

Appendix A

Water Service Area Agreements

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**AGREEMENT
FOR ESTABLISHING WATER UTILITY SERVICE AREA BOUNDARIES
AS IDENTIFIED BY THE EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN**

PREAMBLE

The Agreement for the water utility service area boundary identifies the external boundary of the service area for which the designated water purveyor has assumed direct retail water service responsibility. The responsibilities accepted by the water purveyor are outlined in the East King County Coordinated Water System Plan (CWSP), and as defined by the adopted rules and regulations of the Department of Health (DOH). This agreement does not give new authorities or responsibilities to the water purveyor or to the County or State regulatory agencies, but rather acknowledges the geographical area for these designated service responsibilities.

The terms used within this Agreement shall be as defined in the implementing regulations of Chapter 70.116 RCW, except as identified below.

1. East King County Critical Water Supply Service Area Map shall mean the map referenced in the Agreement as Attachment A for the retail service area, except as amended in accordance with the CWSP procedures and with the concurrence of the affected water purveyors.
2. Retail Service Area shall mean the designated geographical area in which a purveyor shall supply water either by direct connection, by a satellite system, or through interim service by an adjacent utility or Satellite System Management Agency under agreement with the designated utility.
3. Wholesale Service Area shall mean the designated geographical area in which a purveyor, a group of purveyors, or another organization provides water to other water purveyors on a wholesale basis. A wholesale water supplier shall not provide water to individual customers in another purveyor's retail service area except with the concurrence of the purveyor responsible for the geographical area in question.
4. Lead Agency for administering the Agreement for Establishing Water Utility Service Area Boundaries shall be King County, unless otherwise established by amendment to the CWSP.

The authority for this Agreement is granted by the Public Water System Coordination Act of 1977, Chapter 70.116 RCW.

WHEREAS, Such an Agreement is required in WAC 248-56-730, Service Area Agreements-Requirement of the Public Water System Coordination Act; and

WHEREAS, Designation of retail water service areas, together with the cooperation of utilities, will help assure that time, effort, and money are best used by avoiding unnecessary duplication of service; and

WHEREAS, Definite future service areas will facilitate efficient planning for, and provision of, water system improvements within East King County as growth occurs; and

WHEREAS, Definite retail and wholesale service areas will help assure that water reserved for public water supply purposes within East King County will be utilized in the future in an efficiently planned manner,

NOW, THEREFORE, the undersigned party, having entered into this Agreement by signature of its authorized representative, concurs with and will abide by the following provisions:

Section 1. Service Area Boundaries. The undersigned party acknowledges that the East King County Critical Water Supply Service Area Map, included as Attachment A to this Agreement and as may be subsequently updated, identifies the utility's future water service area. The undersigned further acknowledges that there are no service area conflicts with adjacent water utilities, or, where such conflicts exist, agrees that no new water service will be extended within disputed areas until such conflicts are resolved.

Section 2. Common Service Area Transfer. It is understood that utilities may initially continue existing water service within the boundaries of neighboring utilities, as defined in Section 1 hereof. Such common service areas, if they exist, are described in Attachment B to this agreement. Also included in Attachment B are copies of, or a list of, all resolutions, ordinances, or agreements enabling these uncontested overlays. The undersigned party agrees that any water line for retail service extending outside of the retail service area boundary, as set for in Section 1, shall be phased out and service transferred to the designated adjacent utility on an economic basis or by mutual agreement.

Economic basis considerations may include, but are now limited to:

- (a) A determination by the present owner of service lines that maintenance, repair, and/or replacement costs exceed attributable income.
- (b) Planned or imminent major street improvements or major

improvements to either or both water systems which include an opportunity to transfer service. The terms of the transfer of service are described in this Section shall be established in a separate agreement among the adjacent utilities whose boundaries are affected.

Section 3. Boundary Streets. Unless separate agreements exist with adjacent utilities concerning water services or other utility services, this party agrees that the water utility which is located to the north and/or east of boundary streets between this party and adjacent utilities will be entitled to provide future water service on both sides of those streets. Depth of service on boundary streets shall be limited to one platted lot or as otherwise agreed by the utilities. Existing services on boundary streets shall remain as connected unless transfer of service is agreed to by both parties, as per Section 2. These provisions do not disallow the placement of mains in the same street by adjacent utilities where geographic or economic constraints require such placement for the hydraulic benefit of both utilities.

Section 4. Boundary Adjustments. If, at some time in the future it is appropriate for the undersigned party to make service area boundary adjustments, such modifications must receive written concurrence (which shall not be unreasonably withheld) of all utilities that would be directly affected by such a boundary adjustment and the proper legislative authority(ies). This provision does not apply where boundary adjustments are made as a result of municipal annexations or incorporations, nor is it intended to modify the provisions of state law. These written modifications must be noted and filed with the designated King County lead agency and DOH. It is understood by the undersigned party that if, as provided by RCW 70.116.040, it is unable to provide service within its designated service area boundary it may decline to do so. But, in that case, an applicant may be referred to other adjacent utilities, to a pre-qualified Satellite System Management Agency (SSMA), or a new utility may be created and the original service area boundary will be adjusted accordingly.

Section 5. Service Extension Policies. The undersigned party agrees that in order to expand its water service area, other than by addition of retail customers to existing water mains, or to serve in the capacity of a pre-qualified SSMA, it shall have adopted design standards and Utility Service extension policies. The design standards shall meet or exceed the East King County Minimum Design Standards.

Municipalities further agree that if they identify a service area outside of their existing municipal corporate boundaries, the municipality will assume full responsibility for providing water service equivalent to (excluding rates and charges) the level of service provided for their inside-city customers. This will be in conformance with applicable land use policies.

The agreement by reference includes the following attachments:

Attachment A - East King County Critical Water Supply Service Area Map. (see Section 1)

Attachment B - Common Service Area Agreement - Option - Utility may attach copies or list such agreements if relevent (see Section 2)

IN WITNESS WHEREOF, the undersigned party has executed this Agreement as of 3-31-97.

CITY OF DUYALL
Water Utility

[Signature]
Representative

Mayor
Title

Receipt Acknowledged:

King County

Date

Department

INTERLOCAL AGREEMENT REGARDING WATER SERVICE AREA BOUNDARIES

This Agreement ("Agreement") is executed this 30th day of October, 2000, by and between the City of Duvall (the "City") and King County Water District No. 119 (the "District"), both of which are municipal corporations of the State of Washington.

RECITALS

A. WHEREAS, pursuant to Chapter 70.116 RCW, the Public Water System Coordination Act, the City and the District previously agreed upon future water utility service area boundaries for the purpose of designating the water purveyor with the responsibility to provide water service within such designated water service area; and

B. WHEREAS, the future water utility service areas designated by the City and the District are contained in a Coordinated Water System Plan for East King County which was approved by the Washington State Department of Health and other government agencies with jurisdiction, pursuant to the requirements and procedures set forth in Chapter 70.116 RCW; and

C. WHEREAS, the parties now desire to modify and revise the future water service area boundary between the City and the District; now, therefore,

AGREEMENT

IT IS HEREBY AGREED by and between the parties hereto as follows:

1. Revised Water Service Area Boundary. The City and the District hereby agree upon a new future water service area boundary as such revised boundary is legally described on Exhibit "A" attached hereto and as such revised boundary is depicted on a map attached hereto as Exhibit "B" ("Revised Boundary").

2. Governmental Approvals. The Revised Boundary shall be approved by all governmental agencies with jurisdiction and the parties agree to give notice of the approval of this Agreement to Metropolitan King County, the Water Utility Coordinating Committee ("WUCC"), the Washington State Department of Health, the East King County Regional Water Authority, the Washington State Boundary Review Board for King County and any other governmental agencies which are required to review and approve this Agreement. The parties agree to cooperate and assist in any reasonable manner to obtain the approval of the Revised Boundary provided that the District shall pay all costs and expenses incurred to obtain such governmental agency approval including those costs and expenses incurred by the City.

3. Entire Agreement/1988 Water Service Area Agreement. This Agreement constitutes the entire agreement between the parties concerning the subject matter herein and there are no representations or agreements other than those incorporated herein. Future agreements may occur between the parties to identify, agree upon or revise future water service area boundaries. However, that portion of the District's water service area as described and depicted on Exhibit "A" ("the Anderson Area") of an agreement dated January 6, 1988 between the parties entitled "Agreement to Provide Water Service and Amending Water Planning Boundaries and Service Areas" as amended by further agreement dated June 16, 2000 (collectively the "1988 Agreement") shall be included in the City's water service area boundary and the City shall provide water service exclusively to such area if the District's water system is not extended to serve such area within seven (7) years from the date of this Agreement; in such event, the parties shall cooperate to obtain the approval of appropriate governmental agencies required for such change in service area; provided, that no other terms and conditions of the 1988 Agreement are modified or amended by this Agreement and the 1988 Agreement shall remain in full force and effect.

4. Service Area Obligation. Nothing herein shall be construed to alter the rights, responsibilities, liabilities or obligations of the either party regarding provision of water services to the future water service area designated herein except as specifically set forth herein.

Wherefore, the parties have executed this Agreement on the date and year first herein above written.

CITY OF DUVALL

Glen Kuntz 10-20-00
Mayor Date

ATTEST:

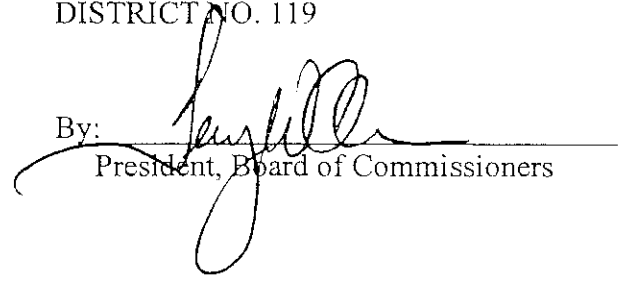
Orlee Schwinn 10-20-00
City Clerk Date

APPROVED AS TO LEGAL FORM

[Signature]
City Attorney

KING COUNTY WATER
DISTRICT NO. 119

By: _____

A handwritten signature in black ink, written over a horizontal line. The signature is cursive and appears to be "J. J. ...".

President, Board of Commissioners

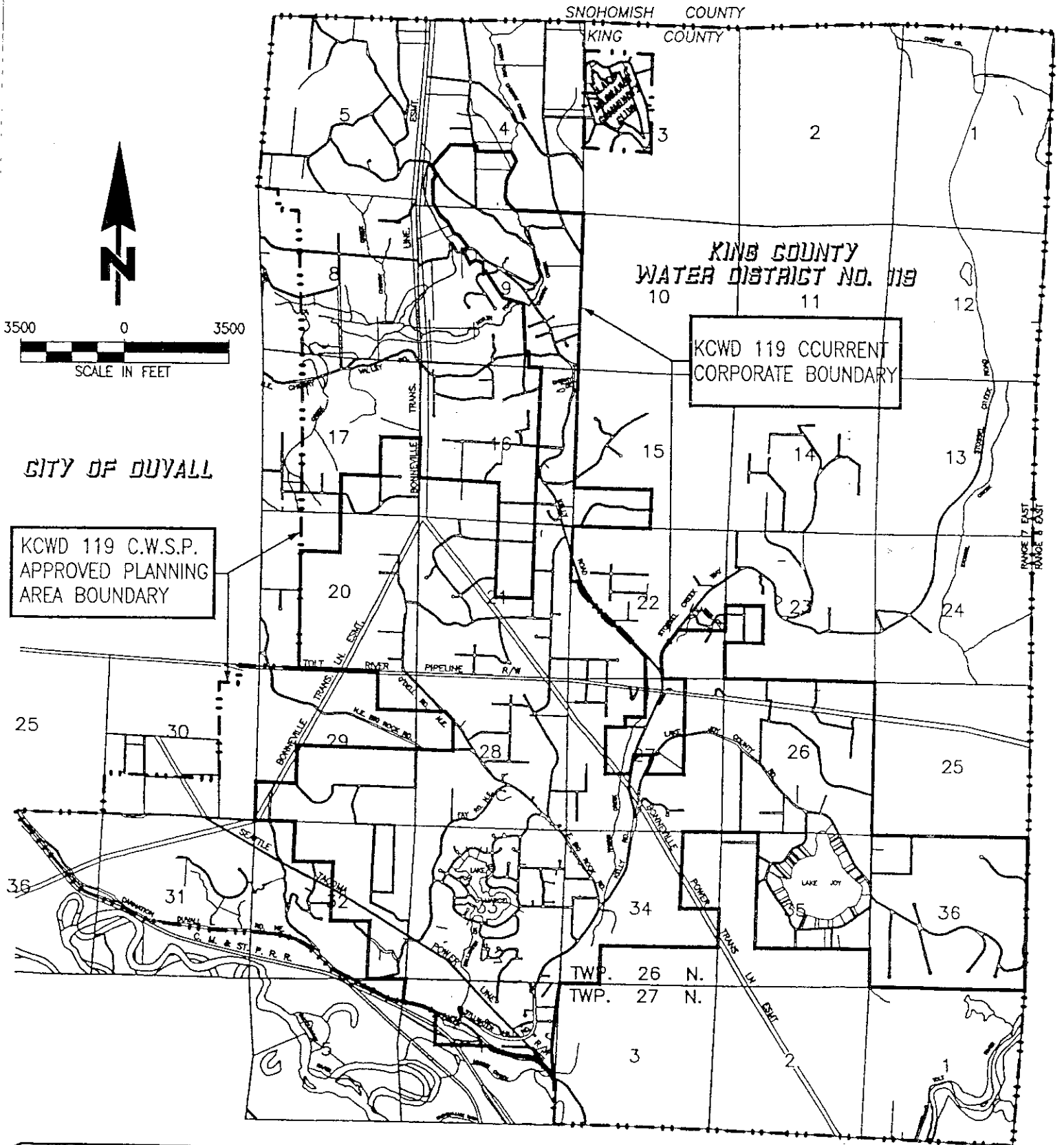
EXHIBIT "A"
LEGAL DESCRIPTION

DATE: OCTOBER 2000

That portion of Township 26 North, Ranges 6 and 7 East, Willamette Meridian, King County, Washington described as follows:

Beginning at a point on the north line of Section 36, Township 26 North, Range 6 East, W.M. at the south margin of Carnation-Duvall Road NE; thence East along the north line of said Section 36 to the southwest corner of Section 30, Township 26 North, Range 7 East, W.M.; thence North along the west line of the Southwest Quarter of the Southwest Quarter of said Section 30 to the northwest corner of the South Half of the South Half of said Section 30; thence East along the north line of said South Half of the South Half of Section 30 to the west line of the East Half of the East Half of said Section 30; thence North along said west line of the East Half of the East Half to the southwest corner of the Northwest Quarter of the Northeast Quarter of the Northeast Quarter of said Section 30; thence East along the south line of the said Northwest Quarter of the Northeast Quarter of the Northeast Quarter to the southeast corner thereof; thence North along the east line of said Northwest Quarter of the Northeast Quarter of the Northeast Quarter to the northwest corner of the Northeast Quarter of the Northeast Quarter of the Northeast Quarter of Section 30, Township 26 North, Range 7 East, W.M.; thence East along the north line of said Northeast Quarter, of the Northeast Quarter, of the Northeast Quarter, to the northwest corner of Section 29, Township 26 North, Range 7 East, W.M.; thence continuing East along the north line of Section 29, Township 26 North, Range 7 East, W.M. to the southwest corner of the Southeast Quarter of the Southwest Quarter of Section 20, Township 26 North, Range 7 East, W.M.; thence North along the east line of the West Half of the West Half of said Section 20 to the southwest corner of the Southeast Quarter of the Southwest Quarter of Section 17, Township 26 North, Range 7 East, W.M.; thence continuing North along the east line of the West Half of the West Half of said Section 17 to the southwest corner of the Southeast Quarter of the Southwest Quarter of Section 8, Township 26 North, Range 7 East, W.M.; thence continuing North along the east line of the West Half of the West Half of said Section 8 to the southeast corner of the Northeast Quarter of the Northwest Quarter of the Northwest Quarter of said Section 8; thence West along the south line of the Northeast Quarter of the Northwest Quarter of the Northwest Quarter to the southwest corner thereof; thence North along the west line of the Northeast Quarter of the Northwest of the Northwest Quarter to the northwest corner thereof; thence West along the north line of Section 8 to the northwest corner of said Section 8, thence North along the west line of Section 5, Township 26 North, Range 7 East, W.M. to the northwest corner thereof and the northern limits of King County and the terminus point of this description.

EXHIBIT "B"



ENGINEERING
CONSULTANTS
NORTHWEST

35717 PACIFIC HWY. S.
FEDERAL WAY, WA 98003
(206) 952-7797
FAX (206) 952-7799

CITY OF GARNATION

AGREEMENT TO PROVIDE WATER SERVICE & AMENDING
WATER PLANNING BOUNDARIES AND SERVICE AREAS
CITY OF DUVALL
WATER DISTRICT NO. 119

THIS AGREEMENT is made this the 6th day of January, 1988,
between the City of Duvall, and Water District No. 119, King County.

WHEREAS, the City of Duvall is a code city under title 35A of the Revised Code of Washington, and maintains and operates a City of Duvall Water Department and municipal water supply system; and

WHEREAS, the real property outlined in Exhibit "A" attached hereto and incorporated herein by reference, consists of property the westerly 1/3 of which is in the City of Duvall's water planning area, and the balance of which is in water planning area of water District No. 119, and all of said area is geographically located close to the Big Rock Road water line, located in the City of Duvall's water service area; and

WHEREAS, Water District No. 119 requests water service from the City of Duvall so as to provide water service to the above-described real property; and

WHEREAS, the City of Duvall has offered to provide such water service to Water District No. 119 in the above described area as based upon discussions between the City Attorneys and Engineers and Water District No. 119 Attorneys and Engineers.

WHEREAS, the westerly one-third of the real property outlined above should be placed into the water planning and service area of Water District No. 119 due to engineering considerations once water service is provided under this Agreement.

NOW THEREFORE, it is hereby agreed as follows:

1. The City of Duvall shall install a tee and valve at the most southerly end of the Big Rock Road water line (this location is immediately just south of the north boundary of the Tolt pipeline right-of-way). Water District No. 119 shall reimburse the City of Duvall for its necessary expenses incurred in installing the tee and valve.
2. Water District No. 119 shall be responsible for all improvements beyond said valve, including pipelines, construction of lines, permits, water services, etc. It is expressly understood that all City of Duvall water service engineering standards as set forth by ordinance shall be applicable to such improvements including but not limited to an eight (8) inch main, installation of eight (8) inch main across frontages of properties requesting service, etc. All charges related to applying for City water service as provided by ordinance shall also be paid to the City by Water District No. 119. Water District No. 119 shall bear all costs and responsibility of maintaining and repairing the improvements. The City of Duvall shall have the right to maintain or repair the

improvements and shall be reimbursed by the Water District for same, if, after reasonable notice to the Water District of maintenance or repairs necessary in the judgment of the City, the Water District fails to effect same.

3. The water service shall be specifically limited to the real property outlined in Exhibit "A" attached hereto and incorporated herein by reference. Water District No. 119 shall be responsible for obtaining and verifying exact legal descriptions of the outlined property, and the same shall be attached hereto as Exhibit "B" and incorporated herein by reference. The same shall be submitted to and approved by the City attorneys and engineers prior to any construction.

4. Water District No. 119 shall be responsible for securing all necessary easements prior to any construction.

5. The City of Duvall shall read and total each water meter connection to the line, and shall bill Water District No. 119 accordingly. Water District No. 119 shall be responsible for billing the individual services off the line.

6. The City of Duvall shall bill Water District No. 119 for water service fees as follows: monthly service charge, basic, \$18.00/400 CF; excess \$1.20/100 CF; as currently set forth by city ordinance for outside City water service, or as the same may be amended by the City in the future for all outside City of Duvall water services. It is also agreed that Water District No. 119 shall reimburse the City of Duvall for any peak surcharges from the City of Seattle Water Department attributable to the water service authorized herein.

7. Water District No. 119 shall pay to the City of Duvall, prior to the installation of any improvements as authorized herein, the sum of \$3,000.00 as a supplemental connection fee for reimbursement of City of Duvall expenses incurred in connection with the new Tolt Pipeline.

8. Water District No. 119 shall reimburse the City of Duvall for all fees associated with its attorneys and engineers related to the preparation of this Agreement and associated legal and engineering costs to the City of Duvall.

9. There shall be a maximum of (10) single family residence serviced by the water line authorized herein within the real property outlined above.

10. Once ten (10) single family residence water service connections are made, the City of Duvall and Water District No. 119 agree to negotiate regarding the costs attendant to the installation of a master meter.

11. Water District No. 119 will defend, protect, indemnify, and hold harmless, the City of Duvall from and against any and all claims, costs, damages, expenses or liability for any and all injuries to persons or tangible property arising from this Agreement, including the costs of attorney's fees incurred in defending any such action, involving the

improvements installed by the Water District as described in Paragraph 2 of this Agreement.

12. The parties understand and confirm that this Agreement is subject to the review and approval of the City of Seattle Water department. Water District No. 119, shall be responsible for securing the approval of the City of Seattle Water Department and be responsible for all costs, fees, permits, etc. attendant thereto. No construction or installation of water line and water service as authorized herein may commence until such approval has been duly secured.

13. The westerly one-third of the area to be serviced by Water District No. 119 by this Agreement is currently in the City of Duvall water planning area pursuant to prior agreement between the parties. The City of Duvall agrees to the placement of this area into Water District No. 119's water planning and service area. Water District No. 119 shall be responsible for obtaining the necessary governmental permits and approvals in order to have this property placed into the Water District's water planning and service area. The City of Duvall shall cooperate with Water District No. 119 in obtaining a change in the water planning and service area described herein.

14. The parties agree to review this Agreement biannually, and updates to the Agreement may be made as mutually agreed upon by the parties.

15. Both parties warrant that the signatures below of the duly authorized representatives of each are made by persons legally authorized to sign on behalf of each party, and the same have secured the permission of each party as provided by statute, ordinance, or otherwise in order to endorse this Agreement.

SIGNED this the 11th day of November 1987.

City of Duvall

Jeanne Baldwin
Jeanne Baldwin, Mayor
As authorized by the City
of Duvall Resolution, dated:

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

On this 12th day of November, 1987, before me, the undersigned, a Notary Public in and for the State of Washington, personally appeared before me Jeanne Baldwin, to me known as the Mayor of the City of Duvall and acknowledges the said instrument to be the free and voluntary act and deed of said Mayor for the uses and purposes therein mentioned, and on oath stated that she is authorized to execute the said instrument.

Witness my hand and official seal hereto affixed the day and year first above written.

David A. Burke
NOTARY PUBLIC in and for
the State of Washington,
residing at Kirkland
My commission expires: 3/1/91.

SIGNED this the 6th day of January 1988 1987.

Water District No. 119

Andrew S. Dalla Pozza
As authorized by WD119, dated:

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

On this 6th day of January, 1987, before me, the undersigned, a Notary Public in and for the State of Washington, personally appeared before me Andrew Dalla Pozza, to me known as President of King County Water District No. 119 and acknowledges the said instrument to be the free and voluntary act and deed of said District for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute the said instrument.

Witness my hand and official seal hereto affixed the day and year first above written.

Goldstein
NOTARY PUBLIC in and for
the State of Washington,
residing at Seattle
My commission expires: 4/20/90

Appendix B

Water Supply Contract

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CITY OF SEATTLE
FULL REQUIREMENTS CONTRACT
FOR THE
SUPPLY OF WATER
TO
CITY OF DUVALL

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FULL REQUIREMENTS CONTRACT
BETWEEN
THE CITY OF SEATTLE
AND
THE CITY OF DUVALL
FOR THE SUPPLY OF WATER

THIS CONTRACT is entered into between the CITY OF SEATTLE ("Seattle"), a municipal corporation of the State of Washington, and the CITY OF DUVALL ("Water Utility"), a municipal corporation of the State of Washington.

RECITALS

1. Seattle owns and operates a system for the supply, transmission, and distribution of potable water and is authorized to sell and distribute water to its residents and to other persons and customers located outside the corporate limits of Seattle.
2. Seattle's water system is integral to the health and welfare of the residents located within the water service area shown in Seattle's Water System Plan. Seattle intends to provide water from the system to meet the current and future needs of the residents of such water service area when such service is requested from Seattle.
3. In meeting this service commitment, Seattle must ensure that this role does not place financial burdens on its retail customers for which they do not receive a corresponding benefit.
4. This contract and contracts of a similar nature with other wholesale customers of Seattle located within Seattle's service area are intended to provide those customers with the security of a long term service commitment and to describe the terms and conditions associated with that commitment.

