBS)				
Additional Fittings (LBS)	6	-inch	0.12	* Pipe Length=LBS (Round to 50 LBS)				
Additional Fittings (LBS)	8	-inch	0.45	* Pipe Length=LBS (Round to 50 LBS)				
Additional Fittings (LBS)	12	-inch	0.50	* Pipe Length=LBS (Round to 50 LBS)				
Additional Fittings (LBS)	16	-inch	0.60	* Pipe Length=LBS (Round to 50 LBS)				
UNIT PRICE	$ 4.00	PER LB						
Trench Safety Systems	$ 2.00	per LF of Pipe Length						
4-inch Gate Valves	N/A	EA	2	Every	300	feet		
6-inch Gate Valves	$ 1,200	EA	2	Every	300	feet		
8-inch Gate Valves	$ 1,800	EA	2	Every	300	feet		
12-inch Gate Valves	$ 3,000	EA	2	Every	300	feet		
16-inch Butterfly Valves	$ 10,000	EA	2	Every	600	feet		
18-inch Butterfly Valves	N/A	EA	2	Every	600	feet		
Hydrant Assembly	$ 6,000	EA	Every	400	feet			

TRENCH WIDTH	PIPE SIZE	WIDTH (ft)
	4	2.5
	6	2.5
	8	3.0
	12	3.5
	16	4.0
	18	4.5

LANE WIDTH	WIDTH (ft)	12.0

	MATL DEPTH (feet)	UNT WEIGHT (TN/CY)	EXTRA MATL FACTOR	FRACTION OF LENGTH	PRODUCT
Gravel Backfill	4.00	1.0	1.1	1.00	0.163 * Trench Width = CY/LF
Cost per CY	$ 25.00				
CDF	4.00	1.0	1.1	1.00	0.163 * Trench Width = CY/LF
Cost per CY	$ 220.00				
Foundation Gravel	0.50	1.8	1.1	0.50	0.018 * Trench Width = TN/LF
Cost per TN	$ 35.00				
Asphalt Concrete Pavement Overlay	NA	NA	NA	NA	0.023 * Lane Width = TN/LF
Cost per TN	$ 120.00				
Sawcutting	$ 3.00	= Cost per LF of sawcutting			
Crushed Surfacing, Top Course	0.17	1.8	1.1	1.00	0.012 * Lane Width = TN/LF
Cost per TN	$ 25.00				
Cold Mix Asphalt	0.25	1.800	1.1	0.50	0.009 * Lane Width = TN/LF
Cost per TN	$ 150.00				

Connections to Existing System	$ 3,000	EA						
3/4" Service Connections, complete	$ 1,200	EA						
Traffic Control	$ 120	EA	24	HRS per	300	feet		

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT SO-1
Well 1 Backup Power

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 5,000	$ 5,000
2	Clearing and Grubbing	1 LS	$ 1,000	$ 1,000
3	Crushed Surfacing	36 TN	$ 25	$ 900
4	Foundation Gravel	36 TN	$ 35	$ 1,260
5	75 KVA Generator	1 LS	$ 70,000	$ 70,000
6	Automatic Transfer Switch	1 LS	$ 20,000	$ 20,000
7	Electrical Modifications	1 LS	$ 50,000	$ 50,000
	Subtotal			$ 148,160
	Tax (8.0%)			$ 11,853
	Subtotal			$ 160,013
	Construction Contingency			$ 32,003
	Engineering, Inspection, Legal, and Administrative			$ 48,004
	Total Estimated Project Cost			$ 240,000

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT SO-2
Well 2 Improvements

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 9,000	$ 9,000
2	Well Pump and Motor	1 LS	$ 70,000	$ 70,000
3	Building Modifications	1 LS	$ 10,000	$ 10,000
4	Minor Changes	1 CALC	$ 5,000	$ 5,000
	Subtotal			$ 94,000
	Tax (8.0%)			$ 7,520
	Total Estimated Project Cost			$ 132,840

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT SO-3
Well 1 Improvements

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 9,000	$ 9,000
2	Well Pump and Motor	1 LS	$ 70,000	$ 70,000
3	Building Modifications	1 LS	$ 10,000	$ 10,000
4	Minor Changes	1 CALC	$ 5,000	$ 5,000
	Subtotal			$ 94,000
	Tax (8.0%)			$ 7,520
	Subtotal			$ 101,520
	Construction Contingency			$ 20,304
	Engineering, Inspection, Legal, and Administrative			$ 30,456
	Total Estimated Project Cost			$ 152,000

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT T-1
Well 2 Iron and Manganese

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 25,000	$ 25,000
2	Clearing and Grubbing	1 LS	$ 6,000	$ 6,000
3	Excavation, Backfill, Compaction, and Grading	1 LS	$ 8,000	$ 8,000
4	Crushed Surfacing	10 CY	$ 25	$ 250
5	Foundation Gravel	22 CY	$ 35	$ 770
6	CMU Building, 20x32	640 SF	$ 200	$ 128,000
7	48" Pyrolusite Filter Units with Plumbing and Valving	4 EA	$ 50,000	$ 200,000
8	Chemical Injection Systems	1 LS	$ 25,000	$ 25,000
9	Backwash Basin	1 LS	$ 20,000	$ 20,000
10	Piping, Valves, and Appurtenances	1 LS	$ 50,000	$ 50,000
11	Flow Meters	2 EA	$ 4,000	$ 8,000
12	Electrical and Telemetry Modifications	1 LS	$ 50,000	$ 50,000
	Subtotal			$ 521,020
	Tax (8.0%)			$ 41,682
	Subtotal			$ 562,702
	Construction Contingency			$ 112,540
	Engineering, Inspection, Legal, and Administrative			$ 168,810
	Total Estimated Project Cost			$ 844,000

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT S-1
Reservoir Maintenance and Recoating

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 9,000	$ 9,000
2	Interior Reservoir Recoating, Complete	1 LS	$ 79,338	$ 79,338
3	Exterior Reservoir Recoating, Complete	1 LS	$ 80,865	$ 80,865
4	Minor Changes	1 CALC	$ 9,000	$ 9,000
	Subtotal			$ 178,202
	Tax (8.0%)			$ 14,256
	Subtotal			$ 192,459
	Construction Contingency			$ 38,491.71
	Engineering, Inspection, Legal, and Administrative			$ 57,738
	Total Estimated Project Cost			$ 290,000

CITY OF ROY
PRELIMINARY PROJECT COST ESTIMATE
CAPITAL IMPROVEMENT PROJECT S-2
Reservoir Seismic Retrofit

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 28,000	$ 28,000
2	Foundation Retrofit	1 LS	$ 220,000	$ 220,000
3	Retrofit Reservoir Shell	1 LS	$ 60,000	$ 60,000
	Subtotal			$ 308,000
	Tax (8.0%)			$ 27,100
	Subtotal			$ 335,100
	Construction Contingency			$ 67,020
	Engineering, Inspection, Legal, and Administrative			$ 100,530
	Total Estimated Project Cost			$ 500,000

APPENDIX O

NISQUALLY WATERSHED DETAILED IMPLEMENTATION PLAN

PREPARED FOR THE
Nisqually Indian Tribe
and WRIA 11 Planning Unit

Final
PHASE IV NISQUALLY IMPLEMENTATION PLAN
for Watershed Management in WRIA 11

February 14, 2007

Golder Associates

FINAL

NISQUALLY WATERSHED
DETAILED IMPLEMENTATION PLAN

Funded through Grant # G0600089 from the Washington State Department of Ecology as authorized by the Watershed Planning Act (Chapter 90.82 RCW).

Submitted to:

Nisqually Indian Tribe
and
Nisqually Watershed Planning Unit

Submitted by:

Golder Associates Inc.
Redmond, Washington

Recommended Citation:
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Distribution: 15 Copies – Nisqually Indian Tribe
1 Copy – Golder Associates Inc.

EXECUTIVE SUMMARY

This Detailed Implementation Plan is intended to guide the implementation of the Nisqually River Watershed Management Plan and fulfills the requirements of the Watershed Planning Act, Revised Code of Washington (RCW) 90.82.043 and RCW 90.82.048. The Nisqually River Watershed (Water Resource Inventory Area 11 [WRIA 11]) includes about 720 square miles of land that drains into the Nisqually River and ultimately into Puget Sound. The boundaries of the Nisqually Watershed do not correspond to specific political or jurisdictional boundaries. The basin includes parts of three counties, a number of cities and towns, and tribal and federal lands. The large number of governmental entities with individual programs within the watershed has resulted in the need for more consistent water related policy.

The WRIA 11 Detailed Implementation Plan was developed over a period of months following the development and adoption (in April 2004) of the Watershed Management Plan by Pierce, Thurston, and Lewis Counties. Many of the original members of the WRIA 11 Watershed Planning Unit, who devoted over five years to develop the Watershed Management Plan, along with new members, continued their dedicated participation to complete this Implementation Plan. Those involved include local, state, federal and tribal governments as well as local agriculture and environmental representatives and landowners in the watershed. The Planning Unit's efforts were guided by their mission statement:

> "***To maximize the ability of the Nisqually Watershed to produce high quality ground and surface water, while protecting and managing the related resources to support environmental, social, economic, and cultural values."***

The Watershed Management Plan contains recommended actions for short-term and long-term water resource management in WRIA 11 at both the watershed-wide scale and the sub-basin scale. The actions are in the form of policy statements, management strategies, and projects. Critical actions include:

- Identify aquifers for potential supply;
- Recommend to Ecology to batch process water right applications by sub-watershed;
- Assess, negotiate and possibly undertake rule-making for minimum instream flows on the Mashel River;
- Monitor the quantity and quality of stream flows and groundwater supplies;
- Understand the interconnection between groundwater and surface water, including the impact of exempt wells on groundwater; and,
- Strengthen the Coordinated Water System Planning policies to provide a more direct link between land use planning and water supply availability.

The actions are to be implemented by various participants as prescribed by the plan, subject to funding constraints. This Implementation Plan provides a practical schedule for implementing the recommended actions in the Watershed Management Plan. It is not intended to be a stand-alone document and is intended to be used in conjunction with the Watershed Management Plan.

This Implementation Plan is adopted by the expanded initiating governments with the understanding that it will be reviewed and may be revised (if necessary) by the Planning Unit on an annual basis at the first meeting of the fiscal year or more often, as deemed appropriate. The review process is intended to include the evaluation and revision of priorities as well as the addition or elimination of projects for funding each year.

ACKNOWLEDGEMENTS

The Nisqually Watershed Plan and this Implementation Plan were developed through the participation and input of numerous stakeholders from the Nisqually Watershed over the past six years; many of whom spent countless hours providing information, reviewing and updating plan actions, and attending meetings to represent their constituencies. These individuals are listed below:

PLANNING UNIT:

Representative - Agency
Alan Corwin – Thurston Public Utility District
Bruce Lachney - Small Scale Agriculture
Chelan Jarrett - Town of Eatonville
Chris Wilcox – Wilcox Farms
Clark Halvorson - Nisqually Indian Tribe
Deborah Johnston - Fort Lewis
Diane Oberquell - Thurston County
Doug Mah – City of Olympia
Fred Michelson - Nisqually River Council
Gary Armstrong – Town of Eatonville
Gayle Adams - Elbe Water District
George Walter - Nisqually Indian Tribe
Harry Bell - Graham Hill Mutual Water
Jerry Petersen – Washington Water
Jim Lowery - Lewis County
Julie Rector - City of Lacey
Ken Hooper - Wilcox Farms
Kevin O'Neill – Washington Water
Kim Eldridge- City of Roy
Marc Wicke - Tacoma Power
Mark Swartout - Thurston County
Mary Ausburn - Pierce County
Norman Rittenhouse - Graham Hill Mutual Water
Rich Hoey – City of Olympia
Robert Smith - Nisqually River Council
Shelly Badger - City of Yelm
Steve Craig - Department of Ecology
Susan Clark – (previously with) Pierce County
Virgil S. Clarkson - City of Lacey

SUB-BASIN COMMITTEES:

MASHEL/OHOP:

Representative – Agency
Mary Ausburn – Pierce County
Clark Halvorson – Nisqually Indian Tribe
Gary Armstrong – Town of Eatonville
George Walter – Nisqually Indian Tribe

MCALLISTER/YELM:

Representative – Agency
Clark Halvorson – Nisqually Indian Tribe
Rich Hoey – City of Olympia
Julie Rector – City of Lacey
Mark Swartout – Thurston County
George Walter – Nisqually Indian Tribe
Shelly Badger – City of Yelm

Special "Thank You" to the host of the Phase IV Planning Unit Meetings:

City of Yelm

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LIST OF ACRONYMS AND ABBREVIATIONS

ASR	Aquifer Storage and Recovery
AWC	Association of Washington Cities
BMP	Best Management Practice
CARA	Critical Aquifer Recharge Area
CWRP	Comprehensive Water Reuse Plan
CWSP	Coordinated Water System Plan
DOH	Department of Health
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GMA	Growth Management Act
GIS	Geographic Information System
GPM	Gallons per Minute
GW	Groundwater
IRPP	Instream Resource Protection Program
MGD	Million Gallons per Day
MGSA	McAllister Geologically Sensitive Area
MOA	Memorandum of Understanding
NEPA	National Environmental Policy Act
NTNC	Non-Transient/Non-Community (Water System)
NTU	Normalized Turbidity Units
PALS	Pierce County Planning and Land Services
PCD	Pierce Conservation District
PU	Planning Unit
PUD	Public Utilities District
RCW	Revised Code of Washington
RM	River Mile
SBR	Sequencing Batch Reactor
SEPA	State Environmental Policy Act
SHB	State House Bill
SRFB	Salmon Recovery Funding Board
SW	Surface Water
SWSMP	Small Water System Management Program
TG	Technical Group
TMDL	Total Maximum Daily Load
TNC	Transient Non-Community (Water System)
UGA	Urban Growth Area
USGS	United States Geological Service
WAC	Washington Administrative Code
WMA	Watershed Management Act
WRATs	Water Rights Allocation and Tracking System
WRIA	Water Resource Inventory Area
WSP	Water System Plan
WUCC	Water Utilities Coordinating Committee

1.0 INTRODUCTION

This Detailed Implementation Plan for the Nisqually River Watershed fulfills the requirements for a detailed implementation plan per the Watershed Planning Act. The Nisqually River Watershed is denoted as Watershed Resource Inventory Area (WRIA) 11. WRIA 11, its rivers and lakes, and the cities, towns and counties within the watershed are shown on Figure 1.

This Implementation Plan provides a vision and framework for water resource management in the Nisqually Watershed. This plan provides details of implementation obligations set forth in the Watershed Management Plan (Plan). These obligations will depend in large measure on the availability of funding, staff resources, technical capability, priorities of the entities involved, and the recommended priorities of the Implementation Plan. These recommendations are the Planning Unit's desire and vision and address important, even vital, issues related to water resources. The success of the watershed planning efforts in WRIA 11 depends substantially on the actions taken to implement the recommendations in this Implementation Plan.

1.1 Background to Watershed Planning

The Watershed Planning Act (Chapter 90.82 RCW) was passed by the State Legislature in 1998 (and amended in 2003) to provide a forum for citizens of the watershed to develop and implement locally based solutions to watershed issues. The intent of the Watershed Management Act is, "meeting the needs of a growing population and a healthy economy statewide; meeting the needs of fish and healthy watersheds statewide; and advancing these two principles together, in increments over time." The Watershed Management Act goes on to state that, "The legislature finds that improved management of the State's water resources, clarifying the authorities, requirements, and timelines for establishing instream flows, providing timely decisions on water transfers, clarifying the authority of water conservancy boards, and enhancing the flexibility of our water management system to meet both environmental and economic goals are important steps to providing a better future for our State" (RCW 90.82 notes 2001 c 237).

Eleven state and local governments (expanded initiating governments) within WRIA 11 signed a Memorandum of Agreement (MOA) in 1999 that established the Nisqually Planning Unit and set up roles and responsibilities of each government in creating the Plan. The local Planning Unit is comprised of members from three counties (Pierce, Thurston, and Lewis); cities and towns (Yelm, Lacey, Olympia, and Eatonville); the Nisqually Tribe; the Ashford Water District; the Elbe Water District; and the Washington State Department of Ecology.

A new MOA was negotiated between Phase III and IV in October of 2004 and was revised to not only include the governments from the previous agreement but also the City of Roy, Public Utility District #1 of Thurston County (Thurston PUD #1), and Fort Lewis (Appendix E). These fourteen entities are referred to as "Implementing Governments" in the MOA. The Planning Unit consists of a member from each of the implementing governments outlined in the MOA and other non-governmental representatives from industries such as agriculture, water districts, private water systems, development, hydroelectric power, and private citizens. The members of the Planning Unit represent a wide range of water resource interests within the watershed. This MOA defined the roles and responsibilities of the Planning Unit, including further development of the objectives of the Watershed Management Plan, preparation of the Implementation Plan, and execution of the Implementation Plan. The Nisqually Indian Tribe was selected as the lead agency of the Planning Unit and was tasked with convening the group, applying for grants, and facilitating Planning Unit meetings. The Planning Unit must, as outlined by the MOA, consider best available science when making decisions about the watershed.

Although the Watershed Planning Act (per Chapter 90.82.120[2] RCW) does not give the Planning Unit authority to change existing laws, alter water rights or treaty rights, or require any party to take an action unless that party agrees, it does provide the Planning Unit considerable flexibility in guiding the planning process and to develop and implement strategies for managing water resources within a WRIA.

The MOA distinctly states that costs of the Implementation Plan (preparation or implementation) will not be incurred by the Planning Unit. Rather, funds must be generated through grants and in kind donations. The allocation of funds must be approved by the Planning Unit. Grant funding through the state Legislature is available for watersheds that elect to initiate this process to develop and implement a Watershed Plan through four phases:

1. *Phase 1* - organize a Watershed Planning Unit;
2. *Phase 2* - assess existing conditions and develop technical assessments of water resources;
3. *Phase 3* - develop and adopt a Watershed Plan; and,
4. *Phase 4* - develop an implementation plan to carry out the recommendations and obligations outlined in the Watershed Plan.

1.2 Watershed Planning In WRIA 11

1.2.1 Phase I

In 1998, the Nisqually Indian Tribe, acting on a request from the Nisqually River Council, initiated Phase I of the Watershed Planning Process. During Phase I, the Expanded Initiating Governments were convened, a Memorandum of Agreement was developed between these initiating governments and signed in September of 1999, public workshops were held, and a scope of work was developed to address the Technical Assessment phase of the planning process (Phase II). The Mission of the Nisqually Planning Unit (as approved at the April 12, 2000 Planning Unit meeting) is:

> *"To maximize the ability of the Nisqually Watershed to produce high quality ground and surface water, while protecting and managing the related resources to support environmental, social, economic, and cultural values*."

The Planning Unit's main objective for the plan is to develop a comprehensive strategy for balancing competing demands for water, while at the same time preserving and enhancing the future integrity of the watershed.

1.2.2 Phase II

In 2000, a Phase II, Level 1 Technical Assessment was completed for the upper Nisqually Watershed (David Evans and Associates, 2000). Planning in the upper basin was completed prior to, and separate from the lower basin due to a pending development in the Upper Basin and the need to secure water rights in a timely manner for the development to move forward. In March 2002, a Phase II, Level 1 Technical Assessment of the lower Nisqually Watershed was completed by Watershed Professionals Network. The entire document is available online at: http://www.ecy.wa.gov/programs/eap/wrias/11.html.

To augment technical information on the watershed, the Planning Unit also agreed to apply for supplemental Phase 2 funds from Ecology to complete an assessment of water storage opportunities, instream flows, and a detailed compilation and assessment of water quality data for the watershed.

The following documents contain the technical information compiled and assessed in Phase II of the Nisqually River Watershed planning process. These documents characterize the Nisqually River Watershed in terms of water quantity (groundwater resources, surface water resources, actual water use and water rights), water storage opportunities, and water quality at the time the Phase II work was completed. The information compiled and assessed for these studies, the new information gained, and the conclusions/recommendations of these studies provide the basis for most of the Plan policy statements, management strategies, and projects.

- Upper Nisqually Level 1 Technical Assessment (David Evans and Associates, December 2000);
- Nisqually River Level I Watershed Assessment (Watershed Professionals Network, March 2002);
- Draft Step A Instream Flow Assessment – Mashel River (Golder Associates, June 2003);
- Water Quality Data Management Plan (Golder Associates, October 2003);
- Water Quality Monitoring Plan (Golder Associates, October 2003);
- Draft Level 1 Storage Assessment (Golder Associates, June 2003);
- Nisqually Watershed Management Plan (Golder Associates, October 2003); and
- Step B Instream Flow Assessment – Mashel River (Golder Associates, April 2006).

Complete reports are available in hard copy for review at the Nisqually Indian Tribe Office located in Olympia, WA, and at the Ecology Southwest Regional office in Lacey, WA.

1.2.3 Phase III

Phase III, the development of the actual Plan, began in October 2002. Individual members of the Planning Unit were interviewed to determine their primary issues pertaining to water resources in the watershed, and to brainstorm potential solutions. Two Planning Unit workshops were convened in late 2002 to identify stakeholder issues, define problem statements and begin to develop recommended actions to address the problems identified. The outcomes of these workshops were incorporated into a Watershed Management Plan Framework for the Nisqually Watershed.

Development of the Plan continued after the workshops in late 2002. Public outreach efforts began in March 2003 and continued until the Plan was adopted by each of the County legislative authorities. The first draft of the Plan was reviewed by State agencies in July 2003. The second draft of the plan was completed in September 2003. After public comment and Planning Unit review, and acceptance, the final plan was submitted to counties for public hearing in October 2003. The Nisqually River Watershed Management Plan (Golder, 2004) was approved by the Planning Unit in 2003 and was approved unanimously and adopted by Pierce, Thurston, and Lewis Counties in April of 2004.

The Plan contains a series of policy statements, management strategies, and projects for short-term and long-term water resource management in WRIA 11. Proactive policies and management strategies were developed to ensure continued protection of the natural resources of the watershed while providing water for well-planned growth. Policies and projects were identified to address water-related challenges that currently impact or have the potential to impact natural resources in the watershed. Critical components of the Plan include:

- Identify aquifers for potential supply;
- Recommend to Ecology to batch process water right applications by sub-watershed;
- Assess, negotiate and possibly undertake rule-making for minimum instream flows on the Mashel River;
- Monitor the quantity and quality of stream flows and groundwater supplies;
- Understand the interconnection between groundwater and surface water, including the impact of exempt wells on groundwater; and,
- Strengthen the Coordinated Water System Planning policies to provide a more direct link between land use planning and water supply availability.

1.3 Purpose of this Implementation Plan

Plan implementation is an important component of the watershed planning process. Planning Units are encouraged to develop a detailed implementation plan within one year of accepting Phase IV planning funds. Effective implementation, including coordination and oversight, is critical to the success of the watershed planning process.

The purpose of this Nisqually River Watershed Implementation Plan is:

1. To guide implementation of the policy statements, management strategies, and projects contained within the Plan;
2. To fulfill the recommendation of House Bill 2E2SHB 1336 that "requires a detailed implementation plan within one year of accepting phase IV implementation funding."
3. To meet the requirements for a detailed implementation plan per RCW 90.82.043 and RCW 90.82.048.

The policy statements, management strategies, and projects outlined in the Plan were organized by key issue categories including:

- Growth and Land Use;
- Groundwater Resources and Supply;
- Water rights;
- Instream Flows and Surface/Groundwater Continuity; and
- Water Quality.

For each of these categories, the Planning Unit identified specific issues, problem statements, and potential planning strategies or projects to address the problem. This Implementation Plan focuses on how these policy statements, management strategies, and projects will be achieved, who the responsible entity is, the schedule for implementation, and potential funding sources.

The following sections from the 2003 update of Chapter 90.82 RCW identify the specific requirements related to Phase IV Implementation. These requirements are addressed in this Implementation Plan and the pertinent sections are referenced.

- RCW 90.82.043[1] Within one year of accepting Phase IV funding, "the planning unit must complete a detailed implementation plan. Submittal of a detailed implementation plan to the department [of Ecology] is a condition of receiving grants for the second and all subsequent years of the phase four grant."
    - This Implementation Plan fulfills this requirement.
- RCW 90.82.043[2] "Each implementation plan must contain strategies to provide sufficient water for: (a) Production agriculture; (b) commercial, industrial, and residential use; and, (c) instream flows."
    - This requirement is addressed in Section 3.4 of this Implementation Plan.
- RCW 90.82.043[2] "Each implementation plan must contain timelines to achieve these strategies and interim milestones to measure progress."
    - This requirement is addressed in Section 4.0 of this Implementation Plan.
- RCW 90.82.043[3] "The implementation plan must clearly define coordination and oversight responsibilities; any needed interlocal agreements, rules, or ordinances; any needed state or local administrative approvals and permits that must be secured; and specific funding mechanisms."
    - This requirement is addressed in Sections 1.1, 1.4, 3.8, and 5.3 of this Implementation Plan.
- RCW 90.82.043[4] "In developing the implementation plan, the planning unit must consult with other entities planning in the watershed management area and identify and seek to eliminate any activities or policies that are duplicative or inconsistent."
    - This requirement is addressed in Section 1.4 of this Implementation Plan.
- RCW 90.82.048[1] "The timelines and interim milestones in a detailed implementation plan …must address the planned future use of existing water rights for municipal water supply purposes, as defined in RCW 90.03.105, that are inchoate, including how these rights will be used to meet the projected future needs identified in the watershed plan, and how the use of these rights will be addressed when implementing instream flow strategies identified in the watershed plan."
    - This requirement is addressed in Section 6 of this Implementation Plan.
- RCW 90.82.048[2] "The watershed planning unit or other authorized lead agency shall ensure that holders of water rights for municipal water supply purposes not currently in use are asked to participate in defining the timelines and interim milestones to be included in the detailed implementation plan."
    - This requirement is addressed in Section 6 of this Implementation Plan.

1.4 Coordination

Numerous ongoing plans, programs, and processes in the Nisqually Watershed are related or interact in some way with the Watershed Management Planning process. Also, there are ongoing projects in the watershed that are gathering critical information that could benefit the implementation of the Plan. Furthermore, watershed boundaries do not follow political boundaries, so watershed planning may be a component of or be affected by water-related activities in adjacent WRIAs. By coordinating with other entities that are conducting these ongoing plans, programs, and projects there can be a beneficial transfer of knowledge. This coordination should be conducted rather than spending time and money trying to duplicate these efforts. Examples of these include adjacent WRIA plans, shellfish protection projects, instream resource protection programs, reclaimed water plans, and multi-species recovery plans. Figure 2 illustrates the relationship between WRIA 11 and other water related plans and policies that have an explicit relationship with recommendations that are addressed in the Plan. For a detailed discussion of the related plans, programs, and processes see Section 11.0 Water Related Programs, Plans and Processes in the Watershed Plan.

1.5 Adaptive Management

Throughout the development and after final publication of the Nisqually Watershed Management Plan (October 31, 2003), the Planning Unit has continued to consider the Plan to be a living, working planning document to address water-related issues in the Nisqually Basin. It has been the intent of the Nisqually Planning Unit that the Plan actions and strategies will evolve as new data are collected and new water-related issues arise in the watershed. Changes in the plan will be based upon best available science and new data as they become available. Best available science is defined as scientific data and methodologies commonly accepted by the scientific community and agreed upon by the Planning Unit. Consistent with the 2005 MOA between initiating governments, the Planning Unit is authorized to support new or revised planning actions (when agreed upon by consensus) throughout the implementation phase of watershed planning in the Nisqually Basin.

This Implementation Plan is adopted by the expanded initiating governments with the understanding that it will be reviewed and revised (if necessary) by the Planning Unit on an annual basis at the first meeting of the fiscal year, and when deemed necessary. This process is intended to include the evaluation and revision of priorities as well as the addition or elimination of projects for funding each year.

1.6 Public Outreach

Public outreach and public participation are important components of Watershed Planning. A Nisqually Watershed Plan Final Public Outreach Plan was drafted in March 2003. This plan outlined the public outreach activities conducted before issuing the final Plan. During this first year of Watershed Planning Phase IV (Implementation), the Planning Unit made every effort to inform and involve members of the public, including an invitation to all of the Group A Water Systems within the Nisqually Watershed asking them to participate in the Implementation Process.

The Planning Unit will look for more opportunities to increase exposure at various public events such as the Nisqually River Council Watershed Festival. Other methods for public outreach that may be implemented throughout the implementation phase include:

- Working with the Department of Ecology's Public Information Officer and/or the Planning Unit to prepare and publish periodic press releases detailing the Planning Unit's efforts;
- Periodic updates to the Nisqually River Council and their advisory committees and subcommittees;
- Coordinate with the Nisqually River Council to distribute informational materials to the public; and
- Investigate the feasibility of establishing and maintaining a website for the Nisqually Watershed where Planning Unit information will be posted. The website could be linked to the Nisqually River Council website so that people interested in the activities within the watershed can easily access information about activities in which both of the groups are involved.

1.7 Approval and Update Schedule for Detailed Implementation Plan

This Implementation Plan will be approved by the WRIA 11 Planning Unit at two consecutive Planning Unit meetings. The 2005 MOA states that all decisions made by the Planning Unit must be a consensus of all of its members. If a consensus can not be reached, an affirmative decision shall be made by a unanimous vote of the governmental representatives on the Planning Unit and a 2/3 majority vote of the non-governmental members. Following Planning Unit approval, the Implementation Plan will be presented to the County Commissioners (Pierce, Thurston, and Lewis) for their approval at a regularly scheduled Board of County Commissioners meeting. The Implementation Plan must be submitted to Ecology within one year of official approval.

This Implementation Plan provides a practical schedule for implementing the Watershed Plan actions. It is not intended to be a stand-alone document. It is intended that this Implementation Plan be used in conjunction with the Watershed Plan and will be revised as necessary (see Section 1.5 – Adaptive Management). Further, the Implementation Plan is a working plan that is expected to grow and evolve as projects are implemented, data are collected and issues are better understood. It is expected that additional Implementation Plan actions will be added and/or eliminated as they become obsolete as time progresses.

2.0 NISQUALLY RIVER WATERSHED OVERVIEW

The location of the Nisqually Watershed (WRIA 11) is shown in Figure 1. The boundaries of the Nisqually Watershed do not correspond to specific political or jurisdictional boundaries. The basin includes parts of three counties, a number of cities and towns, and tribal and federal lands. The large number of governmental entities with individual programs within the watershed has resulted in the need for more consistent water related policy.

The 720 square mile Nisqually Watershed is somewhat unique in the Puget Sound area because the watershed environment has remained relatively intact and healthy despite its proximity to higher density urban land uses in nearby Olympia and Tacoma. A significant portion of the watershed is currently protected, including the Nisqually Indian Reservation, Ft. Lewis Military Reservation, Mt. Rainier National Park, and the Nisqually National Wildlife Refuge. The Nisqually River Basin Land Trust is also actively working to protect critical habitat in the watershed. The watershed boasts a number of native salmon runs, a large protected estuary, and a wide range of habitat values generally characteristic of areas more distant from the fast growing Puget Sound region. In addition, the oldest river council in the State of Washington, the Nisqually River Council, is active in the watershed. However, the watershed is currently poised to experience significant pressure on its natural resources. It is anticipated that population growth will result in water supply shortfalls for the cities of Yelm and Lacey and the Town of Eatonville in the next decade if new sources are not found and water rights are not granted by the State.

3.0 IMPLEMENTATION STRATEGY

The Watershed Plan includes policy statements, management strategies, and projects relating to Growth and Land Use, Groundwater Resources and Supply, Instream Flows, Water Quality, Water Rights, and Habitat in WRIA 11. Some actions are applicable watershed-wide while others are sub-basin specific. Phase IV, Implementation, will provide an opportunity to hone issues and provide concrete actions to support policy statements. This phase will also provide further direction to entities in carrying out the Plan's programs, plans, and studies. The entities that are involved in the implementation process include the three counties, the Nisqually Tribe, cities and towns, water suppliers, Fort Lewis, Water Utilities Coordinating Committees, a Public Utilities District, Washington State Departments of Ecology, Health, Transportation, and Fish and Wildlife, and a Water Conservancy Board. This section of the Implementation Plan provides an approach for implementing the policy statements, management strategies, and projects prescribed in the adopted Watershed Plan. Section 4.0 discusses the schedule for implementation, and Section 5.0 outlines funding options to assist in carrying out these strategies.

3.1 Practical Approach to Implementation

During preparation of this Implementation Plan, the Planning Unit discussed prioritization of planning actions (i.e., policy statements, management strategies, and projects) for implementation. The Planning Unit acknowledged that development of a timeline that specifies a sequence for implementation of Plan actions would be a practical way to order implementation. A number of controls on the sequencing of implementation actions were identified:

- Implementation of Plan policy statements, management strategies, and projects is contingent on the available resources (i.e., funding and personnel) of the implementing entity or entities.
- Implementation of many management strategies are dictated by the schedule of a specific entities' planning process (e.g., comprehensive plan updates, water system plan updates, etc.)
- Some Plan actions have a higher priority than others.
- There is a logical sequence to the most important obligations.

In December 2005 and January 2006, the Planning Unit was given a list of actions outlined in the Plan. The actions were grouped by the key issue categories including Growth and Land Use, Groundwater Resources and Supply, Water Rights, Instream Flows, Water Quality, McAllister Sub-basin Action Plan, Yelm Sub-basin Action Plan, Mashel/Ohop Sub-basin Action Plan, and Implementation. The Planning Unit was then tasked with the following:

- Review and address the "essential" implementation tasks identified in the Plan;
- Provide an overview of early implementation actions and current status;
- Compile timelines and funding information provided by implementing entities; and,
- Consider the sequence in which obligations / recommendations need to be implemented.

Entities responded by providing the requested information when it was known, however, not all of the actions listed have a known status as they are dependent on funding and other planning processes. For some of the actions, the current status is listed as "unknown" or "no action has been taken at this time," whereas other actions have already been completed. Tables 3-1 through 3-9 list all of the actions for each key issue category, and include their status, whether funding is needed prior to implementation, and the preliminary schedule for the action's implementation.

3.2 Priority Actions Requiring Funding

In January 2006 the Planning Unit convened to discuss actions that are projects or studies requiring funding. The Planning Unit was given a list of projects that require funding and were asked to rank them. These actions were ranked in an effort to determine a priority order for use of watershed planning and other related funding sources. The projects that are of highest priority are intended to be funded first; however, funding and implementation of specific projects will also consider such factors as unique funding opportunities and cost share agreements. It is important to note that all components of the Plan are of great importance; however, the Planning Unit is required to prioritize projects for funding as part of this Implementation Plan.

Since the Planning Unit meeting in January 2006, other projects recommended in the Watershed Plan have been identified as requiring funding; however they were not included in the prioritization. These projects are listed at the bottom of Table 3-10.

3.2.1 Considerations For Ranking Importance of Projects

In an effort to rank the importance of projects requiring grant funding there are numerous factors that need to be considered and weighed before a final decision on rank can be made. The Planning Unit was given a list of considerations to take into account during the ranking process. These are listed below:

1. Is this a primary project? Are there other projects or activities that are dependent on the execution of this project (high)? Or, are there actions that need to occur BEFORE this project can occur (lower)?
2. Is the objective time sensitive (deadline)? Does this have to be done within a specific or critical time period? Time sensitivity may imply a higher rank.
3. How achievable is the objective? Do we know the resources (people, data, public support, and money) are available to do it? Higher achievability = higher rank.
4. Will the project result in a long term or short term benefit to the Basin's health? (Longer term benefits may imply a higher rank).
5. Is execution of the project required by local, state, or federal law or other agreements?

Table 3-10 shows the results of the project ranking by the Planning Unit in 2006. These rankings were based on project status and Planning Unit understanding of best available science as of January 2006. Projects will be reviewed and re-ranked each year. These results will be used as a general guideline for the implementation schedule for the project actions (see Section 4.0). Several actions were merged where the focus of the recommended studies or projects was similar or overlapping. It is important to note that there are many important projects and processes outlined in the Plan that were not ranked for funding (and are therefore not listed in Table 3-10). The project ranking and prioritization was limited to those projects requiring direct funding through grants obtained by the

Planning Unit. Many other projects, supported by the Planning Unit are currently being implemented through other funding mechanisms.

3.2.2 Additional Projects

Since the publication of the Plan, additional projects have been identified or proposed that would aid in the implementation of the Plan. Specific storage projects that were outlined in the Level 1 Storage Assessment (Golder Associates, June 30, 2003) for WRIA 11 should be further evaluated. They are briefly mentioned in Table 3-10 under the ISF-5 action (priority #4). The Nisqually Planning Unit has determined that they will adopt a work task to evaluate one or more of these storage projects for further study, and to identify potential new storage projects in the Nisqually Basin as part of the first year of implementation. The Planning Unit will also define conservation strategies and prepare a fact sheet detailing model conservation strategies for the Nisqually Basin as a 2006 work task. Table 3-11 outlines the projects addressed in the Step A Supplemental Storage Assessment and other new projects that have been identified by the Planning Unit. During the 2007 implementation review these projects will be added to the list of projects to be prioritized for funding.

3.3 Regional Water

Cooperative water supply planning and the evaluation of a potential regional water supply are important for the following reasons:

- Groundwater is a finite resource that is vital to human communities, fish and wildlife;
- Water demand within the North Thurston Urban Growth Area is projected to require 81,648 gpm by year 2030; and
- Water supply planning creates efficiencies for jurisdictions by maximizing returns in public investments for water supply and mitigation.

Results from earlier groundwater modeling and field studies performed in the McAllister sub-basin suggested that there was a large quantity of groundwater that discharges from WRIA 11, directly to the Puget Sound (PGG, 1997; PGG, 1998; CDM, 2001; CDM, 2002). It was thought that this water originated from a deep aquifer system that consisted of that portion of the Sea Level (Qc) aquifer and the undifferentiated deposits (TQu) that are below sea level and discharge primarily to Puget Sound. The Nisqually Management Plan referred to this deep aquifer system as the Nisqually Aquifer[*], and indicated that the Nisqually Aquifer may have the potential to provide a significant amount of water to support limited growth in the region.

Recent studies, since the Plan was published in 2004, have shown there is no scientific basis for the name "Nisqually Aquifer". Instead, there are several productive, deep aquifers located within the watershed. Results also demonstrate that they are hydraulically connected to surface waters, in addition to discharging to Puget Sound. Furthermore, more recent studies indicate that water right applications from the McAllister and Yelm sub-basins may have more surface water impacts than originally thought. Consistent with recommendations in the Nisqually Management Plan, further analysis is being conducted by the McAllister Technical Subcommittee to better understand the aquifer systems.

[*] The name "Nisqually Aquifer" is no longer in use. The terms "deep aquifer" or "deep aquifer sequence" are currently being used.

The Planning Unit agrees that there is still potential for the deep aquifers of the McAllister sub-basin to provide some of the supply needed to meet regional needs, but allocations of these resources need to be consistent with the McAllister sub-basin goals of the Plan and laws protecting existing water rights and the Tribal reserved water rights.

If it is determined that a multi-jurisdictional regional water authority is to be developed within the Nisqually Watershed, the Nisqually Tribe will initiate discussions to facilitate agreements, with its regional partners, on ownership, management, operation, monitoring, and finance of a Regional Water Supply. All agreements regarding a multi-jurisdictional regional water authority must include approval from the Nisqually Indian Tribe and other legislative bodies of the Planning Unit participating in the authority.

At this time, the nature of McAllister sub-basin ground waters and their connection to the watershed's surface waters is not fully understood. In order to support effective water appropriation decisions by the Department of Ecology, additional information is being collaboratively gathered and evaluated by the McAllister Technical Subcommittee.

Mutual interest in implementing the McAllister sub-basin plan of the Nisqually Management Plan is shared among the Nisqually Tribe, Thurston County, and the cities of Olympia, Yelm, and Lacey, and others. The actions of the McAllister sub-basin plan, and potentially other recommendations of the Nisqually Management Plan, could be accomplished by the creation of a formally-created stewardship partnership that would be tasked to track how water resources within the sub-basin are used and managed. Potential activities of this partnership that would meet the intent of the McAllister sub-basin goals include the following: aquifer protection; establishing minimum conservation standards for regulated public water systems withdrawing groundwater from the basin; tracking water withdrawals; monitoring mitigation plans; funding commitments for stewardship projects, looking at future water rights and regional water supply options, and possibly joint mitigation. These activities could also address recommendations MC-5, MC-5a, MC-9, and MC-10 of the Plan. This Implementation Plan recommends that a stewardship partnership be established within the McAllister sub-basin to facilitate implementation of the McAllister sub-basin plan.

3.4 Strategies for Water Supply

In accordance with RCW 90.82.043[2], the Implementation Plan "must contain strategies to provide sufficient water for: (a) production agriculture; (b) commercial, industrial and residential use; and, (c) instream flows." The following Plan actions scheduled for implementation (as described in Section 4.0 of this Implementation Plan) address this requirement:

GLU-1 Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.

GLU-4 Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas. These areas are defined through comprehensive plans and codified in zoning ordinances.

GLU-5 Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use.

ISF-1 Creation of a policy statement to support protection of instream resources: "*Support protection of resources by maintaining closures unless new technical information suggests otherwise, or a change in closure status would result in improved flow or habitat conditions in the closed stream or closed streams in other sub-basins.*"

ISF–2 Gain a better understanding of the technical basis for stream closures watershed-wide. The basis of closures could be studied as part of an instream flow study. Priority recommendations for the Level 1 Technical Assessment include: McAllister Creek, Mashel River, Muck Creek, Lower Ohop Creek, and Tanwax Creek for study. (Note an instream flow study of the Mashel River was completed in April 2006).

ISF–3 Identify flow compromised streams based on intermittent nature and beneficial uses(s). Design and install a network of stream gauging stations to monitor these streams and develop an understanding of the hydrology, including current and historical conditions via data collection, analysis, and modeling. Recommend installation of gauging stations on Yelm, Muck, Powell, Murray, Toboton, Tanwax, and Horn Creeks.

ISF-4 Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.

ISF-5 Identify or study methods of surface water augmentation. Methods of surface water augmentation could include reuse, artificial recharge, and/or storage-related projects. This Plan recommends development of strategies to improve and/or augment instream flows in intermittent streams. This could include identification of storage options to augment flows when they are critically low or intermittent. Recommendations for pilot projects should be made as part of this study. Consider projects addressed under the Step A Supplemental Storage Assessment.

3.4.1 Agricultural Lands

Thurston and Pierce County officials met with Ecology in August of 2005 to discuss the preservation of water rights with regards to significant agricultural lands in the counties. An Issue Paper was drafted for this meeting and is included in Appendix B. In sum, the Issue Paper outlined the various statutes providing protection of water resources for agricultural lands. These statutes were drafted in an effort to protect the commercial viability of the state's agricultural lands. Agricultural lands provide a variety of goods and services to the region including jobs for the county's citizens, local fresh food, stimulation of the local economy, species habitat including migratory birds, and flood control. The specific state and local policies that are involved include the following:

- Washington's Growth Management Act (RCW 36.70A);
- Washington's Water Rights Act:
  - Watershed Planning Chapter (RCW 90.82);
  - Water Resources Act of 1971 (RCW 90.54);
  - Water Code Chapter (RCW 90.03);
- Thurston County's Comprehensive Plan; and
- Pierce County's Comprehensive Plan.

Action GLU-5 (as discussed above) relates to the preservation of water rights on designated agricultural land of long-term commercial significance. Zoned agricultural areas for Thurston and Pierce County are shown in Figure 3. Ecology has sent a letter to the Thurston County Water Conservancy Board stating that the recommendation in the Nisqually Watershed Plan should represent a major component for consideration of the public interest test in transferring ground water change decisions in areas of Thurston County designated agricultural lands (Appendix B). Ecology has since agreed to implement this action. To date, Ecology is not approving the transfer of water rights in Thurston County from designated long-term agricultural lands; however, Lewis and Pierce Counties have yet to be addressed.

3.5 Legislative Actions

Three recommendations outlined in the Plan would require some level of State legislative action. These actions were discussed with the Planning Unit in January 2006 and are summarized as follows:

IM – 1 Formal Planning Unit Recommendation to the State Legislature to enable spending of Supplemental Watershed Planning funds during Phase IV, Implementation.

The Planning Unit agreed that it was not timely to pursue IM-1 any further.

WR – 4 Credit for reclaimed water. There are two options identified by this action. (See page 54 of the Phase III Watershed Plan for details).

WR – 5 Recommendation to Ecology to reconcile ambiguity in Reclaimed Water Act. Ecology should assure consistency between water quality and water resource statutes to encourage reclaimed water projects. This effort should include review and amendment of RCW 90.46.130 to remove current conflicts between water quality and water resource values, including the removal of the impairment prohibition, utilization of Ecology's Trust Water Program to purchase assumed impaired rights, or other means. Furthermore, it is recommended that Ecology develop a streamlined water reuse permitting and water right credit system that will enable water reuse project proponents to receive appropriate water right benefits for their investment in improving water quality and conserving the potable water resource (see WR-4 above).

During the 2006 Legislative Session, the organization "Coalition for Clean Water" and the LOTT Alliance (Lacey, Olympia, Tumwater and Thurston County) were active in providing input on proposed bills related to reclaimed water. Additionally, members of the Planning Unit provided input to Legislators on Plan recommendations WR-4 and WR-5.

While there were five bills related to reclaimed water considered by the 2006 Legislature, only two bills were signed into law. SHB 1891, authorizing reclaimed water production by private (non-municipal) utilities, and ESHB 2884. ESHB 2884 updates and provides more comprehensive definitions relating to reclaimed water AND directs the Department of Ecology to undertake rulemaking to provide an updated, comprehensive regulatory scheme for reclaimed water. ESHB 2884 did not specifically address either of the Plan's recommendations related to reclaimed water in WR-4 and WR-5, however it directs rulemaking by December 31, 2010, with the consultation of an advisory committee composed of a broad range of interested individuals representing the various stakeholders that utilize or are potentially impacted by the use of reclaimed water. Because the outcome of the actions through the legislative process is of great importance to the implementation of the Nisqually Management Plan, it is recommended that the Planning Unit participate in the Advisory Committee and rulemaking process outlined in ESHB 2884.

3.6 Recommendations to State Agencies

The following are Plan recommendations to the State agencies and legislature. These recommendations do not require rule change or legislative action, but it is important that the recommendations are understood by the State legislature and associated State agencies. Approval of the Phase III Watershed Plan by Ecology, as the representative agency for the State Caucus, obligates the relevant State agencies to implement the following actions.

Growth and Land Use

GLU – 1b Recommend to DOH that each CWSP be required to include a supply element (and not just service area) from individual water supply plans. This recommendation does not require a revision to the Coordination Act.

GLU – 2 Legislative amendments to comprehensive plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development.

GLU -5 Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use. (This action statement mirrors recent amendments proposed by the Thurston County Planning Commission for the County's Comprehensive Plan, and may require a rule change by Ecology).

Groundwater Resources

GW-7 (EW) This plan recommends that Ecology provide more thorough oversight of exempt wells (see WAC 173-511-070). The issuance of a start card (notice of intent to drill) for an exempt well by well drillers and Ecology's database of start cards should be consistent with available information on Coordinated Water System Plan service area boundaries, available hydrogeologic information on local aquifers, and cumulative effects of exempt wells.

GW-7a (EW) The Department of Ecology should study the cumulative impacts of exempt wells and consider setting a basin-wide standard for the number of houses allowable per exempt well. This plan recommends that Ecology increase their enforcement of the exempt well statute[2] and develop an Exempt Well Action Plan to achieve compliance with the intent of the exempt well withdrawal statute. (See page 43 in the Plan for details). *The Planning Unit will identify areas for characterization in this study as a 2006 work task.*

GW-7b (EW) Once sufficient information is gathered on the cumulative impacts of exempt wells as directed in GW-7a (EW), the Planning Unit may wish to consider avenues to address the drilling of exempt wells in areas where technical data indicate they may have impact on surface water systems. In sensitive areas, this might include the option of drilling in deeper aquifers that are more protective of surface water, if available.

GW-8 (EW) Develop a policy to transfer exempt well water rights within a water service area or urban growth area to a water purveyor and submit to Ecology for water right credit. Define how much credit should be granted for taking exempt wells off line as part of this policy.

[2] Ecology comments stated that they have selectively enforced the exempt well laws as resources have permitted.

Water Rights

WR-1 Current Water Right Application Processing - Recommendation to Department of Ecology. The Planning Unit recommends that Ecology batch process water right applications by sub-basin in the watershed when data available for processing are considered adequate for each sub-basin.

WR-3 Recommended mitigation strategies for water rights processing (see page 53-54 in the Plan for a detailed description of these strategies).

3.7 Water Rights

The Water Rights component of this Plan intends to guide the manner in which the Department of Ecology conducts water rights processing in the watershed. Currently, water rights applications are not being processed due to closures and limited instream flow and staffing shortages throughout the State. As such, this threatens the ability of municipal purveyors to supply water for growth. In WRIA 11, there are currently seven creeks in the watershed that are closed year-round to further water appropriation and seven others that are seasonally closed. Based on this situation, the Planning Unit has made recommendations to the Department of Ecology regarding current water right application processing, in particular action WR-1.

WR-1 states that the Planning Unit recommends that the Department of Ecology batch process water right applications by sub-basin in the Nisqually Watershed when data available for processing are considered adequate for each sub-basin. The Planning Unit is recommending that sub-basins be processed in specific order because some sub-basins have data that are adequate for processing water rights while others do not. Sub-basin based processing will help to avoid delay in processing water rights where data are available. The order of processing is based on the Planning Unit's understanding of information currently available, and is proposed as follows: McAllister, Yelm and Mashel, Toboton/Powell/Lackamas, Muck/Murray and Tanwax/Kreger/Ohop, and Upper Basin. Figure 4 shows the location of all current water right applications on file for WRIA 11.

3.8 Agreements, Approvals and Permits

> RCW 90.82.043[3] "The implementation plan must clearly define coordination and oversight responsibilities; any needed interlocal agreements, rules, or ordinances; any needed state or local administrative approvals and permits that must be secured; and specific funding mechanisms."

The necessary agreements, approvals and permits required to implement the obligations and recommendations outlined in the Watershed Plan and Implementation Plan will be analyzed on an individual or collective basis, as each project is considered and pursued. At the time this Implementation Plan was prepared, the following are being pursued:

- **Coordination and Oversight Responsibilities**: The 2005 MOA (Appendix E) clearly defines the roles and responsibilities of the governments that are involved in the watershed planning process in WRIA 11. Specifically, the role of the Planning Unit and its entities are as a committee formed to prepare the Implementation Plan and put into action the goals of the Watershed Management Plan. The Nisqually Indian Tribe is the lead agency.

- **Interlocal Agreements, Rules, or Ordinances**: The Planning Unit currently operates under a 2005 MOA (see Appendix E) and members of the McAllister/Yelm Sub-committee are currently negotiating MOAs for the stewardship partnership described in Section 3.0, and for other activities in the McAllister and Yelm Sub-basins as outlined in the Watershed Plan. Following instream flow assessment and negotiation, instream flow rule making may occur to update Chapter 173-511 WAC. Other agreements, rules, or ordinances may be authorized as the Planning Unit continues to implement actions prescribed in the Watershed Plan.
- **State or Local Administrative Approvals and Permits**: The Planning Unit expects that the Department of Ecology will batch process water right permit applications (per action WR-1) for any water use that does not meet the provisions of exempt well water use (e.g., residential use less than 5,000 gallons per day and stock watering use) as part of their obligation to implement the Nisqually Watershed Plan. It is expected that Ecology will process those applications in 2006 and 2007. Permits required from federal, state or local agencies to implement plan actions will be determined on a case-by-case basis. This Implementation Plan will be reviewed and approved by the Planning Unit in accordance with the Phase IV operating procedures.
- **Specific Funding Mechanisms:** Section 5.0 of this Implementation Plan addresses funding mechanisms for Watershed Plan implementation.

4.0 IMPLEMENTATION SCHEDULE

The schedule for implementation of the Plan actions (i.e. the policy statements, management strategies, and projects listed in Section 3.0 of this Plan) is summarized below on a year-by-year basis. The timing of the implementation of the actions is subject to funding, legislative action, the availability of data, staffing priorities and limitations, and the commitment of stakeholders to implementation of obligated actions. The availability of funding is a critical component of implementation as without funding many of the projects would not be able to be completed. A list of actions to be implemented year by year is presented on the following Tables. It is important to note that the year associated with each action is an estimate of the year that the action will be implemented and does not necessarily reflect the year that the action will be completed. Some actions may be completed quickly whereas others may be implemented over the long-term. The following tables are included in this Section, immediately following the main text.

- Table 4-1: Completed Actions (as of January 2006)
- Table 4-2: Actions for Implementation in 2006 (updated in May 2006)
- Table 4-3: Actions for Implementation in 2007
- Table 4-4: Actions for Implementation in 2008-2010
- Table 4-5: Long-term Actions for Implementation
- Table 4-6: Actions with Unknown Timelines

Some of the actions are listed on numerous tables because the various entities involved with those actions have varying timelines for implementation of the actions. When an action is listed more than once, it is labeled with the name of the entity that is responsible for implementation that year. Actions with ** symbol after the code indicate projects that were part of the priority ranking. See Table 3-10 for the specific ranking. Actions with † symbol after the code indicate priority projects that were added after the ranking for 2006 occurred.

4.1 Implementation 2006

A summary of the implementation obligations scheduled for 2006 are summarized in Table 4-2. Details, including implementing entities, timelines and interim milestones, and funding mechanisms are included in Tables 3-1 through 3-9. In essence, those projects listed for implementation in 2006 include short-term actions, actions that are in the implementation process that will not be finished until 2006, those deemed a high priority, work tasks for the Planning Unit, and actions that are integral for the completion of other actions. Many of these actions include data gathering projects such as instream flows and water quality. Actions that are not accomplished in 2006 will be addressed in 2007.

4.2 Implementation 2007

A summary of the implementation obligations scheduled for 2007 are summarized in Table 4-3. Details, including implementing entities, timelines and interim milestones, and funding mechanisms are included in Tables 3-1 through 3-9. Those projects listed for implementation in 2007 include short-term actions.

4.3 Implementation from 2008-2010

Recommended actions for implementation in 2008-2010 are included in Table 4-4.

4.4 Long-term Actions for Implementation

Recommended actions for implementation beyond 2010 are considered long-term actions and are included in Table 4-5. These actions are those that will be implemented only after selected short-term actions are completed.

4.5 Review of Actions for Implementation

Since this Implementation Plan is a living document it will grow and evolve over time as actions are implemented and as a better understanding of the nature of the Nisqually Watershed is established. There are actions that will require annual review by the Planning Unit. The following tasks are recommended to be included within the annual review and Implementation Plan update processes:

1. Review, on an annual basis, the list of actions from the Plan that have unknown schedules and attempt to establish timelines and / or reconsider the actions and implementing entities. If new timelines / actions / implementing entities are established these should be included in updates of the Implementation Plan as needed. These actions also include orphan recommendations (i.e. recommendations that currently have not been assigned to an implementing entity). Actions that are not accomplished in the estimated implementation year will be addressed the following year.
2. Annual review of Plan recommendations, namely short-term actions and long-term actions that depend upon the completion of short-term actions.
3. Review of actions that require funding.
4. Update Completed Actions table based on any projects or processes that were completed over the course of the year.

5.0 FUNDING OPTIONS

In order to implement the Plan, incorporate adaptive management concepts, and continue with local water resources management per the intent of Chapter 90.82 RCW, annual funding will be required. The Memorandum of Agreement (MOA) between the expanded initiating governments states that costs required to prepare this Implementation Plan and to implement the actions in the plan will not be incurred by any member of the Planning Unit unless that entity voluntarily agrees to provide the resources required to implement an action. It is expected that funds for implementation will be generated through grants and in-kind donations. The allocation of funds must be approved by the Planning Unit.

This section addresses the requirement for the Implementation Plan to define "specific funding mechanisms" (per RCW 90.82.043[3]) for implementation of the Plan actions. The following funding mechanisms are to be considered: 1) Phase IV Implementation funds; 2) resources committed by implementing entities; 3) administrative and implementation funding options developed by the Planning Unit for Phase IV and beyond; and, 4) grant funding.

5.1 Phase IV Watershed Planning Funds

Phase IV Watershed Planning Implementation funds provided by the State Legislature (House Bill 1336 and Senate Bill 5073) include:

- Up to $100,000 per year for the first three years of implementation, with a 10% required match. Second and third year funding is conditioned on the completion of an approved Implementation Plan.
- At the end of three years, up to $50,000 for the fourth and fifth years of implementation, with a 10% required match.
- Cities, counties and special district entities are authorized to expend up to ten percent of their existing water-related revenues and water-related funds on implementation of new watershed plan projects or activities.

With reference to Table 3-10, Phase IV Implementation funds will be applied to projects per agreement by the Planning Unit. Some of the funds will be utilized by the Planning Unit to:

1. Coordinate Phase IV activities (public outreach, meetings, meeting documentation);
2. Develop and administer the needed local and state agreements to support implementation;
3. Apply for and administer the Phase IV Watershed Planning grants with Ecology; and,
4. Apply for additional grants to fund specific implementation actions (see summary of grant funding sources in Appendix C of this Implementation Plan).

Options for funding include grant applications, identification and solicitation of federal funding, foundation funding, projects as agreed upon by the PU, public/private initiatives and providing lead agency support and in-kind services.

5.2 Resources Committed by Implementing Entities

The implementation tables (3-1 through 3-9) provide a summary of the Plan policy statements, management strategies, and projects and the entities that have committed, by approval of the WRIA 11 Plan, to fulfill these obligations. The specific funding mechanisms provided by the implementing entities are also summarized on these tables. No attempt has been made to quantify the value of these commitments. However, the total value is significant. An overview of some of these important funding commitments include:

- The legislature, through Ecology, has provided funding for the Planning Unit to complete the WRIA 11 instream flow assessment on the Mashel River.
- Ecology staff will provide technical assistance with instream flow assessment and negotiation at cost to the agencies.
- The Planning Unit has allocated $10,000 in their first year of Phase IV for the funding of a partial study of a groundwater model run of cumulative impacts of withdrawal.

5.2.1 Agreements for Implementing Funding Structure

The Memorandum of Agreement (MOA) between the expanded initiating governments of the Nisqually Planning Unit is discussed in Section 3.8 and attached as Appendix E.

5.3 Review of Grant Funding Sources

In order to aid in the implementation of actions prescribed in this Implementation Plan, specifically for those policy statements, management strategies, and projects that will not be funded through Phase IV Watershed Planning funds, additional funding sources must be sought. The most common additional funding sources include:

- Specific grants that may be available through the Washington State Departments of Ecology, Fish and Wildlife and Health. These will vary over time.
- Federal funding sources for monitoring, pollution prevention and control, watershed and drinking water source protection, wetlands and wildlife. These funding sources are compiled in EPA's *Catalog of Federal Funding Sources for Watershed Protection* (EPA, 2003).
- Centennial Clean Water Funds available through the Washington State Department of Ecology.
- The Northwest Power and Conservation Council funding of habitat restoration projects and public involvement and education through the Bonneville Power Administration (BPA).
- Fundraising by the Watershed Planning Unit.
- Boise State University's Environmental Finance Center has partnered with the EPA's Environmental Finance Program to provide a searchable database containing funding options for a variety of environmental protection programs including watershed planning. The database can be found at the following Boise State website: http://efc.boisestate.edu/

A list of alternative funding sources obtained from Boise State University is included in Appendix C. Some of the grants listed in the table may not be applicable to the watershed, so some level of scrutiny must be applied when referencing this table for viable funding options.

- Additional State Ecology funding for water storage projects.

6.0 PLANNED FUTURE USE OF INCHOATE MUNICIPAL WATER RIGHTS

This section of the Implementation Plan meets the requirement of RCW 90.82.048 [1]and [2] for the Planning Unit to address the planned future use of inchoate municipal water rights, including how these rights will be used "to meet the projected needs identified in the watershed plan, and how the use of these rights will be addressed when implementing instream flow strategies identified in the watershed plan."

6.1 Definition of Inchoate Municipal Water Rights

Municipal water rights are water rights held by entities that supply water for municipal purposes. Per RCW 90.03.015, municipal water use is defined as:

> *"beneficial use of water: (a) For residential purposes through fifteen or more residential service connections or for providing residential use of water for a nonresidential population that is, on average, at least twenty-five people for at least sixty days a year; (b) for governmental or governmental proprietary purposes by a city, town, public utility district, county, sewer district, or water district; or (c) indirectly for the purposes in (a) or (b) of this subsection through the delivery of treated or raw water to a public water system for such use.*

Per RCW 90.03.550, beneficial use municipal supply may also include:

> *"water withdrawn or diverted under such a right and used for:*
>
> 1. *Uses that benefit fish and wildlife, water quality, or other instream resources or related habitat values; or*
> 2. *Uses that are needed to implement environmental obligations called for by a watershed plan approved under Chapter 90.82 RCW."*

Under current law, water rights for municipal supply purposes may be retained as inchoate since they are not "relinquished" due to lack of use.

6.2 Inchoate Municipal Water Rights in WRIA 11

In December 2005, the Planning Unit sent letters to the Group A water suppliers in WRIA 11 inviting them to attend the January 2006 Planning Unit meeting. The letter described the watershed planning process and Phase IV requirements to identify inchoate water rights of Group A systems. Group A water suppliers were invited to become active in other aspects of the watershed planning process and were encouraged to attend Planning Unit meetings. Approximately 158 letters were sent to Group A water suppliers and 29 were returned by the Postal Service as "undeliverable." A copy of the letter sent and a list of Group A water suppliers are included in Appendix D.

In an effort to assess the municipal inchoate water rights in WRIA 11, the Planning Unit is attempting to obtain annual water-use data and the number of current connections for all of the Group A water suppliers and water right data for those systems.

Water rights data was obtained from the Department of Ecology WRATs database in order to determine the allocated quantity of water for each Group A water supplier. These data, however, were not compatible with the database of Group A water suppliers that Department of Health maintains. There is no common field between the two databases that allow linkage between water

rights and water use, such as the water system ID number. The Department of Health database was able to provide the following information:

- Water System Identification Number;
- Water System Name;
- Water System Address;
- Water System Contact Name;
- Phone Number;
- Number of Current Connections; and
- Number of Approved Connections.

In an effort to collect water right and water use data by Group A purveyor, the Planning Unit drafted a second letter to the Group A water suppliers requesting the following data:

1. Annual water right(s) and associated water right(s) identification number(s)
2. Current cumulative instantaneous water right (and associated water right identification number(s))
3. Currently installed pumping capacity
4. Most recent reported annual average water use (including the year for which it is reported);
5. Number of connections (for the year reported in #4).

If and when this information is received from municipal purveyors, inchoate water rights associated with municipal systems in WRIA 11 can be estimated. This assessment will help indicate the amount of permitted, municipal water available for future growth and instream flow strategies in the watershed. Additional funding will be required in order to process this information.

The completion of the above activities is consistent with action item WR-9, which recommends the development of a watershed-wide water balance to better understand water availability by sub-basin. This study would include an assessment of actual water use versus permitted/certificated use.

The Planning Unit plans to submit a request to the State agencies to develop mutually compatible databases or systems that will enable Planning Units to efficiently conduct the inchoate water right assessment in the future.

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TABLES[1]

[1]All Tables report project status as of May 2006 unless otherwise noted.