5. Under this contract, Seattle intends to provide wholesale water to Water Utility at an equivalent Wholesale Level of Service with the same pricing and operational principles as it provides itself.
6. Given the extensive growth of Seattle and the surrounding areas and the impacts upon infrastructure and costs, this contract is intended to provide sufficient water for growth. As a general philosophy for cost sharing purposes, the parties desire to adopt the principle that "growth should pay for growth."
7. Seattle and Water Utility, together with other Wholesale Customers of Seattle, have agreed to establish an Operating Board comprised of representatives pledged to represent the best interests of the region in order to provide overall direction to the Administrator of the Seattle Regional Water Supply System.

NOW, THEREFORE, in consideration of mutual covenants herein, it is agreed as follows:

SECTION I. DEFINITIONS

For the purposes of this contract, the following terms have been defined as:

"1982 Water Purveyor Contract" – That certain Water Purveyor Contract between Water Utility and Seattle having an effective date of September 8, 1982 and expiring on December 31, 2011.

"Administrator" - The Director of Seattle Public Utilities or any other title given to that person who maintains the authority to operate and manage the Seattle Regional Water Supply System.

"Block Purchase Contract" – A contract in which Seattle sells a fixed quantity of water to a wholesale customer on a take or pay basis.

“Existing Supply Resources” - Current components of the Seattle Regional Water Supply System which consist of the Cedar River storage, treatment and diversion facilities, the Tolt River storage, treatment and diversion facilities, and the Seattle Well Fields as set forth in Exhibit VII.

“Full Requirements Contract” - A contract in which Seattle supplies a Wholesale Customer with its Full Water Requirements.

“Full Water Requirements” - All of the water needed by Water Utility to meet the needs of its present and future water customers within its service area as shown in Water Utility’s water system plan and as shown on Exhibit X.

“Operating Board” - A board of representatives established by Section V hereof and having the powers and duties set forth in Sections II, III, and IV hereof.

“Partial Requirements Contract” - A contract in which Seattle supplies a Wholesale Customer with that portion of its Full Water Requirements above that provided by the Wholesale Customer’s own supply.

“Partial Water Requirements” - The amount of water over and above Water Utility’s own sources of supply as identified in Exhibits I and XIII and in accordance with this contract needed to meet the needs of its present and future water customers within its service area as shown in Water Utility’s water system plan and on Exhibit X.

“Rate of Return on Investment” - Seattle’s Average Cost of Debt, plus 1.5 percent.

“Regional Water Conservation Program” - A program which addresses water conservation goals for the Seattle Regional Water Supply System for Seattle, Wholesale Customers, and other customers who enter into a water supply contract with Seattle that includes participation in the Program.

"Seattle's Average Cost of Debt" - The weighted average interest rate on Seattle's water system debt outstanding over the course of a calendar year calculated at the end of each calendar year during the term of this contract.

"Seattle Retail Distribution System" - Seattle's retail water distribution system consisting of its retail customers within the Seattle retail service area as defined in its Water System Plan, and including storage facilities, distribution mains, pumps, disinfection facilities, service connections, and all other facilities not included in the Seattle Regional Water Supply System.

"Seattle Regional Water Supply System" - Seattle's water supply system consisting of dams, impounded water, supply and transmission mains, pumps, treatment facilities, and all other facilities utilized in conveying water to the Seattle Retail Distribution System, Water Utility, and other wholesale customers. This definition does not include the Seattle Retail Distribution System.

"Seattle Transmission Facilities" - Those facilities serving the transmission needs of the Seattle Regional Water Supply System as set forth in Exhibit VIII.

"Seattle Water System Plan" - Seattle's Water System Plan dated April, 2007, and amendments thereto, prepared by Seattle to comply with the requirements of WAC 246-290-100, and successor regulations.

"Service Connection" - The water meter and associated appurtenances, including everything from the outlet from the supply pipeline to the end of the Seattle Public Utilities vault, through which water is delivered from the Seattle Regional Water Supply System to a Wholesale Customer's water system.

“Stranded Costs” – Those water supply and related costs that Seattle and others have invested for the region which may not be recovered as a result of lost revenues.

“Wholesale Customer” – Those customers who purchase water from Seattle under a Full or Partial Requirements Contract for the purposes of reselling to others.

“Wholesale Level of Service” – Water delivered by Seattle in accordance with this contract to the Service Connection intended for Wholesale Customers’ distribution to their retail customers. Seattle is not responsible for compliance with Department of Health (“DOH”) standards, including fire flow, emergency back-up and water quality within Water Utility’s retail service area.

SECTION II. TERM OF CONTRACT AND GUARANTEES

II.A. Term of Contract

1. Term. This contract shall be in effect beginning at 12:01 AM on the Effective Date of this contract and shall remain in effect until 12:00 AM on January 1, 2062.
2. Effective Date. This contract shall be effective upon the date that both parties have signed the contract after approval by their respective legislative bodies (“Effective Date”).
3. Subsequent Right of First Refusal. At the end of the term of this contract, Water Utility shall have a right of first refusal to continue to purchase the amount of water then purchased from Seattle at the time of contract expiration.
4. Periodic Review and Right to Change Certain Terms and Conditions. The parties may review and change certain terms and conditions governing the sale of water hereunder by January 1, 2022 and January 1, 2042, or as soon as practicable thereafter, as follows.

- a. Consensual Process. On or before January 1, 2021, and then again on or before January 1, 2041, either party may provide the other with a written proposal to amend the contract terms. The parties shall then meet and consider the proposal. If the parties agree to the proposal prior to January 1, 2022 and January 1, 2042, respectively, a written amendment to this contract shall be approved and executed by both parties and this contract shall be amended accordingly.
- b. Seattle' s Right to Amend. If the parties are unable to agree on a proposal by Seattle pursuant to subsection a above within the respective one-year periods, Seattle may propose in writing its desired amendment to the Operating Board. Seattle and the Operating Board shall meet and consider the proposed amendment and use reasonable efforts to resolve any differences in the proposal. After 90 days from Seattle's written proposal to the Board, Seattle may propose its desired amendment to the Seattle City Council. If the Operating Board does not agree with such proposal, it may submit a revised proposal to the Seattle City Council within 90 days of Seattle's submission of its proposal to the Seattle City Council. After receiving the Operating Board's alternate proposal, or after the lapse of the 90 day period for the Operating Board to make an alternate proposal, the Seattle City Council may then deny both proposals or approve one of them and issue an amendment to this contract which shall be in effect for the remaining term of the contract from the date of issuance, unless later amended pursuant to subsection a above, or by mutual agreement.

- c. Limitation on Seattle's Right to Amend. Notwithstanding subsection b above, Seattle shall not have the right to: (i) reduce its obligation to provide the Full or Partial Water Requirements of Water Utility, as appropriate; (ii) cease to provide wholesale water to Water Utility at an equivalent Wholesale Level of Service as it provides to itself; (iii) charge a higher wholesale rate for water supply and transmission to Water Utility than that charged to the Seattle Retail Distribution System; (iv) reduce its water quality obligations hereunder; (v) change the methodology for calculating Rate of Return on Investment; (vi) restrict Water Utility's right to terminate the contract or reduce its purchase commitment; (vii) disband or significantly reduce the powers of the Operating Board; or (viii) amend any contract provision that will apply only to Water Utility.

II.B. Agreement to Supply and Purchase Water

1. Full Requirements Commitment. Seattle shall supply the Full Water Requirements of Water Utility for the term of this contract. Except as set forth in Exhibit I and section II.B.5 below, Water Utility shall purchase its Full Water Requirements from Seattle.
2. Adjustments in Water Utility's Service Area. In the event Water Utility acquires additional service area that is: 1) located outside of the service area identified in Exhibit X and 2) which is not already served with water from the Seattle Regional Water Supply System, then Seattle shall supply the Full or Partial Water Requirements, as appropriate, of the additional service area subject to a) the availability of water in the Seattle Regional Water Supply System determined on the same basis as would be applied to determine the availability of water for new or expanded wholesale service customers of Seattle; b) the limitation of geographical boundaries in Seattle's water rights claims or permits; and c)

Water Utility's payment of Facilities Charges ("FCs") for the service connections in that additional service area.

3. Assumption or Transfer of Responsibilities. In the event Water Utility's entire service area and service responsibilities are assumed by or are transferred to another utility or utilities, then this contract shall become null and void at the time the assumption or transfer becomes effective; provided, however, if the transferee of the service area is a Wholesale Customer, Seattle shall provide water to the transferee according to the terms of the transferee's water supply contract with Seattle. If the transferee is not a Wholesale Customer, then Seattle shall issue the transferee a water supply contract for such area subject to terms and conditions as Seattle shall determine.
4. Annexation by Seattle. If the entire service area of Water Utility is annexed to Seattle, then this contract shall become null and void upon the effective date of Seattle's assumption of Water Utility's water system.
5. Water Utility's Right to Terminate or Reduce Purchase Commitment. Water Utility's commitment to purchase water from Seattle under this contract may be terminated or reduced subject to the terms and conditions set forth below. Water Utility shall provide Seattle at least 5 years written notice of termination or reduction, provided, however, if Seattle unilaterally amends the terms and conditions of this contract pursuant to Section II.A.4 above, Water Utility may terminate this contract at any time within 1 year thereafter by giving Seattle 1 year written notice.
 - a. Automatically Permitted Reductions. Water Utility may, without restriction, upon five years written notice to Seattle, reduce its water purchases from Seattle by an

amount not to exceed 10 million gallons per day (“MGD”) of its average annual demand.

- b. Reductions Requiring Permission. Water Utility may reduce quantities of water purchased from Seattle by more than 10 MGD or by providing less than five years advance notice of such reduction if in the judgment of the Operating Board, using the criteria listed below, it determines that such reduction is in the best interest of the Seattle Regional Water Supply System as a whole.
- c. Criteria. The criteria to be used by the Operating Board in determining the best interest of the Seattle Regional Water Supply System shall include but not be limited to the following:
 - i. The potential for Stranded Costs and impacts on rates to either the remaining Wholesale Customers or Seattle;
 - ii. The cost of new resources;
 - iii. The feasibility and benefit of reallocating to Seattle or other customers the amount of water foregone by Water Utility; and
 - iv. Environmental aspects of the proposed change.

The Operating Board shall act promptly and reasonably in evaluating and deciding upon Water Utility's request. The Operating Board may approve, with or without reasonable conditions, or deny Water Utility's request based on the above criteria. Approval conditions may include a requirement that Water Utility waive its rights to be served its Full Water Requirements. If the approval conditions are unacceptable to Water Utility, it may elect in writing to withdraw its request and this contract shall continue in full force and effect.

II.C. Continuity of Service within the Term of the Contract

1. Parity of Service. Seattle shall provide wholesale water to Water Utility at an equivalent Wholesale Level of Service that it provides to itself. In the event of a general emergency or weather-related water shortage affecting the entire Seattle Regional Water Supply System, general restrictions placed upon water deliveries to Water Utility shall be determined by the Operating Board and applied consistently to other Wholesale Customers and the Seattle Retail Distribution System. In the event of localized emergency problems, Water Utility acknowledges temporary, localized service interruptions may occur for the duration of the emergency.
2. Emergency Curtailment Measures. It is recognized by both parties that emergency water use curtailment measures may have to be adopted by Seattle to implement on a regional basis in order to meet an emergency condition or a regional water shortage. The procedures to be used in the event of a weather-related regional water shortage, or shortages caused by other emergency factors, shall be as described in Seattle's Water Shortage Contingency Plan in effect as of the effective date of this contract, or successor contingency plans. Successor water shortage contingency plans shall be developed and implemented by Seattle in consultation with the Operating Board. Water Utility shall assist with and support all procedures or emergency curtailment measures that are implemented under the Water Shortage Contingency Plan, or its successor.
3. Other Emergencies. Seattle may temporarily interrupt or reduce deliveries of water to Water Utility if Seattle determines that such interruption or reduction is necessary or reasonable in case of system emergencies or in order to install equipment, make repairs, replacements, investigations and inspections or perform other maintenance work on the

Seattle Regional Water Supply System. Except in cases of emergency, and in order that Water Utility's operations will not be unreasonably interrupted, Seattle shall give Water Utility and the Operating Board reasonable notice of any such interruption or reduction, the reasons for and the probable duration. Seattle shall use its best efforts to minimize service interruptions to Water Utility.

4. Waiver Of Charges. If interruption or reduction in deliveries of water to Water Utility requires that Water Utility draw water supply in a manner that subjects Water Utility to demand charges (as described in Exhibit III hereto), Seattle shall waive such charges during the period of such interruption or reduction.

II.D. Water Quality

1. Seattle Regional Water Supply System. Seattle shall be responsible for water quality within the Seattle Regional Water Supply System as set forth below. Seattle shall construct, operate and maintain water quality treatment facilities and use its best efforts to carry out its water quality responsibilities in the most cost-effective manner for the region.
2. Applicable Standards. Seattle shall at all times during the term hereof deliver water to Water Utility's system that meets or exceeds all applicable Federal, State and local regulations as the same may change from time to time.
3. System-wide Water Quality Plan. Seattle, in consultation with the Operating Board, may develop and maintain a system-wide regional water quality plan. The plan shall describe, at a minimum, goals, objectives, procedures and the means to satisfy legal requirements and industry standards for water quality, monitoring, information exchange, best management practices, adaptive management practices, public health protection, and

cross connection control. The Operating Board may form a technical subcommittee to provide input and review of such plan. Seattle shall share available water quality data and technical expertise with all Wholesale Customers.

4. Distribution Systems. Water Utility shall be responsible for compliance with all applicable federal, State and local water quality laws and regulations applicable to water in its distribution system including any water from its own supply sources.
5. Monitoring. Water quality monitoring shall be performed by Seattle in the Seattle Regional Water Supply System and by Water Utility in its distribution system to comply with federal, State and local water quality regulations, to verify the condition of water that is passing from one entity to the other, to enhance system operation and to document the aesthetic qualities of the water. Notwithstanding the foregoing, Water Utility may contract with Seattle for water quality monitoring services as an elective service under section IV.F. hereof.
6. Water Quality Notifications to Customers (Consumer Confidence Reports). Each party shall prepare at its sole cost periodic water quality notifications to its respective retail customers and regulatory agencies as required by law. Seattle shall provide Water Utility all water quality data in a timely manner regarding the Seattle Regional Water Supply System that Water Utility may be legally required to report in such notices.
7. Water Quality Best Management Practices and Adaptive Management Practices. The Operating Board may develop best management practices ("BMPs") and adaptive management practices ("AMPs") as reasonably necessary to protect water quality within the Seattle Regional Water Supply System. The BMPs and AMPs will include recommendations to prevent deterioration of water quality in transmission and

distribution systems. The parties shall use reasonable efforts to comply with the BMPs and AMPs.

8. Flushing. Water Utility shall be solely responsible for flushing water mains within its system. Flushing allowances will be provided by Seattle only when the Operating Board determines that flushing is required to maintain or improve regional water quality.
9. New Water Sources. Prior to the introduction of any new water supply source, including any direct or indirect potable reuse water, by Water Utility which mixes with water in the Seattle Regional Water Supply System, the proposed source must be evaluated using customary and reasonable water quality criteria developed in consultation with the Operating Board to ensure compatibility with Seattle water and approved in writing by Seattle. The proposed Water Utility source must also meet all federal, state and Seattle water quality and treatment standards. Upon Seattle's request, Water Utility shall also provide Seattle with satisfactory results from a blending study to determine the compatibility of the source with existing sources already in the Seattle Regional Water Supply System, the appropriate method and level of treatment and the probable distribution of the new supply within the Seattle Regional Water Supply System. Water Utility shall also complete a flavor rating analysis of no more than 3.0 as tested by Seattle's flavor profile panel according to the methodology described by the American Water Works Association, or its successor. Water Utility shall obtain all necessary and appropriate regulatory permits, reviews, and approvals for rights to and operational use of such water supply source.

The Operating Board may form a technical subcommittee to develop water quality standards and review and advise on the water quality evaluation criteria for proposed new

sources. Such criteria for new sources shall be the same for surface water and ground water.

10. Transfers Outside the Seattle Regional Water Supply System. If, with the written consent of Seattle, water from the Seattle Regional Water Supply System is transferred between Water Utility and another water utility in a manner that does not use the Seattle Regional Water Supply System, Water Utility, the other water utility, or both, shall be fully responsible for meeting all applicable water quality standards related to the transfer of such water between their respective systems. Seattle will not be responsible for water quality outside of the Seattle Regional Water Supply System or Seattle Retail Distribution System except as may be agreed to under Section II.D.5.

II.E. Conservation

The parties acknowledge that conservation prolongs the time before new supply resources are needed and thus constitutes an important ongoing tool in managing the water resources of the region. Accordingly, Water Utility hereby adopts and agrees to be bound by the Regional Water Conservation Program, as it may be amended from time to time during the term of this contract. In accordance with Part 1, Section B.1.5 of the Settlement Agreement between the Muckleshoot Indian Tribe and the National Marine Fisheries Services and the City of Seattle (Civ. No. 03-3775JLR), Water Utility will implement, through its participation in the Regional Water Conservation Program, conservation measures that are substantially similar to those implemented by Seattle within the Seattle Retail Distribution System.

1. Performance Measurements. For the purposes of determining water conservation performance, Water Utility's water use shall be measured in conjunction with the use of all other participants in the Regional Water Conservation Program. The Operating Board

may develop reasonable criteria to measure the participants' water conservation performance in accordance with such program.

2. Conservation Above the Regional Water Conservation Program. Water Utility acknowledges that water conservation beyond the Regional Water Conservation Program may be required as a condition of State or federal regulations, court orders, settlements or agreements made to avoid litigation, fines or penalties, or as otherwise determined to be reasonably necessary by the Operating Board. The Operating Board may adopt reasonable additional conservation measures and targets for such purposes. Such conservation measures and targets shall apply in the same manner to all holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System. Except as provided in the next subsection, Water Utility shall implement such additional water conservation measures and meet the additional adopted targets.
3. Water Utility's Option to be Conservation Service Provider. Water Utility may elect to provide its own water conservation program, beyond its commitment to the Regional Water Conservation Program to meet conservation targets adopted by the Operating Board, or more stringent targets. Water Utility shall bear the additional costs thereof and shall be solely responsible for its implementation. Under this option, Water Utility shall be evaluated for meeting the additional water conservation targets solely by its own performance.
4. Incentives and Penalties. The Operating Board may adopt penalties for shortfalls in water conservation and rewards for meeting or exceeding adopted targets. In the event Water Utility or Seattle fails to meet the adopted targets set by the Operating Board, the Operating Board may assess a penalty. Penalties may not exceed the cost of Seattle

undertaking those conservation measures reasonably needed to achieve the adopted target.

5. Postponing the Need for New Water Supply Facilities. In order to avoid the necessity of developing new physical water supply facilities for as long as reasonably practicable, any water saved through conservation in either Seattle's or Water Utility's retail service areas shall be dedicated first to the municipal and industrial water supply requirements of the Seattle Regional Water Supply System before any other use of such water may be undertaken.

SECTION III. CONDITIONS OF SERVICE

III.A. Minimum Hydraulic Gradient

1. Initial Minimum. Seattle shall maintain a minimum hydraulic gradient or head at a maximum flow rate in amounts and at locations described in Exhibit II attached hereto for each Service Connection from the Seattle Regional Water Supply System to Water Utility's distribution system. Such gradients and locations shall be contained in Seattle's and Water Utility's future water system plans. Seattle shall operate and maintain the Seattle Transmission Facilities necessary to carry out such obligation. If Seattle and the Operating Board find that a project resulting in the modification of such minimum gradient or head would benefit the Seattle Regional Water Supply System as a whole, the minimum hydraulic gradient or head described in Exhibit II may be modified by Seattle if such modification is feasible from an economic, land use and engineering perspective taking into account the facilities required to carry out and for Water Utility to adapt to such modification. Seattle may make these modifications only once during any fifteen

(15) year period provided that four (4) years advance written notice is given to Water Utility, unless a shorter notice is approved by the Operating Board.

2. Emergencies. If Seattle is prevented by emergency circumstances from providing such minimum hydraulic gradient, Seattle shall supply not less than the volume of water equivalent to the maximum 24-hour average flow rate required by Water Utility as shown on Exhibit II for each 24 hour period that the minimum hydraulic gradient is interrupted.
3. Additional Service Connections. Additional Service Connections between Water Utility's and Seattle Regional Water Supply System's water systems or adjusted minimum gradients may be established from time to time by mutual agreement between Seattle and Water Utility subject to approval by the Operating Board. Exhibit II shall be appropriately revised to reflect such additions or adjustments.

III.B. Resale to Other Parties

Water Utility may sell water supplied by Seattle to other water utilities located outside of Water Utility's existing or future service area only upon the prior written consent of Seattle (or oral, in case of emergency). Agreements for resale of water by Water Utility listed in Exhibit I are hereby approved by Seattle subject to whatever written terms, conditions and limitations that Seattle has imposed on such resale.

III.C. Interconnection With Other Systems

1. Prohibition on Interconnection. Water Utility shall not interconnect any part of its system supplied with water from Seattle with other water systems without the prior written approval of the Operating Board, or, in case of emergency, upon oral approval by Seattle, which shall not be unreasonably withheld. Any such interconnection shall be subject to

the approval of the Washington State Department of Health and the installation of a meter. Such other systems must be in compliance with all applicable local, State and federal laws and regulations including the requirement that they have a valid operating permit issued by the Washington State Department of Health.

2. Requests by Seattle to Interconnect. Seattle may request that Water Utility interconnect its water system to the water system of an adjacent Wholesale Customer. Water Utility shall comply with that request subject to the terms and conditions set forth below.
 - a. Requirement for Interconnection. If Water Utility does not consent to Seattle's request for interconnection, Seattle may propose the interconnection of Water Utility's water system to the adjacent Wholesale Customer to the Operating Board. Water Utility may present facts and arguments to the Operating Board in opposition to the interconnection and document its costs in making the interconnection and conveying water to the adjacent Wholesale Customer. The Operating Board shall hear and consider the matter. Upon (a) a written finding by the Operating Board that the proposed interconnection with an adjacent Wholesale Customer is feasible taking into account Water Utility's capabilities, limitations, and obligations, (b) a written finding by the Operating Board that such interconnection benefits the Seattle Regional Water Supply System and (c) a written demand of the Operating Board that Water Utility carry out the interconnection, Water Utility shall be required to interconnect its facilities to the adjacent Wholesale Customer for the purpose of supplying water to that Wholesale Customer through the distribution system of Water Utility, provided that the adjacent Wholesale Customer agrees to perform the interconnection in a

location and according to a schedule which does not unduly disrupt Water Utility's operations, and to be responsible for the payment and indemnity obligations in Section III.C.2.b below.

- b. Payment and Indemnity. Water Utility shall be paid its actual costs of providing such interconnection and water transmission service by the adjacent Wholesale Customer receiving the water, plus a reasonable amount for overhead, administration and rate of return (equal to Rate of Return on Investment) on such costs, and Water Utility shall be indemnified from any liability that may result from providing such interconnection by the adjacent Wholesale Customer. The Operating Board shall adopt a standard methodology for calculating costs that ensures that Water Utility is fairly compensated for such service.

III.D. Development of Regional Supply and Transmission

Infrastructure

Final decisions and authority to approve construction of capital infrastructure related to the Seattle Regional Water Supply System shall rest with the Seattle City Council. Capital construction activities include, but are not limited to installations, renewals, replacements, upgrades, expansions, and any other costs included in Seattle's comprehensive capital facilities plan.

III.E. Metering Equipment

Seattle shall own and perform testing, cleaning and recalibration on appropriate metering devices and associated appurtenances to measure the amount of water delivered to Water Utility at the Service Connection pursuant to this contract. Seattle shall perform all other work at Water Utility's expense regardless of the cause provided that the cause is consistent with AWWA and

safety standards and practices. Water Utility shall operate and maintain its water system in a manner that the water flowing through the Service Connection meter operates within the normal operating range for the meter as specified by the manufacturer.

Until such time as Seattle determines it to be economical to install metering devices to measure the amount of water delivered from the Seattle Regional Water Supply System to the Seattle Retail Distribution System, the amount of water delivered to the Seattle Retail Distribution System shall be measured indirectly by subtracting the metered water delivered to all of Seattle's wholesale customers from 98% of the total amount of water exiting Seattle's sources of supply as measured by the supply meters.

SECTION IV. COST OF WATER SUPPLY & TRANSMISSION

Cost-based rates are a water industry accepted practice and the historical practice of Seattle and the Wholesale Customers. The rate-making principles, policies and methodologies set forth in this Section IV are intended to meet the objective of equitable and cost-based rates.

IV.A. Rate-making and Cost-allocation Principles

The parties will apply the following general principles and policies to the establishment of all rates, charges, and cost allocations for water supply, transmission, and related services under this contract.

1. No expenses attributable to electric power development may be allocated to the cost pools identified herein unless the pools are allocated a commensurate share of revenue derived from such development.
2. Seattle shall utilize generally accepted accounting principles, as may be amended from time to time, consistently applied as a basis for developing the financial information upon which rates and charges are based.

3. Abrupt changes in financial policies should be avoided.
4. The rate structure should encourage the efficient use of water, conservation and the timely development of new environmentally responsible water sources and should incorporate seasonal rates and other pricing approaches to encourage efficient use.
5. The rate structure should be innovative, flexible and adaptive whenever it is cost effective and beneficial in furthering the rate-making policies.
6. The rate structure should be simple to administer and easily understandable.
7. The rate structure should be fair and equitable while balancing the needs of all parties.
8. Capital costs which benefit only a new Wholesale Customer shall be allocated to that customer and not to any cost pool described in this contract.
9. Capital costs associated with improvements or facilities which benefit or serve individual Wholesale Customers or the Seattle Retail Distribution System may be allocated to a sub-regional or regional cost pool to the extent necessary to alleviate a disproportionate adverse impact to that Wholesale Customer or the Seattle Retail Distribution System from a regional or sub-regional capital improvement and where (i) such impact could have been reasonably avoided through a different project design, or (ii) the other Wholesale Customers, including the Seattle Retail Distribution System, receive tangible benefits, directly or indirectly, from the adopted capital facilities plan.
10. The Seattle Retail Distribution System shall be treated as the equivalent of a Wholesale Customer of the Seattle Regional Water Supply System for the purpose of charging Seattle the same wholesale rates and charges as Water Utility for water supply and transmission. Costs calculated under the costs pools described below shall apply to all Wholesale Customers and to the Seattle Retail Distribution System.

11. The allocation of costs associated with capital construction activities within the Seattle Regional Water Supply System shall be the responsibility of the Operating Board. The Operating Board shall use its best efforts to determine and approve a cost allocation method for infrastructure projects prior to the capital project obtaining construction approval from the Seattle City Council. Failure of the Operating Board to determine and approve a cost allocation method shall not hinder the Seattle City Council from approving capital infrastructure projects in order to assure Seattle's ability to fulfill the requirements of this contract.
12. All parties will use best efforts in establishing rates and cost allocations that reflect the rate-making and cost allocation principles set forth in this Section IV.A.

IV.B. Ratemaking Framework

Subject to the foregoing principles, wholesale rates and charges for the services described in this contract shall be developed by Seattle based on the following framework:

1. Water Supply and Transmission Service. The costs of water supply and transmission of water shall be accounted for separately in the water supply and transmission cost pools described below. The price for each service shall be recovered through separate rates for each service. All direct costs incurred in providing water supply and transmission services shall be allocated to the appropriate cost pool and recovered through the rates for each service. In addition, certain indirect costs consisting of a reasonable overhead and administration cost shall be allocated to the appropriate cost pool and recovered through rates for each service.
2. Water Supply - Basic and Elective Services. The costs of supplying water falls into two categories – basic and elective services. Basic service costs include direct and indirect

costs attributable to the delivery of water to the Wholesale Customers and to Seattle's Retail Distribution System pursuant to the foregoing principles. Elective services are optional services, such as water quality laboratory services and specific engineering support that Seattle makes available.

3. Conservation. Costs incurred by Seattle for the Regional Water Conservation Program shall be allocated to the New Supply Cost Pool and the Operating Board will determine how to recover those costs either through rates or Facility Charges "FCs" from Wholesale Customers and Seattle.

IV.C. Water Supply Pricing – Basic Services

1. Two Water Supply Cost Pools. For the purposes of determining costs of water supply, there shall be two cost pools: An existing supply cost pool ("Existing Supply Cost Pool") and a new supply cost pool ("New Supply Cost Pool").
 - a. Existing Supply Cost Pool. The Existing Supply Cost Pool shall be accounted for as follows:
 - i. A basic services rate for water supply shall be charged to recover the full costs of operating, maintaining, repairing, renewing and replacing the Existing Supply Resources incurred by Seattle.
 - ii. All regional conservation programs undertaken by Seattle prior to January 1, 2002, shall be considered an Existing Supply Resource cost.
 - iii. Renewal and replacement of Existing Supply Resources will be an Existing Supply Resource cost.
 - b. New Supply Cost Pool. The New Supply Cost Pool shall be accounted for as follows:

- i. Water supply resources developed after January 1, 2002 that expand the capacity of the Seattle Regional Water Supply System ("New Supply Resources"), including the costs of the Regional Water Conservation Program from January 1, 2002, shall be included in the New Supply Cost Pool. If any portion of a New Supply Resource project enhances reliability of Existing Supply Resources, the costs thereof may be allocated to the Existing Supply Cost Pool if the Operating Board and Seattle both agree.
- ii. The cost of New Supply Resources plus Rate of Return on Investment may be recovered either through FCs or new supply rates charged to the holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System. The new supply rate shall be applied to all holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System.
- iii. The Operating Board shall determine the portion of the New Supply Resource costs that shall be recovered through FCs or through new supply rates. The FCs and new supply rates may be scalable to create an incentive for developers to build housing or commercial units with efficient water usage levels. Water Utility, as well as each other Wholesale Customer and Seattle in setting rates for retail customers shall be free to choose the method of incorporating FCs or new supply rates into their own retail rates and charges.

- iv. Holders of Full and Partial Requirements Contracts who have not purchased water from Seattle under the 1982 Water Purveyor Contract shall be assessed the full marginal costs of the operation, including Rate of Return on Investment, of the New Supply Resources. This assessment may be satisfied by either paying FCs and new supply rates or arranging a special water supply rate in lieu of paying FCs.
- c. Emergency Surcharge. In the event of a drought, catastrophe, or other extraordinary condition that requires emergency expenditures to maintain a sufficient water supply, Seattle may impose an emergency surcharge on all holders of Full and Partial Requirements Contracts in order to pay for such expenditures or maintain financial stability of the Seattle Regional Water Supply System, or both. Any such emergency surcharge shall be presented to the Operating Board prior to adoption by the Seattle City Council. Seattle shall consider the comments of the Operating Board but shall nevertheless have the full authority to adopt the emergency surcharge.

IV.D. Transmission Pricing - Basic Services

- 1. Transmission Costs Pools. For purposes of determining the cost of the transmission of water to the Wholesale Customers there shall be two transmission cost pools consisting of an existing transmission cost pool ("Existing Transmission Cost Pool") and a new transmission cost pool ("New Transmission Cost Pool").
 - a. Existing Transmission Cost Pool. Costs to be allocated to the Existing Transmission Cost Pool shall consist of the following: operation, maintenance, repairs, renewals, and replacements to the Seattle Transmission Facilities.

- i. The Seattle Transmission Facilities are owned and operated as a regional network by Seattle to convey water to wholesale customers and to the Seattle Retail Distribution System. Therefore, the price of transmission for water transmitted within the Seattle Transmission Facilities shall be calculated on the same basis to holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System.
 - ii. Costs incurred for purposes of transmission reliability may be included in the Existing Transmission Cost Pool subject to the approval of the Operating Board and Seattle.
- b. New Transmission Cost Pool. The cost of new transmission facilities shall be included in the New Transmission Cost Pool. The renewal, replacement, upgrade, expansion, or modification of existing Seattle Transmission Facilities which create an expansion of transmission capacity may be allocated to the New Transmission Cost Pool. The Operating Board shall decide what portion of costs of renewal, replacement, upgrade, expansion or modification of existing Seattle Transmission Facilities may be allocated to the New Transmission Cost Pool and what portion of costs of a transmission project that extends the geographic extent of the transmission system that shall be allocated to the New Transmission Cost Pool or recovered from a new Wholesale Customer if the project benefits only that new Wholesale Customer. Except for costs allocated to a specific Wholesale Customer, New Transmission Cost Pool costs shall be recovered through new transmission rates or FCs as determined by the Operating Board. The new

transmission rate shall be applied in a uniform manner to all holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System.

2. Demand Charge

- a. Seattle may adopt a demand charge in accordance with the methodology described in Exhibit III. The demand charge rate (i.e., dollars per 1000 gallons of deficient storage) shall be based on the equivalent cost of providing the deficient storage.
- b. The proceeds of the demand charge will be treated in rate setting as a credit to the New Transmission Cost Pool.
- c. Seattle shall suspend the demand charge rate in the event of emergencies and unforeseen conditions.

3. Cost of New or Changed Service Connection. If Seattle requests a change in the location of the Service Connection to Water Utility for the benefit of the Seattle Regional Water Supply System, then the costs, including any retirement costs of the old Service Connection, shall be included in the appropriate transmission cost pool. If Water Utility requests a new Service Connection or a change in location of an existing Service Connection, then Water Utility shall pay the costs of the new or changed Service Connection, including any retirement costs of the old Service Connection regardless of the cause provided that the cause is consistent with AWWA and safety standards and practices.

IV.E. Allocation of Costs and Revenues into Cost Pools

1. Accounting. Seattle shall maintain a cost accounting system consistent with the provisions of this contract and generally accepted accounting principles, as amended

from time to time, consistently applied in developing the financial information for determining the costs of acquisition, construction, repair, renewal, replacement, upgrade, expansion, maintenance, and operation of the facilities in each cost pool.

- a. Asset Accounts. An asset account shall be maintained for each facility and within that account Seattle shall record the original cost of that facility plus betterments and less retirements.
 - b. Depreciation. Facilities shall be depreciated according to industry-standard water system asset lives and a record of life-to-date depreciation shall be maintained for each facility. No depreciation shall be recorded in the first calendar year of operation of a facility. A full year's depreciation shall be recorded in every subsequent year.
 - c. Net Book Value. The net book value of any facility shall be its original cost plus betterments and less retirements as recorded in its facility asset account, less life-to-date depreciation.
2. Infrastructure Costs. Each cost pool shall include the infrastructure costs for its respective facilities, calculated on a utility, cash or other basis depending upon the facility and the cost pool as set forth below.
- a. Utility Basis. The utility basis shall be used to calculate the infrastructure costs for all Existing Supply Resources and Seattle Transmission Facilities, as well as their replacements and betterments. The utility basis may also be used for New Supply Resources and new transmission facilities in Seattle's discretion. Under the utility basis, the infrastructure cost for a facility in any year shall be the sum of (i) the annual depreciation expense recorded for that facility and (ii) the

product of the net book value of that facility and the Rate of Return on Investment.

At Seattle's discretion, interest costs may be considered current infrastructure costs during the construction of a facility. However, any such interest costs must be considered contributions in aid of construction, and not included in the Net Book Value of the facility for purposes of calculating Utility Basis costs in future years.

- b. Cash Basis. The cash basis may be used in Seattle's discretion for New Supply Resources and transmission facilities or a portion thereof. Under the cash basis, the infrastructure cost for a facility in any year shall be the actual cash expenditure made by Seattle in that year for either the payment of construction costs or actual principal and interest costs on debt issued to finance its construction. In the event that the depreciation lifetime of the facility is less than the term of the debt issued to finance all or a portion of the facility, debt maturities will be selected such that the construction cost of the facility will be fully amortized at the end of its depreciation lifetime.
 - c. Other Basis. Seattle, with the approval of the Operating Board, may determine one or more other bases on which to calculate infrastructure costs and may apply these bases to facilities in the New Supply and New Transmission Cost Pools. Disposition of any facilities under another basis will be determined at the same time in accordance with Section IV.E.4.
3. Operations Costs. The costs of operating the assets assigned to a cost pool shall be included in the cost pool. The annual operations costs of a cost pool shall be the labor,

materials, equipment and other direct costs required for the operation, maintenance, and repair of the facilities in that cost pool, together with any net profit or expense from the disposition of facilities in that pool. Operations costs shall include the cost of general and administrative overhead applied in a manner consistent with its application to capital construction projects.

- a. Existing Supply Operations Costs. The parties agree that an efficient way of handling operations costs for the Existing Supply Cost Pool shall be as follows: The operations cost base in the Existing Supply Cost Pool for the year 2010 shall be determined in accordance with the line item labeled "2010 Costs in identified activities" under Existing Supply in Note 2 – Operations Costs, Notes to the Wholesale Statements for the City of Seattle, Seattle Public Utilities, Water Fund, during the annual cost-audit process for 2010 in accordance with Section IV.E.10, which occurs by the end of 2011 and applies to all Wholesale Customers and Seattle. Seattle will notify Water Utility of the actual 2010 operations cost base in the Existing Supply Cost Pool in writing, which shall become incorporated as part of this contract at that time. In each succeeding year, the amount of the operations cost base from the previous year shall be adjusted by the percentage increase in the operations cost in the Existing Supply cost centers identified in Exhibit IX, as amended from time to time.
- b. Existing Transmission Operations Costs. The parties agree that an efficient way of handling operations costs for the Existing Transmission Cost Pool shall be as follows: the operations costs base in the Existing Transmission Cost Pool for the year 2010 shall be determined in accordance with the line item labeled "2010

Costs in identified activities” under Existing Transmission in Note 2 – Operations Costs, Notes to the Wholesale Statements for the City of Seattle, Seattle Public Utilities, Water Fund, during the annual cost-audit process for 2010 in accordance with Section IV.E.10, which occurs by the end of 2011 and applies to all Wholesale Customers and Seattle. Seattle will notify Water Utility of the actual 2010 operations cost base in the Existing Transmission Cost Pool in writing, which shall become incorporated as part of this contract at that time. In each succeeding year, the amount of the operations cost base from the previous year shall be adjusted by the percentage increase in the operations cost in the Existing Transmission cost centers identified in Exhibit IX, as amended from time to time.

- c. New Supply Operations Costs. The operation costs of the Regional Water Conservation Program after January 1, 2002, together with the costs of operating facilities assigned to the New Supply Cost Pool and any other costs allocated by the Operating Board, shall be assigned to the New Supply Cost Pool. The operations cost base in the New Supply Cost Pool for 2010 shall be determined in accordance with the line item labeled “2010 Costs in identified activities” under New Supply in Note 2 – Operations Costs, Notes to the Wholesale Statements for the City of Seattle, Seattle Public Utilities, Water Fund, during the annual cost-audit process for 2010 in accordance with Section IV.E.10, which occurs by the end of 2011 and applies to all Wholesale Customers and Seattle. Seattle will notify Water Utility of the actual 2010 operations cost base in the New Supply Cost Pool in writing, which shall become incorporated as part of this contract at that time. In each succeeding year, the amount of the operations cost base shall

be adjusted by the percentage increase in the operations costs in the New Supply cost centers as identified in Exhibit IX, as amended from time to time.

- d. New Transmission Operations Costs. The actual costs of operating facilities assigned to the New Transmission Cost Pool and any other costs allocated by the Operating Board, shall be assigned to the New Transmission Cost Pool.
4. Disposition Costs. The costs of disposing of assets within a cost pool shall be included in the cost pool. Net disposition costs shall be calculated as follows:
 - a. Disposition Under the Utility Basis. The net book value of the facility, less any sales, salvage, or other revenues derived from the disposition of that facility.
 - b. Disposition Under the Cash Basis. The value of principal of unpaid maturities of debt used to finance the construction cost of the facility, less any sales, salvage or other revenues derived from the disposition of that facility.
 - c. Disposition Under Other Basis. Disposition of any facilities whose infrastructure costs are calculated on another basis under section IV.E.2.c. above shall be determined by the parties as part of the definition of such other basis.
 5. Creation of Additional Cost Pools. Seattle, in its discretion, may create additional cost pools to provide equity and flexibility in payment arrangements and the allocation of costs as the Seattle Regional Water Supply System expands to include new infrastructure, operations, and customers. The costs in an additional cost pool, or a portion thereof, may be added to an existing cost pool subject to the consent of the Operating Board if the costs to be allocated satisfy the criteria for allocation to the existing cost pool.
 6. Facilities Charge Revenues. Supply FC revenues, which consist of those revenues from FCs the Operating Board has determined are to recover a certain portion of New Supply

Resources costs, shall offset infrastructure costs in the New Supply Cost Pool. Surpluses and deficits in actual Supply FC revenues over costs to be recovered through the Supply FC shall be carried forward and earn simple interest at Seattle's Average Cost of Debt.

Any current-year deficit (including any surplus balance available from previous years) shall be paid by rates for the New Supply Cost Pool. New Supply Cost Pool rates shall be discounted by surplus Supply FC revenues until any deficit Supply FC balance is repaid, except the amount of this discount shall not exceed, without the agreement of the Operating Board, twice the maximum annual deficit paid by the rate for the New Supply Cost Pool in any one year.

In the event that Supply FC surplus balances exceed the Net Book Value of assets whose costs are allocated to the Supply FC, the difference between the Supply FC balance and the Net Book Value of these assets shall be used to discount the rate for the New Supply Cost Pool (and the Supply FC surplus balance shall be reduced by the amount of this discount). The use and accounting for transmission FCs shall be done in a like manner to supply FCs. Seattle and Water Utility agree that FC revenues are the sole property of Seattle.

7. Allocation of Cost Pools by Customer Class. The costs in cost pools shall be allocated within the pools as follows:
 - a. Allocation of Existing Supply Cost Pool. The total cost of the Existing Supply Cost Pool shall be allocated to two customer classes as follows:
 - i. Block Purchase Customer Class. The portion of costs in the Existing Supply Cost Pool allocated to holders of Block Purchase Contracts shall be determined pursuant to those contracts.

- ii. Full and Partial Requirements Customer Class. The holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System shall be allocated the remaining costs in the Existing Supply Cost Pool.
- b. Allocation of New Supply Cost Pool. The costs allocated to the New Supply Cost Pool shall be:
 - i. Block Purchase Customer Class. The holders of Block Purchase Contracts shall be allocated no costs from the New Supply Cost Pool.
 - ii. Full and Partial Requirements Customer Class. The holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System shall be allocated all costs in the New Supply Cost Pool.
- c. Allocation of Existing Transmission Cost Pool. The costs of the Existing Transmission Cost Pool shall be allocated as follows:
 - i. Block Purchase Customer Class. The proportion of costs in the Existing Transmission Cost Pool allocated to holders of Block Purchase Contracts shall be determined pursuant to those contracts.
 - ii. Full and Partial Requirements Customer Class. The holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System shall be allocated the remaining costs in the Existing Transmission Cost Pool.
- d. Allocation of New Transmission Cost Pool.
 - i. Block Purchase Customer Class. The holders of Block Purchase Contracts shall be allocated no costs from the New Transmission Cost Pool.

- ii Full and Partial Requirements Customer Class. The holders of Full and Partial Requirements Contracts and the Seattle Retail Distribution System shall be allocated all costs in the New Transmission Cost Pool.
 - e. Allocation of Additional Cost Pools. At the time an additional cost pool is created by Seattle pursuant to Section IV.E.5, the additional cost pool will be allocated by customer class.
8. Facilities Charges. If Seattle establishes FCs as authorized herein, then such charges shall be calculated as follows:
- a. ERU Definition. Seattle shall develop a definition of an Equivalent Residential Unit ("ERU") based on, meter size as set forth in Exhibit VI, number of residential units, water use, or other basis which shall be consistent with accepted industry standards. The Operating Board shall have the right to review and comment on the definition and Seattle shall consider the Operating Board's comments.
 - b. Record-Keeping. Water Utility shall provide Seattle with an annual accounting, in a form acceptable to Seattle, of its retail water service connections by January 31st of each year, which shall be accurate as of December 31st of the preceding year. Water Utility shall report the size of the meter and other pertinent data such as the number of residential units or square footage served or water use. Seattle shall provide Wholesale Customers with an annual accounting of its retail service connections on the same basis. Upon reasonable notice, Water Utility shall make its billing and connection records available to Seattle for inspection and copying

during normal business hours and Seattle's billing and connection records shall be made available to any Wholesale Customer on the same basis.

- c. Annual Calculation of ERUs. Until such time as Seattle develops another basis, the calculation of ERUs in any year shall be the annual growth in the number of meters installed by Water Utility during the year taking into account the size of each meter.
 - d. Imposition of Facilities Charges. Seattle shall collect and Water Utility shall pay FCs based on the following:
 - i. the number of ERUs added during the previous month determined by the number of meters installed. Seattle shall pay FCs into the accounts of the Seattle Regional Water Supply System on the same basis.
 - ii. Seattle Report on ERUs. Seattle shall prepare and distribute a report no later than March 31st of each year showing the ERU count of the Seattle Retail Distribution System and each Wholesale Customer on such basis for the previous year and each year since the effective date of this contract.
 - e. Rate Setting. The structure of FCs or water rates charged to the holders of Full and Partial Requirements Contracts shall be determined by Seattle, at its sole discretion, except that the price may not, without the consent of Water Utility, be set to collect more than the costs forecast under Section IV hereof and Rate of Return on Investment. FCs shall be calculated as set forth on page 1 of Exhibit VI.
9. Cost Audit. At the end of each fiscal year, Seattle shall provide a statement of actual costs allocated to each cost pool and other costs and revenues received, which statement may be audited by an external auditor selected by the Operating Board. In addition,

Water Utility may have the statement audited by an external auditor of its choice, solely at Water Utility's expense.

10. Transition.

- a. Settling the Purveyor Balance Account. The parties agree that they will settle the Purveyor Balance Account, as that term is used in Section III.I of the 1982 Water Purveyor Contract, in the following manner no later than December 31, 2011, unless the parties enter into a payment agreement in accordance with this subsection. The Purveyor Balance Account shall be credited if there is a surplus or charged if there is a deficit, to the Wholesale Customers who remained under the 1982 Water Purveyor Contract until the Effective Date of this contract. The Purveyor Balance Account as of December 31, 2010 (which will be finally audited in the 3rd quarter of 2011), shall be prorated by each of those Wholesale Customer's share of the total Purveyor demand (e.g flow) since the most recent year that the balance was at zero. There will be separate proration for the Old Water and New Water accounts as those terms are defined in the 1982 Water Purveyor Contract. In the event the appropriate credits or charges are not or cannot be paid in full by December 31, 2011, the parties shall be entitled to pay the appropriate credits or charges over a term of up to three years with the then current interest at Seattle's Average Cost of Debt. The specific terms of any payment agreement between the parties shall be reasonable and subject to the review and approval of the parties.
- b. Prior Operating Board Decisions. Water Utility acknowledges and agrees it will be bound by decisions the Operating Board has made under the authority in this

contract that have been made prior to the Effective Date of this contract so that such decisions apply to all holders of Full and Partial Requirements Contracts.

- c. Application of Facilities Charges based on Meter or Connection Size. Seattle and Water Utility acknowledge and agree that Water Utility has unresolved concerns relating to guidance issued by the Operating Board in 2002 regarding the application of FCs based on meter or connection size where other requirements (e.g. operational, regulatory) may dictate the meter or connection size, and therefore, may not be an appropriate indicator of the annual demand placed on water supplies. The parties agree that circumstances have changed since that guidance was issued that warrant reconsideration of the guidance. Therefore, Seattle will initiate a discussion with the Operating Board in 2011, which Water Utility may participate in to present its concerns, and will endeavor to resolve the issue for action by the Operating Board as soon as practicable after Water Utility becomes represented by the Operating Board.
- d. Waiver of Facilities Charges. Seattle shall not charge Water Utility FCs until January 1, 2012 if the amount of water it purchases from Seattle does not exceed its old water allowance under the 1982 Water Purveyor Contract. This waiver, however, shall not relieve Water Utility from the record-keeping requirement of subsection IV.E.8 above.
- e. Transition Growth Surcharge. A transition growth surcharge of \$0.60 per CCF shall be applied to the rates of Water Utility for delivery of water in excess of the old water allowance of the 1982 Water Purveyor Contract through December 31, 2011. The revenue from this surcharge shall be used to discount the base rates of

the holders of Full and Partial Requirements Contracts by not more than \$0.16 per CCF. In the event that the revenues generated by the surcharge exceed those required to fund the discount, Seattle may keep the difference.

f. Early Contract Signing Fee. Within two months of the Effective Date of this contract, Water Utility agrees to pay to Seattle an Early Contract Signing Fee of \$13,235. If Water Utility requires a longer period, it may pay the fee in monthly increments until December 2011 at 1% interest.

g. Transfer to Full and Partial Rates and Facilities Charges.

i. Within two months of the Effective Date of this contract, Seattle will: 1) make appropriate changes to its billing system to charge Water Utility for water supplied under this contract at the then current rates for Full or Partial Requirements Contracts under Seattle Municipal Code ("SMC") Section 21.04.440.E.2 ("Billing System Change Date"); and 2) credit back to Water Utility the difference between the amount Water Utility paid for water supplied at the then current rates for Water Purveyor Contracts under SMC 21.04.440.E.1 and what the Water Utility would have paid for water supplied at the then current rates for Full or Partial Requirements Contracts under SMC 21.04.440.E.2 from January 1, 2011 until the Billing System Change Date.

ii. Within two months of the Effective Date of this contract, Water Utility will submit to Seattle an accounting of the number of retail connections made to its water system between January 1, 2011 and the Effective Date of the contract and payment of any FCs at the then current FC rate under

SMC 21.04.440.E.2 that would have been paid in accordance with this contract from January 1, 2011 until the Effective Date of this contract.