Table 3-1
Growth and Land Use Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the Coordinated Water System Plan (CWSP) process should be developed.	3.3, p. 22	Thurston, Pierce and Lewis Counties, Yelm, Roy, Eatonville, Olympia, Lacey.	Lacey's Comprehensive Plan will not be updated until 2009 (it was approved in 2003). There is a moratorium on growth outside of the city limits within the Urban Growth Boundary due to a lack of available water. Through its comprehensive plan and water system plan, Olympia is evaluating water supply availability in its growth planning. Water supply planning is done when updating Comprehensive Water Supply Plans by respective jurisdictions. Yelm is due to update their plan in 2008. Yelm will be working in 2006 & 2007 to draft and complete a Comprehensive Reclaimed Water Plan that will include integrated planning between the water, sewer and reclaimed water utilities. Pierce County: This is accomplished as Comprehensive Plan amendments are processed through the County's Planning Dept. Eatonville: Water Comprehensive Plan will be adopted in 2006. Thurston County: Recent update to Comprehensive Plan that water supply needs to be considered in designating resource lands.	The Olympia Water system Plan is funded by the utility and is updated every 6 years. The next update is scheduled for 2008. Yelm: Funding for Reclaimed Water Plan - secured; 2008 Comprehensive Water Plan will be funded thru Yelm water rates	Undetermined
CWSP Updates	GLU - 1a*	Look for opportunities to resolve inconsistencies between Pierce and Thurston CWSPs such that all CWSPs within the Nisqually Watershed are consistent in their review and coordination of Water System Plans and are also reviewed with respect to consistency with comprehensive plans.	3.3, p. 23	[Water Utilities Coordinating Committees], Pierce County Public Works and Utilities, [Thurston County Public Utilities District #1].	Pierce County will participate in future updates of the Thurston County CWSP.		Undetermined
	GLU - 1b*	Recommend to DOH that each CWSP be required to include a supply element (and not just service area) from individual water supply plans. This recommendation does not require a revision to the Coordination Act.	3.3, p. 23	Washington Department of Health (DOH)	**Implementing body will write a letter to DOH, if warranted.**		Undetermined
	GLU - 1c*	Recommend that a County-wide CWSP for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.	3.3, p. 23	Thurston CWSP Committee? [Thurston Water Utilities Coordinating Committees], [Thurston County Public Utilities District #1], Dept. of Health	The Thurston County wide CWSP has not been done. There is question as to whether the Thurston PUD should do this work or the Thurston Regional Planning Council, or some combination thereof. **On hold pending further discussion.**	CWSP is biggest funding issue.	Undetermined
	GLU - 1d*	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a CWSP.	3.3, p. 23 4.2.6, p. 36	Pierce County Public Works and Utilities, [Thurston County Public Utilities District #1], [Water Utilities Coordinating Committees], DOH	Thurston believes there has been No Action.		Undetermined
	GLU - 1e*	Recommend that CWSPs address water rights associated with failed water systems. CWSPs should specify that when purveyors take over failed water systems that have their own source(s), the acquisition should also include the water rights for the water service area.	3.3, p. 23	Pierce County Public Works and Utilities, [Thurston County Public Utilities District #1], [Water Utilities Coordinating Committees].	This is currently addressed in the Pierce County CWSP. The next update is in 2008.		Undetermined
	GLU - 1f*	CWSPs should require purveyors to provide counties information about how much water is available for hook-ups through approval of Water System Plans. This would allow Counties a working number of connections remaining under the existing Water System Plan	3.3, p. 23	Thurston and Pierce Counties, [water suppliers]	No Action to date. This occurs via DOH approval of small water systems.		Undetermined
General Planning Policies	GLU - 2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development.	3.3, p. 23	Thurston, Lewis, and Pierce Counties, Yelm, Eatonville, Olympia, Lacey.	Need clarification on this action because it seems like City of Lacey doesn't have jurisdiction to do this since it needs legislative amendments. Doesn't apply to Thurston County. The City of Olympia is evaluating infrastructure needs as a part of its comprehensive planning efforts. Yelm Looked at during annual updates to Capital Facilities Plans. Pierce County Planning staff review this as part of the Comprehensive Plan amendment process. Eatonville: Finalized updates to Comprehensive Land-use Plan and will be adopted in 2006. **Recommend convening a workgroup to discuss this topic further. This is adopted as an ordinance by the counties. Long-term Action.**	Olympia: Water infrastructure is funded through a combination of General Facilities Charges and rates. Yelm: Funded locally thru general and utility funds in Yelm.	**Long-term**
	GLU - 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.	3.3, p. 23-24	Thurston, Lewis, and Pierce Counties, Yelm, Eatonville, Olympia, Lacey.	Thurston County is not going to increase the density of land use any further as it is at capacity now (1 per 5 acres). The county is currently under WWGMHB order to reduce Urban Growth boundaries. N/A for Lacey due to moratorium. Olympia evaluates water supply availability in UGA expansions through our Water System Plan. Yelm has adopted Interim Water Service Policies (2002) that restrict expansion of the water service area unless the area can provide water rights sufficient to serve the property. Pierce: This is currently a requirement in order to justify expansion of an Urban Growth Area. Eatonville: Will address water supply for any urban growth boundary changes. Also addressed in the Water Comprehensive Plan.	The Olympia Water system Plan is funded by the utility and is updated every 6 years. The next update is scheduled for 2008. Yelm - funding for Reclaimed Water Plan - secured; 2008 Comprehensive Water Plan will be funded thru Yelm water rates.	Olympia: Ongoing Yelm: 2006 - 2008 Eatonville: 2006 Lacey - N/A Pierce - unknown
	GLU - 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.	3.3, p. 24	Ecology, Thurston, Lewis, and Pierce Counties	**Complete-** Thurston County met with Ecology and wrote an issue letter that was sent to Thurston Water Board. After meeting with Thurston County, Ecology is now not approving transfer of water rights in Thurston from designated long-term agriculture Lands. Lewis and Pierce Counties have yet to be addressed. Pierce: This is being worked on through Graham Community Plan update. DOE may need to be on-board regarding "change in use" requests.		**Complete**
	GLU - 5	Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use.	3.3, p. 24	Ecology, [Water Conservancy Board of Thurston Co.]	After meeting with Thurston County, Ecology is now not approving transfer of water rights in Thurston from designated long-term ag. Lands. Lewis and Pierce Counties have yet to be addressed. Thurston met with Ecology in August with issue paper which identified policies that apply to this action. Ecology and AG agreed to implement this action. A letter was sent to the Thurston County Water Conservancy Board stating that GLU-5 recommendation in the Nisqually Watershed Plan should represent a major component for consideration of the public interest test when considering transfers in ground water change decisions in areas of Thurston County designated as agricultural lands.		Undetermined

*GLU-1a-f are expected to be addressed through CWSP updates, not as standalone actions by Counties.
As CWSP updates have not been scheduled in Thurston County, the PUD and water utilities would need to secure sufficient funding sources in order to carry out the update.

Table 3-2
GW Resources, Supply Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
WRIA Boundaries and Groundwater Divides	GW - 3 (GD)	Policy statement addressing WRIA boundaries versus groundwater divides. For instances where WRIA boundaries and groundwater divides are not the same, the Nisqually Watershed (WRIA11) Planning Unit will work with the Planning Units from WRIA 12 (Chambers Clover Watershed) and WRIA 13 (Deschutes Watershed) to develop a policy for coordination and congruence for groundwater that does not follow the WRIA boundaries.	4.3.2, p. 40-41	Implementing body. Nisqually Indian Tribe	WRIA 13 no longer has an active PU. McAllister TG and models addressing this issue.	Funded by utilities.	2006+
	GW - 4 (GD)	Address locations of groundwater divides through a joint study, or development of joint management strategies, with the Chambers Clover Planning Unit to identify groundwater divide between WRIAs 11 and 12.	4.3.2, p. 41	**Pierce County**, WRIA 11 and [WRIA 12]	**Pierce County studies are underway. Muck Creek Plan is addressing this. This plan is currently underway and is expected to be completed in the summer of 2006. Water flow direction is expected to be to the northwest.**	needs funding	2006
Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.	4.3.3, p. 41	Thurston, Lewis and Pierce Counties, Yelm, Lacey, Olympia	Thurston County recently updated CARA regulations in CAO. The CAO is draft, and has not been adopted yet.Yelm recently adopted their CAO update based on DOE's model ordinance. Lacey is waiting for adoption of CAO. Olympia's CAO covers areas outside WRIA 11. The City of Olympia completed an amendment of its Critical Areas Ordinance in 2004. The ordinance includes elements related to aquifer recharge and groundwater protection.	Olympia: We implement this through our Groundwater Protection Program. No funding needed, policy only for Yelm.	Thurston Co. - 2007 Yelm - Complete Olympia - Complete Lacey - 2008 Pierce - Complete
	GW - 5a (AR)	During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.	4.3.3, p. 41	Thurston, Lewis and Pierce Counties, Yelm, Lacey, Olympia	Thurston county's proposed CAO? CARA is in accordance with DOE guidelines. Lacey is waiting for adoption of CAO. The City of Olympia provided feedback to Thurston Co. on the draft CAO related to CARA regulations. The City of Olympia CAO is less restrictive than Thurston County's. Yelm's adopted CAO. CARA section is based on DOE's model ordinance. Pierce: To be done as needed.	Olympia: We implement this through our Groundwater Protection Program. No funding needed, policy only for Yelm.	Thurston Co. - 2007 Yelm - Complete Olympia - Complete
	GW - 5b (AR)	Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.	4.3.3, p. 41	Thurston, Lewis, and Pierce Counties	Thurston Co. formed a technical advisory committee, which included staff from Lacey and Olympia. In addition, each jurisdiction was invited to review and comment on the CARA during the public comment period. Cities were invited to the technical committee to help craft CARA.		Thurston Co. - 2007 Lacey - complete Pierce - Complete
	GW - 5c (AR)	Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.	4.3.3, p. 41	Thurston, Lewis and Pierce Counties, Yelm, Lacey, Olympia	Thurston Co's CAO update, as well as Yelm's newly adopted CAO ordinance, used best available science including DOE guidelines of ARA. The CARA update includes all WDOH approved wellhead protection areas. Lacey is waiting for adoption of CAO.	Olympia: We implement this through our Groundwater Protection Program. No funding needed, policy only for Yelm.	Thurston Co. - 2007 Yelm - Complete Olympia - Complete Lacey - complete Pierce - Ongoing
	GW - 5d (AR)	Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).	4.3.3, p. 41-42	Thurston, Lewis, and Pierce Counties, Yelm, Eatonville, Olympia, Lacey, and water suppliers.	Thurston Co's TAC used a risk-based matrix to determine which land uses should be restricted within CARAs. The CAO clarified language regarding hydrogeological studies needed for projects that have the potential to impact groundwater quality. The CAO defines how to use an assimilative capacity approach for restricting new land uses that could increase nitrate concentrations. Nonconforming uses may not be expanded unless they comply with current standard. Lacey: Thurston did a good job with the update by putting together a technical committee. The City of Olympia provided feedback to Thurston Co. on the draft CAO related to these issues in writing. A copy of that letter provides more details. Eatonville: CAO recently revised and adopted.	Olympia: We implement this through our Groundwater Protection Program.	Thurston Co. - 2007 Eatonville - Complete Olympia - 2006+ Lacey - Complete Pierce - Unknown
	GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up. If these land uses are nonconforming uses they should be prohibited from further contaminating groundwater.	4.3.3, p. 42	Thurston, Lewis, and Pierce Counties, Yelm, Eatonville, Olympia, Lacey, and water suppliers.	Thurston: No action to date unless it is the wellhead protection areas. Lacey: CAO does not have ability to influence cleanup. Olympia: What about clean-up activities that are within WDOE and Fort Lewis jurisdiction? Olympia coordinates with responsible parties/agencies on clean-up within Wellhead Protection Areas. Yelm: No action to date unless it is the wellhead protection areas. Eatonville: Will address through Storm water Comprehensive Plan that will be implemented in 2006.	Olympia: We implement this through our Groundwater Protection Program.	Eatonville - 2006 Pierce - Unknown
Exempt Wells	GW - 7 (EW)	Ecology should provide more thorough oversight of exempt wells. The issuance of a start card for an exempt well by well drillers and Ecology's database of start cards should be consistent with available information on Coordinated Water System Plan service area boundaries, available hydrogeologic information on local aquifers, and cumulative effects of exempt wells.	4.3.4, p.42	Ecology	Ecology committed to improving exempt well database including cumulative impact wells through established watershed water reserve and debit system relating to increased water use. **No action to date, but tribe is interested in pursuing. Eatonville sent letter to Ecology and county asking them not to allow new exempt wells to be drilled in the town's supply area.**		Ecology - 2006 (ongoing)
	GW - 7a (EW)	Ecology should study the cumulative impacts of exempt wells and consider setting a basin-wide standard for the number of houses allowable per exempt well. This plan recommends that Ecology increase their enforcement of the exempt well statues and develop an Exempt Well Action Plan to achieve compliance with the intent of the exempt well withdrawal statue including the following: (see page 43 in Watershed Plan).	4.3.4, p. 42-43	Ecology	Ecology will continue to enforce 1998 AG's opinion to the extent that resources are available. Expanded exempt well oversight will require legislative action. Ecology is committed to working wit h the PU to address issues of exempt wells in the watershed.**The tribe may be interested in this and it was suggested that they write a letter.**		Ecology - 2006 (ongoing)
	GW - 7b (EW)	Once sufficient information is gathered on the cumulative impacts of exempt wells as directed in GW-7a (EW), the Planning Unit may wish to consider avenues to address the drilling of exempt wells in areas where technical data indicate they may have impact on surface water systems. In sensitive areas, this might include the option of drilling in deeper aquifers that are more protective of surface water, if available.	4.3.4, p. 43	Implementing body	No action to date. PU may make recommendations based on study recommended in 7a. Contingent on Ecology action GW-7a (EW). **Information must be gathered first. May require legislative attention. Long-term Action to pursue at a later date.**	No specific funding	**Long-term**
	GW - 8 (EW)	Develop a policy of transfer of exempt wells' water rights within a water service area or urban growth area to a water purveyor and submit to Ecology for water right credit. Define how much credit should be granted for taking exempt wells off line as part of this policy.	4.3.4, p. 43	Implementing body	**Follow-up with Graham Hill. Yelm Sub-basin has this as an action in their plan.**	No specific funding	2007

Note- Agencies or groups listed in the Responsible Entity column enclosed in brackets "[agency]" have not been formally involved in the watershed planning process. These agencies and groups cannot be officially obligated by this Watershed Implementation Plan.

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Current Water Right Application Processing	WR - 1	Current water right application processing - Recommendations to Ecology. PU recommends that Ecology batch process water right applications by sub-basin in the watershed when data available for processing are considered adequate for each sub-basin.	5.3, p. 49-50	Ecology	Ecology agreed to process water rights within the McAllister sub-basin in 2005. Ecology now working with Yelm, Olympia and Lacey. Progress has happened with the processing of Lacey and Olympia. Lacey has modeled their withdrawals and is meeting with Ecology. Yelm has initiated its modeling and will meet with Ecology as soon as it's complete. If McAllister isn't done and others are ready- they can be processed at that time rather than waiting until McAllister is done.		Yelm- 2006/2007
	WR - 1a	Water right applications for water withdrawal from the McAllister sub-basin be evaluated using either the McAllister Numerical Model or a new expanded model built upon it.	5.3, p. 50-51	Ecology	The recommendation did not acknowledge that access to the model was a barrier to implementation. The model was made available to Yelm and Lacey in July 2005. Yelm, Lacey, and Olympia are now coordinating (with DOE too) on modeling efforts so that methods are standardized.		2006
	WR - 1b	Water right applications - Yelm sub-basin. It's recommended that the City's applications be batch processed with the McAllister Sub-basin.	5.3, p. 51	Ecology	Yelm's study shows that the new well is water from the McAllister sub-basin. Once information is available from the SW Yelm well drilling and pump testing and the model parameters have been fully identified, Yelm will meet with Ecology to determine the timing of Yelm's applications as they relate to Ecology's processing of McAllister sub-basin applications.		2006/2007
	WR - 1c	Water right applications - Mashel sub-basin. It's recommended that Eatonville complete the data collection efforts specified in the short-term action plan for the Mashel/Ohop Sub-basins prior to the processing of water rights in this sub-basin.	5.3, p. 51	Ecology			Ecology - 2006 & 2007
	WR - 1d	Water right applications - Toboton/Powell/Lackamas sub-basin. Ecology should move forward with processing the groundwater applications in these sub-basins as soon as possible.	5.3, p. 51-52	Ecology	Ecology will process following processing of McAllister sub-basin applications.		Unscheduled
	WR - 1e	Water right applications - Muck/Murray sub-basin. Water right applications should be batch processed with the appropriate WRIA.	5.3, p. 52	Ecology	Ecology will process following processing of McAllister sub-basin applications.		Undetermined
	WR - 1f	Water right applications - Tanwax/Kreger/Ohop sub-basin. Ecology should recognize instream flow issues associated with prairie streams in Tanwax and Kreger sub-basins and deny all applications for surface water rights or for groundwater rights that draw water from shallow groundwater in the vicinity of prairie streams.	5.3, p. 52	Ecology	Ecology is paying particular close attention to issuance of water rights in areas where prairie streams may be effected. (on going).		Undetermined
	WR - 1g	Water right applications - Upper Basin sub-basin. New applications in the Upper Basin should only be considered after batch processing of the rest of the sub-basins occur with the exception of public health emergencies.	5.3, p. 53	Ecology	Ecology has no immediate plans to process water rights in the Upper Basin.		Undetermined
	WR - 2	Recommendation that Ecology be staffed at a level that ensures timely response to water right applications and monitoring of withdrawals.	5.3, p. 53	Ecology	Ecology limited by legislative budget allocations. Efforts to secure additional staffing are a priority. (on going).		Undetermined
	WR - 3	Recommended mitigation strategies for water rights processing (see page 53-54 in Watershed Plan).	5.3, p. 53-54	Ecology	Olympia's mitigation plan is considering strategies from this list, plus a few other strategies not on the list. McAllister Sub-basin group possibly send a letter to Ecology reminding of mitigation strategies in Nisqually. Olympia uses the list on pg. 53. Yelm - Results from modeling will prompt recommended mitigation strategies.		2006/2007
	WR-4	Credit for reclaimed water. There are two options identified by this action. (See page 54 in Watershed Plan for details).	5.3, p. 54	Ecology, [Legislature]	During the 2006 Legislative Session, the organization "Coalition for Clean Water" and the LOTT Alliance (Lacey, Olympia, Tumwater and Thurston County) were active in providing input on proposed bills related to reclaimed water. Additionally, members of the Planning Unit provided input to Legislators on Plan recommendation WR-4.		Yelm- 2006 Ecology - possibly 2006/2007
	WR-5	Recommendation to Ecology to reconcile ambiguity in Reclaimed Water Act. Assure consistency between water quality and water resources statutes to encourage reclaimed water projects. Develop streamlined water reuse permitting and water right credit system that will enable water reuse project proponents to receive appropriate water right benefits for their investment in improving water quality and conserving the potable water resource.	5.3, p. 54-55	Ecology	During the 2006 Legislative Session, the organization "Coalition for Clean Water" and the LOTT Alliance (Lacey, Olympia, Tumwater and Thurston County) were active in providing input on proposed bills related to reclaimed water. Additionally, members of the Planning Unit provided input to Legislators on Plan recommendation WR-5.		2006 & 2007 Legislative Sessions
	WR-6	Mechanism for water rights governing body support of water right application. Creation of a mechanism for a WRIA 11 "water rights governing body" charged with providing comment on water right applications for new rights or transfers within the Nisqually Watershed.	5.3, p. 55	Ecology, Implementing body, [Water Conservancy Board of Thurston County]	No action to date- need an implementation group 1st.		Ecology - possibly 2006/2007
	WR-7	Address sub-basin closures (see ISF-2 and ISF-3). Plan recommends a study to better understand basis of closures and current instream flow conditions.	5.3, p. 55	Ecology, Implementing body, WDFW	No action to date- need an implementation group 1st. Ecology: Nisqually not a priority watershed for instream flow assessment since the basin is closed and river flows are maintained through the Nisqually Coordination Agreement.		Ecology - possibly 2006/2008
	WR-8	Investigate the potential for purchase, sale or lease of water rights (e.g. water bank).	5.3, p. 55	Implementing body with state agency support	No action to date	Possibly need funding	Undetermined
	WR-9	Development of watershed-wide water balance to better understand water availability by sub-basin.	5.3, p. 55-56	Implementing body	No action to date	Need funding	2007

Table 3-4
Instream Flows Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Policy/Process	ISF-1	Creation of a policy statement to support protection of instream resources: *Support protection of resources by maintaining closures unless new technical information suggests otherwise, or a change in closure status would result in improved flow or habitat conditions in the closed stream or closed streams in other sub-basins.*	6.3.1, p. 64	Ecology, Implementing body	Ecology has policy of protecting instream flows through conservative management and enforcement of closures.		Ecology - 2006 (ongoing)
Projects	ISF-2	Gain better understanding of technical basis for stream closures watershed-wide. The basis of closures could be studied as part of instream flow study.	6.3.2, p. 65	Implementing body		need funding	Undetermined
	ISF-3	Identify and gage flow compromised streams based on intermittent nature and beneficial use(s). Design and install a network of stream gauging stations to monitor these streams and develop an understanding of the hydrology, including current and historical conditions via data collection, analysis and modeling. Includes installation of gauging stations on: Yelm Creek; Muck Creek; Powell, Murray, Toboton, Tanwax, and Horn Creeks. **Possibly document the flow nature of these creeks in order to determine whether they can be gauged due to seasonal/intermittent nature.**	6.3.2, p. 65	Pierce County and Nisqually Tribe	Pierce County has gauges on Tanwax and Horn Creeks. This study will be further defined in a scope for future grant funding.	need funding	**High Priority** 2006+
	ISF-3a	Yelm Creek ISF-3	6.3.2, p. 65	Nisqually Tribe	Not yet implemented	need funding	2007
	ISF-3b	Muck Creek ISF-3	6.3.2, p. 65	Nisqually Tribe	Not yet implemented	need funding	2007
	ISF-3c	Powell, Murray, Toboton, Tanwax, and Horn Creek ISF-3	6.3.2, p. 65	Nisqually Tribe	Not yet implemented	need funding	2007
	ISF-4	Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.	6.3.2, p. 65	Yelm, Eatonville	**IMPLEMENTED** Yelm: the continuity of GW/SW in the Yelm Creek basin is to be studied only if the SW Yelm well investigation/modeling does not provide sufficient information for development of the future water source. Eatonville: A hydraulic continuity study has been conducted on the Mashel River in the vicinity of Eatonville, and Eatonville has conducted hydrogeologic investigations during new well construction that evaluated groundwater under the influence of surface water.	Yelm may need funding if SW wells tests are inconclusive	Yelm 2008-2010 (if needed) Eatonville - 2006+
	ISF-5	Identify or study methods of surface water augmentation. Methods of surface water augmentation could include reuse, artificial recharge, and/or storage-related projects. This Plan recommends development of strategies to improve and/or augment instream flows in intermittent streams. This could include identification of storage options to augment flows when they are critically low or intermittent. Recommendations for pilot projects should be made as part of this study.	6.3.2, p. 65	Implementing body	Eatonville ASI project falls into this subject. They were put on a supplemental list for a grant.	need funding	2006+

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Water Quality	WQ-1	Implement watershed-wide Water Quality Monitoring Plan. As applicable, the plan will assist planning efforts by providing a framework to determine whether data of the appropriate quantity and quality are collected, optimize the sample locations, improve consistency in the data collected, improve coordination of sampling efforts, and be cost-effective for future studies. The Planning Unit recommends implementation of actions recommended in the Water Quality Plan.	7.3, p. 71	Implementing Body	Complete		**Complete**
	WQ-2	Maintenance and use of the Nisqually Water Quality Data System. The Water Quality Monitoring Plan also recommends creation of the Nisqually Water Quality Data System, a dynamic GIS/Access water quality database in which water quality data from throughout the watershed can be stored, compared, and accessed through a spatial GIS interface. Funding for the creation of this database was provided as a supplemental grant to the Watershed Planning process.	7.3, p. 71	Nisqually Indian Tribe, with cooperation from water sampling programs in the watershed.	Complete		**Complete**
	WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.	7.3, p. 71	State agencies, Pierce, Lewis, and Thurston counties, local, utilities, towns, Nisqually Indian Tribe, DOT, Tacoma Power, Fort Lewis	Neither Tacoma Power, Fort Lewis, or Thurston County is aware of the formation of a workgroup. Someone needs to take the lead on this.Thurston Co.: Doesn't apply herbicides to county roads.		2007
	WQ-4	Address land uses that may threaten watershed health through an open forum with agencies and the public.	7.3, p. 72	Implementing body	Defer action on this.		2008
	WQ-5	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.	7.3, p. 72	Thurston, Lewis, and Pierce Counties, Fort Lewis	Not yet implemented. Planning Unit: Need to convene a work group to see how groundwater is currently monitored and to see what still needs to be done.Fort Lewis: Doesn't do any groundwater monitoring except in association with a TCE plume. Doesn't have any funding for monitoring.**Convene a workgroup to determine status of water quality monitoring in the watershed. Which areas are not being monitored? Which areas not in critical aquifer recharge areas? Given the outcome of the workgroups research, consider whether this needs funding for future monitoring.**	needs funding	2007

Table 3-6
McAllister Sub-basin Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Short-Term Actions	MC-2	Sub-basin committee support of WR-1a.	8.4.1, p. 79	Ecology	Ecology is working with PU and McAllister committee to develop a Regional Water Management Plan.		2006-2007
Short-Term Solutions	MC-2a	City of Lacey short term water supply solutions.	8.4.1, p. 79	Lacey	The Tribe has been discussing Lacey's application internally, and with Lacey staff. This recommendation is still under development, and discussions are on-going between the Nisqually Tribe, Ecology, and the city.	needs funding	2006
	MC-2b	City of Olympia short term water supply solutions.	8.4.1, p. 79	Olympia	The tribe has been discussing Olympia's applications internally, and with Olympia staff. This recommendation is still under development, and discussions are on-going between the Nisqually Tribe, Ecology, and the city.	needs funding	2006 Olympia - 2006+
	MC-3, MC-12	Improve understanding of direction of regional groundwater flow. (Modeling). Update water budget for sub-basin using data collected for the various studies recommended in this action plan.	8.4.1, p. 79-80 8.4.2, p. 82	Nisqually Indian Tribe, Olympia, Lacey, Yelm, [Rainier], Implementing Body	Olympia has invested heavily in the development of a groundwater model of the McAllister Sub-basin and surrounding area (total of 210 square miles). Information gained from this model is being used to evaluate the impacts of proposed groundwater withdrawals by Olympia, Lacey and Yelm. Both Lacey and Yelm have scoped for modeling work that includes reducing model cell sizes in the vicinity of new production wells to 100'x100'. Lacey: Completed all modeling runs of water requested in sub-basin. Finding out that current model is adequate to evaluate Yelm's applications too. **Will use funding to pull together everyone's modeling data and see what impacts are likely to occur to surface water.** (MC-12) TG already talking about sub-basin wide modeling that, among other things, will support updating the water budget. When the Tribe has completed water demand projections, the TG should be able to move forward on this recommendation. The TG will be asking the PU for implementation funds for modeling. **Done as part of modeling work.**	Yelm: Funded, DOE grant AND local funds. **Some funding, $10,000, has been approved for this. Tribe applied for $30,000 EPA grant.**	2006
	MC-4	Recommend options for mitigating impacts from other applications and long term water supply solutions.	8.4.1, p. 80	Ecology	Yelm, Lacey, and Olympia are considering this recommendation while planning modeling and mitigation plans. Ecology is awaiting submittal of mitigation proposal.	Yelm - reclaimed water "plan" funded. Actual mitigation strategies will need funding	Yelm - 2006/2007 Olympia - 2006 Ecology - 2006/2007
	MC-5	Develop programs for monitoring potential impacts to existing water rights.	8.4.1, p. 80 8.4.2, p. 81	Implementing body		**Ecology funds?**	2007
	MC-5a	Potential flow monitoring on Lower Nisqually River.	8.4.1, p. 80 8.4.2, p. 81	Implementing body	Clark offered to write a letter to Ecology asking them to install a flow gage at RM 4.3. Maintenance and data downloads could be coordinated through a joint monitoring effort of the WRIA. **Tribe models show that some water will be pulled from the river. Yelm looking at pumping from deep aquifer which may impact river.**	needs funding and implementation group	2007
	MC-5b	Long term monitoring for surface water impacts from regional supply.	8.4.1, p. 80 8.4.2, p. 81	Implementing body	TG has suggested that a long-term monitoring program also needs to be tied to mitigation planning. Ideally there will be a regional monitoring program as opposed to individual efforts. The TG will be asking the PU for implementation funds for a regional monitoring program.	needs funding and implementation group	2007
	MC-6	Sub-basin committee support of GW-3(GD)	8.4.1, p. 80	Implementing body	The PU needs to contact WRIA 12.	Funded by utilities	2006
	MC-7	Recommendations for Nisqually/McAllister TMDL study.	8.4.1, p. 80-81 8.4.2, p. 81	Thurston County, Ecology, Implementing body	TMDL modeling did not address varying flow conditions in the creek. The bacteria load reductions needed at specific locations are qualified due to the uncertainty associated with flow measurements. There are no load allocations for DO (or nutrients), because the study couldn't differentiate between natural and anthropogenic sources. Thurston Co.: TMDL-SIP is completed, DIP is in process of development.	Ecology TMDL	2006 Thurston Co. - 2007
Long-Term Actions	MC-9	Develop and implement strategies for protecting quantity and quality of groundwater.	8.4.2, p. 81	Implementing body, McAllister TG	Already have MGSA designation - Thurston Co.: looking at down-zoning in this area as part of their efforts exercise to address decision by GMA board. McAllister TG.		2006+
	MC-9b	Recharge and time-of-travel areas should be used to delineate wellhead protection areas.	8.4.2, p. 81	McAllister TG	Lacey: Need regional implementing body first. Need to know where regional aquifer is first. Need to know if it is technically feasible. CAO does have some language re. wellhead protection. Olympia: A wellhead protection plan would be developed after a regional source is identified.		2006+
	MC-10	Implement long-term monitoring programs for quality and water quantity that were developed in short-term recommendations MC-5 through MC-7. Monitoring programs will include establishing baseline conditions prior to full implementation of the watershed Plan.		McAllister TG, Proposed regional water supply governing structure	Not yet implemented. Need an implementation group, possibly McAllister Sub-basin Technical Committee who have requested more coordinated monitoring.	needs funding and implementation group	2007
	MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek and establish a basis for these flows with the understanding that levels in these creeks are under tidal influence.	8.4.2, p. 82	Ecology, Washington Dept of Fish and Wildlife, Nisqually Indian Tribe, Lacey, Olympia, (Yelm).	Lacey: No Action to date. No action to date by Olympia. Ecology: Parties need to get together to discuss.		2006+

Table 3-7
Yelm Sub-Basin Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Short-Term Actions	Y-1	Refine or revise Yelm sub-basin water balance for technical competency. If the methodology for computing the water balance can be improved upon, a new approach will be developed and the water balance and resulting water use summaries will be revised using the new methodology.	9.3.1, p. 85	McAllister TG, Yelm	McAllister/Yelm Technical Group (TG) discussing sub-basin wide modeling that will support updating the water budget. Refined Yelm WB as part of storage assessment. Complete.	$10,000 approved by PU. Additional funding needed	2006
	Y-2	Pursue opportunities for existing water rights transfers.	9.3.1, p. 85	Yelm	One transfer application has been submitted to Ecology. The city is also pursuing other opportunities.	Funded	2006 & 2007
	Y-3	Determine if there is a likelihood that wells draw water from the sequence of deeper aquifers within the Nisqually Basin.	9.3.1, p. 85	McAllister TG, Yelm	The study is underway, and is scheduled to be completed ~spring 2006.	Funded	2006
	Y-4	Develop policy of transfer of exempt wells' water to City of Yelm and submit to DOE for credits.	9.3.1, p. 85	Ecology, Yelm	No activity by Yelm. (Note that Graham Mutual reported recently that they consolidated exempt wells for a water right). Ecology: City gets up to 800 gallons/day for each exempt well. There is a policy in place for this. Yelm needs to tell Ecology what their mitigation strategy is.		2006 & 2007
	Y-4a	Ecology put Y-4 into action.	9.3.1, p. 85	Ecology, Yelm	Ecology - is open to reviewing Yelm proposals for transfer of water rights.		2006 & 2007
	Y-4b	When transfers of exempt wells are found to be acceptable, the City should adopt policies and procedures to facilitate these transfers from the exempt well(s) to the City's existing wells.	9.3.1, p. 85	Ecology, Yelm	No activity by Yelm. Ecology - committed to reviewing and discussing.		2006
	Y-4c	Research records of past development to capture wells that were abandoned as part of approved or proposed development. This procedure should be standardized as part of the development process.	9.3.1, p. 85	Ecology, Yelm	No activity by Yelm. Ecology - See comments in 4b.		2006
	Y-5	Pursue with the Department of Ecology and Health the development of a policy that would provide for the recalculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or stream flow augmentation.	9.3.1, p. 85	Ecology, DOH, Yelm, Implementing Body	During the 2006 Legislative Session, the organization"Coalition for Clean Water" and the LOTT Alliance (Lacey, Olympia, Tumwater and Thurston County) were active in providing input on proposed bills related to reclaimed water.	**Need Champion** This is a policy, but may need funding to further this effort as WRIA 11. **Need funding to address mitigation for using reclaimed water.**	2006 & 2007
	Y-5a	Develop a scientifically based approach to calculate the amount of water that returns to the aquifer through infiltration through constructed wetlands.	9.3.1, p. 85-86	Yelm, Implementing Body	Yelm's Comprehensive RW Plan will provide information to move this item forward.	**Need Champion This is a policy, but may need funding to further this effort as WRIA 11. Need funding to address mitigation for using reclaimed water.**	2006 & 2007
	Y-5b	Contact others with similar goals (Y-5) and perhaps form a committee to present a unified approach and common message to Ecology.	9.3.1, p. 86	Yelm, Implementing Body	Related to coordinated effort in Y-5.	**Need Champion This is a policy, but may need funding to further this effort as WRIA 11. Need funding to address mitigation for using reclaimed water.**	2006 & 2007
	Y-5c	City of Yelm should meet with AWC to promote this concept (Y-5).	9.3.1, p. 86	Yelm	Related to coordinated effort in Y-5.	**Need Champion This is a policy, but may need funding to further this effort as WRIA 11. Need funding to address mitigation for using reclaimed water.**	2006 & 2007
	Y-6	Draft and adopt a CWRP to maximize the use of reclaimed water to offset the need for potable water, thus extending use of existing water rights available.	9.3.1, p. 86	Yelm, Implementing body	Comprehensive RW Plan initiated in December 2005, with an estimated completion date of January 2007.	Funded - Yelm utility rates	2007
	Y-6a	Comprehensive approach for reclaimed water system to identify new reuse opportunities and the location and sizing of new reclaimed water pipe.	9.3.1, p. 86	Yelm	Part of work effort for CWRP.	Funded - Yelm utility rates	2007
	Y-6b	Develop CWRP so it is integrated with WSP. The planning process should pursue and include in the plan opportunities to utilize reclaimed water as mitigation for new water rights.	9.3.1, p. 86	Yelm	Part of work effort for CWRP.	Funded - Yelm utility rates	2007
	Y-6c	Plan, budget, and implement improvements in the CWRP.	9.3.1, p. 86	Yelm, Implementing body	Part of work effort for CWRP.	Funded - Yelm utility rates	2007
Long-Term Actions	Y-7	If applicable, expand McAllister Numerical Model to southwest Yelm and participate in a feasibility study.	9.3.2, p. 86-87	Yelm	Modeling to be conducted after the pump test data are available. Soon to be complete.	Funded - DOE Grant and local funds	2006
	Y-8	If withdrawal of water supply from the sequence of deep aquifers in the Nisqually Basin is not feasible, determine correlation between summer low/no flow conditions in Yelm Creek and use of the Yelm Prairie aquifer.	9.3.2, p. 87	Yelm	See ISF-4. Waiting for study results. At this time Yelm is looking at the long-term solution.	See ISF-4. Long-term funding may be needed. **It may be funded by Yelm and not PU.**	2008-2010 (if needed)
	Y-8a	Retain consultant to perform Yelm Prairie aquifer modeling and analysis.	9.3.2, p. 87	Yelm	See ISF-4. Waiting for study results. At this time Yelm is looking at the long-term solution.	See ISF-4. Long-term funding may be needed. **Need funding for modeling, but it may be funded by Yelm.**	2008-2010 (if needed)
	Y-8b	Gather data to demonstrate relationship between groundwater and surface water flows in Yelm and Thompson Creeks.	9.3.2, p. 87	Yelm	As part of current study, a monitoring well is being installed in Thompson Creek.	Funded - DOE Grant and local funds	2006
	Y-8c	Recommendations on mitigation to low flows in Yelm and Thompson Creeks.	9.3.2, p. 87	Yelm	Waiting for study results. Note that evaluating mitigation options is part of the study.	Funded - DOE Grant and local funds	2006
	Y-9	Sub-basin committee support of GW-7, GW-7a, GW-7b.	9.3.2, p. 87	Yelm, Ecology, Thurston County	No action yet. Ecology is a willing participant in discussions.		2006 & 2007

Table 3-8
Mashel-Ohop Sub-basin Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Short-Term Actions	MO-1	Complete instream flow assessment of Mashel River (completed April 2006) and assess the adequacy of the current low flow regulations.	10.3.1, p. 96	Implementing body	In progress.		2006
	MO-2	Complete groundwater hydrology investigations as recommended by Eatonville planning consultant.	10.3.1, p. 96	Eatonville, Implementing Body	Well field investigation is complete.		Undetermined
	MO-3	Obtain DOH guidance to address the conservation portion of WSP.	10.3.1, p. 96	Eatonville, DOH	In progress.	**Need Funding**	2006-2007
	MO-4	Begin developing conservation strategy for the Town of Eatonville. Seek funding as soon as possible to prepare a Conservation Plan. Commit to holding a public meeting on Conservation.	10.3.1, p. 96	Eatonville, Implementing Body	No Action to Date. 60% rate hike has been implemented.	**Need Funding**	2006-2007
	MO-5	Update Eatonville's WSP.	10.3.1, p. 96	Eatonville	Complete		**Complete**
	MO-6	Seek funding to update WSP.	10.3.1, p. 96	Eatonville	Complete		**Complete**
	MO-7	Complete Storm water Management Plan and mitigate storm water runoff problems.	10.3.1, p. 96	Eatonville	Not been done to date, but want to address in 2006. Partially being addressed by TMDL.	**Need Funding**	2006
	MO-8	Address long term UGA boundaries and adjust to reflect realistic future land use.	10.3.1, p. 96	Eatonville	In progress. New planning commission working in it.		2006
Long-Term Actions	MO-9	Protect fish habitat. Continue to study flow patterns on the Mashel. Implement the salmon habitat restoration plans for the Mashel and Ohop.	10.3.2, p. 97	Eatonville, Nisqually Tribe	To do in 2006. Working with the Tribe The Tribe is conducting this project in 2006 with Eatonville as a partner.	**Need Funding**	2006
	MO-10	Evaluate supply potential. See page 97 in Watershed Plan for more specific action items.	10.3.2, p. 97	Implementing body, Eatonville	**COMPLETE-** Some work has been done to evaluate groundwater supply. Possible additional projects include shallow and deep aquifer recharge storage		**Complete**
	MO-11	Improve shoreline protection. (See page 97 in Watershed Plan for more specific action items).	10.3.2, p. 97	Eatonville, Nisqually Tribe	In Shoreline Plan. Recently revised CAO. Will seek additional shoreline protection with developers	None needed	2006+
	MO-12	Protect water quality. (See page 97 in Watershed Plan for more specific action items).	10.3.2, p. 97	Implementing body, Eatonville	No Action to Date.	**Need Funding**	2006+
	MO-13	Land use impacts on water quality.	10.3.2, p. 98	Implementing body, Eatonville	Recently revised CAO	None needed	Undetermined
	MO-14	Assess viable storage alternatives to seasonally augment water supply. Investigate the potential to purchase existing water rights within Mashel Sub-basin.	10.3.2, p. 98	Implementing body, Eatonville	In progress.	**Need Funding**	2006+
	MO-15	Growth Management Act issues. Develop Interlocal Agreement with Pierce County. Provide Eatonville with some level of oversight on permit applications outside town boundaries but inside the UGA.	10.3.2, p. 98	Eatonville, Pierce County	No Action to Date		Undetermined
	MO-16	Sub-basin committee support for GLU-3.	10.3.2, p. 98	Thurston and Pierce Counties	No Action to Date		As needed

Table 3-9
Implementation Actions

Project Type	Code	Action	Plan Recommendations and Page Reference	Responsible Entity	Status	Funding Status	Schedule
Funding Options	IM-1	Formal PU Recommendation to the State Legislature to enable spending of Supplemental Watershed Planning funds during Phase IV, Implementation.	14.3, p. 151	Ecology	No longer timely to pursue.		Undetermined
Support Development/ Implementation	IM-2	Support the development and implementation of existing and new programs occurring within the Watershed while striving to prevent activities or policies that are duplicates and inconsistent.	14.5, p. 152	Implementing body	On going		2006+
	IM-3	Partnership and/or coordination with other on-going or planned processes.	14.5, p. 153	Implementing body	On going		2006+
	IM-4	Implementation body should participate in seeking funding for plan implementation.	14.5, p. 153	Implementing body	On going		2006+

TABLE 3-10

Priority Ranking of Proposed Projects For Funding

Priority Ranking (Highest to Lowest)	Code & Plan Recommendations and Page Reference	Action
1	**MC-3** Section 8.4.1, p. 79-80 **MC-12** Section 8.4.2, P. 82	Improve understanding of direction of regional groundwater flow. (Modeling). Update water budget for sub-basin using data collected for the various studies recommended in this action plan.
2	**ISF-3a-c** Section 6.3.2, p. 65	Identify and gage flow compromised streams based on intermittent nature and beneficial use(s). Design and install a network of stream gauging stations to monitor these streams and develop an understanding of the hydrology, including current and historical conditions via data collection, analysis and modeling. Includes installation of gauging stations on: Yelm Creek; Muck Creek***; Powell, Murray, Toboton, Tanwax, and Horn Creeks.
3	**MC-5a-b** Section 8.4.1, p. 80	(MC-5) Develop programs for monitoring potential impacts to existing water rights. (MC-5a) Potential flow monitoring on Lower Nisqually River. (MC-5b) Long term monitoring for surface water impacts from regional supply.
4	**ISF-5** Section 6.3.2, p. 65	Identify or study methods of surface water augmentation. Methods of surface water augmentation could include reuse, artificial recharge, and/or storage-related projects. This Plan recommends development of strategies to improve and/or augment instream flows in intermittent streams. This could include identification of storage options to augment flows when they are critically low or intermittent. Recommendations for pilot projects should be made as part of this study. Consider projects evaluated as part of the Level 1 Storage Assessment (Golder Associates, 2004) and other potential storage projects.
5	**Y-5 a-c** Section 9.3.1, p. 85-86	(Y-5) Pursue with the Department of Ecology and Health the development of a policy that would provide for the recalculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or stream flow augmentation. (Y-5a) Develop a scientifically based approach to calculate the amount of water that returns to the aquifer through infiltration through constructed wetlands. (Y-5b) Contact others with similar goals (Y-5) and perhaps form a committee to present a unified approach and common message to Ecology. (Y-5c) City of Yelm should meet with AWC to promote this concept of Y-5.
6	*	Eatonville Shallow Aquifer Recharge Storage, and Aquifer Storage and Recovery Storage Projects.
7	**MO-7** Section 10.3.1, p. 96	Complete Stormwater Management Plan and mitigate stormwater runoff problems.
8	**Y-8, 8a** Section 9.3.2, p. 87	If withdrawal of water supply from the sequence of deep aquifers in the Nisqually Basin is not feasible, determine correlation between summer low/no flow conditions in Yelm Creek and use of the Yelm Prairie aquifer. (Y-8a) Retain consultant to perform Yelm Prairie aquifer modeling and analysis.
9	**ISF-4** Section 6.3.2, p. 65	Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.

TABLE 3-10

Priority Ranking of Proposed Projects For Funding

Priority Ranking (Highest to Lowest)	Code & Plan Recommendations and Page Reference	Action
10	**WQ-5** Section 7.3, p. 72	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.
11	**MO-4** Section 10.3.1, p. 96	Begin developing conservation strategy for the Town of Eatonville. Seek funding as soon as possible to prepare a Conservation Plan. Commit to holding a public meeting on Conservation.
12	**MO-9** Section 10.3.2, p. 97	Protect fish habitat. Continue to study flow patterns on the Mashel. Implement the salmon habitat restoration plans for the Mashel and Ohop.
13	*	Prepare a Water Re-use Plan for Eatonville
14	**MO-12** Section 10.3.2, p. 97	Protect water quality. (See page 97 in Watershed Plan for more specific action items).
15	**GW - 4 (GD)** Section 4.3.2, p. 41	Address locations of groundwater divides through a joint study, or development of joint management strategies, with the Chambers Clover Planning Unit to identify groundwater divide between WRIAs 11 and 12.
16	**MC-10** Section 8.4.2, p. 81	Implement long-term monitoring programs for quality and water quantity that were developed in short-term recommendations MC-5 through MC-7. Monitoring programs will include establishing baseline conditions prior to full implementation of the watershed Plan.
17	**GLU - 1c** Section 3.3, P. 23	Recommend that a County-wide CWSP for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.
**	**MO - 3** Section 10.3.1, p. 96	Obtain DOH guidance to address the conservation portion of WSP.
**	**MO - 14** Section 10.3.2, p. 98	Assess viable storage alternatives to seasonally augment water supply. Investigate the potential to purchase existing water rights within Mashel Sub-basin.
**	**WR - 9** Section 5.3, p. 55-56	Development of watershed-wide water balance to better understand water availability by sub-basin.

Notes:

* These actions were not addressed in the Nisqually Watershed Management Plan

** These actions were added to the funding list after the initial prioritization.

*** Maintenance and access to flow gages on Muck Creek within Ft Lewis property boundaries (if proposed) would require coordination with Ft Lewis personnel.

TABLE 3-11

Additional Projects Identified by the Planning Unit

Lower Basin Aquifer Storage and Recovery Project	Establish the feasibility of developing an ASR project in the lower portion of WRIA 11/13 that would use reclaimed water from the LOTT system. Will be conducted in two phases: 1) Feasibility Study, 2) Pilot Test Plan, and 3) Pilot Test.
McAllister Creek Freshwater Flushing Project	Establish the feasibility of developing one or more small impoundments on the lower reaches of McAllister or Medicine Creek for use as flushing storage during low tide. Phases include: Site Reconnaissance and Baseline Hydrology, Preliminary Engineering Analysis, and Flow Routing/Operational Analysis.
Lake St. Clair Storage Project	Establish the feasibility of diverting excess flows from the Nisqually River to Lake St. Clair. Phases include: Hydrogeologic Analysis, Limnologic Analysis, Preliminary Engineering Analysis, and Flow Routing/Operational Analysis.
City of Yelm/Yelm Creek Groundwater Storage Project	Establish the feasibility of increasing water supply to the City of Yelm by using seasonal groundwater storage to increase flows in Yelm Creek. Phases include: Hydrogeologic Analyses, Flow Routing/Operational Analysis, and Preliminary Engineering Analysis.
Eatonville/Mashel River Groundwater Storage Project	Establish the feasibility of increasing water supply to the Town of Eatonville by using seasonal groundwater storage to increase flows upstream of Eatonville in the Mashel River. Phases include: Hydrogeologic Analyses, Flow Routing/Operational Analysis, and Preliminary Engineering Analysis.
Alder Dam Storage Optimization	Further optimization of storage releases from Alder Dam could improve the ability to implement one or more of the focused storage concepts. Phases include: Discussions with Tacoma and Flow Routing/Operational Analysis.
PU Work Task – Nisqually Watershed Website	Construct a publicly accessible website that will provide information on the Planning Unit's activities.
PU Work Task – Storage Project Evaluation	Evaluate storage projects for future implementation and identify potential new storage assessment projects.
PU Work Task – Groundwater impacts	Identify areas for characterization for the study of the impact of exempt wells in the watershed.
PU Work Task – Model Conservation Strategies	More precisely define conservation strategies.

TABLE 4-1

Completed Actions (as of January 2006)

Code	Action
GLU – 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.
GW - 5	**Pierce, Yelm and Olympia -** Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.
GW – 5a	**Yelm and Olympia -** During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.
GW-5b	**Pierce and Lacey -** Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.
GW – 5c	**Olympia and Yelm -** Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.
GW – 5d	**Eatonville -** Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).
WQ – 1	Implement watershed-wide Water Quality Monitoring Plan. As applicable, the plan will assist planning efforts by providing a framework to determine whether data of the appropriate quantity and quality are collected, optimize the sample locations, improve consistency in the data collected, improve coordination of sampling efforts, and be cost-effective for future studies. The Planning Unit recommends implementation of actions recommended in the Water Quality Plan.
WQ – 2	Maintenance and use of the Nisqually Water Quality Data System. The Water Quality Monitoring Plan also recommends creation of the Nisqually Water Quality Data System, a dynamic GIS/Access water quality database in which water quality data from throughout the watershed can be stored, compared, and accessed through a spatial GIS interface. Funding for the creation of this database was provided as a supplemental grant to the Watershed Planning process.
MO – 5	Update Eatonville's WSP.
MO - 6	Seek funding to update WSP.
MO-10	Evaluate supply potential. (See page 97 in Watershed Plan for more specific action items).

TABLE 4-2

Actions for Implementation in 2006 (Near Term Actions)[1]

Code	Action
GLU – 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.
GW-3	Policy statement addressing WRIA boundaries versus groundwater divides. For instances where WRIA boundaries and groundwater divides are not the same, the Nisqually Watershed (WRIA 11) Planning Unit will work with the Planning Units from WRIA 12 and WRIA 13 to develop a policy for coordination and congruence for groundwater that does not follow the WRIA boundaries.
GW – 4[2]	Address locations of groundwater divides through a joint study, or development of joint management strategies, with the Chambers Clover Planning Unit to identify groundwater divide between WRIAs 11 and 12.
GW – 5d	**Olympia** - Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).
GW – 5e	**Eatonville** - Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up. If these land uses are nonconforming uses they should be prohibited from further contaminating groundwater.
GW-7	Ecology should provide more thorough oversight of exempt wells. The issuance of a start card for an exempt well by well drillers and Ecology's database of start cards should be consistent with available information on Coordinated Water System Plan service area boundaries, available hydrogeologic information on local aquifers, and cumulative effects of exempt wells.
GW-7a	Ecology should study the cumulative impacts of exempt wells and consider setting a basin-wide standard for the number of houses allowable per exempt well. This plan recommends that Ecology increase their enforcement of the exempt well statues and develop an Exempt Well Action Plan to achieve compliance with the intent of the exempt well withdrawal statue including the following: (see page 43 in Watershed Plan).
WR-1	Current water right application processing- Recommendations to Ecology. PU recommends that Ecology batch process water right applications by sub-basin in the watershed when data available for processing are considered adequate for each sub-basin.
WR-1a	Water right applications for water withdrawal from the McAllister sub-basin be evaluated using either the McAllister Numerical Model or a new expanded model built upon it.
WR-1b	Water right applications- Yelm Sub-basin. It's recommended that the City's applications be batch processed with the McAllister Sub-basin.
WR-1c	Water right applications - Mashel sub-basin. It's recommended that Eatonville complete the data collection efforts specified in the short-term action plan for the Mashel/Ohop Sub-basins prior to the processing of water rights in this sub-basin.
WR-3	Recommended mitigation strategies for water rights processing (see page 53-54 in Watershed Plan).
WR-4	Credit for reclaimed water. There are two options identified by this action. (See page 54 in Watershed Plan for details).
WR-5	Recommendation to Ecology to reconcile ambiguity in Reclaimed Water Act. Assure consistency between water quality and water resources statutes to encourage reclaimed water

TABLE 4-2

Actions for Implementation in 2006 (Near Term Actions)[1]

Code	Action
	projects. Develop streamlined water reuse permitting and water right credit system that will enable water reuse project proponents to receive appropriate water right benefits for their investment in improving water quality and conserving the potable water resource.
MC-2	Sub-basin committee support of WR-1a.
MC-2a	City of Lacey short term water supply solutions.
MC-2b	City of Olympia short term water supply solutions.
MC – 3/MC-12[2]	Improve understanding of direction of regional groundwater flow. (Modeling). Update water budget for sub-basin using data collected for the various studies recommended in this action plan.
MC-4	Recommend options for mitigating impacts from other applications and long term water supply solutions.
MC-6	Sub-basin committee support of GW-3.
MC-7	Recommendations for Nisqually/McAllister TMDL study.
MC-9	Develop and implement strategies for protecting quantity and quality of groundwater.
MC-9b	Recharge and time-of-travel areas should be used to delineate wellhead protection areas.
MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek and establish a basis for these flows with the understanding that levels in these creeks are under tidal influence.
MO-1	Complete instream flow assessment of Mashel River (completed April 2006) and assess the adequacy of the current low flow regulations.
MO-3[2,3]	Obtain DOH guidance to address the conservation portion of WSP.
MO-4[2]	Begin developing conservation strategy for the Town of Eatonville. Seek funding as soon as possible to prepare a Conservation Plan. Commit to holding a public meeting on Conservation.
MO – 7[2]	Complete Stormwater Management Plan and mitigate stormwater runoff problems.
MO-8	Address long term UGA boundaries and adjust to reflect realistic future land use.
MO-9[2]	Protect fish habitat. Continue to study flow patterns on the Mashel. Implement the salmon habitat restoration plans for the Mashel and Ohop.
MO-11	Improve shoreline protection. (See page 97 in Watershed Plan for more specific action items).
MO-12[2]	Protect water quality. (See page 97 in Watershed Plan for more specific action items).
MO-14[2,3]	Assess viable storage alternatives to seasonally augment water supply. Investigate the potential to purchase existing water rights within Mashel Sub-basin.
ISF-1	Creation of a policy statement to support protection of instream resources: *Support protection of resources by maintaining closures unless new technical information suggests otherwise, or a change in closure status would result in improved flow or habitat conditions in the closed stream or closed streams in other sub-basins.*
ISF-4	**Eatonville -** Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.
ISF-5[2]	Identify or study methods of surface water augmentation. Methods of surface water augmentation could include reuse, artificial recharge, and/or storage-related projects. This

TABLE 4-2

Actions for Implementation in 2006 (Near Term Actions)[1]

Code	Action
	Plan recommends development of strategies to improve and/or augment instream flows in intermittent streams. This could include identification of storage options to augment flows when they are critically low or intermittent. Recommendations for pilot projects should be made as part of this study.
Y-1	Refine or revise Yelm sub-basin water balance for technical competency. If the methodology for computing the water balance can be improved upon, a new approach will be developed and the water balance and resulting water use summaries will be revised using the new methodology.
Y-2	Pursue opportunities for existing water rights transfers.
Y-3	Determine if there is a likelihood that wells draw water from the sequence of deeper aquifers within the Nisqually Basin.
Y-4	Develop policy of transfer of exempt wells' water to City of Yelm and submit to DOE for credits.
Y-4a	Ecology put Y-4 into Action.
Y-4b	When transfers of exempt wells are found to be acceptable, the City should adopt policies and procedures to facilitate these transfers from the exempt well(s) to the City's existing wells.
Y-4c	Research records of past development to capture wells that were abandoned as part of approved or proposed development. This procedure should be standardized as part of the development process.
Y-5[2]	Pursue with the Department of Ecology and Health the development of a policy that would provide for the re-calculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or stream flow augmentation.
Y-5a[2]	Develop a scientifically based approach to calculate the amount of water that returns to the aquifer through infiltration through constructed wetlands.
Y-5b[2]	Contact others with similar goals (Y-5) and perhaps form a committee to present a unified approach and common message to Ecology.
Y-5c[2]	City of Yelm should meet with AWC to promote this concept (Y-5).
Y-7	If applicable, expand McAllister Numerical Model to southwest Yelm and participate in a feasibility study.
Y-8b	Gather data to demonstrate relationship between groundwater and surface water flows in Yelm and Thompson Creeks.
Y-8c	Recommendations on mitigation to low flows in Yelm and Thompson Creeks.
Y-9	Sub-basin committee support of GW-7, GW-7a, GW-7b.
IM-2	Support the development and implementation of existing and new programs occurring within the Watershed while striving to prevent activities or policies that are duplicates and inconsistent.
IM-3	Partnership and/or coordination with other on-going or planned processes.
IM-4	Implementation body should participate in seeking funding for plan implementation.
Eatonville/Mashel River Groundwater	Establish the feasibility of increasing water supply to the Town of Eatonville by using seasonal groundwater storage to increase flows upstream of Eatonville in the Mashel River. Phases include: Hydrogeologic Analyses, Flow Routing/Operational

TABLE 4-2

Actions for Implementation in 2006 (Near Term Actions)[1]

Code	Action
Storage Project[2]	Analysis, and Preliminary Engineering Analysis.
PU Work Task - Nisqually Watershed Website	Construct a publicly accessible website that will provide information on the Planning Unit's activities.
PU Work Task - Storage Project Evaluation	Evaluate storage projects proposed in the Level 1 Storage Assessment and identify other potential storage projects.
PU Work Task - Model Conservation Strategies	More precisely define conservation strategies.

Notes:
1. The status of these actions was last updated in May 2006.
2. Project was included in PU priority ranking (see Table 3-10 for the specific ranking).
3. Priority project needing funding, was added after the ranking for 2006 occurred and is therefore not yet ranked.

TABLE 4-3

Actions for Implementation in 2007

Code	Action
GW - 5	**Thurston County** - Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.
GW – 5a	**Thurston County** - During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.
GW – 5b	Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.
GW – 5c	Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.
GW – 5d	**Thurston County** - Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).
GW-8	Develop a policy of transfer of exempt wells water rights within a water service area or urban growth area to a water purveyor and submit to Ecology for water right credit. Define how much credit should be granted for taking exempt wells off line as a part of this policy.
WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and state agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.
WQ-5**	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.
WR-9**†	Development of watershed-wide water balance to better understand water availability by sub-basin.
ISF – 3** ISF - 3a-c**	Identify and gage flow compromised streams based on intermittent nature and beneficial use(s). Design and install a network of stream gauging stations to monitor these streams and develop an understanding of the hydrology, including current and historical conditions via data collection, analysis and modeling. Yelm Creek (a); Muck Creek (b); and Powell, Murray, Toboton, Tanwax, and Horn Creek (c).
MC-5a-b**	Develop programs for monitoring potential impacts to existing water rights. Potential flow monitoring on Lower Nisqually River. Long term monitoring for surface water impacts from regional supply.
MC-10**	Implement long-term monitoring programs for quality and water quantity that were developed in short-term recommendations MC-5 through MC-7. Monitoring programs will include establishing baseline conditions prior to full implementation of the watershed Plan.
Y-6	Draft and adopt a CWRP to maximize the use of reclaimed water to offset the need for potable water, thus extending use of existing water rights available.
Y-6a	Comprehensive approach for reclaimed water system to identify new reuse opportunities and the location and sizing of new reclaimed water pipe.

TABLE 4-3

Actions for Implementation in 2007

Y-6b	Develop CWRP so it is integrated with WSP. The planning process should pursue and include in the plan opportunities to utilize reclaimed water as mitigation for new water rights.
Y-6c	Plan, budget, and implement improvements in the CWRP.
Eatonville**	Prepare Water Reuse Plan for Eatonville.
PU Work Task-Groundwater Impacts	Identify areas for characterization for the study of the impact of exempt wells in the watershed.

** Project was included in PU priority ranking (see Table 3-10 for the specific ranking).

† Priority project needing funding, was added after the ranking for 2006 occurred and is therefore not yet ranked.

TABLE 4-4

Actions for Implementation in 2008-2010

Code	Action
GW - 5	**Lacey -** Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.
WQ-4	Address land uses that may threaten watershed health through an open forum with agencies and the public.
ISF-4**	**Yelm -** Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.
Y-8**	If withdrawal of water supply from the sequence of deep aquifers in the Nisqually Basin is not feasible, determine correlation between summer low/no flow conditions in Yelm Creek and use of the Yelm Prairie aquifer.
Y-8a**	Retain consultant to perform Yelm Prairie aquifer modeling and analysis.
Lower Basin Aquifer Storage and Recovery Project	Establish the feasibility of developing an ASR project in the lower portion of WRIA 11/13 that would use reclaimed water from the LOTT system. Will be conducted in two phases: 1) Feasibility Study, 2) Pilot Test Plan, and 3) Pilot Test.
McAllister Creek Freshwater Flushing Project	Establish the feasibility of developing one or more small impoundments on the lower reaches of McAllister or Medicine Creek for use as flushing storage during low tide. Phases include: Site Reconnaissance and Baseline Hydrology, Preliminary Engineering Analysis, and Flow Routing/Operational Analysis.

TABLE 4-4

Actions for Implementation in 2008-2010

Lake St. Clair Storage Project	Establish the feasibility of diverting excess flows from the Nisqually River to Lake St. Clair. Phases include: Hydrogeologic Analysis, Limnologic Analysis, Preliminary Engineering Analysis, and Flow Routing/Operational Analysis.
City of Yelm/Yelm Creek Groundwater Storage Project	Establish the feasibility of increasing water supply to the City of Yelm by using seasonal groundwater storage to increase flows in Yelm Creek. Phases include: Hydrogeologic Analyses, Flow Routing/Operational Analysis, and Preliminary Engineering Analysis.
Alder Dam Storage Optimization	Further optimization of storage releases from Alder Dam could improve the ability to implement one or more of the focused storage concepts. Phases include: Discussions with Tacoma and Flow Routing/Operational Analysis.

** Project was included in PU priority ranking (see Table 3-10 for the specific ranking).

† Priority project needing funding, was added after the ranking for 2006 occurred and is therefore not yet ranked.

TABLE 4-5

Long-term Actions for Implementation

Code	Action
GLU-2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development.
GW-7b	Once sufficient information is gathered on the cumulative impacts of exempt wells as directed in GW-7a, the Planning Unit may wish to consider avenues to address the drilling of exempt wells in areas where technical data indicate they may have impact on surface water systems. In sensitive areas, this might include the option of drilling in deeper aquifers that are more protective of surface water, if available.

TABLE 4-6

Actions with Unknown Timelines

Code	Action
GLU-1	Water supply availability should be considered in city and county land use planning activities.
GLU-1a	Look for opportunities to resolve inconsistencies between Pierce and Thurston Coordinated Water System Plans (CWSP) such that all CWSPs within the Nisqually Watershed are consistent in their review and coordination of Water System Plans and are also reviewed with respect to consistency with comprehensive plans.
GLU – 1b	Recommend to DOH that each Coordinated Water System Plan (CWSP) be required to include a supply element (and not just service area) from individual water supply plans. This recommendation does not require a revision to the Coordination Act.
GLU-1c**	Recommend that a County-wide Coordinated Water System Plan (CWSP) for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.
GLU-1d	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a Coordinated Water System Plan (CWSP).
GLU-1e	Recommend that Coordinated Water System Plans (CWSPs) address water rights associated with failed water systems. CWSPs should specify that when purveyors take over failed water systems that have their own source(s), the acquisition should also include the water rights for the water service area.
GLU-1f	Coordinated Water System Plans should require purveyors to provide counties information about how much water is available for hook-ups through approval of Water System Plans. This would allow Counties a working number of connections remaining under the existing Water System Plan
GLU-5	Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use.
ISF-2	Gain better understanding of technical basis for stream closures watershed-wide. The basis of closures could be studied as part of instream flow study.
WR-1d	Water right applications - Toboton/Powell/Lackamas sub-basin. Ecology should move forward with processing the groundwater applications in these sub-basins as soon as possible.
WR-1e	Water right applications - Muck/Murray sub-basin. Water right applications should be batch processed with the appropriate WRIA.
WR-1f	Water right applications - Tanwax/Kreger/Ohop sub-basin. Ecology should recognize instream flow issues associated with prairie streams in Tanwax and Kreger sub-basins and deny all applications for surface water rights or for groundwater rights that draw water from shallow groundwater in the vicinity of prairie streams.
WR-1g	Water right applications - Upper Basin sub-basin. New applications in the Upper Basin should only be considered after batch processing of the rest of the sub-basins occur with the exception of public health emergencies.
WR-2	Recommendation that Ecology be staffed at a level that ensures timely response to water right applications and monitoring of withdrawals.