- h. Existing Regional Deficit. The parties acknowledge and agree that as of December 31, 2010, there may be an existing regional deficit or surplus in the running balance under Section IV.I.1 that was created by Wholesale Customers signing contracts prior to 2011 and the Seattle Regional Distribution System. Although Water Utility did not contribute to the existing deficit or surplus, it will have to pay higher or lower rates in the 2012-2014 rate period to help eliminate the deficit or surplus, respectively. In the event of a deficit, Seattle agrees to credit back to Water Utility, 70% of the amount that Water Utility will contribute to eliminating the existing deficit through higher rates. In the event of a surplus, Water Utility agrees to pay Seattle 70% of the amount that Water Utility will benefit from eliminating the existing surplus through lower rates. The actual amount of the existing deficit or surplus will be determined during the annual cost audit process for 2010, which is targeted for third quarter 2011. The amount to be credited or charged will be based on Water Utility's percentage of 2010 annual flow times the total existing regional deficit or surplus times 70%. Upon the completion of the 2010 annual cost audit process, Seattle will provide Water Utility with an accounting of the total credit or charge in writing. Beginning January 2012, Seattle will provide one or more monthly credits or charges on Water Utility's water bill until the entire credit or charge balance is paid off. Seattle or Water utility, as appropriate, will pay the entire balance by December 31, 2012. Any outstanding credit or charge balance will accrue interest at

Seattle's average cost of debt from December 31, 2010 until the entire balance is paid off.

IV.F. Elective Services

1. Water Supply Services. Seattle may provide certain elective services (e.g. conservation, engineering) to Water Utility upon request by Water Utility. Such services shall be negotiated and contracted for separately between Water Utility and Seattle.
2. Transmission Wheeling. In consultation with the Operating Board, excess transmission capacity may be made available by Seattle for a fee for purposes of wheeling water between points within the Seattle Regional Water Supply System to Water Utility or to others.
3. Water Quality. So long as Seattle owns and operates a water quality lab, Water Utility may request the services of that lab based on its published rates.

IV.G. Rate Adjustment

1. Rate Adjustment. Upon 120-days notice to Water Utility of its intent to do so, Seattle may adjust water service rates and FCs to Water Utility subject to the terms of this contract. Rate adjustments will be effected only within five years of the completion of a cost of service study to be conducted by Seattle, which shall include an analysis of the allocation of operation, maintenance and capital costs between cost pools. Such study shall be prepared in accordance with accepted industry standards. In addition, Seattle shall review the Operating Board's comments and recommendations on the rate proposal and provide a written explanation of any recommendations that are not accepted.
2. Rate Consultant. An independent rate consultant shall be selected by Seattle in consultation with the Operating Board. Detailed information and progress reports from

the consultant will be made to Water Utility during the course of the study upon drafting of each major study section directly affecting Water Utility and other Wholesale Customers. A final consultant report shall be made available to Water Utility not less than 30 days before Seattle formally transmits any resulting rate adjustment proposal to the Operating Board.

IV.H. Retail Rate-Setting

Each party to this contract shall have sole authority for establishing retail rates, connection charges and other fees and charges within its respective jurisdiction.

IV.I. Truing Actual Costs and Actual Revenues

A mechanism for reconciling revenue targets for the various cost pools and the actual revenues received during each year shall be implemented by Seattle as follows:

1. For each previously identified class of customers in each cost pool, Seattle shall maintain a running balance of the excess or deficit of actual rate revenues collected less actual expenses incurred. Each balance shall earn simple interest at the rate of Seattle's Average Cost of Debt. At the end of each year, each balance shall be adjusted to reflect the operating results of that year. The statement of these balances shall be reviewed and approved by an external auditor.
2. FC balances shall be carried forward as set forth in Section IV.E.6.
3. Each wholesale rate study shall adjust rates to eliminate the cost pool balances. ERU fees shall be based on the costs of increments in supply and transmission capacity, and shall not be adjusted to reflect surpluses or deficits in FC revenues.

SECTION V. OPERATING BOARD

1. Purpose. The purpose of the Operating Board is to provide certain limited authority to a board of representatives over policy and operational matters as they affect the Seattle Regional Water Supply System.
2. Structure and Authority. The Operating Board shall have the powers and authority as set forth herein. Exhibit IV describes the structure and authority of the Operating Board. In the event of a conflict between provisions of this contract which grant specific powers to the Operating Board and Exhibit IV, such grants of specific powers shall control.
3. Review. The structure and authority of the Operating Board may be reviewed as of January 1, 2012 and every five years thereafter to determine its effectiveness in addressing regional and contractual issues. The review may address the composition of the Board and its powers and authority as set forth herein and in Exhibit IV, provided that notwithstanding any other term or provision of this contract, Seattle shall not have the power to disband the Operating Board nor take away or diminish the powers vested in the Operating Board as set forth in Sections II, III and IV of this contract. Either party may initiate the review. The reviewing party shall provide the other with its comments and proposals. The parties agree to consider the other party's comments and proposals and to respond in writing stating its reasons for rejecting any proposals and the reasons for its own counter-proposal. After consideration of all comments and proposals at each five year interval, Seattle may make changes in the structure and authority of the Operating Board that are not inconsistent with the provisions of this subsection.

SECTION VI. PLANNING

VI.A. Reporting of Planning Data

1. By no later than April 1 of each year, Water Utility shall report to Seattle and the Operating Board as follows:
 - a. Its annual and peak day total system demand for each year, during the term of this contract, as of December 31st of the previous year.
 - b. Its forecast of Full or Partial Water Requirements, as appropriate, for the year including estimates of annual water consumption and maximum 24-peak demand for the ensuing calendar year, and for the fifth, tenth, and fifteenth year in the future. Such forecasts shall reflect the best judgment of Water Utility.
2. Water Utility shall report other data relating to water supply and demand as may be reasonably requested by Seattle for water planning purposes.
3. Records relevant to water supply and consumption within the possession of Seattle or Water Utility shall be provided to the other upon reasonable request.

VI.B. Submittal of Water Utility Water System Plans

Water Utility shall provide a copy of its water system plan, including any amendments, to Seattle for review.

VI.C. Seattle as Water Planning Agency

Seattle shall be the lead agency and primary planning authority for the purposes of fulfilling its obligations to provide for the Full or Partial Water Requirements of Water Utility, as appropriate. Seattle, in consultation with the Operating Board, shall examine and investigate water supplies suitable and adequate to meet the present and reasonable future needs of Seattle and the

Wholesale Customers. Seattle shall prepare and adopt a plan for acquiring such water supplies in a timely fashion. The plan shall provide for the lands, waters, water rights and easements necessary therefor, and facilities for retaining, storing and delivering such waters, including dams, reservoirs, aqueducts and pipelines to convey same throughout the Seattle Regional Water Supply System. In preparing or adopting the plan, Seattle shall consider as possible alternatives or additional water supply sources, the acquisition of water from sources controlled or developed by individual water utilities, legally constituted groups of water utilities or utilities which are not presently supplied by the Seattle Regional Water Supply System. Seattle has final responsibility for the plan and for fulfilling the obligations of this contract. However, the Operating Board may participate in developing the plan by proposing goals and objectives for the Seattle Regional Water Supply System, by making any additional suggestions and by acting in a review capacity.

VI.D. Comprehensive Capital Facilities Plan

Before ordering any major improvements to fulfill the requirements of this contract, Seattle shall adopt and maintain a comprehensive capital facilities plan for the Seattle Regional Water Supply System, which provides for such improvements. Any capital facilities plan adopted by Seattle for the Seattle Regional Water Supply System shall comply with and implement the Rate-making and Cost Allocation Principles in Section IV.A of this contract. This plan shall identify any reasonable costs for capital improvements to alleviate a disproportionate adverse impact to the distribution system(s) of Water Utility, another Wholesale Customer represented on the Operating Board or Seattle, to the extent it is caused by a capital improvement in the capital facilities plan for the Seattle Regional Water Supply System. When such plan is updated or amended, it shall be reviewed by the Operating Board prior to submission to the Seattle City Council. The Operating Board shall respond within 60 days of receipt of the plan, or its approval

shall be presumed to be given. The response submitted by the Operating Board regarding facilities substantially affecting Water Utility and other Wholesale Customers shall be seriously considered by Seattle. Seattle shall reply to the Operating Board within 90 days with its comments. The Operating Board and Seattle shall use their best efforts to arrive at a mutually acceptable plan.

VI.E. Emergency Planning

An emergency plan shall be prepared and maintained by Seattle as part of its Water System Plan to provide for water supply in the event of drought or disaster. Such plan shall be prepared pursuant to the procedure outlined in Section VI.D. Water Utility shall use reasonable efforts to comply with the provisions of such plan, or alternatively, Water Utility may adopt its own emergency plan if it believes it is prudent to do so.

SECTION VII. PAYMENT

VII.A. Collection of Money Due City

Seattle shall bill Water Utility on a monthly basis for all charges due under this contract. Water Utility shall pay such charges within 60 days of the billing date.

VII.B. Penalties for Late Payment

All late payments, and any refund of an amount in dispute that was paid under protest, shall accrue interest at 1% per month.

VII.C. Billing Disputes

Water Utility may dispute the accuracy of any portion of charges billed by Seattle by notifying Seattle in writing within the 60-day payment period of the specific nature of the dispute and paying the undisputed portion of the charges. This provision is not intended to limit Water

Utility's right to dispute billing errors or charges that are not reasonably discoverable by Water Utility within the 60-day payment period.

Seattle shall consider and decide any billing dispute in a reasonable and timely manner. Any billing disputes that remain after such consideration shall be reconciled pursuant to the dispute resolution procedures of this contract.

SECTION VIII. CONTRACT AMENDMENTS

Seattle shall notify Water Utility and all other holders of Full or Partial Requirements Contracts of any amendments to such contracts within 30 days of the execution of such amendment. Water Utility shall then have 90 days to decide whether to include such amendment in this contract by giving written notice to Seattle of its election to do so. Upon the issuance of such notice, Seattle shall issue the amendment to Water Utility and the amendment shall be final and binding upon both parties upon mutual execution.

SECTION IX. DISPUTE RESOLUTION

Dispute resolution shall proceed as follows:

IX.A. Operating Board Review

Any dispute regarding this contract that remains unresolved after good faith negotiations between Water Utility and Seattle shall be referred to the Operating Board for consideration and recommendation. Each party shall submit a written statement regarding the dispute to the Operating Board.

1. If the dispute cannot be resolved in discussions with the Operating Board, then the Operating Board shall provide written recommendations to each party within 60 days of the above submittal setting forth its interpretation of the applicable facts and law.

2. If either party rejects the written recommendation of the Operating Board, that party shall, within 10 days, notify the other party in writing of its reasons.

IX.B. Seattle City Council Review

The written statements of the parties, the recommendations of the Operating Board, if applicable, and the written reasons for either party's rejection of those recommendations shall then be submitted to the Seattle City Council for review.

1. Within 60 days of the submittal of the written materials, the Seattle City Council shall provide written recommendations to resolve the dispute.
2. If either party rejects the written recommendation of the Seattle City Council, that party shall, within 10 days, notify the other party in writing of its reasons.

IX.C. Non-binding Mediation

Within 10 days of receiving the written rejection of the Seattle City Council's recommendations by one or both parties, each party shall designate in writing not more than 5 candidates it proposes to act as a non-binding mediator.

1. If the parties cannot agree on one of the mediators from the combined list within 5 days, the Operating Board shall, within an additional 5 days, select one of the mediators from either list to serve as mediator.
2. Upon selection of the mediator, the parties shall use reasonable efforts to resolve the dispute within 30 days with the assistance of the mediator.

IX.D. Resort to Litigation

If mediation fails to resolve the dispute within 30 days of selection of the mediator, the parties may thereafter seek redress in court subject to Section X.H below.

IX.E. EFFICIENCY OF REVIEW

In order to facilitate a more efficient review of disputes under this Section, the Parties agree to skip the step in Section IX.A above in order to avoid a redundant act. The Parties may also mutually agree to skip the step in Section IX.C, if it is in the best interests of the Parties in resolving the dispute.

SECTION X. MISCELLANEOUS

X.A. Notification

Whenever written notice is required by this contract, that notice shall be given to the following representatives by actual delivery or by the United States mail (registered or certified with return receipt requested,) addressed to the respective party at the following addresses or a different address hereafter designated in writing by the party):

<u>SEATTLE:</u>	<u>WATER UTILITY:</u>
Director	Public Works Manager
Seattle Public Utilities	City of Duvall
Seattle Municipal Tower	PO Box 1300
700 Fifth Ave. , Suite 4900	Duvall, WA 98019
PO Box 34018	
Seattle, WA 98124-4018	

The date of giving such notice shall be deemed to be the postmarked date of mailing.

X.B. Severability

The purpose of this contract is to provide for long-term water supply planning and certainty for both Seattle and Water Utility through adoption of orderly plans calling for the expenditure of significant sums of money for regional water supply and transmission facilities. It is the intent of the parties that if any provision of this contract or its application is held by a court of competent jurisdiction to be illegal, invalid, or void, the validity of the remaining provisions of this contract or its application to other entities, or circumstances shall not be affected. The remaining provisions shall continue in full force and effect, and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular invalid provision; provided, however, if the invalid provision or its application is found by a court of competent jurisdiction to be substantive and to render performance of the remaining provisions unworkable and non-feasible, is found to seriously affect the consideration and is inseparably connected to the remainder of the contract, the entire contract shall be null and void.

X.C. Consent

Whenever it is provided in this contract that the prior written consent or approval of either party is required as a condition precedent to any actions, in each such instance said consent or approval shall not be unreasonably withheld, and in each such instance where prior consent is sought, failure of the party to respond in writing within 90 days of the request shall be deemed as that party's consent or approval unless expressly stated herein. This provision does not apply to requests for amendments of this contract.

X.D. Emergency Situations

Nothing in this contract shall be deemed to preclude either party from taking necessary action to maintain or restore water supply in emergency situations and such action shall not be deemed a violation of this contract.

X.E. No Joint Venture - Individual Liability

This is not an agreement of joint venture or partnership, and no provision of this contract shall be construed so as to make Water Utility individually or collectively a partner or joint venturer with any other Wholesale Customer or with Seattle. Neither party is an agent of the other. Neither Seattle nor Water Utility shall be liable for the acts of the other in any representative capacity whatsoever.

X.F. Complete Agreement

This contract represents the entire agreement between the parties hereto concerning the subject matter hereof. This contract may not be amended except as provided herein.

X.G. Relinquishment of Prior Contract

Upon the Effective Date of this contract, Water Utility relinquishes its then existing 1982 Water Purveyor Contract with Seattle and the terms and conditions of that 1982 Water Purveyor Contract shall have no further force and effect.

X.H. Venue, Jurisdiction and Specific Performance

In the event of litigation between the parties, venue and jurisdiction shall lie with the King County Superior Court of the State of Washington. The parties shall be entitled to specific performance of the terms hereof.

X.I. Default

In the event of default of any provision of the contract, the non-defaulting party shall issue written notice to the other party setting forth the nature of the default. If the default is for a monetary payment due hereunder, the defaulting party shall have thirty (30) days to cure the default. In the event of other defaults, the defaulting party shall use its best efforts to cure the default within ninety (90) days. If such default cannot be reasonably cured within such ninety (90) day period, the defaulting party shall, upon written request prior to the expiration of the ninety (90) day period be granted an additional sixty (60) days to cure the default.

X.J. Force Majeur

The time periods for the parties' performance under any provisions of this contract shall be extended for a reasonable period of time during which a party's performance is prevented, in good faith, due to fire, flood, earthquake, lockouts, strikes, embargoes, acts of God, war and civil disobedience. If this provision is invoked, the parties agree to immediately take all reasonable steps to alleviate, cure, minimize or avoid the cause preventing such performance, at their sole expense.

X.K. Successors

This contract shall inure to the benefit of and be binding upon the parties and their successors and assigns.

X.L. Exhibits

Exhibits I through X are attached hereto and are hereby incorporated by reference as if set forth in full herein.

SIGNATURE PAGE

IN WITNESS WHEREOF, the parties hereby execute this contract.

THE CITY OF DUVALL

BY: _____

TITLE: _____

DATE _____

AUTHORIZING LEGISLATION: ORDINANCE/RESOLUTION _____

THE CITY OF SEATTLE

BY: _____
Director, Seattle Public Utilities

DATE: _____

AUTHORIZING LEGISLATION: ORDINANCE No.

SIGNATURE PAGE

IN WITNESS WHEREOF, the parties hereby execute this contract.

THE CITY OF DUVALL

BY:  _____

TITLE: Mayor, City of Duvall

DATE 3/24/11

AUTHORIZING LEGISLATION: ORDINANCE/RESOLUTION AB11-14

THE CITY OF SEATTLE

BY:  _____
Director, Seattle Public Utilities

DATE: 5/5/11

AUTHORIZING LEGISLATION:

ORDINANCE No.

LIST OF EXHIBITS

- I. Contract Sections II.B and III.B list
- II. Service Connections, Minimum Hydraulic Gradients, and Maximum Flow Rates of Water Supplied
- III. Demand Charge Methodology
- IV. Operating Board Structure
- V. Reserved
- VI. Calculation of ERUs as a Part of Facilities Charges
- VII. Seattle Supply Facilities
- VIII. Seattle Transmission Facilities
- IX. Cost Centers used for Operations Cost Indexes
- X. Water Utility Service Area

EXHIBIT I

List of documents, commitments, adjustments, reductions, agreements, and/or written approvals by Seattle regarding the supply, purchase or resale of water according to Sections II.B. and III.B of this Contract:

1. Intertie Agreements:

Entity/location	Meter Size	Capacity	Type of Service	Comment
City of Duvall near intersection of Big Rock Road and Tolt River Pipeline	--	As needed	Continuous	See Below*

2. Independent Well Sources:

3. Water Supply Contracts To Other Water Utilities:

*The City has an intertie with the Water District 119 from which five customers of the District are supplied in an area not yet connected to the District's main system. This will eventually become an emergency intertie with Water District 119 when the District mains are further extended to that location.

**SERVICE CONNECTIONS, MINIMUM HYDRAULIC GRADIENTS,
AND MAXIMUM FLOW RATES OF WATER SUPPLIED**

SERVICE CONNECTION⁽¹⁾				MINIMUM HYDRAULIC GRADIENT FOR PLANNING PURPOSES AT STATION UPSTREAM OF METER (FEET NAVD-88 Datum)	MAXIMUM FLOW RATE UP TO WHICH THE MINIMUM HYDRAULIC GRADIENT APPLIES (gpm)^(3,4)
LOCATION	STATION NUMBER⁽²⁾	PIPELINE SEGMENT NUMBER⁽²⁾	SIZE OF METER (IN.)		
Tolt Pipeline & Big Rock Road NE	112	23	6	645	1,800
Tolt Pipeline near Pipeline station 714 (275 Ave NE)	111	23	4	640	backup
				TOTAL:	1,800

Notes:

- (1) Water is provided to Service Connections at a Wholesale Level of Service.
- (2) Station and Pipeline Segment Numbers pertain to cost allocations and the demand metering program.
- (3) City of Seattle's estimate of Water Utility's average daily demand for 2030 with a peaking factor of 2.0 for peak day use.

(4)

EXHIBIT III

DEMAND CHARGE METHODOLOGY

The policy of Seattle Public Utilities is to supply water to its Wholesale Customers at, as near as is practical, the twenty-four hour average flow rate, during the peak demand season (June through August). To comply, the Wholesale Customers have to construct adequate storage volume within their individual systems, or sometimes collectively, so as to avoid excessive peak flow withdrawals from the Seattle Transmission Facilities. The Demand Metering Program is established to set performance standards, and to monitor the Wholesale Customer's compliance with this policy. If an individual Water Utility exceeds the prescribed threshold, a "demand charge" is calculated.

Except where other agreements supersede the provisions of this contract, each Water Utility shall be subject to a demand charge based on effective deficient storage, as determined by the peak instantaneous flow rate, and the equivalent financing costs to provide storage. The demand charge rate (i.e., dollars per 1000 gallons of deficient storage) shall be based on the equivalent cost of providing the deficient storage. This rate will be determined as part of each rate study.

The Demand Metering Program is charged with implementation of the "demand charge" methodology. It shall be the responsibility of Seattle, in consultation with the Operating Board, to determine the appropriate means to achieve the program's purpose. The options that may be considered range from temporary suspension on a year by year basis to full activation, as described below.

There shall be no requirement for Seattle to install demand-metering equipment at each Service Connection in order to assess a demand charge. Seattle may choose to apply "demand metering" selectively to certain parts of the Seattle Transmission Facilities that are designated as "critical" from the standpoint of hydraulic capacity or other operational considerations. Seattle may choose to apply "demand metering" intermittently in various parts of the Seattle Transmission Facilities for the purpose of monitoring for compliance by individual Wholesale Customers or groups of Wholesale Customers on a given line segment.

OPERATING BOARD STRUCTURE

1. **Structure.** The Operating Board (or "Board") shall be structured as follows:
 - a. The Board shall consist of seven (7) members, composed of three members representing Seattle Public Utilities (SPU), three members representing Seattle's Wholesale Customers selected as described below and one independent party selected as set forth below to be a tie-breaker as needed. Board members shall, to the best of their ability, act in the best interests of the Seattle Regional Water Supply System as a whole and shall not represent the interest of a group of utilities or an individual utility.
 - b. The term of each Board position shall commence on January 1 and shall be for four (4) years. Terms of each Board position shall be staggered such that no more than two positions are renewed in any single year. Board members may serve not more than three successive terms.
 - c. Three Board members representing the Wholesale Customers will be selected from the holders of Full and Partial Requirements Contracts . Wholesale Customers will be sorted into three categories based on utility size. The selected categories will be small, medium and large utilities, which will be made up from approximately equal numbers of holders of Full and Partial Requirements Contracts. Each category of utility may elect, by majority vote (one vote per utility) its representative to the Operating Board. The Board will be recomposed on January 1, 2012 and every 5 years thereafter.
 - d. The seventh member of the Board shall be a person having expertise in the operations of regional water supply systems. Such person shall be selected by majority vote of the other Board members. In the event of a deadlock in selecting the independent representative, the independent Board member shall be selected by Judicial Arbitration and Mediation Services Inc., of Seattle, Washington or its successor. The seventh member shall not vote on issues coming before the Board unless there is a deadlock in the voting among the other six Board members. The seventh member may nevertheless express his or her opinions in Operating Board discussions. Such member shall have no employment, financial or contractual relationship with Seattle nor any Wholesale Customer or any other actual or apparent conflict of interest in holding this position.
2. **Voting.** Except as otherwise provided above, each member of the Board shall have one vote on all matters coming before the Board. Each Board member may appoint an alternate to vote in his or her absence. A quorum of four (4) Board members present shall be required for any vote. Members of the Board may not grant proxies for any vote.
3. **Chairperson.** The Board shall have a Chairperson who will be selected and have duties as defined below:
 - b. The Chairperson shall be selected at the first regularly scheduled meeting of each new year.