TABLE 4-6

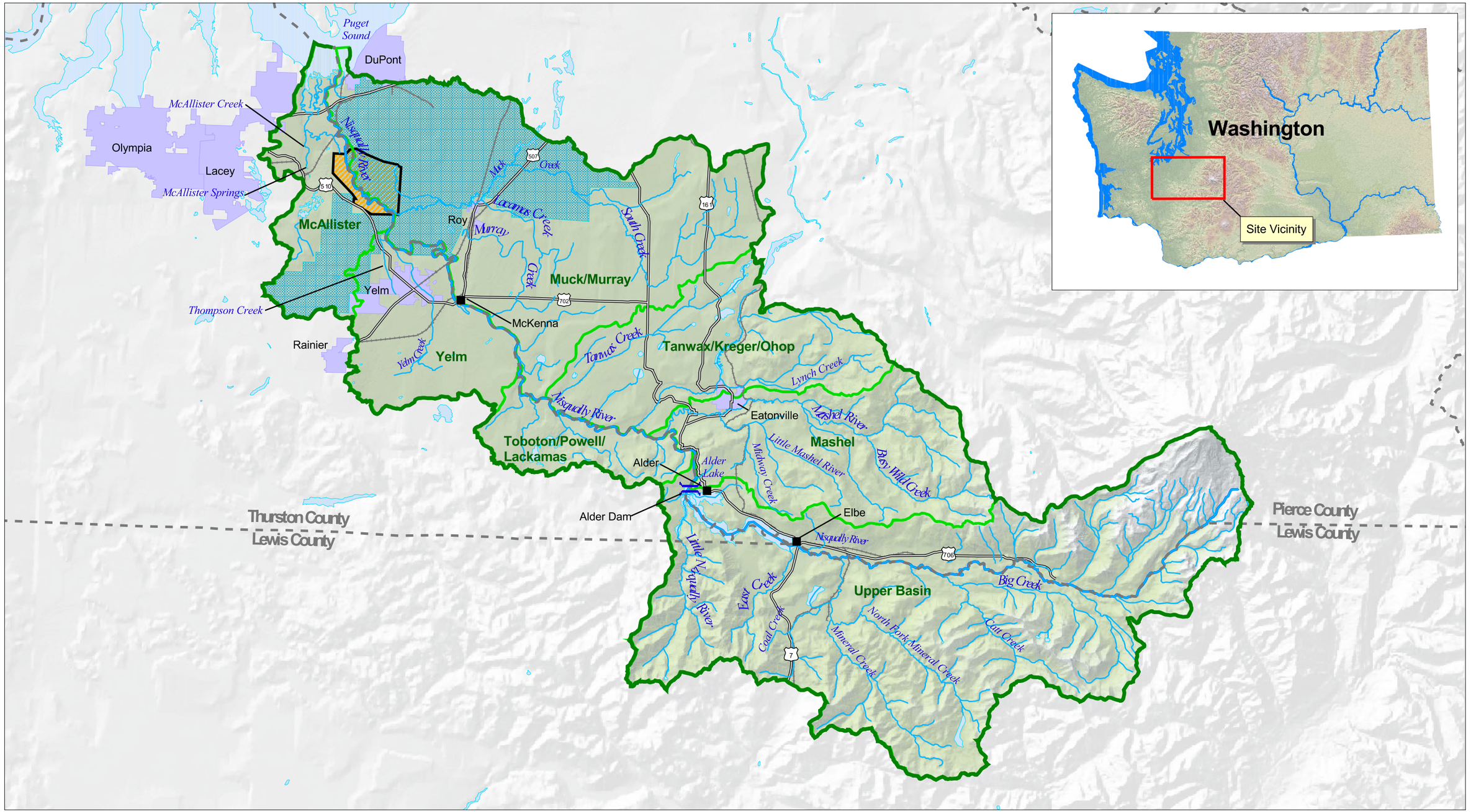
Actions with Unknown Timelines

WR-6	Mechanism for water rights governing body support of water right application. Creation of a mechanism for a WRIA 11 "water rights governing body" charged with providing comment on water right applications for new rights or transfers within the Nisqually Watershed.
WR-7	Address sub-basin closures (see ISF-2 and ISF-3). Plan recommends a study to better understand basis of closures and current instream flow conditions.
WR-8	Investigate the potential for purchase, sale or lease of water rights (e.g. water bank).
MO-2	Complete groundwater hydrology investigations as recommended by Eatonville planning consultant.
MO-13	Land use impacts on water quality.
MO-15	Growth Management Act issues. Develop Interlocal Agreement with Pierce County. Provide Eatonville with some level of oversight on permit applications outside town boundaries but inside the UGA.
MO-16	Sub-basin committee support for GLU-3.
IM-1	Formal PU Recommendation to the State Legislature to enable spending of Supplemental Watershed Planning funds during Phase IV Implementation.

** Project was included in PU priority ranking (see Table 3-10 for the specific ranking).

† Priority project needing funding, was added after the ranking for 2006 occurred and is therefore not yet ranked.

FIGURES



LEGEND

- WRIA 11 Boundary
- WRIA 11 Sub-Basins
- Ft Lewis Military Base
- Nisqually Reservation
- County Lines
- Urban Areas
- Streams and Rivers
- Highways
- Railways
- Cities or Towns
- Historic Nisqually Indian Reservation Boundary

0 25,000

Scale 1" = 25,000 feet

Map Projection:
Washington State Plane South
NAD83, Feet

Source: WAGDA, WSDOT, WSDOE, WSDNR

N

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Nisqually Watershed Overview

NISQUALLY IMPLEMENTATION PLAN/WA

Drawn: SJG	Revision: 1	Date: April 10 2007	Figure: 1

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Golder Associates

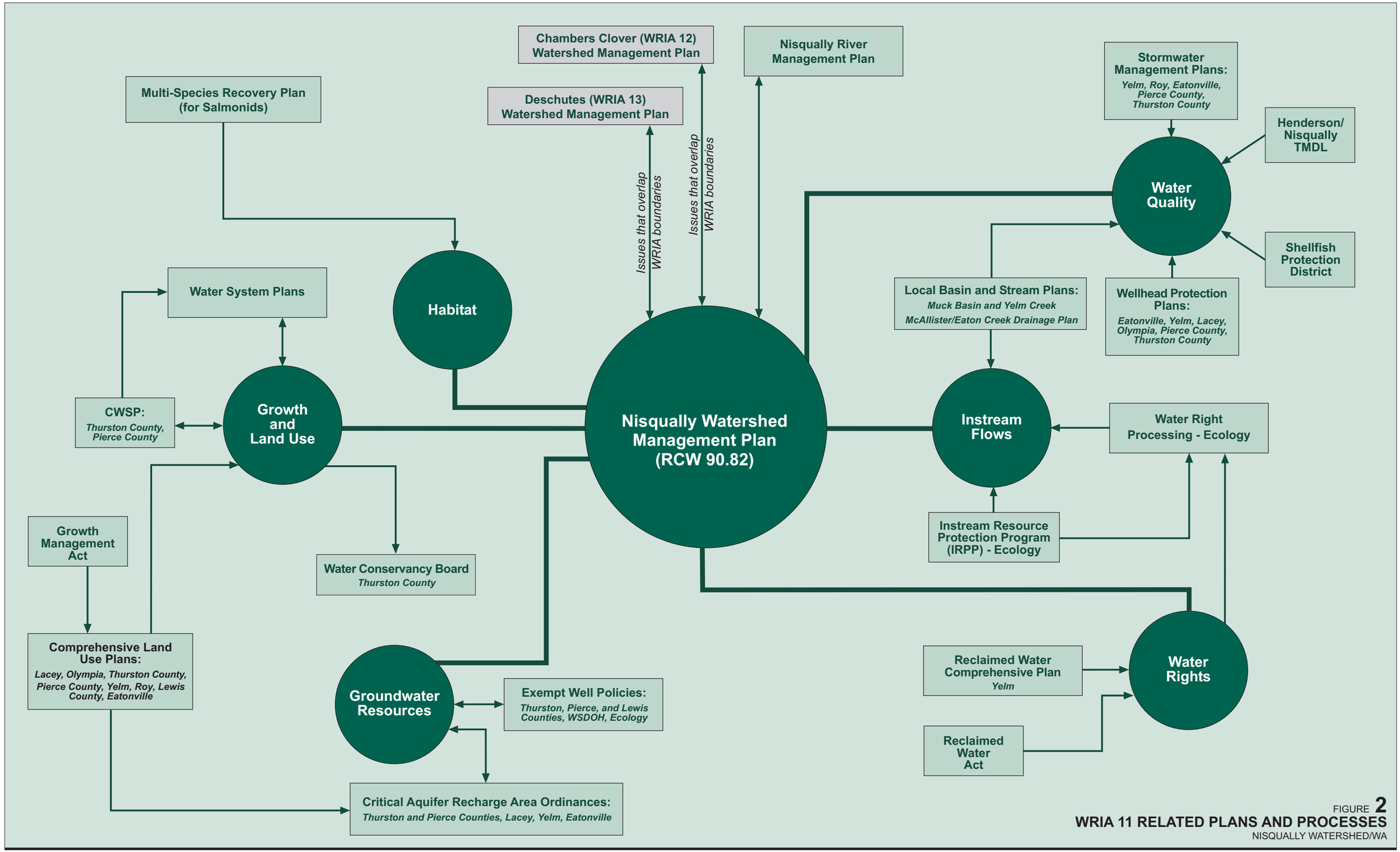


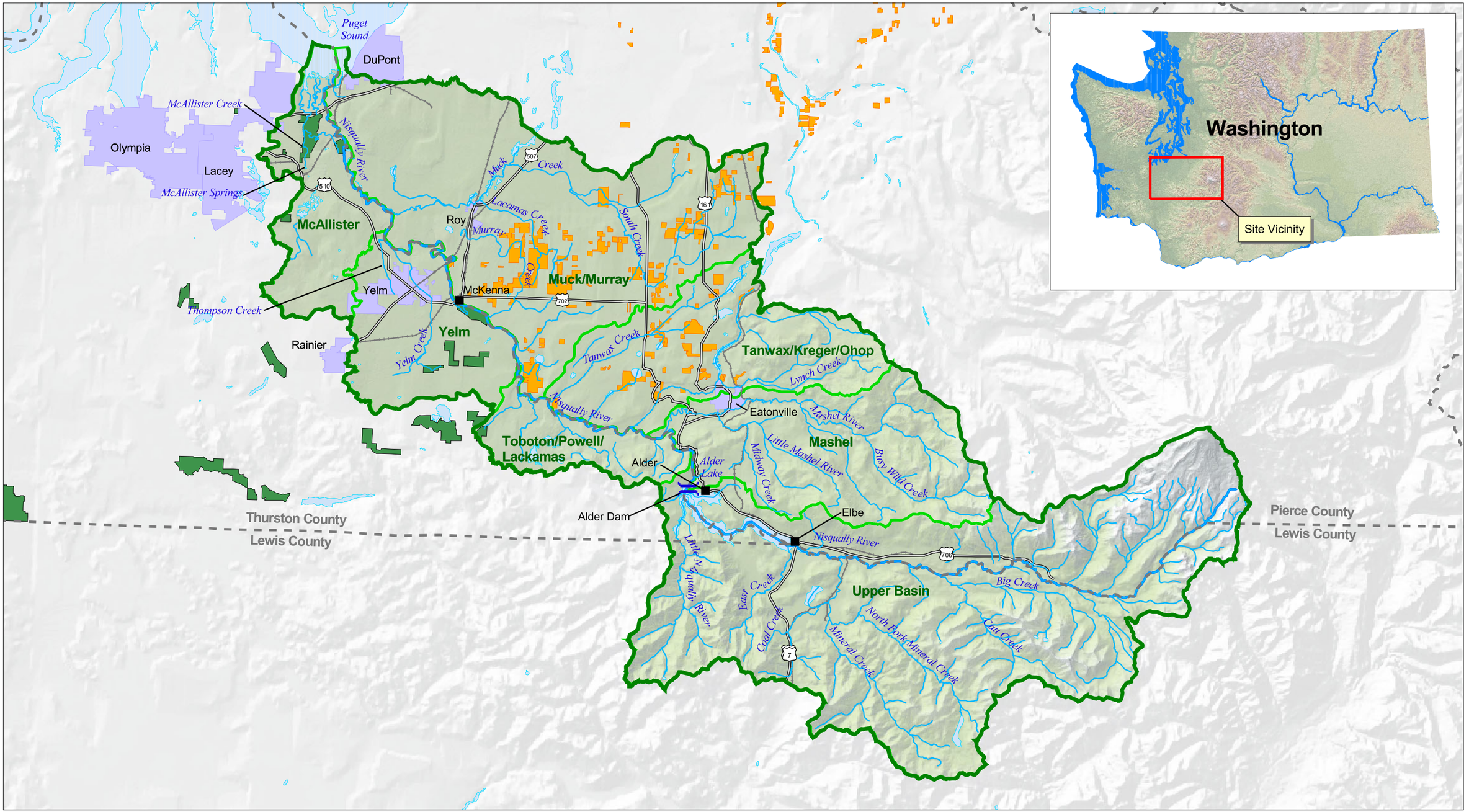
FIGURE **2**

WRIA 11 RELATED PLANS AND PROCESSES

NISQUALLY WATERSHED/WA

DRAWING NO. 0231248700100oc01.fh11 DATE 03/23/06 DRAWN BY EL

Golder Associates



LEGEND

- WRIA 11 Boundary
- WRIA 11 Sub-Basins
- County Lines
- Urban Areas
- Streams and Rivers
- Highways
- Railways
- Cities or Towns
- Pierce County Agricultural Zoning
- Thurston County Agricultural Zoning

0 25,000

Scale 1" = 25,000 feet

Map Projection:
Washington State Plane South
NAD83, Feet

Source: WAGDA, WSDOT, WSDOE, Thuston County, Pierce County, WSDNR

N

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Nisqually Agricultural Lands

NISQUALLY IMPLEMENTATION PLAN/WA

Drawn: SJG	Revision:	Date: April. 1, 2006	Figure: 3

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Puget Sound
DuPont
McAllister Creek
Olympia
Lacey
McAllister Springs
L1, L2, L4
L3
McAllister
Roy
Muck Creek
Lacamas Creek
Murray Creek
South Creek
Muck/Murray
Yelm
McKenna
Rainier
Thompson Creek
Nisqually River
Yelm Creek
Tanwax Creek
Tanwax/Kreger/Ohop
Lynch Creek
Eatonville
Mashel River
Mashel
Little Mashel River
Busy Wild Creek
Toboton/Powell/
Lackamas
Alder Lake
Muddy Creek
Alder Dam
Alder
Elbe
Nisqually River
Little Nisqually River
East Creek
Coal Creek
Upper Basin
Big Creek
North Fork Mineral Creek
Mineral Creek
Ohop Creek
Thurston County
Lewis County
Pierce County
Lewis County

WRIA 11 Water Right Applications

Surface Water Right → 4 ← Order in which they appear in WRATs database

Groundwater Right → 4 ← Order in which they appear in WRATs database

Lacey Water Rights → L4 ← Lacey Water Rights Filed under WRIA 13

Note: Water Rights are located by PLSS section. Actual location of well or diversion within the section is not shown.

Sections

36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6
12	7	8	9	10	11	12	7
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6

LEGEND

- WRIA 11 Boundary
- WRIA 11 Sub-Basins
- Ft Lewis Military Base
- Nisqually Reservation
- County Lines
- Urban Areas
- Streams and Rivers
- Highways
- Railways
- Cities or Towns
- Historic Nisqually Indian Reservation Boundary

0 25,000

Scale 1" = 25,000 feet

Map Projection:
Washington State Plane South
NAD83, Feet

Source: WAGDA, WSDOT, WSDOE, WSDNR

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Pending Water Right Applications

NISQUALLY IMPLEMENTATION PLAN/WA

Drawn: SJG	Revision: 1	Date: April 1, 2006	Figure: 4

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APPENDIX A

ACTION TABLES BY OBLIGATED ENTITY

Note- Agencies or groups that have not been formally involved in the watershed planning process are not officially obligated by this Watershed Implementation Plan. For tables in Appendix A, Thurston County Public Utility District #1 and the Thurston County Water Conservancy Board are not considered obligated, however, the Planning Unit has listed actions in which they can be involved.

Table A-1
Department of Ecology Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Planning Policies	GLU - 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.
		GLU - 5	Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use.
Ground Water Resources	Exempt Wells	GW - 7 (EW)	Ecology should provide more thorough oversight of exempt wells. The issuance of a start card for an exempt well by well drillers and Ecology's database of start cards should be consistent with available information on Coordinated Water System Plan service area boundaries, available hydrogeologic information on local aquifers, and cumulative effects of exempt wells.
		GW - 7a (EW)	The Department of Ecology should study the cumulative impacts of exempt wells and consider setting a basin-wide standard for the number of houses allowable per exempt well. This plan recommends that Ecology increase their enforcement of the exempt well statues and develop an Exempt Well Action Plan to achieve compliance with the intent of the exempt well withdrawal statue including the following: (see page 43 in Watershed Plan).
Instream Flows	Policy/Process	ISF-1	Creation of a policy statement to support protection of instream resources: *Support protection of resources by maintaining closures unless new technical information suggests otherwise, or a change in closure status would result in improved flow or habitat conditions in the closed stream or closed streams in other sub-basins.*
McAllister Sub-basin	Short-term Actions	MC-2	Sub-basin committee support of WR-1a.
	Short-term Solutions	MC-4	Recommend options for mitigating impacts from other applications and long term water supply solutions.
		MC-7	Recommendations for Nisqually/McAllister TMDL
	Long-term Actions	MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek and establish a basis for these flows with the understanding that levels in these creeks are under tidal influence.
		Y-4	Develop policy of transfer of exempt wells' water to City of Yelm and submit to DOE for credits.
		Y-4a	Ecology put Y-4 into action.

Table A-1
Department of Ecology Actions

Discipline	Project Type	Code	Action
Yelm Sub-basin	Short-term Actions	Y-4b	When transfers of exempt wells are found to be acceptable, the City should adopt policies and procedures to facilitate these transfers from the exempt well(s) to the City's existing wells.
		Y-4c	Research records of past development to capture wells that were abandoned as part of approved or proposed development. This procedure should be standardized as part of the development process.
		Y-5	Pursue with the Department of Ecology and Health the development of a policy that would provide for the recalculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or streamflow augmentation.
	Long-term Actions	Y-9	Sub-basin committee support of GW-7, GW-7a, GW-7b.
Implementation	Funding Options	IM-1	Formal PU Recommendation to the State Legislature to enable spending of Supplemental Watershed Planning funds during Phase IV, Implementation.
		WR - 1	Current water right application processing - Recommendations to Ecology. PU recommends that Ecology batch process water right applications by sub-basin in the watershed when data available for processing are considered adequate for each sub-basin.
		WR - 1a	Water right applications for water withdrawal from the McAllister sub basin be evaluated using either the McAllister Numerical Model or a new expanded model built upon it.
		WR - 1b	Water right applications - Yelm sub basin. It's recommended that the City's applications be batch processed with the McAllister Sub-basin.
		WR - 1c	Water right applications - Mashel sub basin. It's recommended that Eatonville complete the data collection efforts specified in the short-term action plan for the Mashel/Ohop Sub-basins prior to the processing of water rights in this sub-basin.
		WR - 1d	Water right applications - Toboton/Powell/Lackamas sub basin. Ecology should move forward with processing the groundwater applications in these sub-basins as soon as possible.
		WR - 1e	Water right applications - Muck/Murray sub basin. Water right applications should be batch processed with the appropriate WRIA.

Table A-1
Department of Ecology Actions

Discipline	Project Type	Code	Action
Water Rights	Current Water Right Application Processing	WR - 1f	Water right applications - Tanwax/Kreger/Ohop sub basin. Ecology should recognize instream flow issues associated with prairie streams in Tanwax and Kreger sub-basins and deny all applications for surface water rights or for groundwater rights that draw water from shallow groundwater in the vicinity of prairie streams.
		WR - 1g	Water right applications - Upper Basin sub basin. New applications in the Upper Basin should only be considered after batch processing of the rest of the sub-basins occur with the exception of public health emergencies.
		WR - 2	Recommendation that Ecology be staffed at a level that ensures timely response to water right applications and monitoring of withdrawals.
		WR - 3	Recommended mitigation strategies for water rights processing (see page 53-54 in Watershed Plan).
		WR-4	Credit for reclaimed water. There are two options identified by this action. (See page 54 in Watershed Plan for details).
		WR-5	Recommendation to Ecology to reconcile ambiguity in Reclaimed Water Act. Assure consistency between water quality and water resources statutes to encourage reclaimed water projects. Develop streamlined water reuse permitting and water right credit system that will enable water reuse project proponents to receive appropriate water right benefits for their investment in improving water quality and conserving the potable water resource.
		WR-6	Mechanism for water rights governing body support of water right application. Creation of a mechanism for a WRIA 11 "water rights governing body" charged with providing comment on water right applications for new rights or transfers within the Nisqually Watershed.
		WR-7	Address sub-basin closures (see ISF-2 and ISF-3). Plan recommends a study to better understand basis of closures and current instream flow conditions.

Table A-2
Department of Health Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1b*	Recommend to DOH that each CWSP be required to include a supply element (and not just service area) from individual water supply plans. This recommendation does not require a revision to the Coordination Act.
	CWSP Updates	GLU - 1c*	Recommend that a County-wide CWSP for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.
		GLU - 1d*	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a CWSP.
Yelm Sub-basin	Short-term Actions	Y-5	Pursue with the Department of Ecology and Health the development of a policy that would provide for the recalculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or stream flow augmentation.
Mashel-Ohop Sub-basin		MO-3	Obtain DOH guidance to address the conservation portion of WSP.

Table A-3
Department of Transportation Actions

Discipline	Project Type	Code	Action
Water Quality		WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.

Table A-4
Eatonville Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.
	General Planning Policy	GLU - 2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development.
		GLU - 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.
Instream Flows	Projects	ISF-4	Research the groundwater/surface water continuity issues that are relevant to water rights processing in Yelm and Eatonville.
Mashel-Ohop Sub-basin	Short-term Actions	MO-2	Complete groundwater hydrology investigations as recommended by Eatonville planning consultant.
		MO-3	Obtain DOH guidance to address the conservation portion of WSP.
		MO-4	Begin developing conservation strategy for the Town of Eatonville. Seek funding as soon as possible to prepare a Conservation Plan. Commit to holding a public meeting on Conservation.
		MO-5	Update Eatonville's WSP.
		MO-6	Seek funding to update WSP.
		MO-7	Complete Stormwater Management Plan and mitigate stormwater runoff problems.
		MO-8	Address long term UGA boundaries and adjust to reflect realistic future land use.
	Long-term Actions	MO-9	Protect fish habitat. Continue to study flow patterns on the Mashel. Implement the salmon habitat restoration plans for the Mashel and Ohop.
		MO-10	Evaluate supply potential. See page 97 in Watershed Plan for more specific action items.
		MO-11	Improve shoreline protection. (See page 97 in Watershed Plan for more specific action items).
		MO-12	Protect water quality. (See page 97 in Watershed Plan for more specific action items).
		MO-13	Land use impacts on water quality.

Table A-4
Eatonville Actions

Discipline	Project Type	Code	Action
		MO-14	Assess viable storage alternatives to seasonally augment water supply. Investigate the potential to purchase existing water rights within Mashel Sub-basin.
		MO-15	Growth Management Act issues. Develop Interlocal Agreement with Pierce County. Provide Eatonville with some level of oversight on permit applications outside town boundaries but inside the UGA.

Table A-5
Fort Lewis Actions

Discipline	Project Type	Code	Action
Water Quality		WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.
		WQ-5	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.

Table A-6
Implementing Body Actions

Discipline	Project Type	Code	Action
Ground Water Resources	WRIA Boundaries and Groundwater Divides	GW - 3 (GD)	Policy statement addressing WRIA boundaries versus groundwater divides. For instances where WRIA boundaries and groundwater divides are not the same, the Nisqually Watershed (WRIA11) Planning Unit will work with the Planning Units from WRIA 12 (Chambers Clover Watershed) and WRIA 13 (Deschutes Watershed) to develop a policy for coordination and congruence for groundwater that does not follow the WRIA boundaries.
		GW - 4 (GD)	Address locations of groundwater divides through a joint study, or development of joint management strategies, with the Chambers Clover Planning Unit to identify groundwater divide between WRIAs 11 and 12.
	Exempt Wells	GW - 7b (EW)	Once sufficient information is gathered on the cumulative impacts of exempt wells as directed in GW-7a (EW), the Planning Unit may wish to consider avenues to address the drilling of exempt wells in areas where technical data indicate they may have impact on surface water systems. In sensitive areas, this might include the option of drilling in deeper aquifers that are more protective of surface water, if available.
		GW - 8 (EW)	Develop a policy of transfer of exempt wells' water rights within a water service area or urban growth area to a water purveyor and submit to Ecology for water right credit. Define how much credit should be granted for taking exempt wells off line as part of this policy.
Instream Flows	Policy/Process	ISF-1	Creation of a policy statement to support protection of instream resources: *Support protection of resources by maintaining closures unless new technical information suggests otherwise, or a change in closure status would result in improved flow or habitat conditions in the closed stream or closed streams in other sub-basins.*
	Projects	ISF-2	Gain better understanding of technical basis for stream closures watershed-wide. The basis of closures could be studied as part of instream flow study.
		ISF-3	Identify and gage flow compromised streams based on intermittent nature and beneficial use(s). Design and install a network of stream gauging stations to monitor these streams and develop an understanding of the hydrology, including current and historical conditions via data collection, analysis and modeling. Includes installation of gauging stations on: Yelm Creek; Muck Creek; Powell, Murray, Toboton, Tanwax, and Horn Creeks.
		ISF-3a	Yelm Creek ISF-3.
		ISF-3b	Muck Creek ISF-3.
		ISF-3c	Powell, Murray, Toboton, Tanwax, and Horn Creek ISF-3.

Table A-6
Implementing Body Actions

Discipline	Project Type	Code	Action
		ISF-5	Identify or study methods of surface water augmentation. Methods of surface water augmentation could include reuse, artificial recharge, and/or storage-related projects. This Plan recommends development of strategies to improve and/or augment instream flows in intermittent streams. This could include identification of storage options to augment flows when they are critically low or intermittent. Recommendations for pilot projects should be made as part of this study.
Water Quality		WQ-1	Implement watershed-wide Water Quality Monitoring Plan. As applicable, the plan will assist planning efforts by providing a framework to determine whether data of the appropriate quantity and quality are collected, optimize the sample locations, improve consistency in the data collected, improve coordination of sampling efforts, and be cost-effective for future studies. The Planning Unit recommends implementation of actions recommended in the Water Quality Plan.
		WQ-4	Address land uses that may threaten watershed health through an open forum with agencies and the public.
McAllister Sub-basin	Short-term Solutions	MC-5	Develop programs for monitoring potential impacts to existing water rights.
		MC-5a	Potential flow monitoring on Lower Nisqually River.
		MC-5b	Long term monitoring for impacts from regional supply
		MC-6	Sub-basin committee support of GW-3(GD).
	Long-term Actions	MC-9	Develop and implement strategies for protecting quantity and quality of groundwater.
		MC-9b	Recharge and time-of-travel areas should be used to delineate wellhead protection areas.
		MC-10	Implement long-term monitoring programs for quality and water quantity that were developed in short-term recommendations MC-5 through MC-7. Monitoring programs will include establishing baseline conditions prior to full implementation of the watershed Plan.
		MC-12	Update water budget for sub-basin using data collected for the various studies recommended in this action plan.
		Y-1	Refine or revise Yelm sub-basin water balance for technical competency. If the methodology for computing the water balance can be improved upon, a new approach will be developed and the water balance and resulting water use summaries will be revised using the new methodology.
		Y-3	Determine if there is a likelihood that wells draw water from the sequence if deeper aquifers within the Nisqually Basin.

Table A-6
Implementing Body Actions

Discipline	Project Type	Code	Action
Yelm Sub-basin	Short-term Actions	Y-5	Pursue with the Department of Ecology and Health the development of a policy that would provide for the recalculation of water use or additional water rights considering the return of reclaimed water from aquifer recharge, wetland enhancement and/or streamflow augmentation.
		Y-5a	Develop a scientifically based approach to calculate the amount of water that returns to the aquifer through infiltration through constructed wetlands.
		Y-5b	Contact others with similar goals (Y-5) and perhaps form a committee to present a unified approach and common message to Ecology.
		Y-6	Draft and adopt a CWRP to maximize the use of reclaimed water to offset the need for potable water, thus extending use of existing water rights available.
		Y-6c	Plan, budget, and implement improvements in the CWRP.
Mashel-Ohop Sub-basin	Short-term Actions	MO-1	Complete instream flow assessment of Mashel River (completed April 2006) and assess the adequacy of the current low flow regulations.
		MO-2	Complete groundwater hydrology investigations as recommended by Eatonville planning consultant.
		MO-4	Begin developing conservation strategy for the Town of Eatonville. Seek funding as soon as possible to prepare a Conservation Plan. Commit to holding a public meeting on Conservation.
		MO-6	Seek funding to update WSP.
	Long-term Actions	MO-9	Protect fish habitat. Continue to study flow patterns on the Mashel. Implement the salmon habitat restoration plans for the Mashel and Ohop.
		MO-10	Evaluate supply potential. See page 97 in Watershed Plan for more specific action items.
		MO-11	Improve shoreline protection. (See page 97 in Watershed Plan for more specific action items).
		MO-12	Protect water quality. (See page 97 in Watershed Plan for more specific action items).
		MO-13	Land use impacts on water quality.
		MO-14	Assess viable storage alternatives to seasonally augment water supply. Investigate the potential to purchase existing water rights within Mashel Sub-basin.
Implementation	Support Development/ Implementation	IM-2	Support the development and implementation of existing and new programs occurring within the Watershed while striving to prevent activities or policies that are duplicates and inconsistent.
		IM-3	Partnership and/or coordination with other on-going or planned processes.
		IM-4	Implementing body should participate in seeking funding for plan implementation.

Table A-6
Implementing Body Actions

Discipline	Project Type	Code	Action
Water Rights		WR-6	Mechanism for water rights governing body support of water right application. Creation of a mechanism for a WRIA 11 "water rights governing body" charged with providing comment on water right applications for new rights or transfers within the Nisqually Watershed.
		WR-7	Address sub-basin closures (see ISF-2 and ISF-3). Plan recommends a study to better understand basis of closures and current instream flow conditions.
		WR-8	Investigate the potential for purchase, sale or lease of water rights (e.g. water bank).
		WR-9	Development of watershed-wide water balance to better understand water availability by sub-basin.

Table A-7
Lacey Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Consider water supply availability in planning for growth
	General Planning Policies	GLU - 2	Amendments to Comprehensive Plan land use updates should demonstrate how infrastructure needs will be met.
		GLU - 3	Consideration of water supply availability in UGA expansions outside the water service area.
Ground Water Resources	Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances.
		GW - 5a (AR)	Evaluate adequacy of protection provided by Critical Areas Ordinances.
		GW - 5c (AR)	Ensure relevant technical information available for CAO updates.
		GW - 5d (AR)	Jurisdictional review of CAOs.
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up
McAllister Sub-basin	Short-term Solutions	MC-2a	City of Lacey short term water supply solutions.
		MC-3	Improve understanding of direction of groundwater flow.
	Long-term Actions	MC-10	Implement long-term monitoring programs from MC-5 through MC-7.
		MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek.

Table A-8
Lewis County Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.
	General Planning Policies	GLU - 2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development..
		GLU - 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.
		GLU - 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.
Groundwater Resources	Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.
		GW - 5a (AR)	Yelm and Olympia - During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.
		GW - 5b (AR)	Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.
		GW - 5c (AR)	Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.
		GW - 5d (AR)	Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).

Table A-8
Lewis County Actions

Discipline	Project Type	Code	Action
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up. If these land uses are nonconforming uses they should be prohibited from further contaminating groundwater.
Water Quality	Water Quality	WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.
		WQ-5	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.

Table A-9
Nisqually Indian Tribe Actions

Discipline	Project Type	Code	Action
Ground Water Resources	WRIA Boundaries and Groundwater Divides	GW - 3 (GD)	Policy statement addressing WRIA boundaries versus groundwater divides.
Water Quality		WQ-2	Maintenance and use of the Nisqually Water Quality Data System.
		WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities
McAllister Sub-basin	Short-term Solution	MC-3	Improve understanding of direction of groundwater flow.
	Long-term Action	MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek.

Table A-10
Olympia Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Consider water supply availability in planning for growth
	General Planning Policy	GLU - 2	Amendments to Comprehensive Plan land use updates should demonstrate how infrastructure needs will be met.
		GLU - 3	Consideration of water supply availability in UGA expansions outside the water service area.
Ground Water Resources	Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances.
		GW - 5a (AR)	Evaluate adequacy of protection provided by Critical Areas Ordinances.
		GW - 5c (AR)	Ensure relevant technical information available for CAO updates.
		GW - 5d (AR)	Jurisdictional review of CAOs.
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up
McAllister Sub-basin	Short-term Solutions	MC-2b	City of Olympia short term water supply solutions.
		MC-3	Improve understanding of direction of groundwater flow.
	Long-term Actions	MC-10	Implement long-term monitoring programs from MC-5 through MC-7.
		MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek.

Table A-11
Pierce County Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.
		GLU - 1a*	Look for opportunities to resolve inconsistencies between Pierce and Thurston CWSPs such that all CWSPs within the Nisqually Watershed are consistent in their review and coordination of Water System Plans and are also reviewed with respect to consistency with comprehensive plans.
		GLU - 1d*	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a CWSP.
		GLU - 1e*	Recommend that CWSPs address water rights associated with failed water systems. CWSPs should specify that when purveyors take over failed water systems that have their own source(s), the acquisition should also include the water rights for the water service area.
	CWSP Updates	GLU - 1f*	CWSPs should require purveyors to provide counties information about how much water is available for hook-ups through approval of Water System Plans. This would allow Counties a working number of connections remaining under the existing Water System Plan or Water Right approval, understanding that this number may be subject to change based on water usage and mitigation factors.
	General Planning Policies	GLU - 2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development..
		GLU - 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.
		GLU - 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.
		GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.