- c. All Chairpersons shall be selected by the Board using a nomination and voting process.
- d. Nomination for the position of Chairperson shall be taken from Board members. The Chairperson shall be selected based upon the simple majority vote of Board members. Should the Board fail to elect a Chairperson at the first regularly scheduled meeting of the new year, a designated representative from SPU shall be the Acting Chairperson until such time as the Board elects a Chairperson.
- e. The Chairperson shall have the responsibility to call meetings, determine the agenda and preside over meetings. In the absence of the Chairperson, for whatever reason, a designated representative from SPU shall be the Acting Chairperson for that meeting. The Chairperson shall also act as the spokesperson for the Board and liaison between the Administrator and the Seattle City Council's Committee on Seattle Public Utilities & Neighborhoods or successor committees.

4. Schedule/Procedures. The Board shall adopt a regular meeting schedule and notify all Wholesale Customers of the schedule. The Operating Board may adopt its own internal procedures. The latest edition of Roberts Rules of Order shall, in the absence of agreement by the Operating Board on procedural matters, govern all meetings and votes of the Operating Board.

5. Reporting. The Board will provide reports to the Wholesale Customers and to the Seattle City Council Committee on Seattle Public Utilities & Neighborhoods, or successor City Council committee, on its decisions and recommendations in a timely manner.

6. Responsibilities and Authority of the Board. Where no clear responsibility or authority on an issue is established in this contract the responsibility and authority shall rest with the Seattle City Council.

7. Expenses. The Board shall be authorized to incur reasonable expenses which will be allocated by the Board to either or both of the New Transmission or Supply Cost Pools.

EXHIBIT V - RESERVED

Calculation of ERUs as a Part of Facilities Charges

The ERU Fee is:

- the flat debt service payment required to finance the facility providing the ERU over the lesser of (i) the facility life or (ii) the period over which new demand will fully utilize the facility's supply
- divided by -
- the number of new ERUs of demand expected in each year.

Seattle's Average Cost of Debt shall be used as the interest rate in this calculation. In the event that several New Supply Resources are added simultaneously, the facilities may be considered together as providing a total new supply capacity for a total construction cost.

Example: A new facility costing \$100 million is built with a capacity of 100,000 ERUs. Growth of 5,000 ERUs per year is expected over the next 20 years, so the facility is projected to be supplying its full capacity in 20 years. Were this facility financed over 20 years at 6% interest, the flat annual debt service payment would be \$8.7 million. Each ERU would cost 0.02% of this annual amount, or about \$1,740.

At the time a New Supply Resources is added, the ERU price for this supply shall be calculated. This ERU price shall then be averaged with the then-current ERU Fee. This average shall be weighted by the number of unpurchased ERUs available at the then-current ERU fee and the number of new ERUs being added at the new ERU price. This weighted average shall be the new ERU Fee, and the number of ERUs available at the fee shall be the sum of the unsold ERUs at the previous fee and the ERU capacity of the new facility.

Example: 10 years ago, a \$100 million facility was constructed that can supply 100,000 ERUs. Growth and demand projections have proven accurate, and now 50,000 ERUs have been purchased, each for \$1,740. The facility also has an additional 50,000 ERUs still available at the same price. This year, we construct a facility worth \$70 million, with a capacity of 40,000 ERUs. Based on demand projections, this facility (on its own) would be fully utilized in 10 years, and its ERU price is therefore \$2,375. The average price of any of the 90,000 available ERUs is therefore \$2,022.

ERUs by Connection Size

<u>Connection Size</u>	<u>Number of ERUs</u>
3/4" and smaller	1
1"	2
1 1/2"	5
2"	8
3"	22
4"	31
6"	66
8"	112
10"	169
12"	238

ERU Proving Methodology

The size of the water service connection used to serve an establishment depends upon both the total demand of that establishment and the instantaneous flow required by that establishment. For this reason, connection size is only a general indicator of the annual demand placed on water supplies by the establishment.

Seattle Supply Facilities

1. Cedar Source

- All roads, buildings, structures, water supply facilities, recreational and educational facilities, and fisheries enhancement and mitigation facilities located within or close to the Cedar River Hydrographic Watershed boundary as defined by Seattle land ownership, including the land itself, and any capitalized studies related to the above. Excepted are facilities solely owned by Seattle City Light for the purpose of power generation. Facilities shared by Seattle City Light and Seattle Public Utilities shall be part of the Seattle Regional Water Supply System only to the extent of SPU share or responsibility.
- All facilities located within the Lake Youngs Reservation as defined by Seattle ownership of the land except for conveyance facilities used to transport finished water during non-emergency operation
- All facilities located within the Lake Youngs Aqueduct, the Landsburg Tunnel, and the Lake Youngs Supply Lines right-of-way, including the right-of-way itself
- Existing Morse Lake Floating Pump Stations

2. Tolt Source

- All roads, buildings, structures, water supply facilities, recreational and educational facilities, and fisheries enhancement and mitigation facilities located within or close to the South Fork Tolt River Hydrographic Watershed boundary as defined by Seattle land ownership, including the land itself, and any capitalized studies related to the above. Excepted are facilities solely owned by Seattle City Light for the purpose of power generation. Facilities shared by Seattle City Light and Seattle Public Utilities shall be part of the Seattle Regional Water Supply System only to the extent of SPU share or responsibility.
- Tolt Treatment Facility

3. Seattle Wellfields

- Riverton Wells, including all pumping and treatment equipment, original yard piping, to the connection to CRPL4, and the low flow piping to Riverton Reservoir
- Boulevard Well, including all pumping and treatment equipment, and all piping up to the connection to CRPL4

4. Other

- One Percent Conservation Program through December 31, 2001
- GIS Projects related to facilities identified herein as part of the Seattle Regional Water Supply System

Seattle Transmission Facilities

1. Pipelines

- Tolt Pipeline No. 1 from the Tolt Regulating Basin to Lake Forest Reservoir, including any transfer and ancillary small diameter parallel pipes
- Tolt Pipeline No. 2 (where constructed), including any transfer and ancillary small diameter parallel pipes
- Tolt Tieline
- Tolt Eastside Supply Line (from TESS Junction to the intersection of SE 16th ST and 145th Place SE)
- Tolt Eastside Line Extension (from the intersection of SE 16th ST and 145th Place SE to Eastside Reservoir)
- The 540 head Pipeline from Maple Leaf Reservoir to Lake Forest Reservoir
- Lake Youngs Bypass No. 4 from the outlet of each of the Cedar Treatment Facility clearwells to Control Works
- Lake Youngs Bypass No. 5 from the outlet of each of the Cedar Treatment Facility clearwells to the Lake Youngs Tunnel
- The Lake Youngs Tunnel (from the original lake outlet to Control Works)
- The Maple Leaf Pipeline (from the intersection of 18th Avenue E. and E. Prospect Street to Maple Leaf Reservoir)
- Cedar River Pipeline No. 1 from Control Works to Volunteer Reservoir
- Cedar River Pipeline No. 2 from Control Works to Lincoln Reservoir
- Cedar River Pipeline No. 3 from Control Works to the intersection of 18th Avenue E. and E. Prospect Street
- 30" intertie between Cedar River Pipelines 2 and 3 in east Olive Street
- Cedar River Pipeline No. 4 from Control Works to the West Seattle Pipeline
- Cedar Eastside Supply Line (from the Cedar Wye to the intersection of SE 16th St and 145th Place SE)
- West Seattle Pipeline from Augusta Gatehouse to Cedar River Pipeline 4
- The 8th Avenue S. Pipeline between S. 146th Street and S. 160th Street
- The Bow Lake Pipeline (between 8th Avenue S. and CRPL 4, and as relocated outside runways at Seatac Airport)
- The Burien Feeder (in S. 146th Street between 8th Avenue S. and CRPL 4)
- The Fairwood Line (between Fairwood Pump Station and Soos Reservoirs)
- The 24-inch discharge pipeline of Lake Youngs Pump Station up to Soos Reservoirs
- The 12-inch discharge pipeline of Lake Youngs Pump Station up to Soos Reservoirs
- The 630 head pipeline between Lake Youngs Pump Station and the Cedar River WSD pump station at the eastern boundary of the Lake Youngs Reservation

2. Reservoirs, Tanks, and Standpipes, including overflow pipes, all valves, appurtenances, and disinfection facility located on the premises of each storage facility, unless otherwise noted

- Lake Forest Reservoir
- Eastside Reservoir
- Riverton Reservoir
- Maple Leaf Reservoir (excluding Roosevelt Way Pump Station and its suction and discharge piping, Maple Leaf Tank and 520 zone piping, except where solely serving the disinfection facility)
- Soos Reservoirs

3. Pump Stations, Major Valve Structures, and other Facilities

- Eastgate Pump Station
- TESS Junction Pump Station
- Lake Hills Pump Station
- Maplewood Pump Station
- Maple Leaf Pump Station
- Bothell Way Pump Station
- Fairwood Pump Station
- Lake Youngs Pump Station
- The Control Works
- Augusta Gatehouse

4. Service Connections to Wholesale Customers installed before January 1, 2002 are part of the Seattle Transmission Facilities. Service Connections to Wholesale Customers installed after December 31, 2001 shall not be part of the Seattle Transmission Facilities.

The Seattle Transmission Facilities include all necessary and convenient appurtenances, including, but not limited to, rights of way, line valves, system meters, and remote automation devices.

EXHIBIT IX (as amended)

Cost Centers Used for Operations Cost Indices

The following costs centers or successor cost centers, as reflected in the amended Exhibit IX, and as amended further from time to time, that capture the direct costs of operation of Existing Supply Facilities, Seattle Transmission Facilities and the Regional Water Conservation Program shall be used as the indices for operations cost in the Existing Supply Cost Pool, Existing Transmission Cost Pool and for the Regional Water Conservation Program in the New Supply Cost Pool.

Supply

Program	Project	Project Name	Activity
Communications	N1203	Communications Activity Group	N120304 Purveyor Relations
Audit & Accounting	N3303	Customer Audit	N330303 Purveyor Audit
Watershed Management	N5401	Program Management	N540194 Department Support
Watershed Management	N5401	Program Management	N540195 General Expense
Watershed Management	N5401	Program Management	N540196 General Management
Watershed Management	N5401	Program Management	N540197 Training
Watershed Management	N5401	Program Management	N540198 Safety
Watershed Management	N5401	Program Management	N540199 Personnel
Watershed Management	N5401	Program Management	N540289 Capital Purchase
Watershed Management	N5403	Support Services	N540301 Modified Duty
Watershed Management	N5403	Support Services	N540302 Procuring/Paying/Receiving
Watershed Management	N5403	Support Services	N540303 Vehicle Equipment Downtime
Watershed Management	N5404	Watershed Protection	N540401 Hydrological Data Collection
Watershed Management	N5404	Watershed Protection	N540402 Fire Protection
Watershed Management	N5404	Watershed Protection	N540403 Inspection
Watershed Management	N5404	Watershed Protection	N540404 Boundaries
Watershed Management	N5405	Facility Management	N540501 WS Grounds
Watershed Management	N5405	Facility Management	N540502 WS Buildings
Watershed Management	N5405	Facility Management	N540503 WS Facilities & Roads
Watershed Management	N5406	Watershed Road Maintenance	N540601 Grade/Gravel/Ditching
Watershed Management	N5406	Watershed Road Maintenance	N540602 Bridges/Streams Culvert
Watershed Management	N5406	Watershed Road Maintenance	N540603 Roads/Row/Vegetation Cutting
Watershed Management	N5406	Watershed Road Maintenance	N540604 Tolt Roads & Streams
Watershed Management	N5407	Watershed Operations Support	N540701 Veh/Equipment Management
Watershed Management	N5407	Watershed Operations Support	N540702 Veh/Equip/Tool Repair
Watershed Management	N5408	Water Quality & Hydrology	N540801 Water Quality Monitoring
Watershed Management	N5408	Water Quality & Hydrology	N540802 Hydrological Monitoring
Watershed Management	N5409	Public/Cultural Programs	N540901 Recreation Planning
Watershed Management	N5409	Public/Cultural Programs	N540902 Management & Research
Watershed Management	N5409	Public/Cultural Programs	N540903 Watershed Education
Watershed Management	N5409	Public/Cultural Programs	N540904 Watershed Public Information
Watershed Management	N5410	Wildlife & Fisheries Programs	N541001 Program Planning & Evaluation
Watershed Management	N5410	Wildlife & Fisheries Programs	N541002 Interagency/Public Involvement
Watershed Management	N5410	Wildlife & Fisheries Programs	N541003 Ecological Monitoring & Research
Watershed Management	N5410	Wildlife & Fisheries Programs	N541004 Habitat & Species Inventory
Watershed Management	N5410	Wildlife & Fisheries Programs	N541005 Habitat Enhancement/Restoration
Watershed Management	N5411	Resource Information Mgmt	N541101 Program Plan/Evaluation
Watershed Management	N5411	Resource Information Mgmt	N541102 Information Maintenance

Program	Project	Project Name	Activity
Watershed Management	N5411	Resource Information Mgmt	N541103 Information Services
Watershed Management	N5412	Special Projects	N541202 Silviculture
Watershed Management	N5412	Special Projects	N541205 Land Exchanges/Acquisitions
Watershed Management	N5415	Cedar HCP	N541501 ASSESS OF EXPAND FOREST STAND
Watershed Management	N5415	Cedar HCP	N541502 ASSESS EXPAND FOREST ATTRIBUTE
Watershed Management	N5415	Cedar HCP	N541503 AUGMENT FOREST HABITAT INV
Watershed Management	N5415	Cedar HCP	N541504 LONG-TERM FOREST HABITAT
Watershed Management	N5415	Cedar HCP	N541505 OLD-GROWTH CLASSIFICATION
Watershed Management	N5415	Cedar HCP	N541506 RIPARIAN RESTOR PROJECT MONIT'
Watershed Management	N5415	Cedar HCP	N541507 UPOLAND FOREST RESTOR PROJ MONT
Watershed Management	N5415	Cedar HCP	N541515 GIS DATA COMPATIBILITY STUDY
Watershed Management	N5415	Cedar HCP	N541516 FOREST HABITAT MODELING
Watershed Management	N5415	Cedar HCP	N541517 SPECIE HABITAT RELATION MODEL
Watershed Management	N5416	Cedar HCP	N541601 CRHCP GIS SUPPORT
Watershed Management	N5416	Cedar HCP	N541603 CRHCP TECHNICAL SUPPORT
Watershed Management	N5417	Cedar HCP	N541701 ROAD MAINTENANCE
Watershed Management	N5418	Cedar HCP	N541801 EXPERIMENTAL STREAM MONITORING
Watershed Management	N5418	Cedar HCP	N541802 LONG-TERM STREAM MONITORING
Watershed Management	N5418	Cedar HCP	N541803 AQUATIC RESTORATION MONITORING
Watershed Management	N5418	Cedar HCP	N541804 BULL TROUT SURVEYS (ADULT)
Watershed Management	N5418	Cedar HCP	N541805 BULL TROUT SPAWNING SURVEY
Watershed Management	N5418	Cedar HCP	N541806 BULL TROUT FRY/JUVENILE SURVEY
Watershed Management	N5418	Cedar HCP	Riparian Zone Studies
Watershed Management	N5418	Cedar HCP	N541809 BULL TROUT STREAM DISTRIBUTION
Watershed Management	N5418	Cedar HCP	N541810 BULL TROUT REDD INUNDATION STU
Watershed Management	N5418	Cedar HCP	N541811 COMMON LOON MONITORING
Water Quality & Supply	N5503	Water System Operations	N550301 Water Management
Water Quality & Supply	N5503	Water System Operations	N550302 Water System Control
Water Quality & Supply	N5503	Water System Operations	N550303 Anadromous Fishery Mgmt
Water Quality & Supply	N5503	Water System Operations	N550304 SCADA Management
Water Quality & Supply	N5503	Water System Operations	N550305 Highline Well Field
Water Quality & Supply	N5503	Water System Operations	N550306 Morse Lake PS
Water Quality & Supply	N5503	Water System Operations	N550307-SAFETY PROCESS MGMT COMPLIANCE
Water Quality & Supply	N5503	Water System Operations	N550308-EPA RISK MGMT COMPLIANCE
Water Quality & Supply	N5504	Water System Analysis	N550401 Eng Analysis/Modeling
Water Quality & Supply	N5504	Water System Analysis	N550402 Water Rights Mgmt
Water Quality & Supply	N5504	Water System Analysis	N550403 DEMAND METERING
Water Quality & Supply	N5505	Surface Water Trtmnt Rule	N550501 Monitoring, Reporting & Admin
Water Quality & Supply	N5505	Surface Water Trtmnt Rule	N550502 Cholrination Facilities O&M
Water Quality & Supply	N5505	Surface Water Trtmnt Rule	N550503 Watershed Management
Water Quality & Supply	N5506	Total Coliform Rule Compl.	N550601 Monitoring, Reporting & Admin
Water Quality & Supply	N5508	Lead & Copper Rule Compl.	N550801 Monitoring, Reporting & Admin
Water Quality & Supply	N5508	Lead & Copper Rule Compl.	N550802 Corrosion Trtmnt Facil O&M
Water Quality & Supply	N5509	Fluoridation Program	N550901 Fluoridation Program O&M
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551001 Otr Reg/Operational Analysis
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551002 Disinfection By-Product Rule
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551003 Limnology
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551005 WQ Lab
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551006 DW Reg Dev & App Research
Water Quality & Supply	N5510	Other Reg Comp/Monitoring	N551007 Public Information/Notification
Water Quality & Supply	N5511	Special Projects	N551104 LIMS & QA/QC
Program	Project	Project Name	Activity

Water Quality & Supply	N5512	Cedar HCP	N551201 INTERIM CHINOOK COHO
Water Quality & Supply	N5513	Cedar HCP	N551301 HCP STREAMFLOW GAUGING
Water Quality & Supply	N5513	Cedar HCP	N551302 SWITCHING CRITERIA STUDY
Water Quality & Supply	N5513	Cedar HCP	N551303 STEELHEAD REDD MONITORING
Water Quality & Supply	N5513	Cedar HCP	N551304 CHINOOK STUDIES
Water Quality & Supply	N5514	WQ Monitoring	Salmonid Studies
Water Quality & Supply	N5515	HCP Fisheries	N551403 DRINKING WATER QUALITY MONITOR
Water Quality & Supply	N5515	HCP Fisheries	N551501 FRY CONDITION AT RELEASE
Water Quality & Supply	N5515	HCP Fisheries	N551502 FRY MARKING & EVALUATION
Water Quality & Supply	N5515	HCP Fisheries	N551503 FRY TRAPPING & COUNTING
Water Quality & Supply	N5515	HCP Fisheries	N551504 FISH HEALTH
Water Quality & Supply	N5515	HCP Fisheries	N551505 SHORT-TERM FRY REARING
Water Quality & Supply	N5515	HCP Fisheries	N551506 LAKE WASHINGTON PLANKTON STUDY
Water Quality & Supply	N5515	HCP Fisheries	N551508 ADULT SURVIVAL DISTRIBUTION
Water Quality & Supply	N5515	HCP Fisheries	N551509 PHENOTYPIC & GENETIC STUDY
Water Quality & Supply	N5516	Tolt DBO	N551601-CONTRACTOR PAYMENTS
Water Quality & Supply	N5516	Tolt DBO	N551603-MANAGEMENT COSTS
Resource Planning	N5609	Water Resource & Habitat Issues	N560903-ESA

Transmission

Program	Project	Project Name	Activity
Water Operation	N6540	WT - Headwork/Storage	N654001 Program Maintenance
Water Operation	N6540	WT - Headwork/Storage	N654002 Event Driven Repairs
Water Operation	N6541	WT - Transmission Pipeline Maint	N654101 Program Maintenance
Water Operation	N6541	WT - Transmission Pipeline Maint	N654102 Event Driven Repairs
Water Operation	N6542	WT - Value Op/Maint - Water Tran	N654201 Program Maintenance
Water Operation	N6542	WT - Value Op/Maint - Water Tran	N654202 Event Driven Repairs
Water Operation	N6543	WT - Grounds/Roads/ROW	N654301 Grade/gravel roads - P
Water Operation	N6543	WT - Grounds/Roads/ROW	N654302 Grade/gravel roads - E
Water Operation	N6543	WT - Grounds/Roads/ROW	N654303 Bridges/culverts - P
Water Operation	N6543	WT - Grounds/Roads/ROW	N654304 Bridges/culverts - E
Water Operation	N6543	WT - Grounds/Roads/ROW	N654305 Fences/gates - P
Water Operation	N6543	WT - Grounds/Roads/ROW	N654306 Fences/gates - E
Water Operation	N6543	WT - Grounds/Roads/ROW	N654307 Mow ROW - P
Water Operation	N6543	WT - Grounds/Roads/ROW	N654308 Mow ROW - E
Water Operation	N6543	WT - Grounds/Roads/ROW	N654309 Mow Other
Water Operation	N6544	WT - Facility Maintenance	N654401 Program Maintenance
Water Operation	N6544	WT - Facility Maintenance	N654402 Event Driven Repairs
Water Operation	N6545	WT - Castings	N654501 Casting Adjustments
Water Operation	N6546	WT - Customer Services	N654601 Communications/Dispatch
Water Operation	N6546	WT - Customer Services	N654602 Locating/Marking
Water Operation	N6547	WT - Damage by Others	N654701 P/L/ROW/Facility
Water Operation	N6548	WT - Transmission Shops	N654801 Shops/Fabrication
Water Operation	N6549	WT - General Expenses	N654905 Tools/small equipment
Water Operation	N6549	WT - General Expenses	N654906 Standby
Water Operation	N6549	WT - General Expenses	N654907 Truck Inventory
Water Operation	N6549	WT - General Expenses	N654908 Downtime - Job Related
Water Operation	N6549	WT - General Expenses	N654909-DISASTER-EMERG RESPONSE

Regional Water Conservation Program

Program	Project	Project Name	Activity
Community Services	N5303	Resource Conservation	N530301 1% Conservation

Cost Centers Used for Operations Cost Indices

amended 12/31/2009

Existing Supply

Program	Project	Project Name	Activity	Description
SPU General Expense	N0108	Emergency Response	NN90036	4/23/09 Tolt Trmt Plant Emrgcy
SPU General Expense	N0503	Water Fund Contracts	N050302	Tolt DBO Contract Payments
SPU General Expense	N0503	Water Fund Contracts	N050303	Cedar DBO Contract Payments
Branch Administration	N3106	Water Wholesale Contracts	N310601	Wholesale Water Contracts Mgmt
Customer Billing Services	N3303	Customer Audit	N330303	Purveyor
Cedar & Tolt Watershed Srvc	N5401	Program Management	N540198	Safety
Drainage & Wastewater	N6210	Landsburg Mgmt & HCP Support	N621001	Oprtn of Passage Facility-HCP
Drainage & Wastewater	N6210	Landsburg Mgmt & HCP Support	N621002	Interim Hatchery Ops-HCP
Water Operation	N6510	Misc Water Operations	N651004	Alternative Duty
Water Operation	N6540	Headwork/Storage	N654003	(Cedar) Chlorination Facility O&M
Water Operation	N6540	Headwork/Storage	N654004	Fluoridation Program O&M
Water Operation	N6540	Headwork/Storage	N654005	RMP/PSM Compliance
Water Operation	N6573	In-Town Reservoir Treatment	N657304	Highline Well F(Location Code)
Asset Data Systems	N6903	SCADA Development & Support	N690301	SCADA SYSTEM PLANNING
Asset Data Systems	N6903	SCADA Development & Support	N690302	SCADA INFRASTRUCTURE O&M
Asset Data Systems	N6903	SCADA Development & Support	N690303	DAM SAFETY SCADA
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731101	Fry Condition @ Release - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731102	Fry Marking & Evaluation - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731103	Fry Tapping & Counting - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731104	Fish Health - IICP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731105	Adult Survival Distribution - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731106	Pheno & Gen Study - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731107	Zooplnktn Stds (Sprng) - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731108	HCP Support
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731109	Operation of Passage Facility - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731110	Landsburg Fish Ladder - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731111	DW Quality Monitoring - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731112	Interim Hatchery Ops - HCP
Surface Water LOB	N7311	Landsburg Mtgtn & HCP Support	N731113	Adaptive Mgmt - Sockeye Hatch
Drinking Water LOB	N7503	Water LOB Planning & Perf	N750303	Network Hydraulic Model Dev
Drinking Water LOB	N7504	Water Resource Business	N750403	Hydrology Model Dev & Maintenance
Drinking Water LOB	N7504	Water Resource Business	N750404	Water Resource Operation Mgmt
Drinking Water LOB	N7504	Water Resource Business	N750406	Morse Lake Pump Plant
Drinking Water LOB	N7504	Water Resource Business	N750407	Anadromous Fishery Mgmt
Drinking Water LOB	N7504	Water Resource Business	NN90053	Tolt Spillway Leak Repair
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750501	Existing Stream Gage At Cedar F
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750502	Exist. Stream Gage Below Landsburg
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750503	New Stream Gag Above Powerhouse
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750504	New Gage At Renton
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750505	Temporary Gages In Lower River
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750506	Accretion Flow Study
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750507	Switching Criteria Study
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750509	Instream Flow Commission
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750511	Dead Strg Bull Trout Dltm Mdln
Drinking Water LOB	N7505	HCP Instream Flow Monitor & Res	N750512	Steelhead Redd Monitoring
Drinking Water LOB	N7507	Water Quality & Treatment Business Area	N750705	Tolt Management Costs
Drinking Water LOB	N7507	Water Quality & Treatment Business Area	N750707	Cedar DBO Management Costs
Drinking Water LOB	N7509	Operations Plan & System Control	N750802	Water System Monitor & Control
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751101	Fry Condition @ Release - HCP