Table A-11
Pierce County Actions

Discipline	Project Type	Code	Action
Groundwater Resources	Aquifer Recharge Areas	GW - 5a (AR)	Yelm and Olympia - During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.
		GW - 5b (AR)	Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.
		GW - 5c (AR)	Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.
		GW - 5d (AR)	Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up. If these land uses are nonconforming uses they should be prohibited from further contaminating groundwater.
Water Quality	Water Quality	WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.
		WQ-5	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.
Mashel-Ohop Sub-basin	Long-term Actions	MO-15	Growth Management Act issues. Develop Interlocal Agreement with Pierce County. Provide Eatonville with some level of oversight on permit applications outside town boundaries but inside the UGA.
		MO-16	Sub-basin committee support for GLU-3.
McAllister Sub-basin		MC-9c	Critical Areas Ordinances protection of regional water supply needs to be evaluated.

Table A-12
Roy Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.

Table A-13
Tacoma Power Actions

Discipline	Project Type	Code	Action
Water Quality		WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.

Table A-14
Thurston County Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Water supply availability should be considered in city and county land use planning activities. As such, an integrated approach to planning for water for growth in WRIA 11 via the CWSP process should be developed.
	CWSP Updates	GLU - 1a*	Look for opportunities to resolve inconsistencies between Pierce and Thurston CWSPs such that all CWSPs within the Nisqually Watershed are consistent in their review and coordination of Water System Plans and are also reviewed with respect to consistency with comprehensive plans.
		GLU - 1c*	Recommend that a County-wide CWSP for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.
		GLU - 1d*	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a CWSP.
		GLU - 1e*	Recommend that CWSPs address water rights associated with failed water systems. CWSPs should specify that when purveyors take over failed water systems that have their own source(s), the acquisition should also include the water rights for the water service area.
		GLU - 1f*	CWSPs should require purveyors to provide counties information about how much water is available for hook-ups through approval of Water System Plans. This would allow Counties a working number of connections remaining under the existing Water System Plan or Water Right approval, understanding that this number may be subject to change based on water usage and mitigation factors.
	General Planning Policies	GLU - 2	Amendments to Comprehensive Plan land use designations that intensify land use should demonstrate how infrastructure needs will be met at the time of development..
		GLU - 3	For proposed Urban Growth Boundary expansions that are outside the jurisdiction of a water service area, the proposal for expansion should include documentation of the city or town's intention to provide water, their ability to provide water, or the ability of the development to provide water if it is to be self-served. Burden of proof is left to the applicant for the expansion.

Table A-14
Thurston County Actions

Discipline	Project Type	Code	Action
		GLU - 4	Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas.
Groundwater Resources	Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances to preserve the long-term integrity of recharge areas (both quantity and quality) and implement studies to delineate critical recharge areas.
		GW - 5a (AR)	Yelm and Olympia - During any amendments mandated by the Growth Management Act, evaluate adequacy of Critical Areas Ordinances and data supporting them, and whether they provide adequate protection. This includes geographic scope and dynamics of recharge areas. This will require coordination with Fort Lewis, as Fort Lewis lands overlay critical aquifer recharge areas.
		GW - 5b (AR)	Ensure process is in place to obtain the input of municipalities when a Critical Areas Ordinance is updated. Support current efforts, suggest a review process, and link projects to updates of the Critical Areas Codes or Ordinances for respective entities.
		GW - 5c (AR)	Coordinate the collection of relevant technical information regarding recharge areas and assure it is made available during updates of critical areas ordinances. Assure that all wellhead protection areas as delineated by water purveyors are incorporated into Critical Areas Codes or Ordinances.
		GW - 5d (AR)	Perform jurisdictional review of Critical Areas Ordinances and include the following activities: (see pages 41-42 in Watershed Plan for the listed activities).
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up. If these land uses are nonconforming uses they should be prohibited from further contaminating groundwater.
Water Quality	Water Quality	WQ-3	Convene a workgroup to address potential inconsistencies in handling of pollutants between federal and State agencies and utilities. This review would include assessing potential inconsistencies in procedures regarding the spraying of pesticides, toxics handling, and other relevant activities.
		WQ-5	Ensure adequate water quality monitoring of groundwater in designated critical aquifer recharge areas. As part of the Nisqually Watershed Water Quality Monitoring Plan, the adequate monitoring of groundwater in these areas should be addressed.

Table A-14
Thurston County Actions

Discipline	Project Type	Code	Action
McAllister Sub-basin	Short-term Solutions	MC-7	Recommendations for Nisqually/McAllister TMDL
Yelm Sub-basin	Long-term Actions	Y-9	Sub-basin committee support of GW-7, GW-7a, GW-7b.
Mashel-Ohop Sub-basin		MO-16	Sub-basin committee support for GLU-3.

Table A-15
Thurston PUD Actions

Discipline	Project Type	Code	Action
Growth and Land Use	CWSP Updates	GLU - 1a*	Look for opportunities to resolve inconsistencies between Pierce and Thurston CWSPs such that all CWSPs within the Nisqually Watershed are consistent in their review and coordination of Water System Plans and are also reviewed with respect to consistency with comprehensive plans.
		GLU - 1c*	Recommend that a County-wide CWSP for Thurston County be developed as a means to implement recommendations identified in this section including ensuring adequate water supply and limiting the numbers of exempt wells where alternate supply is available. This CWSP will address any potential inconsistencies between South Thurston and North Thurston CWSPs and form an integrated North and South Thurston CWSP.
		GLU - 1d*	Develop linkage between issuance of water availability certificates and exempt wells in areas encompassed by a CWSP.
		GLU - 1e*	Recommend that CWSPs address water rights associated with failed water systems. CWSPs should specify that when purveyors take over failed water systems that have their own source(s), the acquisition should also include the water rights for the water service area.

NOTE - Agencies or groups that have not been formally involved in the watershed planning process are not officially obligated by this Watershed Implementation Plan. The Thurston County Public Utility District #1 is not considered obligated, however, the Planning Unit has listed actions in which they can be involved.

Table A-16
Water Conservancy Board Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Planning Policies	GLU - 5	Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use.
Water Rights	Current Water Right Application Process	WR-6	Mechanism for water rights governing body support of water right application.

NOTE - Agencies or groups that have not been formally involved in the watershed planning process are not officially obligated by this Watershed Implementation Plan. The Thurston County Water Conservancy Board is not considered obligated, however, the Planning Unit has listed actions in which they can be involved

Table A-17
WDFW Actions

Discipline	Project Type	Code	Action
McAllister Sub-basin	Long-term Actions	MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek and establish a basis for these flows with the understanding that levels in these creeks are under tidal influence.
Water Rights	Current Water Right Application Process	WR-7	Address sub-basin closures (see ISF-2 and ISF-3). Plan recommends a study to better understand basis of closures and current instream flow conditions.

Table A-18
Yelm Actions

Discipline	Project Type	Code	Action
Growth and Land Use	General Policy Statement	GLU - 1	Consider water supply availability in planning for growth
	General Planning Policy	GLU - 2	Amendments to Comprehensive Plan land use updates should demonstrate how infrastructure needs will be met.
		GLU - 3	Consideration of water supply availability in UGA expansions outside the water service area.
Ground Water Resources	Aquifer Recharge Areas	GW - 5 (AR)	Address Aquifer Recharge Areas under Critical Areas Ordinances.
		GW - 5a (AR)	Evaluate adequacy of protection provided by Critical Areas Ordinances.
		GW - 5c (AR)	Ensure relevant technical information available for CAO updates.
		GW - 5d (AR)	Jurisdictional review of CAOs.
		GW - 5e (AR)	Land uses with potential to pollute groundwater in CARAs should have priority for expedited clean-up
Instream Flows	Projects	ISF-4	Research the GW/SW continuity issues in Yelm and Eatonville.
McAllister Sub-basin	Short-term Solutions	MC-3	Improve understanding of direction of groundwater flow.
	Long-term Actions	MC-10	Implement long-term monitoring programs from MC-5 through MC-7.
		MC-11	Recommend Ecology establish target flows for freshwater spring discharges into McAllister Creek.
	Short-Term Actions	Y-1	Refine or revise Yelm sub-basin water balance.
		Y-2	Pursue opportunities for existing water rights transfers.
		Y-3	Determine if there is a likelihood that wells draw water from the sequence of deeper aquifers within the Nisqually Basin.
		Y-4	Develop policy of transfer of exempt wells' water to City of Yelm and submit to DOE for credits.
		Y-4a	Ecology put Y-4 into action.
		Y-4b	Policies and procedures to facilitate exempt well transfers.
		Y-4c	Capture abandoned wells.
		Y-5	Develop policy to provide water use credit for reclaimed water.
		Y-5a	Develop a scientifically based approach to calculate the amount of water that returns to the aquifer through infiltration through constructed wetlands.
		Y-5b	Contact others with similar goals (Y-5) and perhaps form a committee.
		Y-5c	City of Yelm should meet with AWC to promote this concept (Y-5).

Table A-18
Yelm Actions

Discipline	Project Type	Code	Action
Yelm Sub-basin		Y-6	Draft and adopt a CWRP.
		Y-6a	Comprehensive approach for reclaimed water system to identify new reuse opportunities and the location and sizing of new reclaimed water pipe.
		Y-6b	Develop CWRP so it is integrated with WSP.
		Y-6c	Plan, budget, and implement improvements in the CWRP.
	Long-Term Actions	Y-7	If applicable, expand McAllister Numerical Model to southwest Yelm and participate in a feasibility study.
		Y-8	If withdrawal of water supply from the sequence of deep aquifers in the Nisqually Basin is not feasible, determine correlation between summer low/no flow conditions in Yelm Creek and use of the Yelm Prairie aquifer.
		Y-8a	Retain consultant to perform Yelm Prairie aquifer modeling and analysis.
		Y-8b	Gather data to demonstrate relationship between groundwater and surface water flows in Yelm and Thompson Creeks.
		Y-8c	Recommendations on mitigation to low flows in Yelm and Thompson Creeks.
		Y-9	Sub-basin committee support of GW-7, GW-7a, GW-7b.

APPENDIX B

WATER TRANSFERS ON AGRICULTURAL LANDS – ISSUE PAPER AND LETTER TO THE THURSTON WATER CONSERVANCY BOARD

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 10, 2005

Thurston County Conservancy Board
PO Box 1037
Olympia WA 98507

Dear Conservancy Board Members:

This is a letter to inform you of how we believe recommendations from completed watershed plans in Thurston County regarding transferring water from agricultural lands have an impact on the public interest test for water rights changes on agricultural land.

As you may know the State Legislature enacted the Watershed Planning Law in 1997 (Chapter 90.82. RCW) as a way to provide for more stakeholder participation, in the planning and management of Washington's Water Resources. RCW 90.82.010 states:

> "The legislature finds that the local development of watershed plans for managing water resources and for protecting existing water rights is vital to both state and local interests. The local development of these plans serves vital local interests by placing it in the hands of people: Who have the greatest knowledge of both the resources and the aspirations of those who live and work in the watershed; and who have the greatest stake in the proper, long-term management of the resources. The development of such plans serves the state's vital interests by ensuring that the state's water resources are used wisely, by protecting existing water rights, by protecting instream flows for fish, and by providing for the economic well-being of the state's citizenry and communities. Therefore, the legislature believes it necessary for units of local government throughout the state to engage in the orderly development of these watershed plans. [1997 c 442 § 102.]

Subsequent to the enactment of the Watershed Planning Law, two watershed plans have been completed and approved in Thurston County; the Chehalis Basin Plan and the Nisqually Basin Plan. Both of these planning groups had as participants a variety of water resource interests including cities, counties, tribes, and a variety of interest groups including agricultural, water utilities, fisheries, and environmental groups.

Two recommendations regarding transferring water rights from designated agricultural lands that I would like to highlight are as follows:

> RECOMMENDATION GLU-5 (p.24) NISQUALLY WATERSHED PLAN: Ecology should not grant permits for transfers of existing water rights from designated agricultural lands unless long term arrangements are made for a suitable surrogate water supply to maintain agricultural use.

> RECOMMENDATION #23 (p.23) CHEHALIS BASIN WATERSHED PLAN: Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless

long-term arrangements are made for water supply to maintain agricultural use, including suitable surrogate sources

Given the legislative direction provided to these watershed planning groups and the support of these plans by such a broad and diverse group of water resources interests, the recommendations coming from these plans are an expression of public interest. Consequently, these recommendations will represent a major component for consideration of the public interest test we will use in making determinations for ground water right change decisions in areas of Thurston County designated as agricultural lands.

Please call me (360) 407-6058 if you have any questions on this.

Sincerely,

Tom Loranger
Water Resources Section Manager

TL:th

Cc: Mark Swarthout, Thurston County
Brian Walsh, Department of Ecology

Issue Paper
Meeting with Ecology August 30, 2005

Issue: Implement actions related to keeping water rights on those lands designated as long-term agricultural lands of commercial significance in Thurston and Pierce Counties. These actions came from the approved Nisqually and the Chehalis Basin Watershed Management Plans and consider recommendations from the final proposed WRIA 13 (Deschutes) Watershed Plan.

Policies related to the issue include:

1. The Growth Management Act's requirement that counties designate agricultural lands of long-term commercial significance. These lands should be designed to **conserve** agricultural lands and **encourage the agricultural economy**.

   Thurston and Pierce Counties have designated agricultural areas in accordance with the Growth Management Act. Additional considerations include:

   A. The Growth Management Hearings Board recently ordered Thurston County to increase the amount of designated agricultural land.
   B. In 2004 Thurston County updated its Comprehensive Plan by adopting policies including:

      1) To the extent possible, future land use designations, or changes to existing land use designations, should take into account the availability of water rights and an adequate water supply as this information becomes available.
      2) Adequate water rights should be reserved for designated agricultural land of long-term commercial significance.
      3) Adopt policies to ensure that lands intended for long-term agricultural use have the water supply necessary for this use.

2. Watershed Planning Act includes:

   A. Providing sufficient water for production agriculture.
   B. An obligation of state agencies to implement adopted watershed plans.
   C. The department shall use the plan as the framework for making future water resource decisions for the planned watershed or watersheds.
   D. Additionally, the department shall rely upon the plan as a primary consideration in determining the **public interest** related to such decisions

3. Water Resources Act of 1971:

   Expressions of the **public interest** will be sought at all stages of water planning and allocation discussions.

4. Water Code:

   RCW 90.03.380 does not specify a public interest requirement for transfers, the standard for maximizing beneficial use of water provides the state administering agency with great discretion to apply conditions that go beyond the prevention of injury to vested water rights.

   RCW 90.03.005; RCW 90.54.020. In order to maximize beneficial use of all the waters of the state, conditions may be placed on transfers to adequately protect the environment or **limit the impacts on communities whose social and economic structures rely upon the use of water in a specific area.**

SUMMARY:

There is a clear statutory obligation for jurisdictions to provide for and protect agricultural lands. There is also a clear statutory authority for the state to protect the public interest when regulating water use. Sound planning in the public interest involves ensuring that land uses, whether residential, critical areas, or agricultural, can be supported with adequate water resources. Without secure water rights, the viability of commercially productive agriculture is particularly threatened. Agriculture not only provides jobs, local sources of fresh food, and a diverse local economy; farmlands provide habitat for numerous species including migratory birds, flood control, and "rural character" that jurisdictions must protect under the Growth Management Act. So long as water rights can be transferred permanently from lands identified by jurisdictions as important for agricultural use, these public benefits are under threat, and the public interest is not being met.

RESOURCES:

ACTIONS FROM THE NISQUALLY AND CHEHALIS WATERSHED PLANS PERTINENT TO THIS DISCUSSION INCLUDE:

Nisqually Watershed Management Plan actions:

GLU-4 (p.24) Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas. These areas are defined through comprehensive plans and codified in zoning ordinances. Zoned agricultural areas for Thurston County and Pierce County are shown in figure 6.

GLU-5 (p.24) Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for a suitable surrogate water supply to maintain agricultural use. (This action statement mirrors recent amendments proposed by the Thurston County Planning Commission for the County's Comprehensive Plan, and may require a rule change by Ecology.)

Chehalis Basin Watershed Management Plan Action:

Action #23 (p.23) Thurston County adopted local policies protecting water supply in agriculture designated lands.

- Adequate water supply should be retained on and provided to designated agricultural land of long-term commercial significance and other important agricultural areas; and
- Ecology should not grant permits for transfers of existing water rights from designated agricultural lands, unless long-term arrangements are made for water supply to maintain agricultural use, including suitable surrogate sources.

Final Proposed WRIA 13 (Deschutes River) Watershed Plan Recommendation 10 **(This plan failed to be approved by the Planning Unit by one dissenting vote).**

Water Right Recommendation 10

"Public Interest" Recommendations Regarding Existing Rights and Water Right Changes

The Watershed Plan has an appropriate and important role in helping define "public interest" regarding water right transfers within WRIA 13. The Legislature intends that Watershed Plans help guide Ecology and Water Conservancy Board decision-making on water right applications and other water resource management actions.

The following public interest guidance is recommended to Ecology and Conservancy Boards related to WRIA 13 water resources:

Existing Rights Recommendation 1:

Protect water rights associated with designated Long-Term Agriculture Areas.

Within WRIA 13, about 1,700 acres are designated for exclusive agricultural use under "Long-Term Agriculture" (LTA) zoning. The County is required by the Growth Management Act to designate and reserve lands having "long-term commercial agricultural significance". But current Washington water rights laws may not ensure similar long-term protection of water supply for these exclusive-use areas.

Two actions could threaten LTA water rights:

1.) Partial relinquishment due to low water use for a period of years, due to market conditions or crop selection. Ecology allocated two acre-feet per acre for most Irrigation Purpose water rights. This is still the appropriate volume to serve high water-demand crops such as turf and nursery stock. However, most of the LTA lands in WRIA 13 are currently in lower-intensity pasture and hay uses. The original water right quantity needs to be protected to provide long-term adaptability for agricultural production, to achieve long-term land use objectives.

2.) Sale and transfer of water rights out of LTA lands. Ecology and the Water Conservancy Board have no specific public interest statement that could avoid such an action in the future. Loss of water rights would effectively negate the intent of the County's land use designation that these are lands of "long-term commercial agricultural significance."

Watershed Plan recommendations should support policies adopted in the County's Comprehensive Plan – such as the designation of Long-Term Agricultural Lands. However, if land use policies regarding these lands change in the future, changes in water rights should be allowed to support the new intended land uses.

For municipal water systems, recent legislation balances improved "certainty" in the ability to use existing water rights without fear of relinquishment, with increased requirements for water use efficiency (see HB 1338.) This type of comprehensive legislative action has not yet adopted for agricultural water rights. Thus, there is no specific requirement for conservation for agricultural rights.

Recommended actions:

1a. Preclude permanent transfers that would remove water rights from Long Term Agriculture areas: Inform Ecology and the Water Conservancy Board that the public interest is served by retaining water rights associated with Long-Term Agriculture Areas within these areas. Ecology or the Conservancy Board should not approve water right transfer applications that permanently remove existing water rights from Long Term Ag areas. This protection should extend for the duration of the zoning designation. When land use policies are revised, changes in water rights should be allowed to serve the new land uses.

1 b. Protect water rights in Long-Term Agriculture Areas from relinquishment: The WRIA 13 Watershed Planning Committee finds that the public interest is served by protecting water rights from relinquishment in designated Long-Term Agriculture Areas (LTA). This protection should extend for the duration of the zoning designation.

> The WRIA 13 Planning Committee requests that Ecology determine that permanent protection of LTA water rights is in the public interest and that this protection from relinquishment is in harmony with RCW 90.14.140.

1c. Improve water use efficiency within Long-Term Ag Areas. The Department of Ecology, Thurston Conservation District and other agencies should work with agricultural operators to

improve efficiency in irrigation and other agricultural water uses. Long-Term Ag areas should be a focus for such efforts, given the policy intent that these lands remain in agricultural use for the foreseeable future. Also see the following recommendation on "water trust" support for conservation incentives.

STATE AND LOCAL POLICIES THAT NEED TO BE CONSIDERED FOR IMPLEMENTING THESE RECOMMENDED ACTIONS:

Growth Management Act:

RCW 36.70A.170 - Natural resource lands and critical areas -- Designations.

(1) On or before September 1, 1991, each county, and each city, shall designate where appropriate:

(a) Agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products;

RCW 36.70A.177 - Agricultural lands -- Innovative zoning techniques -- Accessory uses.

(1) A county or a city may use a variety of innovative zoning techniques in areas designated as agricultural lands of long-term commercial significance under RCW 36.70A.170. The innovative zoning techniques should be designed to **conserve** agricultural lands and **encourage the agricultural economy**. A county or city should encourage nonagricultural uses to be limited to lands with poor soils or otherwise not suitable for agricultural purposes.

Thurston County's Comprehensive Plan:

Chapter 2 –Land Use

VII. Goals, Objectives And Policies:

GOAL 1: TO PROVIDE FOR RURAL AREAS THAT:
- MAINTAIN A BALANCE BETWEEN HUMAN USES AND THE NATURAL ENVIRONMENT IN ORDER TO PROTECT RURAL CHARACTER;
- MAINTAIN THE LAND AND WATER ENVIRONMENTS REQUIRED BY NATURAL RESOURCE-BASED ECONOMIC ACTIVITIES, FISH AND WILDLIFE HABITATS, RURAL LIFESTYLES, OUTDOOR RECREATION, AND OTHER OPEN SPACE; AND
- DEVELOP AT LOW LEVELS OF INTENSITY SO THAT DEMANDS WILL NOT BE CREATED FOR HIGH LEVELS OF PUBLIC SERVICES AND FACILITIES.

OBJECTIVE A: *Rural Land Use and Activities* - County development requirements and programs provide for a balance between human uses and the natural environment in rural and resource areas, and for low levels of demand for public services and facilities.

POLICY:

13. To the extent possible, future land use designations, or changes to existing land use designations, should take into account the availability of water rights and an adequate water supply as this information becomes available.

Chapter 3 – Natural Resource Lands

V. Goals, Objectives and Policies:

GOAL 2: AGRICULTURAL LAND OF LONG-TERM COMMERCIAL SIGNIFICANCE SHOULD BE CONSERVED.

OBJECTIVE A: Agriculture lands of long-term commercial significance should receive the highest priority for **conservation**.

POLICIES:

6. Adequate water rights should be reserved for designated agricultural land of long-term commercial significance.

ACTION NEEDS FOR OBJECTIVE A:

1. The County should study the problem of water rights for lands designated as long-term commercially significant, and adjust designations or policies to ensure that lands intended for long-term agricultural use have the water supply necessary for this use.

Pierce County's Comprehensive Plan:

19A.30.070 Resource Lands - Agriculture.
Agricultural lands are distinct from rural lands and include lands that have been designated as having long-term commercial agricultural significance. In November 1991, Pierce County, on an interim basis, classified and designated agricultural lands of long-term commercial significance, which were located outside the Urban Growth Areas. The criteria for designation were reviewed and the interim criteria became the final criteria for the adopted 1994 Comprehensive Plan.

A. LU-Ag Objective 15. Implement the Growth Management Act's planning goal related to maintaining and enhancing natural resource-based industries by preserving and enhancing the agricultural land base which is being used for, or offers the greatest potential for, production of agricultural products.

1. The conservation and enhancement of the County's agricultural land base serves the following purposes:
   a. Supporting the local and regional economic base for agriculture;
   b. Maintaining local, regional, state and national agricultural reserves;
   c. Preserving the high quality agricultural soils for future farming;
   d. Facilitating the availability of locally grown, healthy food options for residents;
   e. Retaining natural systems and natural processes;
   f. Alleviating some of the pressures to urbanize;
   g. Supporting the rural lifestyle; and
   h. Providing environmental benefits, such as air quality and habitat.
2. The County encourages agricultural activities as an appropriate land use throughout the rural area.
3. Agricultural activities are also allowed in the urban area.

E. LU-Ag Objective 19. Implement the Agricultural Resource Lands with development regulations that support and enhance farming.

F. LU-Ag Objective 20. Provide programs, policies and other regulations to achieve agricultural conservation and support agricultural activities:

7. Investigating other innovative techniques to achieve agricultural conservation;
8. Coordinating with other jurisdictions, tribes, and special districts, and engaging in the joint planning of agricultural lands;

H. LU-Ag Objective 22. Protect agricultural operations from incompatible uses and ensure regulations are in place that maintain the vitality of the agricultural industry.

RCW 90.82 Watershed Planning

RCW 90.82.043 (2) Each implementation plan must contain strategies to provide **sufficient water** for: (a) **Production agriculture**; (b) commercial, industrial, and residential use; and (c) instream flows. Each implementation plan must contain timelines to achieve these strategies and interim milestones to measure progress. (Both the Chehalis and Nisqually watershed Planning Units are beginning Phase 4 Implementation.)

RCW 90.82.130 (3) The planning unit shall not add an element to its watershed plan that creates an obligation unless each of the governments to be obligated has at least one representative on the planning unit and the **respective members appointed to represent those governments agree to adding the element that creates the obligation**. A member's agreeing to add an element shall be evidenced by a recorded vote of all members of the planning unit in which the members record support for adding the element. **If the watershed plan is approved under subsections (1) and (2) of this section and the plan creates obligations: (a) For agencies of state government, the agencies shall adopt by rule the obligations of both state and county governments and rules implementing the state obligations, or, with the consent of the planning unit, may adopt policies, procedures, or agreements related to the obligations or implementation of the obligations in addition to or in lieu of rules.** The obligations on state agencies are binding upon adoption of the obligations, and the agencies shall take other actions to fulfill their obligations as soon as possible, and should annually review implementation needs with respect to budget and staffing; (b) for counties, the obligations are binding on the counties and the counties shall adopt any necessary implementing ordinances and take other actions to fulfill their obligations as soon as possible, and should annually review implementation needs with respect to budget and staffing; or (c) for an organization voluntarily accepting an obligation, the organization must adopt policies, procedures, agreements, rules, or ordinances to implement the plan, and should annually review implementation needs with respect to budget and staffing.

RCW 90.82.130 (4) After a plan is adopted in accordance with subsection (3) of this section, and if the department participated in the planning process, the plan shall be deemed to satisfy the watershed planning authority of the department with respect to the components included under the provisions of RCW 90.82.070 through 90.82.100 for the watershed or watersheds included in the plan. **The department shall use the plan as the framework for making future water resource decisions for the planned watershed or watersheds.** Additionally, the department shall rely upon the plan as a primary consideration in determining the **public interest** related to such decisions

RCW 90.54 – Water Resources Act of 1971

RCW 90.54.020(10) Expressions of the **public interest** will be sought at all stages of water planning and allocation discussions.

"A permit cannot be issued if the use of water will be detrimental to the public welfare. Wash. Rev. Code 90.03.290. On the other hand, to grant a permit, the use of water must be in the public interest. Wash. Rev. Code 90.54.020(10). The public interest criteria provide for the greatest level of discretion afforded Ecology in the permit process. It invokes the application of the general environmental and water management policies enacted by the Legislature."[1]

RCW 90.03 – Water Code

RCW 90.03.380 - Right to water attaches to land -- Transfer or change in point of diversion -- Transfer of rights from one district to another -- Priority of water rights applications -- Exemption for small irrigation impoundments.

"Although Wash. Rev. Code 90.03.380 does not specify a public interest requirement for transfers, the standard for maximizing beneficial use of water provides the state administering agency with great discretion to apply conditions that go beyond the prevention of injury to vested water rights. Wash. Rev. Code 90.03.005; 90.54.020. In order to maximize beneficial use of all the waters of the state, conditions may be placed on transfers to adequately protect the environment or limit the impacts on communities whose social and economic structures rely upon the use of water in a specific area."[2]

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[1] Office of Attorney General, An Introduction to Washington Water Law, January 2000, p. IV:39
[2] Office of Attorney General, p. VII:9

APPENDIX C

GRANT FUNDING TABLE

This table includes a list of alternative funding sources obtained from Boise State University. Some of the grants listed in the table may not be applicable to projects in the watershed, so some level of scrutiny must be applied when referencing this table for viable funding options.