FULL REQUIREMENTS CONTRACT
CITY OF DUVALL

Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751102	Fry Marking & Evaluation - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751103	Fry Trapping & Counting - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751104	Fish Health – HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751105	Adult Survival Distribution - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751106	Pheno & Gen Study – HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751107	Zooplknktn Stds (Sprng) - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751108	HCP Support
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751109	Operation of Passage Facility - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751110	Landsburg Fish Ladder - HCP
Drinking Water LOB	N7511	Landsburg Mitigation. & HCP Support	N751112	Interim Hatchery Ops - HCP
Tech systems	N7705	SCADA Development & Support	N770501	SCADA System Planning
Tech systems	N7705	SCADA Development & Support	N770502	SCADA Infrastructure O&M
Watershed Management	N7801	Program Management	N780196	General Management
Watershed Management	N7803	Support Services	N780301	Procuring/Paying/Receiving
Watershed Management	N7804	Watershed Protection	N780401	Hydrological Data Collection
Watershed Management	N7804	Watershed Protection	N780402	Fire Protection
Watershed Management	N7804	Watershed Protection	N780403	Inspection
Watershed Management	N7804	Watershed Protection	N780404	Boundaries
Watershed Management	N7804	Watershed Protection	N780405	Facilities Security
Watershed Management	N7805	Facility Management	N780501	WS Grounds
Watershed Management	N7805	Facility Management	N780502	WS Buildings
Watershed Management	N7805	Facility Management	N780503	WS Edu Facilities Mgmt
Watershed Management	N7806	Watershed Road Maintenance	N780601	Grade/Gravel/Drain
Watershed Management	N7806	Watershed Road Maintenance	N780602	Bridges/Streams Culvert
Watershed Management	N7806	Watershed Road Maintenance	N780603	Roads/ROW/Vegetation Cutting
Watershed Management	N7806	Watershed Road Maintenance	N780604	Tolt Roads & Streams
Watershed Management	N7807	Watershed Operations Support	N780701	Vehicle/Equipment Management
Watershed Management	N7807	Watershed Operations Support	N780702	Vehicle/Equip/Tool Repair
Watershed Management	N7808	Water Quality & Hydrology	N780801	Hydrological Monitoring
Watershed Management	N7809	Public/Cultural Programs	N780901	Recreation Planning
Watershed Management	N7809	Public/Cultural Programs	N780902	CR Management & Research
Watershed Management	N7809	Public/Cultural Programs	N780903	Watershed Education
Watershed Management	N7809	Public/Cultural Programs	N780904	Watershed Public Information
Watershed Management	N7809	Public/Cultural Programs	N780905	Educational Center Operations
Watershed Management	N7809	Public/Cultural Programs	N780906	Cedar River Watershed Institute
Watershed Management	N7809	Public/Cultural Programs	N780907	Tolt WS MP Impl Cultural Rest
Watershed Management	N7810	Wildlife & Fisheries Programs	N781001	Program Planning & Evaluation
Watershed Management	N7810	Wildlife & Fisheries Programs	N781002	Interagency/Public Involvement
Watershed Management	N7810	Wildlife & Fisheries Programs	N781003	Ecological Monitoring & Research
Watershed Management	N7810	Wildlife & Fisheries Programs	N781004	Habitat & Species Inventory
Watershed Management	N7810	Wildlife & Fisheries Programs	N781005	Habitat Enhancement/Restoration
Watershed Management	N7811	Resource Information Mgmt	N781101	Information Services
Watershed Management	N7812	Special Projects	N781201	Silviculture
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781301	Assess Of Expand Forest Stand
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781302	Assess Expand Forest Attribute
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781303	Long-Term Forest Habitat Inventory
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781304	Old-Growth Classification
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781305	Riparian Restoration Project Monitoring
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781306	Upland Forest Restoration Project Mont
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781308	Experimental Murrelet Habitat
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781309	Spotted Owl Baseline Survey
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781311	OPTION SPECIES/HABITAT SURVEYS
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781312	GIS Data Compatibility Study
Watershed Management	N7813	CRHCP WS Terestr Mnitrr/Resrch	N781313	Species Habitat Relation Modeling
Watershed Management	N7814	CRHCP Program Support	N781401	CRHCP Technical Support
Watershed Management	N7814	CRHCP Program Support	N781402	BPA Mitigation Program - Watershed
Watershed Management	N7815	CRHCP Watershed Road Managment	N781501	Road Maintenance
Watershed Management	N7816	CRHCP WS Aquatic Monitrr/Resrch	N781601	Long-Term Stream Monitoring

Watershed Management	N7816	CRHCP WS Aquatic Monitr/Resrch	N781602	Aquatic Restoration Monitoring
Watershed Management	N7816	CRHCP WS Aquatic Monitr/Resrch	N781604	Bull Trout Spawning Survey
Watershed Management	N7816	CRHCP WS Aquatic Monitr/Resrch	N781605	Bull Trout Fry/Juvenile Survey
Watershed Management	N7816	CRHCP WS Aquatic Monitr/Resrch	N781606	Bull Trout Stream Distribution
Watershed Management	N7816	CRHCP WS Aquatic Monitr/Resrch	N781607	Common Loon Monitoring
Watershed Management	N7817	Watershed Svc MIT Implement	N781701	Watershed Tribal Relations Coordination
Watershed Management	N7818	Tolt WS MP Impl Habitat Rest	N781801	Tolt WS MP Impl Habitat Rest
Laboratory Services	N7903	WQ Regulatory Compliance	N790301	SWTR Monitoring, Reporting & Adm
Laboratory Services	N7903	WQ Regulatory Compliance	N790302	TCR Monitoring, Reporting & Adm
Laboratory Services	N7903	WQ Regulatory Compliance	N790303	LCR Monitoring, Reporting & Adm
Laboratory Services	N7903	WQ Regulatory Compliance	N790304	DBP Monitoring, Reporting & Adm
Laboratory Services	N7903	WQ Regulatory Compliance	N790305	Public Information/Notification
Laboratory Services	N7903	WQ Regulatory Compliance	N790306	Regulatory Support
Laboratory Services	N7904	WQ Monitoring	N790402	Operations Support
Laboratory Services	N7904	WQ Monitoring	N790403	Limnology
Laboratory Services	N7905	Customer Support	N790502	Applied Research
Laboratory Services	N7906	Lab Systems	N790601	WQ Lab Facility O&M
Laboratory Services	N7906	Lab Systems	N790602	Lab System Administration & Support
Laboratory Services	N7906	Lab Systems	N790603	QA Admin
Pre-Capital	N5001	E - Water Fund	E100078	Cedar Falls Railroad Hazard
Pre-Capital	N5001	E - Water Fund	E101008	Rock Creek Fishway
Pre-Capital	N5001	E - Water Fund	E105018	BPA - Rd Improve
Pre-Capital	N5001	E - Water Fund	E105019	BPA Roads Other Decommission
Pre-Capital	N5001	E - Water Fund	E105035	BPA Forest ROW Plant Removal
Pre-Capital	N5001	E - Water Fund	E105036	BPA Forest ROW Wood Rplment
Pre-Capital	N5001	E - Water Fund	E105038	BPA Old Forest Restore
Pre-Capital	N5001	E - Water Fund	E107004	Watershed Emergency/Opportunity
Pre-Capital	N5001	E - Water Fund	E107015	Watershed Vegetation Management
Pre-Capital	N5001	E - Water Fund	E107016	Muckleshoot Agreement Implementation Plan
Pre-Capital	N5001	E - Water Fund	E107019	Restoration Thinning Slash Tree
Pre-Capital	N5001	E - Water Fund	E109001	BPA Cedar Invasive Vegetation Mgmt
Pre-Capital	N5001	E - Water Fund	E109002	BPA Restoration Slash Treatment
Pre-Capital	N5001	E - Water Fund	E109003	BPA Information Mgmt Systems

Existing Transmission

SECTION XI. OGRAM	PR	Project	Project Name	Activity
Water Operation	N6540	WT - Headwork/Storage	N654001	Program Maintenance
Water Operation	N6540	WT - Headwork/Storage	N654002	Event Driven Repairs
Water Operation	N6541	WT - Transmission Pipeline Mai	N654101	Program Maintenance
Water Operation	N6541	WT - Transmission Pipeline Mai	N654102	Event Driven Repairs
Water Operation	N6541	WT - Transmission Pipeline Mai	NN90043	CRPL4 at Airport Expressway
Water Operation	N6542	WT - Valve Op/Maint-Water Tran	N654201	Program Maintenance
Water Operation	N6542	WT - Valve Op/Maint-Water Tran	N654202	Event Driven Repairs
Water Operation	N6543	WT - Grounds/Roads/Row	N654301	Grade/Gravel Roads - P
Water Operation	N6543	WT - Grounds/Roads/Row	N654302	Grade/Gravel Roads - E
Water Operation	N6543	WT - Grounds/Roads/Row	N654303	Bridges/Culverts - P
Water Operation	N6543	WT - Grounds/Roads/Row	N654304	Bridges/Culverts - E
Water Operation	N6543	WT - Grounds/Roads/Row	N654305	Fences/Gates - P
Water Operation	N6543	WT - Grounds/Roads/Row	N654306	Fences/Gates - E
Water Operation	N6543	WT - Grounds/Roads/Row	N654307	Mow Row - P
Water Operation	N6543	WT - Grounds/Roads/Row	N654308	Mow Row - E
Water Operation	N6543	WT - Grounds/Roads/Row	N654309	Mow Other
Water Operation	N6543	WT - Grounds/Roads/Row	NN90042	Derby Creek and Tolt ROW
Water Operation	N6544	WT - Facility Maintenance	N654401	Program Maintenance
Water Operation	N6544	WT - Facility Maintenance	N654402	Event Driven Repairs
Water Operation	N6545	WT - Castings	N654501	Casting Adjustments
Water Operation	N6546	WT - Customer Services	N654601	Communications/Dispatch

Water Operation	N6546	WT - Customer Services	N654602	Locating/Marking
Water Operation	N6547	WT - Damage By Others	N654701	P/L/Row/Facility
Water Operation	N6548	WT - Transmission Shops	N654801	Shops/Fabrication
Water Operation	N6549	WT - General Expenses	N654905	Tools/Small Equipment
Water Operation	N6549	WT - General Expenses	N654906	Standby
Water Operation	N6549	WT - General Expenses	N654907	Truck Inventory
Water Operation	N6549	WT - General Expenses	N654908	Downtime - Job Related
Water Operation	N6549	WT - General Expenses	N654909	Disaster-Emergency Response

New Supply

Program	Project	Project Name	Activity
Customer Service	N3904	Resource Conservation	N390401 Water Conservation
Customer Service	N3904	Resource Conservation	N390412 Water Conservation-Landscape

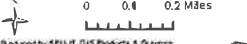
New Transmission

Program	Project	Project Name	Activity
Branch Administration	N3106	Water Wholesale Contracts	N310602 Operating Board Website

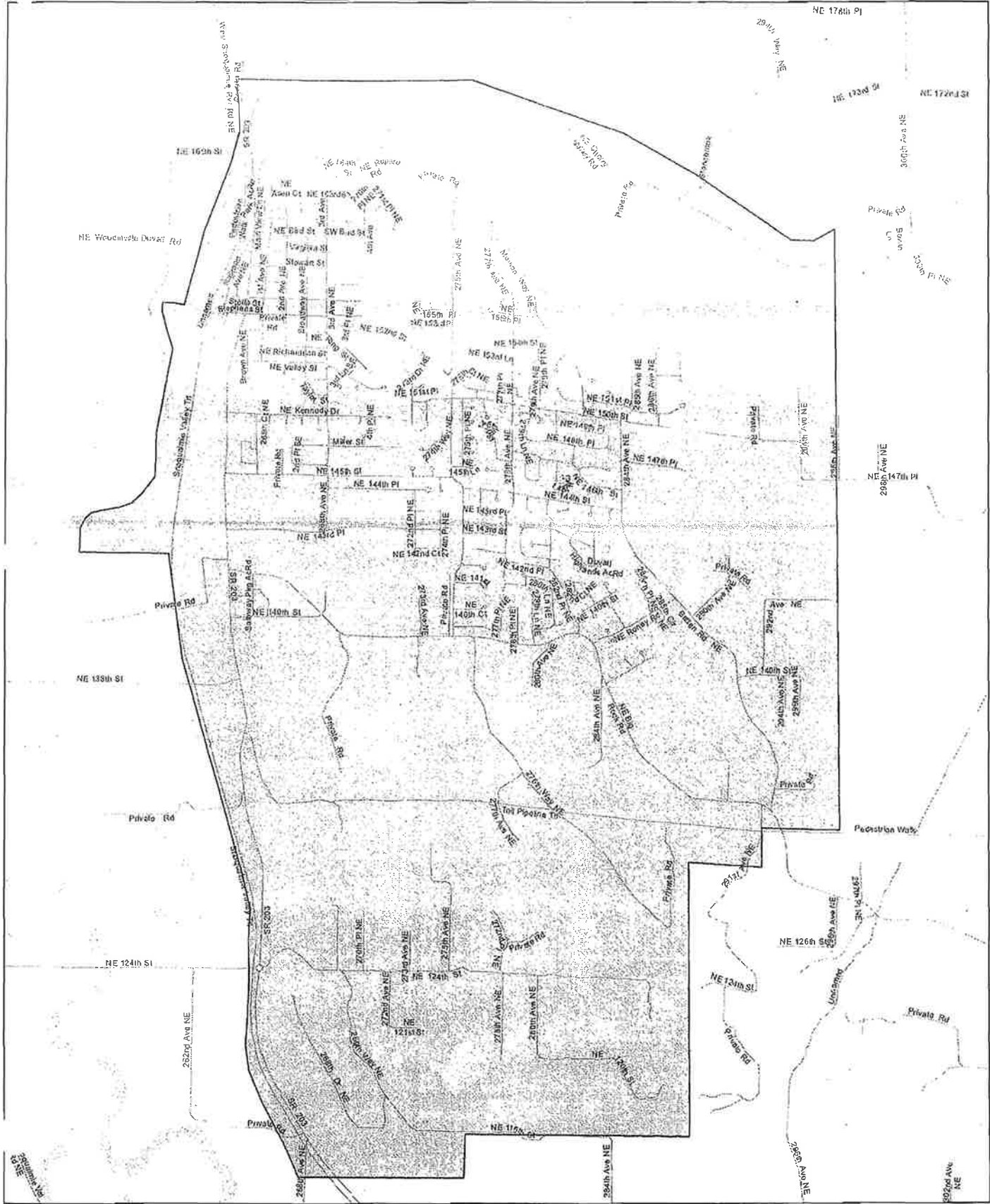
DUVALL ULTIMATE SERVICE AREA

Duvall

0 0.1 0.2 Miles



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**OPERATING BOARD ORGANIZATIONAL CHART
By Category**

	FUTURE?			CURRENT		INTERIM 2011	Representative
1	Northshore	2,394,673		Northshore		Northshore	Matt Everett - OB Member
2	Highline	2,143,580		Highline		Highline	Ron Speer - Alternate
3	Soos Creek	1,873,183	LARGE	Soos Creek	LARGE	Soos Creek	
4	Woodinville	1,781,785		Woodinville		Woodinville	
5	WD 20	1,237,780				WD 20	Walt Canter - OB Member
6	Mercer Island	855,678				Mercer Island	Terry Smith - Alternate
1	Cedar River	800,755		WD 20		Cedar River	
2	Shoreline	771,973	MEDIUM	Mercer Island	MEDIUM	Shoreline	
3	Bothell	640,359		Cedar River		Bothell	
4	WD 49	556,683		Shoreline		WD49	
5	WD 125	515,485				WD 125	Steve Moye - OB Vice Chair
6	Coal Creek	485,859				Coal Creek	John Thompson - Alternate
1	WD 90	433,468		WD 125		Olympic View	
2	Olympic View	361,712	SMALL	Coal Creek	SMALL	WD 45	
3	Duvall	224,298		Olympic View		WD 90	
4	WD 119	115,579		WD 45		WD 119	
5	WD 45	100,229				Duvall	
6	Renton	59,904				Renton	
		2010					
		10 ccf					
		Consumption					

May 3, 2011

EXHIBIT X

Water Utility Service Area

SEE NEXT PAGE

Appendix C

Water Facilities Inventory (WFI) Form

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WATER FACILITIES INVENTORY (WFI) FORM

Quarter: 1
Updated: 12/03/2018

ONE FORM PER SYSTEM

Printed: 2/20/2020
WFI Printed For: On-Demand
Submission Reason: Pop/Connect Update

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

1. SYSTEM ID NO. 20750 8	2. SYSTEM NAME DUVALL CITY OF	3. COUNTY KING	4. GROUP A	5. TYPE Comm						
6. PRIMARY CONTACT NAME & MAILING ADDRESS MIKE E. FISHER [PW SUPERINTENDENT] PO BOX 1300 DUVALL, WA 98017		7. OWNER NAME & MAILING ADDRESS DUVALL, CITY OF MIKE E. FISHER PO BOX 1300 DUVALL, WA 98019 PW DIRECTOR								
STREET ADDRESS IF DIFFERENT FROM ABOVE ATTN ADDRESS CITY STATE ZIP		STREET ADDRESS IF DIFFERENT FROM ABOVE ATTN ADDRESS CITY								
9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION								
Primary Contact Daytime Phone: (425) 788-3434		Owner Daytime Phone: (425) 788-3434								
Primary Contact Mobile/Cell Phone: (206) 255-1374		Owner Mobile/Cell Phone: (206) 914-3469								
Primary Contact Evening Phone: (xxx)-xxx-xxxx		Owner Evening Phone:								
Fax: E-mail: xxxxxxxxxxxxxxxxxxxxxx		Fax: (425) 788-0311 E-mail: xxxxxxxxxxxxxxxxxxxxxx								
11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)										
<input checked="" type="checkbox"/> Not applicable (Skip to #12) <input type="checkbox"/> Owned and Managed SMA NAME: _____ SMA Number: _____ <input type="checkbox"/> Managed Only <input type="checkbox"/> Owned Only										
12. WATER SYSTEM CHARACTERISTICS (mark all that apply)										
<input checked="" type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Commercial / Business <input checked="" type="checkbox"/> Day Care <input checked="" type="checkbox"/> Food Service/Food Permit <input type="checkbox"/> 1,000 or more person event for 2 or more days per year <input checked="" type="checkbox"/> Hospital/Clinic <input checked="" type="checkbox"/> Industrial <input checked="" type="checkbox"/> Licensed Residential Facility <input type="checkbox"/> Lodging <input type="checkbox"/> Recreational / RV Park <input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> School <input type="checkbox"/> Temporary Farm Worker <input checked="" type="checkbox"/> Other (church, fire station, etc.): _____										
13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)						
<input type="checkbox"/> Association <input checked="" type="checkbox"/> City / Town <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> Investor <input type="checkbox"/> Private <input type="checkbox"/> Special District <input type="checkbox"/> State				2,700,000						
15	16 SOURCE NAME	17 INTERTIE	18 SOURCE CATEGORY	19 USE	20	21 TREATMENT	22 DEPTH	23	24 SOURCE LOCATION	
	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 IN A WELL FIELD WELL SPRING SPRING FIELD SEA WATER SURFACE WATER RANNEY / INF. GALLERY OTHER	PERMANENT SEASONAL EMERGENCY SOURCE METERED NONE		CHLORINATION FILTRATION FLUORIDATION IRRADIATION (UV) OTHER	DEPTH TO FIRST OPEN TERVERAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER TOWNSHIP RANGE
S01	77050Y/SEATTLE (2)	77050 Y		X				0		00N 00E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
20750 8	DUVALL CITY OF	KING	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?)		2895	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	2541		
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	35		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	354		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	142	142	
28. TOTAL SERVICE CONNECTIONS		3037	

29. FULL-TIME RESIDENTIAL POPULATION
A. How many residents are served by this system 180 or more days per year? 7500

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?	1492	1492	1492	1492	1492	1492			1492	1492	1492	1492
B. How many days per month are they present?	20	20	20	20	20	20			20	20	20	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
* Requirement is exception from WAC 246-290	10	10	10	10	10	10	8	8	10	10	10	10

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: _____

Total WFI Printed: 1



Water Facilities Inventory (WFI)

Report Create Date: 2/20/2020
Water System Id(s): 207508
Print Data on Distribution Page: ALL
Print Copies For: DOH Copy
Water System Name: ALL
County: -- Any --
Region: ALL
Group: ALL
Type: ALL
Permit Renewal Quarter: ALL
Water System Is New: ALL
Water System Status: ALL
Water Status Date From: ALL **To** ALL
Water System Update Date ALL **To** ALL
Owner Number: ALL
SMA Number: ALL
SMA Name: ALL
Active Connection Count From: ALL **To:** ALL
Approved Connection Count ALL **To:** ALL
Full-Time Population From: ALL **To:** ALL
Water System Expanding ALL
Source Type: ALL
Source Use: ALL
WFI Printed For: On-Demand

Appendix D

Water System Facility Data

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**City of Duvall
Comprehensive Water System Plan
Supply Station Facilities Data**

Supply Facility Data

Name	Suction Pressure Zone	Discharge Pressure Zone	Year Const.	Above or Below Grade	Maximum Capacity (gpm)	Flow Meter Size	Have Standby Power	Have Pressure Relief	Have Surge Protection
Tolt 2 Supply Station (Sta 111)	SPU	450	1963	Below	1,200	12	No	No	No
Tolt 1 Supply Station (Sta 112)	SPU	615	1984	Below	1,760	12	No	No	No

Control Valve Data

Name	Description	Control Valve Size	Control Valve Model	Valve Mfrgr	Valve Elv (feet)	Valve Set Point	
						(psi)	(feet H.E.)
Tolt 2 Supply Station (Sta 111)	Mainline	10	131G-12BCSYKX	Cla-Val	269	75	442
Tolt 2 Supply Station (Sta 111)	Bypass	4	131G-12BCSYKX	Cla-Val	269	80	454
Tolt 1 Supply Station (Sta 112)	Mainline	8	131G-12BCSYKX	Cla-Val	467	65	617
Tolt 1 Supply Station (Sta 112)	Bypass	4	131G-12BCSYKX	Cla-Val	467	70	629

Control Data

Name	Control Component	Supplied Pressure Zone	Supply		Station Have Telemetry
			To Zone Priority	Operation Priority	
Tolt 2 Supply Station (Sta 111)	Flow Rate Controlled	450			Yes
Tolt 1 Supply Station (Sta 112)	Flow Rate Controlled	615			Yes

Other Data

Name	Ground Elv (feet)	Control Valve Elv (feet)	SPU Min. Con. Head (feet) ¹	Normal Pressure	
				Inlet (psi)	Outlet (psi)
Tolt 2 Supply Station (Sta 111)	274	269	630	220	80/75
Tolt 1 Supply Station (Sta 112)	472	467	635	100	70/65

¹ Minimum head elevations based on City of Seattle datum rounded to nearest 5 feet. Revised 12/13/96, effective 12/13/00 due to Tolt Filtration Plant improvements. To convert between City of Seattle and NAVD88 Datums, use: ("City of Seattle Datum" + 9.7 ft. = NAVD88)

**City of Duvall
Comprehensive Water System Plan
Pump Station Facilities Data**

Pump Station Data									
Name	Suction Pressure Zone	Discharge Pressure Zone	Year Const.	Above or Below Grade	Maximum Capacity (gpm)	Meter Size & Model	Have Standby Power	Have E.G. Set Receptacle	Have Surge Protection
615 Zone BPS	450	615	1996	Above	2,000	12"	Yes	Yes	6" SAV

Pump Data									
Pump Name	Pump Manufacturer	Pump Model	Pump Type	Current Pump Rate (gpm)	Design Capacity (gpm)	Design Head (feet)	Motor Mfgr	Motor Size (HP)	Control Valve Size & Model
Booster Pump #1	Floway	8 JOH	VT 6 stage		350	154	GE	30	Check only
Booster Pump #2	Peerless	2624332/MC	VT 4 stage		1000	165	GE	60	Check only
Booster Pump #3	Goulds	DWI 12RJLC	VT 3 stage		1000	158	US Electric	60	Check only
Notes:	All pumps have VFD's								

Pump Curve Data								
Pump Name	Point 1		Point 2		Point 3		Pump Serial Number	Pump Impeller Diameter
	Flow (gpm)	Head (feet)	Flow (gpm)	Head (feet)	Flow (gpm)	Head (feet)		
Booster Pump #1							21245-1-1	
Booster Pump #2								
Booster Pump #3							FR426919	

Pump Control Data					
Pump Name	Control Facility	Supplied Pressure Zone	Supply To Zone Priority	Pump Operation Priority	Station Have Telemetry
Booster Pump #1	615 Zone pressure	615	Secondary, Tolt 1st	Primary	Yes
Booster Pump #2	615 Zone pressure	615	Secondary, Tolt 1st	1st Lag	Yes
Booster Pump #3	615 Zone pressure	615	Secondary, Tolt 1st	2nd Lag	Yes

**City of Duvall
Comprehensive Water System Plan
Storage Facilities Data**

Reservoir Data										
Reservoir Name	Pressure Zone	Year Const.	Material	Capacity (gallons)	Overall Height (feet)	Diameter (feet)	Water Base Elv (feet)	Overflow Elv (feet)	Ground Elv (feet)	Seismic Restraint (Y or N)
Crestview Estates	555	1988	Steel	500,000	63.2	38	496.0	556.0	496	Y
Big Rock Road	450	1996	Steel	2,200,000	27.3	138	430.0	450.5	430	N

Piping Data									
Reservoir Name	Outlet Size (in)	Inlet Size (in)	Elevated Inlet Elv. (feet)	Altitude Valve		Overflow Size (in)	Drain Size (in)	Meter Size (in)	Notes
				Size (in)	Setting (feet)				
Crestview Estates	12	8 to 6	545	4		6	12/6	n/a	1
Big Rock Road	12	inlet/outlet combo	n/a	6		8	12	n/a	2

1. Altitude control valve with backpressure sustaining and 8" insertion flow meter on inlet piping
2. Altitude control valve (Cla-Val 210-03-ADS) with solenoid control from 615 Zone

Storage Data		
Reservoir Name	Max Water Height (feet)	Volume Per Foot (gallons)
Crestview Estates	60.0	8,484
Big Rock Road	20.5	111,887

Level Control Data			
Reservoir Name	Controlled Supply Facility	Reservoir Have Telemetry	Normal Operating Range (feet)
Crestview Estates	615 Zone Pump Station	Yes	544 - 555
Big Rock Road	Tolt 2 Supply Station	Yes	440 - 450

City of Duvall
Comprehensive Water System Plan
Pressure Reducing Station Data

Station Data							
PRV Name	Upper Pressure Zone	Lower Pressure Zone	Year Const.	Ground Elv (feet)	Normal Pressure		Station Operation Status
					Inlet (psi)	Outlet (psi)	
Kennedy Drive	450	330		213	99	54	Active
26500 145th	450	330		168	118	73	Active
Park Street	450	330		200	104	60	Active
3rd & Virginia	450	330		222	95	50	Active
3rd & Stewart	450	330		220	96	51	Active
3rd & Cherry	450	330		220	96	51	Active
3rd & Stella	450	330		220	96	51	Active
143rd & 268th	450	330		235	89	44	Active
NE Big Rock Road	450	330		173	116	71	Active
Stephens St & Broadwa	450	330		188	110	65	Active
272nd & 143rd	555	450		300	106	63	Active
Sunset Heights 144th	555	450		292	109	67	Active
Millers Home Stead	555	450		317	98	56	Active
Bruett Road	555	450		320	97	55	Active
Kasper Heights	555	485		360	80	56	Active
275th & 141st	555	485		336	90	66	Active
150th & 278th	615	555		436	77	49	Active
Manion & 156th	615	555		434	78	50	Active
282nd & 140th	615	555		406	90	62	Active

PRV Set Point Data							
PRV Name	Description	Valve Size (inches)	Valve Mfgr	Valve Model	Valve Elv (feet)	Valve Set Point	
						(psi)	(feet H.E.)
Kennedy Drive	Small PRV	2	Cla-Val	90G-01AS	208	50	324
	Large PRV	6	Cla-Val	90G-01AB	208	45	312
26500 145th	Small PRV	2	Cla-Val	90G-01AS	163	66	315
	Large PRV	6	Cla-Val	90G-01AB	163	61	304
Park Street	Small PRV	3	Cla-Val	G-01A W/X4	195	48	306
	Large PRV	--	--	--	--	--	--
3rd & Virginia	Small PRV	3	Cla-Val	90G-01AS	217	50	333
	Large PRV	6	Cla-Val	90G-01AB	217	45	321
3rd & Stewart	Small PRV	2	Cla-Val	90G01AJ	215	50	331
	Large PRV	--	--	--	--	--	--
3rd & Cherry	Small PRV	2	Cla-Val	90G-01AS	215	50	331
	Large PRV	--	--	--	--	--	--
3rd & Stella	Small PRV	2	Cla-Val	90G-01AS	215	50	331
	Large PRV	--	--	--	--	--	--
143rd & 268th	Small PRV	1-1/4	Cla-Val	90G-01AS	230	35	311
	Large PRV	4	Cla-Val	90G-01AB	230	30	299
NE Big Rock Road	Small PRV	4	Cla-Val	90G-01YBC	168	65	318
	Large PRV	10	Cla-Val	90G-01YBC	168	60	307
Stephens St & Broadwa	Small PRV	3	Cla-Val	90G-01AS	183	55	310
	Large PRV	8	Cla-Val	90G-01AB	183	50	299
272nd & 143rd	Small PRV	3	Cla-Val	90G-01AS	295	45	399
	Large PRV	6	Cla-Val	90G-01AB	295	40	387
Sunset Heights 144th	Small PRV	2	Cla-Val	90G-01AS	287	55	414
	Large PRV	6	Cla-Val	90G-01AB	287	50	403
Millers Home Stead	Small PRV	2	Cla-Val	90G-01YS	312	48	423
	Large PRV	6	Cla-Val	90G-01YBS	312	43	411
Bruett Road	Small PRV	2-1/2	Cla-Val	90G-01YCS	315	43	414
	Large PRV	8	Cla-Val	90G-01YBC	315	38	403
Kasper Heights	Small PRV	3	Cla-Val	90G-01YS	355	56	484
	Large PRV	8	Cla-Val	90G-01YBC	355	46	461
275th & 141st	Small PRV	2	Cla-Val	90G-01AS	331	62	474
	Large PRV	6	Cla-Val	90G-01ABC	331	52	451
150th & 278th	Small PRV	2-1/2	Cla-Val	90G-01CSY	431	28	496
	Large PRV	8	Cla-Val	90G-01BCY	431	25	489
Manion & 156th	Small PRV	2	Cla-Val	90G-01YCS	429	30	498
	Large PRV	6	Cla-Val	90G-01BCY	429	27	491
282nd & 140th	Small PRV	3	Cla-Val	90G-01ABCS	401	42	498
	Large PRV	8	Cla-Val	90G-01ABCS	401	39	491

Appendix E

Consistency Statement Checklist

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Local Government Consistency Determination Form

Water System Name: City of Duvall PWS ID: 207508

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: March 2021

Local Government with Jurisdiction Conducting Review: _____

Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development regulations** (WAC 246-290-108). Submittals under Section 105 require a local consistency determination if the municipal water supplier requests a water right place-of-use expansion. The review must address the elements identified below as they relate to water service.

By signing this form, the local government reviewer confirms the document under review is consistent with applicable local plans and regulations. If the local government reviewer identifies an inconsistency, he or she should include the citation from the applicable comprehensive plan or development regulation and explain how to resolve the inconsistency, or confirm that the inconsistency is not applicable by marking N/A. See more instructions on reverse.

Local Government Consistency Statement	For use by water system	For use by local government
	Identify the page(s) in submittal	Yes or Not Applicable
a) The water system service area is consistent with the adopted <u>land use and zoning</u> within the service area.	Pg 3-4 to 3-6	Yes
b) The <u>growth projection</u> used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Pg 3-7 to 3-9	Yes
c) For <u>cities and towns that provide water service</u> : All water service area policies of the city or town described in the plan conform to all relevant <u>utility service extension ordinances</u> .	Pg 5-2 to 5-4	Yes
d) <u>Service area policies</u> for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	Pg 5-4 to 5-12	Yes
e) <u>Other relevant elements</u> related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	Pg 3-1 to 3-4	Yes

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Signature
Steven Leniszewski, P.E., Public Works Director, City of Duvall

Date

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

This checklist may be used to meet the requirements of WAC 246-290-108. When using an alternative format, it must describe all of the elements; 1a), b), c), d), and e), when they apply.

For **water system plans (WSP)**, a consistency review is required for the service area and any additional areas where a municipal water supplier wants to expand its water right's place of use.

For **small water system management programs**, a consistency review is only required for areas where a municipal water supplier wants to expand its water right's place-of-use. If no water right place-of-use expansion is requested, a consistency review is not required.

For **engineering documents**, a consistency review is required for areas where a municipal water supplier wants to expand its water right's place-of-use (water system plan amendment is required). For noncommunity water systems, a consistency review is required when requesting a place-of-use expansion. All engineering documents must be submitted with a service area map (WAC 246-290-110(4)(b)(ii)).

A) Documenting Consistency: The planning or engineering document must include the following when applicable.

- a) A copy of the adopted **land use/zoning** map corresponding to the service area. The uses provided in the WSP should be consistent with the adopted land use/zoning map. Include any other portions of comprehensive plans or development regulations that relate to water supply planning.
- b) A copy of the **growth projections** that correspond to the service area. If the local population growth projections are not used, explain in detail why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.
- c) Include water service area policies and show that they are consistent with the **utility service extension ordinances** within the city or town boundaries. *This applies to cities and towns only.*
- d) All **service area policies** for how new water service will be provided to new customers.
- e) **Other relevant elements** the Department of Health determines are related to water supply planning. See Local Government Consistency – Other Relevant Elements, Policy B.07, September 2009.

B) Documenting an Inconsistency: Please document the inconsistency, include the citation from the comprehensive plan or development regulation, and explain how to resolve the inconsistency.

C) Documenting a Lack of Local Review for Consistency: Where the local government with jurisdiction did not provide a consistency review, document efforts made and the amount of time provided to the local government for review. Please include: name of contact, date, and efforts made (letters, phone calls, and emails). To self-certify, please contact the DOH Planner.

Appendix F

SEPA Checklist

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SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [\[HELP\]](#)

1. Name of proposed project, if applicable:

**City of Duvall
Comprehensive Water System Plan 2021 (Plan)**

2. Name of applicant:

City of Duvall

3. Address and phone number of applicant and contact person:

**Mr. Steven Leniszewski, P.E., Public Works Director
City of Duvall
Physical Address: 14525 Main St. NE
Mailing Address: P.O. Box 1300
Duvall, WA 98019**

4. Date checklist prepared:

January 15, 2021

5. Agency requesting checklist:

City of Duvall

6. Proposed timing or schedule (including phasing, if applicable):

The intent is to adopt the Plan in the first half of 2021. The capital improvement program in the Plan will be implemented and constructed between 2020 and 2030.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, this is the regular Plan update, and it will be updated in ten (10) years as required by State regulation.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

10. List any government approvals or permits that will be needed for your proposal, if known.

Washington Department of Health, Washington Department of Ecology, King County, City of Duvall

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The purpose of this update is to: evaluate historical growth and water usage for use in future water demands; inventory, describe and analyze the existing water system to determine if it meets minimum requirements mandated by DOH standards and City policies; perform a capital improvements program (CIP) that identifies water system improvements which resolve existing system deficiencies and accommodate future needs of the system for at least 20 years into the future, prepare an implementation schedule of improvements and financing plans that meet the goals of the financial program; review and update the water use efficiency program; document operations and maintenance program and comply with all other water system plan requirements of DOH.

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.

City wide, see: Attachment A (legal description) & Attachment B (service area map)

B. Environmental Elements [\[HELP\]](#)

1. Earth [\[help\]](#)

a. General description of the site:

(circle one) Flat, rolling, hilly, steep slopes, mountainous, other _____

The City of Duvall is located on the east slope of the Snoqualmie River Valley and generally slopes down to the west from an upland plateau situated at approximate elevation 500 ft to the Snoqualmie River at approximate elevation at 30 ft.

b. What is the steepest slope on the site (approximate percent slope)?

Slopes vary within the City but do not generally exceed 20% in any of the proposed project areas.

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.

Topsoil, weathered glacial soils, and glacially consolidated till and outwash are generally present within the City. No agricultural or farmlands are present within the proposed project areas.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None known as part of this planning project. This issue will be individually addressed at the time of each capital improvement.

- 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.

Project quantities will vary greatly. This issue will be individually addressed at the time of each capital improvement.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

None known as part of this planning project. This issue will be addressed at the time of each capital improvement.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

This issue will be addressed at the time of each capital improvement.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

None known as part of this planning project. This issue will be addressed at the time of each capital improvement.

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.

None known as part of this planning project. Projects proposed in this Plan typically involve emissions emitted from equipment during construction.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None located within city limits or the surrounding areas.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

None known as part of this planning project. This issue will be addressed at the time of each capital improvement.

3. Water [\[help\]](#)

- a. Surface Water: [\[help\]](#)

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

A list of the proposed projects is defined in Chapter 9 of the Plan. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None of the proposed projects discharge of waste material to surface waters.

b. Ground Water: [\[help\]](#)

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

None of the proposed projects withdraw or discharge to groundwater.

- 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.

None of the proposed projects discharge waste material to groundwater.

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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

This Plan does not anticipate waste materials entering ground or surface waters. Individual evaluations and permits will be completed prior to any construction activity.

- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

This is a planning project. Individual evaluations and permits will be completed prior to any construction activity.

4. Plants [\[help\]](#)

a. Check the types of vegetation found on the site:

- deciduous tree: alder, maple, aspen, other
- evergreen tree: fir, cedar, pine, other
- shrubs
- grass
- pasture
- crop or grain
- Orchards, vineyards or other permanent crops.
- wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- water plants: water lily, eelgrass, milfoil, other
- other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Project quantities will vary greatly. Individual evaluations and permits will be completed prior to any construction activity.

c. List threatened and endangered species known to be on or near the site.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Duvall Municipal Code requires use of native plants for landscaping.

e. List all noxious weeds and invasive species known to be on or near the site.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

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.

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other: coyotes, rodents

fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.

Chinook Salmon are present in Coe Clemons, Thayer Creek, and the Snoqualmie River. If projects located in these areas will require additional environmental studies.

c. Is the site part of a migration route? If so, explain.

Yes, the City of Duvall is located along the Pacific Flyway.

d. Proposed measures to preserve or enhance wildlife, if any:

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

e. List any invasive animal species known to be on or near the site.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

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.

None known as part of this planning project.

- b. Would your project affect the potential use of solar energy by adjacent properties?
If so, generally describe.

Nothing in the Plan would affect the use of solar energy.

- 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:

None proposed.

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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 1) Describe any known or possible contamination at the site from present or past uses.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None known.

- 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.

None known.

- 4) Describe special emergency services that might be required.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 5) Proposed measures to reduce or control environmental health hazards, if any:

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None known.

- 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.

Typical noise associated with construction equipment used for water system construction. Hours will be addressed at the time of each capital improvement

- 3) Proposed measures to reduce or control noise impacts, if any:

Hours of construction are regulated to reduce impacts of nearby residence and business.

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.

Nearby landuse will vary by project. Almost all right-of-way projects are located in existing ROW. Individual evaluations and permits will be completed prior to any construction activity.

- 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?

No recent agricultural activity.

- 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:

None known affects as part of this planning project.

- c. Describe any structures on the site.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- d. Will any structures be demolished? If so, what?

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- e. What is the current zoning classification of the site?

Right-of-ways are not zoned.

- f. What is the current comprehensive plan designation of the site?

Right-of-ways do not have comprehensive plan designations.

g. If applicable, what is the current shoreline master program designation of the site?

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable because there are no displacement impacts of this planning project.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The Plan is coordinated with the land use used in the City's comprehensive plan.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

9. Housing [\[help\]](#)

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable because no known housing impacts.

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?

None, all anticipated projects in the Plan are underground or existing structures.

- b. What views in the immediate vicinity would be altered or obstructed?

None.

- c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and Glare [\[help\]](#)

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

No lighting is proposed.

- c. What existing off-site sources of light or glare may affect your proposal?

None.

- d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation [\[help\]](#)

- a. What designated and informal recreational opportunities are in the immediate vicinity?

None of the proposed projects will cause land term impact to recreational opportunities.

- b. Would the proposed project displace any existing recreational uses? If so, describe.

None.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None known as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None were done as part of this planning project. Individual evaluations and permits will be completed prior to any construction activity.

- 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.

None were done as part of this planning project. If needed, measures will be taken for individual projects prior to construction.

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.

Streets and highways vary by project. Individual evaluations will be completed prior to any construction activities.

- 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?

King County Metro provides public transit to the City. This planning project will have no impacts on public transit. Individual evaluations and permits will be completed prior to any construction activity.

- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

None.

- 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).

Improvements will be necessary for some of the proposed projects as they involve removing roadways to install waterlines. Individual evaluations will be completed prior to any construction activity.

- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

- 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?

This planning project will have no impacts on vehicular trips in the City. If an individual is expected to affect vehicular trips, evaluations and permits will be completed prior to any construction activity.

- 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.

This planning project will have no impacts on the movement of agricultural and forest products.

- h. Proposed measures to reduce or control transportation impacts, if any:

No impacts are expected, and therefore, no measures to reduce or control them have been provided.

15. Public Services [\[help\]](#)

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed projects respond to an increased need for public service.

- b. Proposed measures to reduce or control direct impacts on public services, if any.

No adverse impacts to access to public services is expected, and therefore, no measures to reduce or control them have been provided.

16. Utilities [\[help\]](#)

- a. Circle utilities currently available at the site:

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

- d. 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.

Varies by location. Individual evaluations and permits will be completed prior to any construction activity.

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: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____

D. Supplemental sheet for nonproject actions [\[HELP\]](#)

(IT IS NOT NECESSARY to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Air and noise pollution may occur during construction of individual projects.

Proposed measures to avoid or reduce such increases are:

Individual projects within the proposal will be evaluated with respect to discharge or emissions at the planning and permitting stage and any or all impacts will be avoided or mitigated.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The majority of the improvements will be constructed in existing developed ROW. Individual projects within the proposal will be evaluated with respect to plant and animal at the planning and permitting stage and any or all impacts will be avoided or mitigated.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Individual projects within the proposal will be evaluated with respect to plant and animal at the planning and permitting stage and any or all impacts will be avoided or mitigated.

3. How would the proposal be likely to deplete energy or natural resources?

Individual projects within the proposal will be evaluated with respect to resource depletion at the planning and permitting stage and any or all impacts will be avoided or mitigated.

Proposed measures to protect or conserve energy and natural resources are:

The City encourages water conservation through the distribution of low-flow showerheads and faucet fittings, as well as leak detection kits, and public information 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?

This proposal is a non-project planning action and will not have any environmental impacts. Individual projects within the proposal will be evaluated with respect to environmental impacts at the planning and permitting stage and any or all impacts will be avoided or mitigated.

Proposed measures to protect such resources or to avoid or reduce impacts are:

The projects taking place in the vicinity of a sensitive area will require additional environmental evaluation (SEPA) and will be required to comply with the city's sensitive area code.

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?

This Plan will not encourage incompatible uses. The Plan is compatible with the City's land use elements of the Comprehensive Plan and Duvall Municipal Code.

Proposed measures to avoid or reduce shoreline and land use impacts are:

The proposal is a non-project planning action and will not have any shoreline and land use impacts. Individual projects within the proposal will be evaluated with respect to shoreline and land use impacts at the planning and permitting stage and any or all impacts will be avoided or mitigated.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The Plan responds to an increased need for municipal water service in new annexed areas or replacement of existing lines. Individual projections within the proposal will be evaluated with respect to transportation, public service, or utility impacts at the planning and permitting stage and any or all impacts will be avoided or mitigated.

Proposed measures to reduce or respond to such demand(s) are:

See above.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The proposal is a requirement of state law.

Appendix G

Water Use Efficiency Program

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CITY OF DUVALL

Water Use Efficiency Program

1.0 Introduction

The City of Duvall recognizes that water is a valuable and essential natural resource that needs to be used wisely. This Water Use Efficiency Program provides an approach to increase water use efficiency within the City’s water service area. The City purchases all its water from Seattle Public Utilities (SPU) and participates in SPU’s regional water use efficiency (WUE) program.

1.1 Water Use Efficiency Requirements

The 2007 Water Use Efficiency Rule came out of the 2003 Municipal Water Law and was finalized as WAC 246-290-800. The planning requirements for water use efficiency programs include

- (1) data collection and reporting,
- (2) demand forecasting,
- (3) evaluation and selection of water use efficiency measures,
- (4) evaluation of water rates, and
- (5) evaluation of water reclamation opportunities.

In addition to these planning requirements, the WUE Rule requires municipal water systems to establish water saving goals through a public process, meet a distribution system leakage standard, and report annually on the progress of meeting goals and using water efficiently.

1.2 Regional Water Use Efficiency Planning

The City primarily works to promote water use efficiency on a regional basis in King County through groups like the [Saving Water Partnership](#). The Saving Water Partnership is administered by SPU and is comprised of the City of Duvall and other local utilities that purchase wholesale water from SPU. The Saving Water Partnership encourages customers to conserve water through public education materials and programs, and by using resource efficient appliances, fixtures, and equipment. The Saving Water Partnership also conducts evaluations of their programs to ensure that they are meeting their water use efficiency goals. Additionally, the City also promotes programs like [WaterSense](#) from the United



States Environmental Protection Agency and from [Washington State’s Department of Ecology](#)

2.0 Water Use Efficiency Program

Washington State’s water conservation requirements are incorporated in the Water Use Efficiency Rule, which was finalized as WAC 246-290-800 in January 2007. DOH published the first Water Use Efficiency Guidebook (Guidebook) in July 2007; the latest (third) edition of this guidance was released in January 2017. The City’s WUE program is consistent with the Guidebook and the WUE Rule.

Based on this Guidebook, municipal water suppliers must develop and implement WUE programs to achieve their goals by implementing cost-effective measures. It lists eleven items that must be included in WUE programs. **Table 1** shows where the required program elements can be found in this document.

Table 1
Required WUE Program Elements

Water Use Efficiency Program Element	Section ¹
1a. Describe current water conservation program.	2.1
1b. For systems with 1,000 or more connections, estimate of water saved over the last six years.	2.5
2. Describe the WUE goals that support your WUE program and how the goals were established.	2.3
3. Evaluate WUE measures for cost-effectiveness.	2.3
4. Describe the WUE measures you will implement to meet your established goals for the next 10 years.	2.3
5. Describe how you will educate customers to use water efficiently.	2.3
6. Estimate projected water savings from the selected WUE measures.	WSP 4.5.1
7. Describe how you will evaluate the effectiveness of your WUE program.	2.5
8. Evaluate distribution system leakage.	2.3 & WSP 4.3
9. Evaluate rate structures that encourage water demand efficiency.	2.3
10. Evaluate reclaimed water opportunities.	2.3 & 2.4
11. Describe your water supply characteristics.	WSP 6.2

1. Sections shown as “WSP X.X” refers to sections of the City’s 2021 Water System Plan.

2.1 Previous Water Use Efficiency Efforts

Most water use efficiency efforts in Duvall are currently implemented at the regional level by the Saving Water Partnership. From 2013-2018 the regional goal has been to reduce per capita water usage so that the total average annual retail water usage of the Saving Water Partnership members was less than 105 MGD from 2013 to 2018. The Saving Water Partnership publishes an annual report that monitors the performance of past conservation efforts to ensure the program is meeting its goals and is being managed efficiently. The annual reports are available at <http://www.savingwater.org>. The Saving Water Partnership’s programs such as past plumbing and fixture rebates, landscaping audits, outreach and technical assistance, and water use efficiency

marketing continue to help the region achieve significant water savings consistent with its goals and will therefore continue to be supported.