Sponser	Grant/Program Name
Federal/ Interstate Agency Sponsors	
Bureau of Indian Affairs	Agriculture on Indian Lands
Bureau of Indian Affairs	Environmental Management on Indian Lands
Bureau of Indian Affairs	Fish, Wildlife, and Parks Programs on Indian Lands
Bureau of Indian Affairs	Forestry on Indian Lands
Bureau of Indian Affairs	Indian Loan Guaranty Program - BIA
Bureau of Indian Affairs	Native American Employment Assistance (BIA)
Bureau of Indian Affairs	Soil and Moisture Conservation
Bureau of Indian Affairs	Training and Technical Assistance for Indian Tribal Governments
Bureau of Indian Affairs	Water Resources on Indian Lands
Bureau of Land Management (BLM)	BLM Learning Landscapes - Idaho
Bureau of Land Management (BLM)	BLM Learnng Landscapes - Oregon & Washington
Bureau of Land Management (BLM)	Challenge Cost Share
Bureau of Land Management (BLM)	Secure Rural Schools & Community Self-Determination
Bureau of Land Management (BLM)	Wyden Ammendment
Bureau of Reclamation	Bridging-the-Headgate - A Conservation Partnership
Bureau of Reclamation	Construction Program
Bureau of Reclamation	General Investigations Program
Bureau of Reclamation	Native American Program
Bureau of Reclamation	Planning/Technical Assistance Program
Bureau of Reclamation	Technical Assistance to States
Bureau of Reclamation	Waste Water Reuse Program
Corporation for National and Community Service	AmeriCorps Education Awards Program
Corporation for National and Community Service	AmeriCorps Indian Tribes and US Territories Program
Corporation for National and Community Service	AmeriCorps National Civilian Community Corps (NCCC)
Corporation for National and Community Service	AmeriCorps National Program
Corporation for National and Community Service	AmeriCorps State Program
Corporation for National and Community Service	AmeriCorps Volunteers In Service To America (VISTA)
Corporation for National and Community Service	Learn and Serve America Program
Corporation for National and Community Service	Senior Corps

Sponser	Grant/Program Name
Department of Natural Resources	Forestry Riparian Easment Program
Economic Development Administration	Center for Economic Development - University of Alaska
Economic Development Administration	Economic Adjustment Program
Economic Development Administration	Partnership Planning Grants for Economic Development Districts, Indian Tribes, & Other Eligible Area
Economic Development Administration	Public Works and Development Facilities Program
Economic Development Administration	Public Works and Economic Development Program
Economic Development Administration	Sudden and Severe Economic Dislocation Program
Economic Development Administration	Support for Planning Organizations
Economic Development Administration	Technical Assistance Program (Local)
Environmental Protection Agency	Brownfields Assessment and Demonstration Projects
Environmental Protection Agency	Brownfields Cleanup Revolving Loan Fund Pilots
Environmental Protection Agency	Brownfields Job Training and Development Pilots
Environmental Protection Agency	Capitalization Grants for Drinking Water State Revolving Fund
Environmental Protection Agency	Chemical Emergency Preparedness and Prevention Technical Assistance Grants
Environmental Protection Agency	Clean Water Act Indian Set-Aside Grant Program
Environmental Protection Agency	Clean Water Act Water Quality Cooperative Agreements
Environmental Protection Agency	Direct Implementation Tribal Cooperative Agreements
Environmental Protection Agency	Drinking Water SRF Tribal Set-Aside Program
Environmental Protection Agency	Energy Star Program
Environmental Protection Agency	Environmental Education Grant Program
Environmental Protection Agency	Environmental Justice Collaborative Problem-Solving Grant Program
Environmental Protection Agency	Environmental Justice Grants to Small Community Groups
Environmental Protection Agency	Environmental Justice Through Pollution Prevention
Environmental Protection Agency	Environmental Monitoring for Public Access and Community Tracking (EMPACT)
Environmental Protection Agency	Five-Star Restoration Program
Environmental Protection Agency	Guidebook of Financial Tools
Environmental Protection Agency	Hazardous Waste Management Grants for Tribes
Environmental Protection Agency	Indian Environmental General Assistance Program (GAP) Grant
Environmental Protection Agency	Indian Set-Aside Wastewater Treatment Grant Program
Environmental Protection Agency	National Estuary Program
Environmental Protection Agency	Nonpoint Source Implementation Grant (319) Program - Idaho
Environmental Protection Agency	Nonpoint Source Implementation Grant (319) Program - Washington

Sponser	Grant/Program Name
Environmental Protection Agency	Pesticide Environmental Stewardship Grants
Environmental Protection Agency	Pollution Prevention Incentives for States
Environmental Protection Agency	Regional Geographic Initiative (RGI)
Environmental Protection Agency	Science to Achieve Results Program
Environmental Protection Agency	Small Community Wastewater Technical Assistance and Outreach Program
Environmental Protection Agency	State/Tribal Wetland Planning Grants
Environmental Protection Agency	Superfund Technical Assistance Grants
Environmental Protection Agency	Sustainable Development Challenge Grants
Environmental Protection Agency	Toxic Substances Compliance Monitoring Cooperative Agreements
Environmental Protection Agency	Tribal Drinking Water Capacity Building/Source Water Protection Grants
Environmental Protection Agency	Tribal Grants for Surface and Groundwater Protection, Pesticide Management Planning
Environmental Protection Agency	Tribal Multimedia Compliance Assistance and Enforcement Support
Environmental Protection Agency	Tribal Municipal Solid Waste Landfills Programs
Environmental Protection Agency	Tribal Pesticide Program Support
Environmental Protection Agency	Water Pollution Control - State and Interstate Program Support
Environmental Protection Agency	Water Protection Grants to the States
Environmental Protection Agency	Water Protection Grants to the States
Environmental Protection Agency	Wetlands Program Development Grants
Federal Emergency Management Agency (FEMA)	Flood Mitigation Assistance Program
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Grant Program
Federal Emergency Management Agency (FEMA)	Project Impact Grant Program
Federal Highway Administration	Alaska Scenic Byways Program
Federal Highway Administration	Transportation Environmental Research Program (TERP)
Federal Highway Administration	Transportation Equity Act for the 21st Century (TEA-21)
National Oceanic and Atmospheric Administration (NOAA)	Coastal Services Center Cooperative Agreements
National Oceanic and Atmospheric Administration (NOAA)	Coastal Zone Management Administration/Implementation Awards
National Oceanic and Atmospheric Administration (NOAA)	Community-Based Restoration Program - Individual Project Grants
National Oceanic and Atmospheric Administration (NOAA)	Fisheries Financing Program

Sponser	Grant/Program Name
National Oceanic and Atmospheric Administration (NOAA)	Saltonstall-Kennedy (S-K) Grant Program
National Park Service	Historic Preservation Grants-In-Aid
National Park Service	Outdoor Recreation
National Park Service	Rivers, Trails, and Conservation Assistance Program
Small Business Administration	Pollution Control Loans
Small Business Administration	SBA Business Development Assistance to Small Businesses
Small Business Administration	SBA Loans for Small Businesses
Small Business Administration	SBA Minority Enterprise Development
Small Business Administration	Small Business Development Centers
United States Army Corps of Engineers	Basinwide Restoration New Starts General Investigation
United States Army Corps of Engineers	Construction of Municipal and Industrial Water Supply Projects
United States Army Corps of Engineers	Ecosystem Restoration in the Civil Works Program
United States Army Corps of Engineers	Flood Fighting
United States Army Corps of Engineers	Floodplain Management Services Program
United States Army Corps of Engineers	Levee Rehabilitation
United States Army Corps of Engineers	Partners for Environmental Progress
United States Army Corps of Engineers	Section 107: Small Navigation Projects
United States Army Corps of Engineers	Section 1135: Project Modifications to Improve the Environment
United States Army Corps of Engineers	Section 14: Emergency Streambank and Shoreline Protection
United States Army Corps of Engineers	Section 203: Tribal Partnership Program
United States Army Corps of Engineers	Section 204: Environmental Restoration Projects in Connection with Dredging
United States Army Corps of Engineers	Section 205: Flood Damage Reduction Projects
United States Army Corps of Engineers	Section 206: Aquatic Ecosystem Restoration Program
United States Army Corps of Engineers	Section 208: Snagging and Clearing for Flood Control
United States Army Corps of Engineers	Section 22: Planning Assistance to the States Program (PAS)
United States Army Corps of Engineers	Section 306: General Investigation Studies for Environmental Restoration
United States Department of Agriculture (USDA)	Agricultural and Economic Research
United States Department of Agriculture (USDA)	Business and Industry Loans
United States Department of Agriculture (USDA)	Grassland Reserve Program
United States Department of Agriculture (USDA)	National Integrated Water Quality Program (NIWQP)

Sponser	Grant/Program Name
United States Department of Agriculture (USDA)	National Organic Certification Cost-Share Program - Idaho
United States Department of Agriculture (USDA)	National Research Initiative Competitive Grants Program
United States Department of Agriculture (USDA)	Small Watershed Rehabilitation Program
United States Department of Agriculture (USDA)	Watershed Processes and Water Resources Program
United States Department of Agriculture (USDA) - Cooperative State Research Education and Extension Service	Sustainable Agriculture Research Education (SARE)
United States Department of Agriculture (USDA) - Cooperative State Research Education and Extension Service	Water Quality Special Research Grants Program
United States Department of Agriculture (USDA) - Farm Service Administration	Conservation Reserve Enhancement Program(CREP)
United States Department of Agriculture (USDA) - Farm Service Administration	Conservation Reserve Program (CRP)
United States Department of Agriculture (USDA) - Farm Service Administration	Direct and Guarenteed Farm Loans
United States Department of Agriculture (USDA) - Farm Service Administration	Emergency Conservation Program (ECP)
United States Department of Agriculture (USDA) - Farm Service Administration	Farm Debt Cancellation-Conservation Easement Program
United States Department of Agriculture (USDA) - Farm Service Administration	Interest Assistance Program
United States Department of Agriculture (USDA) - Farm Service Administration	Water Quality Incentives Projects
United States Department of Agriculture (USDA) - Forest Service	Forest Land Enhancement Project (FLEP)
United States Department of Agriculture (USDA) - Forest Service	Forest Stewardship Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Conservation of Private Grazing Land Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Conservation Partnership Initiative (CPI)
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Conservation Security Program (CSP)
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Conservation Technical Assistance Program

Sponser	Grant/Program Name
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Emergency Watershed Protection Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Environmental Quality Incentives Program (EQIP) - Idaho
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Environmental Quality Incentives Program (EQIP) - Washington
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Farm and Ranch Land Protection Program (FRPP)
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Farm Bill 2002 Conservation Programs
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Forestry Incentives Program - Washington
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	National Natural Resources Conservation Foundation
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Plant Materials Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Resource Conservation and Development (RC&D) Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	River Basin Surveys and Investigations
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Rural Development (RD) Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Snow Survey & Water and Climate Services Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Soil and Water Conservation Assistance (SWCA)
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Soil Survey Program

Sponser	Grant/Program Name
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Tribal Conservation Districts
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Water Bank Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Watershed Protection and Flood Prevention Program
United States Department of Agriculture (USDA) - Natural Resources Conservation Service	Wildlife Habitat Incentives Program (WHIP)
United States Department of Agriculture (USDA) - Rural Development	Agricultural Cooperatives Technical Assistance
United States Department of Agriculture (USDA) - Rural Development	Community Facilities Direct and Guaranteed Loans and Grants for Rural Areas - Idaho
United States Department of Agriculture (USDA) - Rural Development	Community Facility Loan and Grant Program
United States Department of Agriculture (USDA) - Rural Development	Emergency Community Water Assistance Grant Program
United States Department of Agriculture (USDA) - Rural Development	Guaranteed Business and Industry Loans
United States Department of Agriculture (USDA) - Rural Development	Guaranteed Water and Waste Disposal Loans
United States Department of Agriculture (USDA) - Rural Development	Intermediary Relending Program - Alaska
United States Department of Agriculture (USDA) - Rural Development	Rural Alaskan Village Water and Waste Disposal Grants
United States Department of Agriculture (USDA) - Rural Development	Rural Business Enterprise Grant Program
United States Department of Agriculture (USDA) - Rural Development	Rural Business Loan Fund
United States Department of Agriculture (USDA) - Rural Development	Rural Economic Development Loan Program
United States Department of Agriculture (USDA) - Rural Development	USDA Water and Waste Disposal Grants
United States Department of Agriculture (USDA) - Rural Development	USDA Water and Waste Disposal Loans
United States Department of Commerce	Alaska Export Assistance Center
United States Department of Commerce	Alaska Minority Business Development Center
United States Department of Commerce	Community Development Quota (CDQ) Fisheries Program
United States Department of Defense	Doing Business with the Federal Government (PTAC)
United States Department of Energy	Best Practices Program

Sponser	Grant/Program Name
United States Department of Energy	Center of Excellence for Sustainable Development
United States Department of Energy	Million Solar Roofs Initiative
United States Department of Energy	Office of Industrial Technologies Clearinghouse, The
United States Department of Energy	Rebuild America
United States Department of Health and Human Services	Capacity Building Among American Indian Tribes
United States Department of Health and Human Services	Environmental Regulatory Enhancement
United States Department of Health and Human Services	IHS Sanitation Facilities Construction Program
United States Department of Health and Human Services	Mitigation of Environmental Impacts to Indian Lands Due to Department of Defense Activities
United States Department of Health and Human Services	Social and Economic Development Strategies (SEDS) for Native Americans (Non-Alaska)
United States Department of Housing and Urban Development	Community Development Block Grant Program (CDBG) - American Indian and Alaska Native
United States Department of Housing and Urban Development	Community Development Block Grant Program (ICDBG) - Idaho
United States Department of Interior	Abandoned Mine Land Reclamation Program
United States Department of Interior	Acid Mine Drainage Grant
United States Department of Interior	Land & Water Conservation Fund Grants to States
United States Fish and Wildlife Service	Alaska Coastal Conservation Grants
United States Fish and Wildlife Service	Alaska Coastal Conservation Grants
United States Fish and Wildlife Service	Chehalis Fisheries Restoration Program
United States Fish and Wildlife Service	Clean Vessel Act Grant Program
United States Fish and Wildlife Service	Coastal Grant Program
United States Fish and Wildlife Service	Cooperative Endangered Species Conservation Fund
United States Fish and Wildlife Service	Fish Screen Construction Program
United States Fish and Wildlife Service	Fish Screening or Passage Program
United States Fish and Wildlife Service	Greenspaces Program
United States Fish and Wildlife Service	Habitat Conservation - U.S. Fish and Wildlife Service Coastal Program
United States Fish and Wildlife Service	Habitat Conservation Plan Land Aquisition Grants Program
United States Fish and Wildlife Service	Habitat Conservation Planning Assistance Grants - Cooperative Endangered Species Conservation Fund
United States Fish and Wildlife Service	Hatfield Restoration Program
United States Fish and Wildlife Service	National Coastal Wetlands Conservation Grant Program
United States Fish and Wildlife Service	National Wildlife Refuge Challenge Cost Share Program
United States Fish and Wildlife Service	Neotropical Migratory Bird Conservation Act Grants Program

Sponser	Grant/Program Name
United States Fish and Wildlife Service	North American Wetlands Conservation Act Grants Program
United States Fish and Wildlife Service	Private Stewardship Grants Program (PSGP)
United States Fish and Wildlife Service	Puget Sound Program
United States Fish and Wildlife Service	Recovery Land Acquisition Grants - Cooperative Endangered Species Conservation Fund
United States Fish and Wildlife Service	Recovery Land Acquisition Grants - Cooperative Endangered Species Conservation Fund
United States Fish and Wildlife Service	Refuges and Wildlife - North American Waterfowl Management Plan
United States Fish and Wildlife Service	State Wildlife Grants
United States Forrest Service (USFS)	Economic Action Programs
United States Forrest Service (USFS)	Forest Legacy Program - Cooperative Forestry Assistance Program
United States Forrest Service (USFS)	Forest Legacy Program - Washington/Idaho
United States Forrest Service (USFS)	Forest Stewardship & Stewardship Incentive Program
United States Forrest Service (USFS)	Mini-Grants Assistance Program
United States Forrest Service (USFS)	Rural Community Assistance Program
United States Forrest Service (USFS)	Stewardship Incentive Program
United States Forrest Service (USFS)	Urban & Community Forestry Program
United States Forrest Service (USFS)	WACERT Process
United States General Services Administration (GSA)	Doing Business with the Federal Government (GSA)
United States Geological Survey	State Partnership Initiative
United States Geological Survey	USGS Cooperative Water Program
State - Idaho Sponsors	
Idaho Department of Agriculture	Container Recycling Operation Program (CROP)
Idaho Department of Agriculture	Idaho OnePlan Program
Idaho Department of Agriculture	National Organic Certification Cost-Share Program - Idaho
Idaho Department of Agriculture	Noxious Weed Cost-Share Program
Idaho Department of Agriculture	Pesticide Disposal Program
Idaho Department of Commerce & Labor	Idaho Gem Community Implementation Grants (GCI)
Idaho Department of Environmental Quality	Drinking Water Revolving Loan Fund - Idaho
Idaho Department of Environmental Quality	Planning Grant Program for Drinking Water Facilities - Idaho
Idaho Department of Environmental Quality	Planning Grant Program for Wastewater Facilities - Idaho
Idaho Department of Environmental Quality	Water Pollution Control State Revolving Loan Fund - Idaho

Sponser	Grant/Program Name
Idaho Department of Fish & Game	Habitat Improvement Program (HIP
Idaho Department of Fish & Game	Project WILD - Idaho
Idaho Department of Fish & Game	State Wildlife Grants Program - Idaho
Idaho Department of Fish & Game	Wildlife Conservation and Restoration Program (WCRP)
Idaho Department of Lands	Arbor Day Grants
Idaho Department of Lands	Community Transportation Enhancement (CTE) Grant
Idaho Department of Lands	Hazardous Fuels Treatment Grants
Idaho Department of Lands	Western Wildland Urban Interface (WUI)
Idaho Department of Parks and Recreation	Land and Water Conservation Fund - Idaho
Idaho Department of Parks and Recreation	Motorbike Recreation Fund
Idaho Department of Parks and Recreation	Off-highway Vehicle Programs
Idaho Department of Parks and Recreation	Recreational Trails Program - Idaho
Idaho Department of Parks and Recreation	Snowmobile Registration Fund
Idaho Department of Parks and Recreation	Waterways Improvement Grants
Idaho Department of Water Resources	Energy Conservation Loan Program
Idaho Department of Water Resources	Idaho Water Resource Board Funding Programs
Idaho Office of Species Conservation	Idaho Wolf Depredation Compensation Program
Idaho Soil Conservation Commission	Natural Resource Conservation Tax Credit
Idaho Soil Conservation Commission	Resource Conservation and Range Development Program (RCRDP) Loans
Idaho Soil Conservation Commission	Water Quality Program for Agriculture (WQPA)
Idaho Transportation Department	Congestion Mitigation and Air Quality Improvement Program - Idaho
Idaho Transportation Department	Enhancement Program
Idaho Water Resources Research Institute	Water Resources Research Institute
University of Idaho	Project WET - Idaho
State - Washington	
Interagency Committee for Outdoor Recreation	Athletic Facility Account Program
Interagency Committee for Outdoor Recreation	Boating Facilities Program
Interagency Committee for Outdoor Recreation	Firearms and Archery Range Recreation

Sponser	Grant/Program Name
Interagency Committee for Outdoor Recreation	Non-Highway & Off-Road Vehicle Activities Program
Interagency Committee for Outdoor Recreation	Recreational Trails Program - Washington
Interagency Committee for Outdoor Recreation	Riparian Habitat Program
Interagency Committee for Outdoor Recreation	Salmon Recovery Funding Board
Interagency Committee for Outdoor Recreation	Washington Wildlife and Recreation Program (WWRP)
Transportation Improvement Board (TIB)	Arterial Improvement Program
Transportation Improvement Board (TIB)	City Hardship Assistance Program
Transportation Improvement Board (TIB)	FEMA Match Program
Transportation Improvement Board (TIB)	Small City BRAC Match Program
Transportation Improvement Board (TIB)	Small City Pedestrian Safety and Mobility Program
Transportation Improvement Board (TIB)	Small City Program (SCP)
Transportation Improvement Board (TIB)	Transportation Partnership Program
Transportation Improvement Board (TIB)	Urban Pedestrian Safety and Mobility Program
Washington Conservation Commission	Non-Point Water Quality Grants
Washington Department of Community, Trade and Economic Development	Community Development Block Grant Community Investment Fund - Washington
Washington Department of Community, Trade and Economic Development	Community Development Block Grant General Purpose - Washington
Washington Department of Community, Trade and Economic Development	Community Development Block Grant Imminent Threat Fund - Washington
Washington Department of Community, Trade and Economic Development	Community Development Block Grant Planning Only - Washington
Washington Department of Community, Trade and Economic Development	Community Economic Revitalization Board Rural Program
Washington Department of Community, Trade and Economic Development	Community Economic Revitalization Board Traditional Program
Washington Department of Community, Trade and Economic Development	Energy Policy
Washington Department of Community, Trade and Economic Development	Public Works Trust Fund Capital Facilities Planning Program

Sponser	Grant/Program Name
Washington Department of Transportation	City Fish Passage Barrier, Stormwater and Habitat Restoration Grant Program
Washington Military Department	Public Assistance Program
Washington Public Works Board	Public Works Trust Fund Construction Loan Program
Washington Public Works Board	Public Works Trust Fund Emergency Loan Program
Washington Public Works Board	Public Works Trust Fund Pre-Construction Loan Program
Washington State County Road Administration Board	County Arterial Preservation Program
Washington State County Road Administration Board	Rural Arterial Program
Washington State County Road Administration Board	Rural Arterial Program (RAP) Emergency and Emergent Provisions
Washington State Department of Agriculture	Pesticide Management and Collection Program
Washington State Department of Ecology	Aquatic Weeds Management Fund
Washington State Department of Ecology	Centennial Clean Water Fund/ State Revolving Loan Fund/ Section 319 Nonpoint Source Grants Program
Washington State Department of Ecology	Coastal Protection Fund (CPF)
Washington State Department of Ecology	Community Litter Cleanup Program
Washington State Department of Ecology	Coordinated Prevention Grants Non-Emergency Program
Washington State Department of Ecology	Drought Emergency Water Supply
Washington State Department of Ecology	Flood Control Assistance Account Program
Washington State Department of Ecology	Model Toxics Control Act
Washington State Department of Ecology	Project WET - Washington
Washington State Department of Ecology	Public Participation Grants
Washington State Department of Ecology	Puget Sound Wetland Restoration Program
Washington State Department of Ecology	Referendum 38 Emergency Water Supply
Washington State Department of Ecology	Remedial Action Grant Program
Washington State Department of Ecology	Safe Drinking Water (Hazardous Waste Sites)
Washington State Department of Ecology	Shoreline Master Program Grants
Washington State Department of Ecology	Site Hazard Assessment (Hazardous Waste Sites)
Washington State Department of Ecology	Toxic Clean-up Program
Washington State Department of Ecology	Washington State Water Pollution Control Revolving Fund
Washington State Department of Ecology	Water Reclamation and Reuse - DOE
Washington State Department of Fish and Wildlife (WDFW)	Eastern Washington Pheasant Habitat Enhancement Grant Program
Washington State Department of Fish and Wildlife (WDFW)	Landowner Incentive Program (LIP)
Washington State Department of Fish and Wildlife (WDFW)	Regional Fisheries Enhancement Groups

Sponser	Grant/Program Name
Washington State Department of Fish and Wildlife (WDFW)	Upland Wildlife Restoration Program
Washington State Department of General Administration	Building Commissioning
Washington State Department of General Administration	Energy Life Cycle Cost Analysis
Washington State Department of General Administration	Energy Savings Performance Contracting
Washington State Department of General Administration	Plant Operations Support Consortium
Washington State Department of General Administration	Resource Conservation Management Program
Washington State Department of Health	Public Water System Technical Assistance Program
Washington State Department of Health	Water Reclamation and Reuse - DOH
Washington State Department of Natural Resources	Aquatic Lands Enhancement Account (ALEA)
Washington State Department of Natural Resources	Jobs for the Environment Program
Washington State Department of Transportation	Bridge Replacement
Washington State Department of Transportation	Commute Trip Reduction
Washington State Department of Transportation	Congestion Mitigation and Air Quality Program - Washington
Washington State Department of Transportation	Emergency Relief Program
Washington State Department of Transportation	Essential Rail Assistance Account
Washington State Department of Transportation	Local Government Traffic Engineering Services
Washington State Department of Transportation	Metropolitan Planning Organization Funding
Washington State Department of Transportation	Public Lands Highway
Washington State Department of Transportation	Public Transportation for Non-Urbanized Areas
Washington State Department of Transportation	Regional Transportation Planning Organization Funding
Washington State Department of Transportation	Rural Mobility Grant Program
Washington State Department of Transportation	Small City Pavement Preservation Program
Washington State Department of Transportation	STP Hazard Elimination Safety (HES)

Sponser	Grant/Program Name
Washington State Department of Transportation	STP Railway/Highway Crossings
Washington State Department of Transportation	STP Regional Allocation
Washington State Department of Transportation	STP Transportation Enhancements
Washington State Department of Transportation	Transportation & Community & System Preservation Pilot Program
Washington State Department of Transportation	Transportation Community System Preservation
Washington State Department of Transportation	Wetlands Mitigation Program
Washington State Parks and Recreation Commission Boating Program Office	Clean Vessel Boat Sewage Disposal Program - Washington
Washington State University Cooperative Extension Program	Education and Training
Washington State University Cooperative Extension Program	Energy Efficient Low-Income Housing
Washington State University Cooperative Extension Program	Energy Efficient Manufactured Housing
Washington State University Cooperative Extension Program	Energy Ideas Clearinghouse
Washington State University Cooperative Extension Program	Residential Energy Code Training
Washington State University Cooperative Extension Program	Resource Efficiency Management - Total Efficiency Network
Private/ Foundation Sponsors	
A Territory Resource (ATR)	A Territory Resource (ATR)
Abelard Foundation West / Common Councel Foundation	Abelard Foundation West / Common Councel Foundation
Acorn Foundation	Acorn Foundation
American Farmland Trust	Farm Legacy Program
American Land Conservancy	American Land Conservancy Program
American Water Works Association Research Foundation (AwwaRF)	American Water Works Association Research Foundation (AwwaRF)
American Wildlands	American Wildlands
Andrew Mellon Foundation	Conservation and the Environment Program
ARCO Foundation	ARCO Foundation
Barker (Donald R.) Foundation	Barker (Donald R.) Foundation
Bay Foundation, The	Bay Foundation, The
Ben & Jerry's Foundation	Ben & Jerry's Foundation
Bikes Belong Coalition	Bikes Belong Coalition

Sponser	Grant/Program Name
Bonneville Environmental Foundation	Bonneville Environmental Foundation Watershed Program, The
Bonneville Environmental Foundation	Renewable Energy Program
Brainerd Foundation	Communications & Capacity Building Program - Brainerd Foundation
Brainerd Foundation	Endangered Ecosystems Program
Bullitt Foundation	Bullitt Foundation - Aquatic Ecosystems Program
Bullitt Foundation	Bullitt Foundation - Conservation and Stewardship in Agriculture Program
Bullitt Foundation	Bullitt Foundation - Energy and Climate Change Program
Bullitt Foundation	Bullitt Foundation - Growth Management and Transportation Program
Bullitt Foundation	Bullitt Foundation - Terrestrial Ecosystems Program
Bullitt Foundation	Bullitt Foundation - Toxic and Radioactive Substances Program
Bullitt Foundation	Bullitt Foundation - Training, Communications, and Unique Opportunities
C. Giles Hunt Charitable Foundation	Hunt Charitable Trust, C. Giles
Captain Planet Foundation	Captain Planet Foundation
Cascade Natural Gas Foundation	Cascade Natural Gas Corporate Giving Program
Charla Richards Kreitzberg Charitable Foundation	Charla Richards Kreitzberg Charitable Foundation
Collins Foundation	Collins Foundation Environmental Program, The
Compton Foundation	Compton Foundation Environmental Grants, The
ConocoPhillips Petroleum Company	ConocoPhillips Petroleum Company
Conservation Alliance, The	Conservation Alliance Grants
Conservation Fund, The	Conservation Fund, The
Conservation Fund, The	Kodak American Greenways Award
Defenders of Wildlife	National Stewardship Initiatives: Conservation Strategies for U.S. Land Owners
Diack Ecology Education Program	Diack Ecology Education Program
Doris Duke Charitable Foundation	Doris Duke Charitable Foundation, The
Ducks Unlimited	Ducks Unlimited
Ducks Unlimited	Matching Aid to Restore States Habitat (MARSH) - Ducks Unlimited
Ducks Unlimited	U.S. Habitat Projects
Dudley Foundation	Dudley Foundation Grant
Earth Force, Inc.	Earth Force, Inc.
Educational Foundation of America	Educational Foundation of America, Environmental Grant Program, The

Sponser	Grant/Program Name
Educational Foundation of America	Environmental Program
Elisha-Bolton Foundation	Elisha-Bolton Foundation
Evergreen Community Development Association	Evergreen Community Development Association
Evergreen Rural Water of Washington	Evergreen Rural Water of Washington
First Nations Development Institute (FNDI)	First Nations Development Institute - Grants
First Nations Development Institute (FNDI)	First Nations Oweesta Corporation
FishAmerica Foundation	FishAmerica Foundation
Flintridge Foundation	Flintridge Foundation's Conservation Program
FMC Corporation and The National Fish and Wildlife Foundation	FMC Corporation Bird and Habitat Conservation Fund
For the Sake of the Salmon	Technical Assistance Directory (TAD)
For the Sake of the Salmon	Watershed & Community Support
Friends of Paul Bunyan Foundation	Friends of Paul Bunyan Foundation
Fund for Wild Nature	Fund for Wild Nature Grant Program
General Electric Foundation	General Electric Foundation
General Service Foundation	General Services Foundation - Western Water Program
Gifts In Kind International	Gifts In Kind International
Groundwater Foundation, The	Groundwater Foundation, The
Henry M. Jackson Foundation	Henry M. Jackson Foundation (Environmental and Natural Resource Management Program)
Home Depot Foundation	Home Depot Foundation
Homeland Foundation, The	Homeland Foundation, The
Homer Foundation, The	Homer Foundation, The
Hugh and Jane Ferguson Foundation, The	Hugh and Jane Ferguson Foundation, The
Idaho Fish and Wildlife Foundation	Idaho Fish and Wildlife Foundation
Idaho Forest Products Commission	Project Learning Tree
Idaho Forest Products Commission	Teachers Grant Program
Ittleson Foundation	Ittleson Foundation - Environmental Program
Izaak Walton League	Save Our Streams Program
Jackson Foundation, The	Jackson Foundation, The
Jessie Smith Noyes Foundation	Sustainable Agriculture Program
Kellogg Foundation	Entrepreneurship Development Systems for Rural America Project
Kongsgaard-Goldman Foundation	Environmental Protection and Conservation Program
L.J. and Mary C. Skaggs Foundation	L.J. and Mary C. Skaggs Foundation, Environmental Education Grant Resource

Sponser	Grant/Program Name
Laird Norton Endowment Foundation, The	Laird Norton Foundation
Lamb Foundation	Lamb Foundation Grants
Land Trust Alliance	Land Trust Alliance-Northwest Program
Laura Jane Musser Fund	Laura Jane Musser Fund
Lawrence Foundation	Lawrence Foundation, The
Lazar Foundation, The	Lazar Foundation, The
Lightfoot Foundation	Lightfoot Foundation, The
Ludwick Family Foundation	Ludwick Family Foundation
Micron Foundation	Micron Foundation - Community Grants
Mountaineers Foundation	Mountaineers Foundation Environmental Program, The
Nathan Cummings Foundation	Nathan Cummings Foundation Grant Program, The
National Association of Development Organizations (NADO)	National Association of Development Organizations
National Congress of American Indians (NCAI)	National Congress of American Indians
National Cooperative Bank (NCB)	National Cooperative Bank
National Credit Union Administration	Revolving Loan Fund for Credit Unions
National Economic Development and Law Center (NED&LC)	National Economic Development and Law Center
National Environmental Eucation & Training Foundation	NEETF Challenge Grant Program
National Fish and Wildlife Foundation	Bring Back the Natives
National Fish and Wildlife Foundation	Centennial Refuge Legacy
National Fish and Wildlife Foundation	Challenge / General Matching Grants Program - National Fish and Wildlife Foundation
National Fish and Wildlife Foundation	Challenge Grants for Conservation
National Fish and Wildlife Foundation	Community Salmon Fund
National Fish and Wildlife Foundation	Migratory Bird Conservancy
National Fish and Wildlife Foundation	National Fish and Wildlife Foundation
National Fish and Wildlife Foundation	National Fish and Wildlife Foundation in partnership with Natural Resources Conservation Service
National Fish and Wildlife Foundation	Natural Resources Conservation Service: Conservation on Private Lands
National Fish and Wildlife Foundation	Nature of Learning, The
National Fish and Wildlife Foundation	Pacific Grassroots Salmon Initiative
National Fish and Wildlife Foundation	Pathways to Nature Conservation Fund
National Fish and Wildlife Foundation	Pulling Together Iniative
National Forest Foundation	National Forest Foundation - Community Assistance Program (CAP)

Sponser	Grant/Program Name
National Forest Foundation	National Forest Foundation - Matching Awards Program
National Geographic Society	Conservation Trust
National Geographic Society	Expeditions Council Grants
National Geographic Society	Grants for Scientific Field Research and Exploration
National Geographic Society	Grosvenor Grant Program
National Geographic Society	Teacher Grants
National Geographic Society	Venture Fund
National Science Foundation - Division of Environmental Biology	Water and Watersheds
National Wildlife Federation	National Wildlife Federation - Campus Ecology Fellowship
National Wildlife Federation	National Wildlife Federation - Schoolyard Habitats Program
National Wildlife Federation	National Wildlife Federation's Species Recovery Fund (SRF)
Native American Fish & Wildlife Society	Native American Fish & Wildlife Society
Nature Conservancy, The	Nature Conservancy, The
Northwest Small Cities Services	Northwest Small Cities Services - Technical Assistance and Training
Patagonia	Patagonia Environment Grants
Paul G. Allen Forest Protection Foundation	Paul G. Allen Forest Protection Foundation, The
Pew Charitable Trusts	Pew Charitable Trusts Environmental Program, The
PGE Foundation	PGE Foundation
Pheasants Forever	Pheasants Forever
Plum Creek Foundation	Plum Creek Foundation
Public Welfare Foundation	Public Welfare Foundation - Environment Grants
REI	REI Conservation and Outdoor Grants
Richard & Rhoda Goldman Fund	Richard & Rhoda Goldman Fund
River Network	River Network
Rockefeller Family Fund	Rockefeller Family Fund (Environment Grants Program)
Rocky Mountain Elk Foundation	Rocky Mountain Elk Foundation
Rural Community Assistance Corporation	Native American RCAC Program
Ruth H. Brown Foundation	Ruth H. Brown Foundation
Ruth Mott Fund	Ruth Mott Fund
Seventh Generation Fund	Seventh Generation Fund
Skaggs Foundation, The	Skaggs Foundation, The
Sonoran Institute	Resources for Community Collaboration
Strong Foundation for Environmental Values, The	Strong Foundation for Environmental Values, The
Teton Regional Land Trust	Teton Regional Land Trust

Sponser	Grant/Program Name
The William and Flora Hewlett Foundation	The William and Flora Hewlett Foundation
Tiffany & Co. Foundation	Environmental Conservation, The Tiffany & Co. Foundation
Town Creek Foundation	Town Creek Foundation
Training Resources for the Environmental Community (TREC)	Training Resources for the Environmental Community (TREC)
Treasure Valley Land Trust	Treasure Valley Land Trust
Trout Unlimited	Embrace-A-Stream, Education Project
Trout Unlimited	Embrace-A-Stream, Research Project
Trout Unlimited	Embrace-A-Stream, Resource Project
Trust management Services - Braemar Charitable Trust	Braemar Charitable Trust
Turner Foundation	Turner Foundation Environmental Grant Programs
Wal-Mart Foundation	Local Wal-Mart Environmental Grant Program, The
Washington Water Trust, The	Washington Water Trust
WaterWatch	WaterWatch
Weyerhaeuser Company Foundation	Weyerhaeuser Company Foundation
Wilburforce Foundation	Wilburforce Foundation
Wildhorse Foundation	Wildhorse Foundation
Wildlife Forever	Wildlife Forever - Challenge Grants
William C. Kenney Watershed Protection Foundation	William C. Kenney Watershed Protection Foundation

APPENDIX D

GROUP A WATER SUPPLIERS LETTER

and

DATABASE OF GROUP A SYSTEM CONTACTS

Nisqually Watershed Planning Unit
12501 Yelm Hwy. SE • Olympia, WA 98513 • (360) 438-8687

March 31, 2006

Dear Nisqually Watershed Group A Water System:

RE: Future Water Use Planning In the Nisqually Watershed

Back in December of 2005, the Nisqually Planning Unit sent letters to all the Group A Water Suppliers in the Nisqually Watershed informing you of current watershed planning efforts under RCW 90.82 and inviting you to participate during the implementation phase of Watershed Planning in the Nisqually Basin.

The Nisqually Watershed Planning Unit is a group of initiating governments and local stakeholders with varied interests that have been working on different Phases of watershed planning over the past five years. The group includes representatives of local cities and towns, water purveyors, the Nisqually Tribe, citizens groups and counties. The Planning Unit unanimously approved the Nisqually Watershed Plan in 2003, and the plan was subsequently approved by Pierce, Thurston and Lewis Counties in April of 2004. The Planning Unit is now beginning to implement the plan.

As part of the Watershed Plan implementation, future public water supply needs are being assessed. Along these lines, recent legislation requires that the Planning Unit evaluate planned future use of existing Group A water rights that are inchoate (currently unused) [RCW 90.82.048(1)].

The Planning Unit is responsible for estimating the inchoate (currently unused) municipal water rights in the watershed (e.g., those water rights generally used to serve residences). The most efficient way to address this requirement is to request that all local Group A Water System owners and/or operators provide data regarding your current water rights and water use.

We are sending this letter to all Group A water systems in the Nisqually Basin as a request for information. We would like to obtain the following water rights/use information from you:

1. Annual water right(s) and associated water right(s) identification number(s) and instantaneous water right(s) and associated water right identification number(s)
2. Most recent reported annual average water use (including the year for which it is reported);
3. Number of connections (for the year reported in #2).
4. Currently installed pumping capacity

Please fill out the attached questionnaire and submit it as soon as possible to:

George Walter, Watershed Planning Coordinator
12501 Yelm Hwy S.E.
Olympia, Washington 98513

If you would like more information about the Nisqually Watershed Planning Unit or regarding this information request please contact George Walter, Watershed Plan Coordinator, at (360) 438-8687, or by E-mail at gwalter@nwifc.org. A copy of the Nisqually Watershed Plan can be found on the internet at http://www.ecy.wa.gov/biblio/0306030.html

Sincerely,

George Walter
Nisqually Planning Unit Chair

WRIA 11 Water Rights/Water Use Questionnaire

Water System Name:_____

Water System ID:_____

Water System Manager and Phone Number: _____

1. Please fill in the table for each Water Right (NOTE: Instead of completing this table, you can simply send us copies of your water rights):

Associated certificate or claim #	Annual Water Right (acre-feet)	Instantaneous Water Right (gpm)

2. Average Annual Water Use (most recent yearly average):_____gallons. Year for which annual use is reported _____(year)

3. Number of Connections (for the year reported above):_____

4. Currently installed pumping capacity of your system, listed by water source.

Nisqually Indian Tribe
Natural Resources Division
12501 Yelm Hwy. S.E.
Olympia, Washington 98513
Phone: (360) 438-8687
Fax: (360) 438-8742

December 15, 2005

Dear Nisqually Watershed Group A Water System:

The Nisqually Watershed Planning Unit is a group of initiating governments and local stakeholders with varied interests that have been working on different Phases of watershed planning over the past five years. The Planning Unit unanimously approved the Nisqually Watershed Plan in 2003, and the plan was subsequently approved by Pierce, Thurston and Lewis Counties in April of 2004. The Planning Unit is now initiating the implementation phase (Phase IV) of the watershed planning process. We are sending this letter to all Group A water systems in the Nisqually Basin to inform you of the watershed planning effort, and if you are not already involved, to invite you to participate during implementation of the plan.

The Watershed Plan includes actions, recommendations and projects that may interest you or directly or indirectly affect your water system. The plan provides recommendations for processing water right applications, for coordinated water system planning, for linking water availability and land use planning, and more. Furthermore, recent legislation requires that, as part of Phase IV, the Planning Unit evaluate planned future use of existing Group A water rights that are inchoate (currently unused) [RCW 90.82.048(1)].

Further information about the Watershed Planning process can be found on the Nisqually River Council website at http://www.nisquallyriver.org/planning.html. A copy of the plan can also be found on the internet at http://www.ecy.wa.gov/biblio/0306030.html.

We invite you to join our watershed planning efforts. Our next Nisqually Watershed Planning Unit meeting will be Wednesday, January 11th, 2006 beginning at 9:00 a.m. Most of our meetings are held in Yelm; however, the location of the January meeting has yet to be determined. We have an established system of distributing materials and meeting notifications by e-mail. If you simply want to be included in the meeting notification process, just let me know at the address below. If you would like more information about participating in this process, or you would like to receive a schedule of upcoming Nisqually Planning Unit meeting dates, please contact George Walter, Watershed Plan Coordinator, at (360) 438-8687, or by E-mail at gwalter@nwifc.org.

Sincerely,

George Walter
Watershed Planning Program Coordinator

Water Service Name	Address	City	Contact Person
ACME WATER DISTRICT NO 18	PO BOX 13	ACME	STEVE ROSSING
AIRPORT LANDS WATER SYSTEM	10847 AERO LANE S E	YELM	DORIS JOHNSTON
ALDER LAKE PARK	PO BOX 23	LA GRANDE	BRAD INGLE
ALPINE VILLAGE PROPERTY OWNERS	PO BOX 88	ASHFORD	ALAN VAUGHAN
ANDREWS FIRST	6800 MERIDIAN RD SE	OLYMPIA	WASHINGTON WATER SERVICE CO
ASHFORD WATER DISTRICT	DRAWER 'C'	ASHFORD	JARROLD A. PARRY
BARNEYS CORNER WATER SYSTEM	PO BOX 127	EATONVILLE	MIKE WILLIAMS
BAVARIEN RETREAT HOMEOWNERS ASSOC	113 BIG CRK RD	ASHFORD	HERBERT R. BARKELL
BELWOOD PARK	6800 MERIDIAN RD SE	OLYMPIA	WASHINGTON WATER SERVICE CO
BETHANY LUTHERAN W.S.	26418 MT HWY	SPANAWAY	WAYNE RIND
BETHEL CHRISTIAN CENTER	3202 30TH AVE SE	OLYMPIA	WAYNE DOTSON
BETHEL GREEN ACRES WATER ASSOC	PO BOX 4760	SPANAWAY	KATHY AUSLEY
BIG CREEK CAMPGROUND	PO BOX 670	RANDLE	GARY DEIBOLD
BLUE HORIZON WATER COMPANY	PO BOX 1870	ORTING	JACK MCMAHON
BOOTS & SADDLES WATER CO	36521 102ND ST E	EATONVILLE	OBERT ESTBY
CALAHAN SUPPLY	BOX 73	ALDER	
CALVARY BAPTIST CHURCH	PO BOX 401	ROY	WALT STOWE
CAMP OF THE CASCADES N PACIFIC CON	22825 PEISSNER RD SE	YELM	TOM MOLINE
CAMPO VERDE STREET & WATER ASSN	PO BOX 1287	ROY	MIKE GUERRERO
CAPITOL CITY GOLF CLUB (DEV)	5604 PACIFIC AVE	LACEY	
CATTLEMENS LIVESTOCK EXCHANGE	17020 HWY 507 SE	YELM	MIGUEL CONTRERAS
CHILDRENS SCHOOL OF EXCELLENCE	PO BOX 2036	YELM	MICHAEL IRELAND
CITIZENS WATER ASSOC	RT 2 BOX 171	EATONVILLE	
CITIZENS WATER ASSOCIATION	10820 CEMETARY RD E	EATONVILLE	HOWARD HULL
CLEAR LAKE WATER DISTRICT	PO BOX 1399	EATONVILLE	TOM FOLK/GEORGE BERRY
CLEARWOOD	21603 CLEAR LK BLVD N	YELM	DAYRL HARRINGTON
COAL WATER SUPPLY	MT RAINIER NATIONAL	LONGMIRE	
COLUMBIA CREST ELEMENTARY SCHOOL	PO BOX 698	EATONVILLE	DAN DAWKINS
COUGAR MOUNTAIN WATER ASSN	PO BOX 1719	YELM	JOHN INMAN
COUGAR ROCK WATER SUP	MT RAINIER NAT PARK	LONGMIRE	ROGER DRAKE
COUNTRY GREEN ESTATES	PO BOX 2243	OAK HARBOR	CHUCK & SUZY KING
COUNTY UTILITIES SERVICES INC	15927 SPANAWAY LP RD	SPANAWAY	L. DON RABER
CRYSTAL SPRINGS	6800 MERIDIAN RD SE	OLYMPIA	WASHINGTON WATER SERVICE CO
DINELT WATER SYSTEM	25617 72ND AVE E	GRAHAM	ROGER DINELT
DRIFTWOOD VALLEY CAMP ASSN	17827 25TH DRIVE SE	MILL CREEK	BOB NORTON
DUPONT PLANTS	DUPONT WASH	DUPONT	

Water Service Name	Address	City	Contact Person
EAGLES NEST ALDER LAKE MOTEL	3742 N 29TH ST	TACOMA	CANDI RIMA
EATONVILLE KINGDOM HALL	307 336TH ST S	ROY	RICHARD COMSTOCK
ELBE WATER DISTRICT	PO BOX 4	ELBE	GAYLE ADAMS
ELK HEIGHTS - 247	921 B MIDDLE FORK RD	ONALASKA	VIRGIL FOX
EQUIPMENT SUPERVISORY-DNR	8410 MARTIN WAY E	OLYMPIA	
EVERGREEN GROVE TRAILER PARK	527 PATTISON ST S E	OLYMPIA	JIM MAYTHER
EVERGREEN PRAIRIE	PO BOX 3374	LACEY	JIM CASEBOLT
FIR GROVE MOTEL & M H P	3434 MARTIN WAY N E	OLYMPIA	STEPHEN COOPER
FOREST GLEN ESTATES	32519 MOUNTAIN HWY	EATONVILLE	HELEN PETERSON
FOUR CORNERS STORE	11500 BALD HILLS RD	YELM	MI KIM
GATEWAY INN	38820 SR 706 EAST	ASHFORD	SO, KENNY K.
GAYDAS RESORT	RT 1 BOX 223	EATONVILLE	
GAYDA'S RESORT	RT 1 BOX 223	EATONVILLE	
GLACIER VIEW MOBILE HOME PARK	6200 FAIR OAKS RD SE #201	OLYMPIA	TED LAMBERT
GOLDEN HORSESHOE	8615 72ND AVE E	PUYALLUP	MARCIE ROUNDTREE
GRAHAM HILL MUTUAL WATER CO INC	PO BOX 1468	GRAHAM	KATE NOTTAGE
GRANIT PARK WATER SYSTEM	7115 MARTIN WAY	OLYMPIA	
GREENWOOD PARK	PO BOX 1576	MUKILTEO	HYONG AHN
H & H TRAILER COURT	8210 MARTIN WAY	OLYMPIA	
H & N INTERNATIONAL	15012 SMITH PRAIRIE RD SE	YELM	ALAN BARGMEYER
HARDPAN WATER CO	1211 S FERN ST	OLYMPIA	
HARTWOOD WATER SYSTEM	PO BOX 2061	YELM	DAVE WILSON
HERRON MAINTENANCE WATER SYSTEM	PO BOX 119	LAKEBAY	LARRY WILLIAMS
HIDDEN HILL WATER	P O BOX 403	YELM	
HITCHING POST RESTAURANT	RT 3 BOX 393	EATONVILLE	
HOLIDAY HILLS COMMUNITY CLUB INC	PO BOX 144	EATONVILLE	BARRY KRITZ & KYLE QUARANTO
HOPE INTERNATIONAL #3 WATER SYSTEM	PO BOX 940	EATONVILLE	VERNON JENNINGS
INDIAN SPRINGS WATER COMPANY	PO BOX 44427	TACOMA	ROBERT BLACKMAN
KAPOWSIN ALE HOUSE	PO BOX 188	KAPOWSIN	JOYCE YOUNG
KENNEDY ADDITION WATER	2744 BETHEL ST NE	OLYMPIA	BILL LARSEN
KINGS MEADOW MOBILE HOME PARK	8915 WILKENSEN RD SE SP3	YELM	CAROLYN MOORE
L & M IN & OUT	PO BOX 1056	YELM	LEO A LEFEBVRE
LA GRANDE MOTEL	P O BOX 24	LA GRANDE	
LACAMAS FARMSTEADS WATER SYSTEM	6800 MERIDIAN RD SE	OLYMPIA	JERRY PETERSON
LACEY PACIFIC AVE WATER	4701 14TH S E	LACEY	
LAKE LAWRENCE MOBILE HOME PARK	17114 153RD AVE SE SP 17	YELM	HOWARD FITZGERALD

Water Service Name	Address	City	Contact Person
LAKE LAWRENCE WEST	RT 1 BOX 1365	YELM	
LAKE SERENE WATER SYSTEM	PO BOX 698	ROY	JAMES PARR
LAKEWOOD PARK WATER	RT 12 BOX 686	OLYMPIA	
LE MAR TRAILER COURT	P O BOX_1056	YELM	LEO LEFEBUNE
LEBEUF I LOTS 1-46	10900 KUHLMAN RD SE SP 52	OLYMPIA	REAL OR SHERRI LEBEUF
LEBEUF II LOTS 47-100	10900 KUHLMAN RD SE #53	OLYMPIA	REAL OR SHERRI LEBEUF
LIBBY ROAD EAST	6800 MERIDIAN RD SE	OLYMPIA	WASHINGTON WATER SERVICE CO
LINCOLN TREE FARM	28001 MT HWY	SPANAWAY	RALPH THORPE
LITTLE LAKE MOBILE HOME PARK	PO BOX 529	MCKENNA	JOHN DRAKE
LITTLEROCK WATER CO	12711 LA FRANZ RD SW	OLYMPIA	JANE REED
LOST LAKE	PO BOX 8208	OLYMPIA	UNKNOWN
MAPLE MANOR MOBILE HOME PARK	PO BOX 4438	TUMWATER	DAVE CLARKE
MARTENS ADD MUTUAL WATER ASSOC	15025 SPANAWAY LP RD S	SPANAWAY	DONALD MCALLISTER
MARTIN WAY MOBILE HOME PARK	8625 EVERGREEN WAY STE 200	EVERETT	MELANEY SCOTT
MARTINEZ WATER SYSTEM	30323 MERIDIAN E	GRAHAM	SANDY MARTINEZ
MARVIN ROAD TEXACO	1545 MARVIN RD	OLYMPIA	
MCKENNA SCHOOL		MCKENNA	
MCKENNA SQUARE	15009 SPANAWAY LOOP RD	SPANAWAY	WILLIAM BURLESON
MCKENNA WATER DISTRICT	PO BOX 143	MCKENNA	JIM DAVIS
MERIDIAN TERRACE MOBILE HOME PARK	9816 193RD ST E	GRAHAM	WILLIAM A JENKS
MOUNTAIN HIGHWAY APARTMENTS	PO BOX 174	PUYALLUP	NANCY BURGESS
NEW LIFE CHRISTIAN CENTER	13036 MORRIS RD SE	YELM	KATHERINE WORTHY
NEW LIFE FELLOWSHIP CHURCH	10209 299TH ST E	GRAHAM	BRUCE LEONARD
NISQUALLY COMMERCIAL PARK	10220 MARTIN WAY SE	OLYMPIA	GENE ELWESS
NISQUALLY ENTRANCE	MT RAINIER NATIONAL PARK	ASHFORD	ROBERT MCGEE-BALLINGER
NISQUALLY HEIGHTS	P O BOX 3400	LACEY	TERRY CARGIL
NISQUALLY NATIONAL WILDLIFE REFUGE	170 SE WALKER PARK RD	SHELTON	ARCADIA DRILLING INC
NISQUALLY PINES COMMUNITY CLUB	8903 PEPPERIDGE LN SE	YELM	SCOTT V. FORBES
NISQUALLY SPORTSMENS CLUB INC	11520 DURGIN RD SE 80	LACEY	DENNIS EBERHARDT
NISQUALLY VALLEY CARE CENTER	P O BOX B	MC KENNA	DUANE MCCORMIES
NISQUALLY VALLEY GOLF COURSE	1802 BROOKDALE RD E	TACOMA	CHRISTINE JONES
NISQUALLY VALLEY RESTAURANT-LOUNGE	PO BOX 5160	YELM	CHARLES BROWN
NORTHWEST TREK	11610 TREK DR E	EATONVILLE	CHIP HEINZ
OAK DUPLEXES	510 STOLL RD	OLYMPIA	DEL PETTIT
OAKCREST	6800 MERIDIAN RD SE	OLYMPIA	SOUTH SOUND UTILITY CO
OUR REEDEEMER LUTHERAN CHURCH	10335 HIWAY 507 SE	YELM	MARK E. PARKS

Water Service Name	Address	City	Contact Person
PARADISE COMMUNITY CLUB INC	124 MOWICH WAY	ASHFORD	TOM MIERKEY
PARKLANE WATER SYSTEM	PO BOX 44427	TACOMA	BOB BLACKMAN
PATTISON WATER COMPANY #2	6010 44TH WAY N E	OLYMPIA	CLIFF CASEBOLT/JIM CASEBOLT
PEOPLES CHURCH YOUTH PROPERTY	RT 2 BOX 318	EATONVILLE	STEVEN SHACKETT
PLEASANT VALLEY - 307	921 B MIDDLE FORK RD	ONALASKA	VIRGIL FOX
PLEASANT VALLEY CHRISTIAN CAMP	PO BOX 175	MINERAL	DAN HAMILTON
PRAIRIE ELEMENTARY	PO BOX 476	YELM	ERLING BIRKLAND
R V TOWN INC	P O BOX 12	EASTON	LEE FRAZIER
R&D FAMILY STORE	14840 HIGHWAY 507 SE	YELM	
RANCH ACRES	PO BOX 480	YELM	BILL PETTY
ROCKY POINT CAMPGROUND	PO BOX 23	LA GRANDE	BRAD INGLE
ROUNDUP TAVERN	30411 MT HWY E	GRAHAM	GARY FERRIN
ROY BAR & GRILL	PO BOX 604	ROY	DOUG & BARBARA HANSCH
ROY, TOWN OF	P O BOX 177	ROY	
ROYAL OAKS MOBILE HOME PARK	6719 152ND ST EAST	PUYALLUP	ANN LIZOTTE
SHADOW PINES MOBILE ESTATES	2228 143RD PL SE	MILL CREEK	GLENN STONE
SINGLE TREE ESTATES	18429 HAMES ST SE	YELM	BILL OLIVER
SOUND VIEW VILLA	474 BLUEBERRY HILL RD	PORT LUDLOW	DAVE MATHIS
SOUTHWORTH ELEMENTARY	PO BOX 476	YELM	ERLING BIRKLAND
SPAN-A-PARK EAGLES	PO BOX 4189	SPANAWAY	PHILIP A MEMBRERE
STEAD WATER SYSTEM	32619 MOUNTAIN HWY	EATONVILLE	CHRIS STEAD
STEWARTS MEATS	17821 SR 507	YELM	DOROTHY CARLSON
STILLWATER MOBILE HOME PARK WS	PO BOX 4438	TUMWATER	DAVE CLARKE
SUMMER SHORES WATER ASSOCIATION	6103 LK SAINT CLAIR DR SE	OLYMPIA	VIRGINIA MILLER
SUMMERSET WATER ASSOCIATION	6824 SUMMERSET DR SE	LACEY	DONNA BOURET
SUNRISE PARK	MT RAINIER NAT PARK	LONGMIRE	
THREE PONDS MOBILE PARK & APTS.	425 PECKS DR	EVERETT	KIM DOTSON & GAYLE SHAW
TOLMIE STATE PARK	12245 TILLEY RD S	OLYMPIA	MANAGER, MILLERSYLVANIA STATE PARK
TRIPLE G LAKEVIEW ESTATES	6800 MERIDIAN RD SE	OLYMPIA	WASHINGTON WATER SERVICE CO
TURF ACRES	5650 YELM HIGHWAY APT 41A	OLYMPIA	JEANIE ST. JOHN
V.I.P. MARVIN RD # 21	2120 MARVIN ROAD NE	OLYMPIA	ROGER T CHOO
VALLEY TRADING POST	15547 VAIL RD SE	YELM	NORMA LUPPINO
VINSON'S VILLA MHP/ROY WYE INN	5413 79TH AVE CT W	UNIVERSITY PLACE	TONG SAN NA
WATER CORP. OF NATIONAL	ASHFORD W D DRAWER C	ASHFORD	HARRY H ANDERSON
WEBSTER WATER HOMEOWNERS ASSOC	PO BOX 611	GRAHAM	STACEY STANDON
WESTERN AIRPARK	PO BOX 57	MCKENNA	GREG BRUCE

Water Service Name	Address	City	Contact Person
WEYERHAEUSER VAIL SHOP	PO BOX 889	RAINIER	DAN REID
WEYERHAUSER ELEMENTARY SCHOOL	PO BOX 698	EATONVILLE	DAN DAWKINS
WHITE HOUSE WATER SYSTEM	2932 70TH AVE SW	OLYMPIA	
WILCOX FARMS INC	40400 HARTS LAKE VALLEY RD	ROY	KEN HOOPER
WILD BERRY RESTAURANT	PO BOX 176	ASHFORD	ERICA B LUNDBERG
WILDAIRE ESTATES	18025 158TH AVE SE	YELM	JUDI BAILEY DEXTER
WILDERNESS GLEN - 263	921 B MIDDLE FORK RD	ONALASKA	VIRGIL FOX
WILDERNESS GLENN	23414 70TH AVE E	GRAHAM	THOMAS KETZENBERG
YELM BROTHERS LDS CHURCH	CLARK RD	YELM	WILLIAM J. BARRETT
YELM EAGLES	PO BOX 1183	YELM	GERALD C NORRIS
YELM KINGDOM HALL	170 SE WALKER PARK RD	SHELTON	ARCADIA DRILLING INC
YELM SCHOOL DIST #2	P O BOX 476	YELM	
YELM, CITY OF	PO BOX 479	YELM	EDWARD B. SMITH
ZEBRAS AQUEOUS SUBSTANCE	14507 YELM HWY SE	YELM	MATTHEW SCHUBART

APPENDIX E

MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT

WATERSHED PLAN IMPLEMENTATION

NISQUALLY WRIA 11

WHEREAS, the Washington Watershed Management Act, RCW 90.82, as now or hereafter amended, provides a process to plan and manage the uses of water within the Nisqually Water Resources Inventory Area (WRIA 11); and,

WHEREAS, the initiating governments of WRIA 11, as defined under RCW 90.82 were Lewis, Pierce and Thurston Counties, the City of Yelm, the Ashford Water District, and the Nisqually Indian Tribe; and

WHEREAS, in 1999 the initiating governments of WRIA 11 approved a Memorandum of Agreement ("MOA") that designated "Expanded Initiating Governments" to include the initiating governments as well as the cities of Lacey and Olympia, the Town of Eatonville, the Elbe Water District, and the Department of Ecology; and

WHEREAS, in the 1999 MOA the expanded initiating governments set forth their roles and responsibilities in watershed planning under the Washington State Watershed Management Act (RCW 90.82); and,

WHEREAS, operating under the terms of the 1999 MOA, the members of the WRIA 11 Planning Unit in October 2003 approved the "Nisqually Watershed Management Plan" and forwarded it to the counties for approval; and,

WHEREAS, at a joint meeting held April 13, 2004, Thurston, Lewis and Pierce counties unanimously approved the Plan as submitted to them by the Planning Unit; and,

WHEREAS, the expanded initiating governments wish to proceed with implementation of the Nisqually Watershed Management Plan of 2003 through the development of an Implementation Plan under RCW 90.82.043, and wish to set forth their respective roles and responsibilities in such a process;

NOW, THEREFORE, the expanded initiating governments for WRIA 11 agree as follows:

Preamble: The purpose of this agreement is for the Expanded Initiating Governments, as defined in the 1999 MOA and herein, to set forth their mutual understanding and agreement regarding their respective roles and responsibilities in implementing the

Nisqually Watershed Management Plan of 2003 through development of an Implementation Plan called for by RCW 90.82.043.

1.0 Implementing Governments:

1.1 The parties to this Agreement, hereafter "the Implementing Governments," are those entities comprising the "expanded initiating governments" from the WRIA 11 watershed planning process, specifically the Nisqually Indian Tribe; Lewis, Pierce and Thurston counties; the cities of Yelm, Lacey and Olympia and the Town of Eatonville; Ashford and Elbe water districts; and the Department of Ecology as representative of State of Washington interests; plus the City of Roy, Public Utility District #1 of Thurston County (Thurston PUD #1), and Fort Lewis. Additional parties may be added with the concurrence of all Implementing Governments and adoption of this Agreement by the entity to be added.

2.0 Scope: This Agreement covers the roles and responsibilities of the lead agency, the Implementing Governments and the Planning Unit in implementing the Nisqually Watershed Management Plan of 2003 through the development of the Implementation Plan called for by RCW 90.82.043.

3.0 Agreement: The parties to this Agreement hereby agree to:

3.1 Form and maintain for the term of this Agreement a balanced Planning Unit representing a wide range of water resource interests in the Nisqually Watershed. The Planning Unit's duties are set forth in Section 5 below.

3.2 Review the proposed Implementation Plan prepared by the Planning Unit and, when the approving authority of the parties hereto have agreed upon its contents, authorize the Planning Unit to approve and submit the Implementation Plan consistent with RCW 90.82.043,.048 and .120 to the Department of Ecology within one year of acceptance by the Lead Agency of grant funding under RCW 90.82.040(2)(e). The parties agree that the Implementation Plan may not require or obligate an Implementing Government to take any specific implementing action, or to refrain from taking any specific action, unless that Implementing Government so agrees.

3.3 Review and decide upon any amendments to the 2003 Nisqually Watershed Management Plan or to the Implementation Plan once adopted, as recommended by the Planning Unit.

4.0 Lead Agency: The Nisqually Indian Tribe will be the lead agency for the purposes of convening the implementing governments, applying for and administering watershed plan implementation grants (including but not limited to grants under RCW 90.82.040(2)(e)), facilitating meetings of the Planning Unit, and providing and/or contracting for services necessary for preparing the Implementation Plan. Other Implementing Governments and entities with representatives on the Planning Unit may also individually or collectively apply for and administer watershed plan implementation and other grants. The lead agency or agencies for implementing the Implementation Plan shall be as specified in that Implementation Plan.

5.0 Planning Unit:

5.1 The Planning Unit is the committee formed by the Implementing Governments to prepare the Implementation Plan to advance the goals and objectives of the Nisqually Watershed Management Plan of 2003, as approved by the counties in April 2004. In addition, the Planning Unit shall implement the Implementation Plan to the extent authorized by that Implementation Plan.

5.2 The approving authority of each party to this Agreement shall appoint a representative to the Planning Unit. The approving authority of each Implementing Government shall authorize its Planning Unit representative to participate on its behalf on the Planning Unit. Members of the Planning Unit formed by the implementing governments shall agree to cooperate with the planning process identified in this Agreement.

5.3 The Planning Unit shall be the policy recommendation committee for the Implementation Plan as envisioned in RCW 90.82.043 and .048. The Planning Unit shall fulfill this function in the following manner: (a) by preparing the Implementation Plan and forwarding it to the approving authorities of the Implementing Governments for their review and decision; (b) if authorized by the approving authorities pursuant to Section 3.2 above, submit the agreed upon Implementation Plan to the Department of Ecology; and (c) by recommending to the Implementing Governments any changes to the 2003 Nisqually Watershed Management Plan that the Planning Unit determines are necessary to facilitate implementation of the 2003 Plan or as otherwise consistent with RCW 90.82.060. In addition, the Planning Unit may, but is not required to, support or endorse grant applications that are consistent with the Nisqually Watershed Management Plan of 2003 and/or its Implementation Plan.

5.4 Representation on the Planning Unit shall consist of

representatives of the Implementing Governments listed in Section 1.1, and non-governmental representatives from interests including agriculture, water districts, private water systems, development/business, federal agencies, hydroelectric power, and private citizens. The Planning Unit shall provide for non-governmental representation of a wide range of water resource interests.

6.0 Nisqually River Council: The parties recognize that the Nisqually River Council implements the Nisqually River Management Plan and has a special role in natural resource planning in WRIA 11. The planning unit shall report at regular intervals to the Nisqually River Council on the Implementation Plan and shall seek the Council's support for it.

7.0 Process:

7.1 The Planning Unit will strive to make decisions by consensus of all members of the Planning Unit. For the purposes of this process, consensus shall mean general concurrence, with no one member of the Planning Unit refusing to support the implementation of the decision. If the Planning Unit is unable to reach a consensus decision on an issue, an affirmative decision shall be made by the unanimous vote of the Implementing Government's representatives on the Planning Unit and a 2/3 majority vote of all non-governmental participants present.

7.2 In making all decisions, the Planning Unit shall consider the best available science. Best available science is defined as scientific data and methodologies commonly accepted by the scientific community and agreed upon by the planning unit.

7.3 Technical and other advisory committee(s) may be established by the planning unit to provide reports and recommendations on specific issues.

7.4 Sub-area investigation/implementation plans may be developed by the Planning Unit. Any sub-area investigation/implementation plan must be compatible with the overall watershed plan and policy recommendations, and the overall Implementation Plan. If a sub-area investigation/implementation plan is developed by the Planning Unit subsequent to adoption of the Implementation Plan, the investigation/implementation plan must be submitted to the approving authorities of the sub-area for decision in the same manner described in Section 5.3(a) above for approval of the Implementation Plan.

7.5 Nothing contained herein or in the Implementation Plan shall prejudice the legal claims (including water rights applications) of any party hereto, nor shall participation in this Agreement and preparation of the Implementation Plan abrogate any parties' authority or the reserved or other rights of the Nisqually Indian Tribe, except where an obligation has been accepted in writing.

7.6 Prior to reaching a consensus decision on an issue, a representative of the lead agency shall clearly state the decision facing the planning unit. Further, consensus decisions will be reported in minutes distributed to the planning unit members.

7.7 An issue requiring a decision by the planning unit shall be a "discussion item" during at least one meeting of the planning unit. Such an issue, after being reviewed during at least one planning unit meeting, may then be referred for action at a subsequent meeting of the planning unit. Agendas shall be prepared by the lead agency and mailed or delivered electronically to planning unit members. Agenda items shall be labeled as either "discussion items" or "action items."

8.0 Funding:

8.1 This agreement does not obligate the Implementing Governments to pay any costs for WRIA 11 watershed planning, for preparation of the Implementation Plan, or for any implementation actions thereunder, unless the Implementing Government or Governments to be obligated so agree.

8.2 Annual budgets allocating use of Phase IV implementation grant funds shall be approved by the Planning Unit as provided in Section 7.1. Grant funds shall be used for staff support, technical staff and/or consulting services, and may include preparation of technical reports for review by the planning unit and committee(s).

8.3 Participation in the Planning Unit and any subcommittees by officials and staff shall be regarded as contributed time and not eligible for grant reimbursement, but may qualify for in-kind match. Use of grant funds to reimburse time spent by Implementing Government representatives and/or staff may occur only if approved by the Implementing Governments.

9.0 Duration: This Agreement will be in effect for six (6) years from the Agreement's effective date, unless extended by the agreement of the parties.

10.0 Modifications:

10.1 This Agreement may be modified or amended only by a subsequent written document, signed by all of the Implementing Governments, expressly stating the parties' intention to amend the agreement. No amendment or alteration of this agreement shall arise by implication, course of conduct or change of state law.

10.2 Notwithstanding the above, any Implementing Government shall have the right to withdraw from this Agreement at any time. All parties agree that if an entity withdraws, it shall not be deemed to be a party to the Implementation Plan produced pursuant to RCW 90.82 and shall not be bound thereby.

11.0 Notice: Any notice for or concerning this Agreement shall be in writing and shall be deemed given when sent to the address below. To: Lead Agency - Nisqually Indian Tribe
Natural Resources Division
12501 Yelm Hwy. SE
Olympia, WA 98513

12.0 Authorization to Sign: The parties hereto each represent and warrant that all necessary signatures and consents to enter this agreement and to assume and perform the obligations hereunder have been duly and properly obtained.

This Memorandum of Agreement has been executed this ___ day of _____, 2005, on one or more originals, by the parties below.

Nisqually Indian Tribe

Pierce County

Thurston County

Lewis County

Town of Eatonville

City of Yelm

City of Lacey

City of Olympia

Ashford Water District	Elbe Water District
Department of Ecology	City of Roy
Thurston PUD#1	Fort Lewis

Approved as to form: _____
Pierce County Dep. Prosecuting Attorney