2.2 Water Use Efficiency Program Goals and Objectives

The City's WUE Program supports goals established by regional partners. The 2019-2028 Water Use Efficiency Goal adopted through SPU's 2019 Water System Plan for the Saving Water Partnership consists of measures to promote efficient water use which includes public education to promote behavioral changes, customer incentives for installing water-efficient equipment, and price induced water savings from rates as detailed in SPU's 2019 WSP.

The goals and objectives of the City of Duvall Water Use Efficiency Program consist of formal goals established in its Regional Partnership with SPU, and adopted by Council resolution; such as *Resolution 20-23 adopted October 6th, 2020* which set the 2019 – 2028 goal:

- Keep the total average annual retail water use of Saving Water Partnership members under 110 MGD through 2028 despite forecasted population growth by reducing per capita water use.

And less formal objectives such as the following:

- Continue to increase awareness among all water users of the value and importance of conserving water and of the methods available to achieve reductions in water use.
- Continue to evaluate potential uses of reclaimed water from the City's Wastewater Treatment Plant for irrigation or other non-potable applications.

The City of Duvall will achieve these goals and objectives through the implementation of the water use efficiency program that follows.

2.3 Evaluation and Selection of Alternative Measures

The City's evaluation of water use efficiency measures and selected levels of implementation are presented in **Table 2**.

Table 2
Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
PUBLIC EDUCATION	
<p>School Outreach - This water use efficiency measure is only required for large systems. This measure requires educational programs that increase awareness of local water resources and encourage water use efficiency.</p>	<p><i>This measure is currently accomplished through the Saving Water Partnership’s youth education program; therefore, the City will not duplicate this effort. Because resources to accomplish this water use efficiency measure are allocated at the regional level, rather than directly from Duvall, this measure is highly cost-effective for the City.</i></p>
<p>Speakers Bureau - This water use efficiency measure is only required for large water systems and is described in the <i>Conservation Planning Requirements</i> as “Seeking speaking opportunities and making speakers available to a wide cross-section of services, community, and other groups.”</p>	<p><i>The City will encourage and make information available about upcoming water use efficiency speakers or meetings to City customers. At any time, as resources allow, the City will strive to schedule speakers or have City staff speak to residents regarding water use efficiency measures and benefits.</i></p>

Table 2 (continued)
 Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
PUBLIC EDUCATION (CONTINUED)	
<p>Program Promotion - This item is a required element of all water use efficiency programs. The <i>Conservation Planning Requirements</i> provides the following definition for this measure: “Publicize the need for water conservation through television and radio public service announcements, news articles, public water systems’ bill inserts, or other means. This includes promoting efficient indoor and outdoor water usage, distribution of Ecology/Health water use efficiency brochures or other printed material, informing customers, builders and contractors of new plumbing code regulations requiring efficient plumbing fixtures, and other efforts.”</p>	<p><i>The City will continue to support the regional water use efficiency promotion activities of the Saving Water Partnership. Water use efficiency information can also be accessed by Duvall customers via informational material created by the Saving Water Partnership. This includes newspaper articles, radio and television public service announcements, informational websites, displays at local fairs and mall shows, water-related conferences and seminars, community presentations, quarterly newsletters, water use efficiency education courses for children, and various water use efficiency programs for the elementary, middle, and high schools. The City will also provide water use efficiency brochures in water bills to further increase the promotion of water use efficiency programs</i></p>
<p>Theme Shows and Fairs – The evaluation of this measure is not required for Duvall, because the <i>Conservation Planning Requirements</i> lists it as a recommended measure for large and regional systems only. This measure requires that a portable display be made, along with educational materials to be exhibited at local fairs and theme shows.</p>	<p><i>This measure has been accomplished by the Saving Water Partnership in the past. Therefore, the City will not duplicate this effort. Because resources to accomplish this water use efficiency measure are allocated at the regional level, rather than directly from Duvall, this measure is highly cost-effective for the City.</i></p>

Table 2 (continued)
Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
TECHNICAL ASSISTANCE	
<p>Purveyor Assistance - This item is required for medium water systems such as Duvall and is described in the <i>Conservation Planning Requirements</i> as “assistance from wholesale suppliers to aide wholesale customers in developing and implementing conservation programs tailored to their needs, and in carrying out the wholesale suppliers conservation program.”</p>	<p><i>This measure will not be included in the City’s water use efficiency program at this time, because the City currently does not have any wholesale customers. However, as a wholesale water purchaser, the City will continue to comply with SPU water use efficiency requirements.</i></p>
<p>Customer Assistance - This water use efficiency measure is required for medium water systems such as Duvall. The <i>Conservation Planning Requirements</i> defines this water use efficiency measure as the utility providing “assistance and information to customers which facilitates water conservation.” A great deal of the information on water use efficiency will be disseminated to customers in the distributed brochures, radio advertisements, and newspaper articles described above under “Program Promotion”.</p>	<p><i>The City will distribute water use efficiency information at the local level and coordinate with the Saving Water Partnership, as needed, on regional activities. The cost of this program and its predicted water savings are included in the program promotion measure section.</i></p>
<p>Technical Studies - This water use efficiency measure is only required for large water systems and requires that “Studies would be designed and conducted by the public water system and/or regional organization.”</p>	<p><i>The City will utilize studies conducted by the Saving Water Partnership and larger water systems such as SPU. These studies will be used to evaluate the latest water use efficiency techniques applicable to the City’s water system and how they can best be implemented. Because resources to accomplish this water use efficiency measure are allocated at the regional level, rather than directly from Duvall, this measure is highly cost-effective for the City.</i></p>
<p>Bill Showing Consumption History - This water use efficiency measure is required for medium water systems such as Duvall. According to the <i>Conservation Planning Requirements</i>, water billings should display a comparison of current water use with past water use from the same period of the previous year and show a percent increase or decrease.</p>	<p><i>The City began providing this data to its customers on both electronic and paper bills beginning in 2007. Customers logging on to electronic billing can look at their consumption over various years and compare all of them at once. Additional resources outside of the meter reading and billing system upgrade project will not be necessary to implement this water use efficiency measure; therefore, this is a cost-effective measure for the City.</i></p>

Table 2 (continued)
 Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
SYSTEM MEASURES	
<p>Source Meters - Metering of all sources is required for all new or expanding public water systems needing additional water rights. Periodic meter testing and meter repair program is also required under this measure.</p>	<p><i>Both of the City's supply sources are currently equipped with meters and are recorded continuously by SPU and the City. The meters are periodically tested and repaired, or replaced, as necessary. While the City does not expect to receive any additional water savings from the program, the maintenance of source meters is vital to sustain current water use efficiency levels, for accurate unaccounted-for water calculations, to ensure accurate billing from SPU, and to maintain proper operation of the water system during SPU's demand metering periods.</i></p>
<p>Service Meters - The <i>Conservation Planning Requirements</i> recommends that all utilities install individual service meters for all water users and maintain a periodic meter testing and repair program.</p>	<p><i>All of the City's service connections are metered. As part of improvements that include the meter reading and billing system upgrade, all residential meters were replaced between 2006-2008 and commercial meters were replaced or upgraded in 2007. The City currently maintains a program in which meters are periodically tested and repaired or replaced, as necessary. While the City does not expect to receive any additional water savings from the program, the maintenance of service meters is vital to sustain current water use efficiency levels, for accurate unaccounted-for water calculations, and to ensure accurate customer billing.</i></p>
<p>Distribution System Leakage - This water use efficiency measure is required for all public water systems. Starting with data collected in 2007, distribution leakage must not be more than 10 percent of supply, based on a 3-year rolling average. If the City is not able to meet this requirement in the future, a water loss control action plan must be prepared and implemented. This plan will need to identify steps and timelines for reducing leakage.</p>	<p><i>The City will continue its water main replacement program to reduce the amount of older and potentially leaking water mains. The City will also require the metering of all non-revenue unaccounted-for water usage such as water main flushing and street cleaning. The City will also continue to implement its comprehensive leak detection/water main repair program to reduce the risk of future leaks..</i></p>

Table 2 (continued)
Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
INCENTIVES/OTHER MEASURES	
<p>Single-Family/Multi-Family Kits - This water use efficiency measure is required for medium-sized water systems. The <i>Conservation Planning Requirements</i> defines this measure as the following: “Distribute kits containing easily installed water saving devices to single-family residential homes and the owners and managers of apartment buildings and condominiums.” These kits could include shower flow restrictors, toilet tank water displacement bags, leak detection dye tablets for toilets, and informational brochures.</p>	<p><i>The City receives and makes available water use efficiency kits for all water system customers. The City will support and promote other regional plumbing retrofit programs and will also enforce the use of low-flow plumbing fixtures through the building permit process.</i></p>
<p>Nurseries/Agriculture - This item is also required for medium-sized water systems such as Duvall. The <i>Conservation Planning Requirements</i> defines this measure as the following: “Encourage and/or require the application of current technology to water use practices of large agriculture/irrigation operations. Examples include nurseries and commercial agriculture.”</p>	<p><i>The City will encourage agricultural landowners and large irrigation operations to utilize the latest technology available to help conserve water.</i></p>
<p>Landscape Management/Playfields - Xeriscaping - This water use efficiency measure is required for medium-sized water systems. The <i>Conservation Planning Requirements</i> defines this measure as the following: “Promote low water demand landscaping in all retail customer classes (private, public, commercial, industrial, etc.)” The promotion of low water demand landscaping can be accomplished by (1) preparing a demonstration garden which can provide an example of this type of landscaping to interested customers and developers, (2) working with local nurseries to promote the availability of low water demand plants and/or (3) developing codes that require landscaping on new development that is of the low demand type. The Saving Water Partnership works with the landscape industry to promote water use efficiency practices within the industry and to its customers. The Saving Water Partnership has worked with the Washington Association of Landscape Professionals and the Washington State Nursery and Landscape Association to develop informational brochures on proper irrigation and landscaping practices.</p>	<p><i>The City currently supports the water use efficiency efforts of these groups through the Saving Water Partnership’s Free Savvy Gardner Classes. Because resources to accomplish this water use efficiency measure are allocated at the regional level, rather than directly from Duvall, this measure is highly cost-effective for the City.</i></p>

Table 2 (continued)
Summary of Water Use Efficiency Program Measures

PROGRAM MEASURE	EVALUATION
INCENTIVES/OTHER MEASURES (CONTINUED)	
<p>Water Use Efficiency Pricing - This water use efficiency measure is also required for medium-sized water systems. All water use efficiency programs are required to consider the benefits and costs of implementing rate design techniques to provide economic incentives to conserve water.</p>	<p><i>The City's rates are structured to emphasize the commodity charge more than the base charge to enable customers to have more control over their water bill and recognize the benefits of conserving water. The City will continue to establish an increasing block rate structure that provides economic incentives for conserving water. Future funds will not be required to continue to support this water use efficiency measure; therefore, this is a cost-effective measure for the City.</i></p>
<p>Utility Financed Retrofit - This water use efficiency measure is only required for large systems. This measure requires that the City "install water efficient fixtures in existing residences and commercial/industrial facilities by: (a) providing fixtures at no cost, (b) giving a rebate for consumer purchased fixtures, or (c) arranging for suppliers to provide fixtures at a reduced price."</p>	<p><i>Currently, the Saving Water Partnership has a rebate program for residential toilets and certain irrigation equipment and offers business rebates and technical assistance. The City will continue to support and promote the regional water fixture rebate program of the Saving Water Partnership. Because resources to accomplish this water use efficiency measure are allocated at the regional level, rather than directly from the City, this measure is highly cost-effective for the City.</i></p>
<p>Seasonal Demand Management - This includes water use efficiency measures aimed at controlling peak seasonal demand. The evaluation of this measure is not required for Duvall, because the <i>Conservation Planning Requirements</i> lists it as a recommended measure for large and regional systems only.</p>	<p><i>Although this is not a cost-effective measure, it is prudent in continuing to support the City's long-range efforts to conserve regional water resources.</i></p>
<p>Recycling/Reuse – Ecology requires that the City "Examine opportunities for water reuse and recycling as an approach to providing additional water." The City currently operates its own Wastewater Treatment Plant that could be a source of reclaimed water for non-potable uses such as irrigation, commercial and/or other beneficial uses. A list of Duvall's largest water users in 2019 is shown in Table 4-2 of the City of Duvall's Comprehensive Water System Plan. The use of reclaimed water by these customers may have the most impact on reducing overall water consumption; therefore, the City will continue to consider how water reclamation activities could target these large water users.</p>	<p><i>The City will evaluate methods that would provide reclaimed water from the new Wastewater Treatment Plant for non-potable uses to City parks, the Riverview School District, Duvall Village or other water system customers for irrigation or other purposes. The City will also further consider reclaimed water use for large water users that have large potential water savings and will begin to implement reclaimed water use once it is deemed cost-effective at these locations.</i></p>

2.4 Reclaimed Water Evaluation

The City has evaluated reclaimed water opportunities for the Riverview School District, City of Duvall, and Duvall Village. These evaluations are described below, and are followed by the City's

Reclamation Checklist, shown in **Table 3**.

Riverview School District

Potential Use: Landscape irrigation at Cherry Valley Elementary School

Potential Water Savings: 320,000 gallons per year estimated

Operational Feasibility: The Cherry Valley Elementary School is located approximately one-mile northeast of the Wastewater Treatment Plant. Irrigation pipe and associated appurtenances will need to be constructed to convey reclaimed water to the school. Alternatively, water trucks may instead be used to haul water to the elementary school site as is currently done by the City to irrigate parks with water from the Taylor’s Landing Well. Regular irrigation of all landscaping would require a significant effort from City or school district staff.

Financial Feasibility: Construction of approximately one-mile of irrigation pipe, most of which would be located in the City’s business district, would be quite costly. Further financial analyses will need to be performed to determine potential cost sharing opportunities that may be achieved between the City, the school district, and other potential reclaimed water users that may be located along the proposed alignment. The City will need to perform a more detailed feasibility analysis to determine the cost effectiveness of constructing an irrigation system to the elementary school. The labor hours necessary to haul water to irrigate all landscaping is more than the cost savings that may be realized by using reclaimed water. However, it may be feasible to irrigate a portion of the school district’s landscaping with reclaimed water to supplement the potable water supply from the existing irrigation system.

City of Duvall

Potential Use: Landscape irrigation at city parks; street sweeping; washing sidewalks; dust control and other construction purposes.

Potential Water Savings: 100,000 gallons per year estimated

Operational Feasibility: Currently, the City has the ability to haul water in water trucks from the Taylor’s Landing Well to irrigate some city parks. Utilizing reclaimed water from the Wastewater Treatment Plant, a similar program may be implemented with minimal impact to existing maintenance practices. Additionally, reclaimed water may be hauled for use by the City for street sweeping, dust control, and dust control at construction sites, which currently utilizes the City’s potable water supply.

Financial Feasibility: This program could be implemented with minimal costs to the City. The cost savings that may be realized from limiting the use of potable water for landscape irrigation at city parks, street sweeping, washing sidewalks, dust control and other construction purposes have the potential to make this the most cost-effective option for the use of reclaimed water for the City to implement.

Table 3
Reclaimed Water Potential Checklist

Reclaimed Water Potential Use Checklist		Est. Future Annual Use	Est. Future Annual Savings
Crop Irrigation	✓		
Trees	<input type="checkbox"/>	N/A	N/A
Sod	<input type="checkbox"/>	N/A	N/A
Nursery	<input type="checkbox"/>	N/A	N/A
Pasture	<input type="checkbox"/>	N/A	N/A
Irrigation of Food Crops	<input type="checkbox"/>	N/A	N/A
Landscape Irrigation			
Cemeteries	<input type="checkbox"/>	N/A	N/A
Freeway Landscapes	<input type="checkbox"/>	N/A	N/A
Other Restricted Landscape Areas	<input type="checkbox"/>	N/A	N/A
Golf Courses	<input type="checkbox"/>	N/A	N/A
Parks	<input checked="" type="checkbox"/>	50,000 gal	\$100
Playgrounds	<input type="checkbox"/>	N/A	N/A
Schoolyards	<input checked="" type="checkbox"/>	320,000 gal	\$640/\$1,200 ¹
Other Open Access Areas	<input type="checkbox"/>	N/A	N/A
Residential Landscapes	<input checked="" type="checkbox"/>	900,000 gal	\$1,800/\$3,400 ¹
Ponds			
Landscape Impoundments	<input type="checkbox"/>	N/A	N/A
Recreational Impoundments	<input type="checkbox"/>	N/A	N/A
Water Trucks			
Street Sweeping	<input checked="" type="checkbox"/>	30,000 gal	\$60
Fire fighting & protection	<input type="checkbox"/>	N/A	N/A
Washing of Corporation Yards, Lots, and Sidewalks	<input checked="" type="checkbox"/>	10,000 gal	\$20
Dust Control (Dampening Unpaved Roads, Other Surfaces)	<input checked="" type="checkbox"/>	10,000 gal	\$20
Dampening Soil for Compaction (Construction Sites, Landfills, Pipelines, etc.)	<input type="checkbox"/>	N/A	N/A
Other			
Toilet and Urinal Flushing	<input type="checkbox"/>	N/A	N/A
Lift Stations	<input type="checkbox"/>	N/A	N/A
Ship Ballast	<input type="checkbox"/>	N/A	N/A
Fish Hatchery Basins	<input type="checkbox"/>	N/A	N/A
Washing Aggregate and Making Concrete	<input type="checkbox"/>	N/A	N/A
Flushing of Sanitary Sewers	<input type="checkbox"/>	N/A	N/A
Industrial Boiler Feed	<input type="checkbox"/>	N/A	N/A
Industrial Cooling	<input type="checkbox"/>	N/A	N/A
Industrial Process	<input type="checkbox"/>	N/A	N/A
*Other uses not listed above			
<u>Duval Village Wetland Mitigation</u>	<input checked="" type="checkbox"/>	100,000 gal	\$200/\$375 ¹

1 = Annual savings based on customer purchase price

2.5 Water Use Efficiency Program Results and Monitoring

Since adopting the water use efficiency goals and implementing its water use efficiency program the City has reduced its average per capita water consumption while its population has increased. Between 2013 and 2018 the population of the City increased approximately 7.5 percent, total water consumption increased by 6.0 percent, and per capita water consumption decreased by 1.4 percent. The reduction can be attributed to the increased awareness and interest in water use efficiency of our customers, and improved accounting and tracking methods.

The City will continue to monitor overall water use, per capita water use, and the amount of unaccounted-for water on an annual basis. The City will monitor the success or failure of its water use efficiency program by analyzing this data and determining the long-term trend in per capita water usage. The City will evaluate the effectiveness of water use efficiency methods, to determine if existing programs should be continued, or if new methods should be instituted. If the results of the program monitoring show that the water savings' goals for per capita water use are not being met, more rigorous program implementation or additional program items will be considered.

Appendix H

Water System Construction Standards

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Memorandum

To: Department of Health, File
From: Engineering Department
Date: ~~July 6, 2012~~ April 7, 2021 (updated)
Re: Comprehensive Water System Plan – Submittal Exception

The City of Duvall requests a submittal exception in accordance with [WAC 246-290-125](#). Included in Appendix H of the City's comprehensive water system plan are the City's standard water system details as well as standard construction and testing procedures for water system projects.

Appendix I

Cross Connection Control Program

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CITY OF DUVALL

Cross-Connection Control Program

Program Administration, Requirements, and Implementation



March 2021

INTRODUCTION

PURPOSE AND SCOPE

This Cross Connection Control Procedures Program, used in conjunction with *Duvall Municipal Code (DMC) 9.02.040* and state regulations *WAC 246-290-490*, outlines the framework for implementing cross connection control requirements for the City of Duvall. All public water systems in Washington State are required to implement a cross-connection control program. To be acceptable to the Washington State Department of Health (DOH) the cross connection control program must include 10 minimum program elements listed in *WAC 246-290-490(3)*.

The ten minimum required elements in a CCC program are as follows:

ELEMENT 1: Adopt a local ordinance, resolution or code that establishes the purveyor's legal authority, describes operating policies and the corrective actions of a CCC program.

ELEMENT 2: Develop and implement procedures and schedules for evaluating new and existing service connections to assess hazards.

ELEMENT 3: Develop and implement procedures and schedules that eliminate or control cross-connections and ensure approved backflow preventers are properly installed.

ELEMENT 4: Ensure that personnel, including one certified Cross-Connection Control Specialist (CCS), are provided to develop and implement the CCC program.

ELEMENT 5: Develop and implement procedures to ensure approved backflow preventers are properly inspected and tested.

ELEMENT 6: Develop and implement a backflow prevention assembly testing quality control assurance program.

ELEMENT 7: Develop and implement procedures for backflow incident response.

ELEMENT 8: Include cross-connection control program information in customer education materials.

ELEMENT 9: Develop and maintain CCC program records.

ELEMENT 10: Meet any additional CCC requirements if reclaimed water is distributed or received in the water service area.

This cross-connection control (CCC) program is a proactive and ongoing effort of the City to protect the health of its customers by preventing contamination to the municipal water supply that it supplies by preventing backflow of contaminants through cross-connection. This program provides direction to staff on implementation activities, describes policies and procedures, and summarizes current City, State, and Federal requirements regarding cross connection control. The program is structured so that it may be supplemented with updated documents and materials developed by Public Works for its specific use. The authority to enforce these practices and policies is established in *DMC 9.02.040* and *Ordinance 1071 (April 24, 2008)*.

Cross connection control is an integral part of the multiple-barrier approach to ensure safe drinking water. This concept includes providing protection to the City's water supply through source protection programs like wellhead protection areas, providing treatment (disinfection),

covered storage tanks, using good engineering design and practices, implementation of a cross connection control program compliance, and surveillance water quality monitoring programs, having certified operators, and emergency planning.

Implementation of this program results in protecting the City's water system from contamination from the customers plumbing supply / system through proper installation of the right backflow prevention assembly and annual testing of these assemblies by a DOH certified Backflow Assembly Tester (BAT).

DEFINITIONS

Air Gap (AG): means a physical separation between the free flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel. This separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and
- Three times the diameter of the supply piping if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

Approved: depending upon the context, City of Duvall-approved or Washington State Department of Health-approved.

Approved backflow prevention assembly: means a reduced pressure backflow assembly (RPBA), a reduced pressure detector assembly (RPDA), a double check valve assembly (DCVA), a double check detector assembly (DCDA), a pressure vacuum breaker assembly (PVBA), or a spill resistant vacuum breaker (SVBA) of make, model, and size that is approved by DOH. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research or other entity acceptable to the DOH are considered approved by the DOH.

Atmospheric Vacuum Breaker (AVB): means an AVB or make, model, and size that is approved by the DOH. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the DOH.

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

Backflow: means the undesirable reversal of flow of water or other substances through a cross connection into the public water system or consumer's potable water system.

Backflow Prevention Assembly: an assembly to prevent backflow; an assembly that, when

installed, controls cross connections.

BAT: a Washington State certified Backflow Assembly Tester holding a valid, State of Washington-issued, certificate in accordance with chapter WAC 246-290.

Category of contaminant: means a communicable disease, chemical, or physical hazard. Communicable diseases and chemical hazards can cause illness and in some cases death and are high health hazards. Physical hazards such as gasoline, propane, hot water and steam are examples of both low and high health hazards.

CCC: Cross Connection Control; a program to control or eliminate cross connections; the act of controlling or eliminating cross connections.

CCS: Cross Connection Control Specialist; one who is certified by the State of Washington to execute the City's Cross Connection Control Program.

City: The City of Duvall, City personnel or designee, having the authority to perform the associated duties described herein.

Cross connection: means any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminant the potable water supply by backflow.

DCDA: Double Check Detector Assembly; a type of backflow prevention assembly used to protect against low-health hazard. Generally installed on fire systems that require metering.

DCVA: Double Check Valve Assembly; a type of backflow prevention assembly used to protect against low-health hazard.

Degree of hazard: means either a low cross connection hazard or a high health cross connection hazard.

DMC: Duvall Municipal Code; the body of law for the City of Duvall.

DOH: the Washington State Department of Health, Division of Drinking Water, the authoritative body for public drinking water systems.

High health cross connection hazard (HHH): means a cross connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease. WAC 246-290-490 refers to these types of hazards as Table 9 hazards.

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.

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

Potable: water suitable for drinking by the public.

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

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

RCW: The Revised Code of Washington; the compilation of all permanent laws now in force.

RPBA: Reduced Pressure Backflow Assembly; a type of backflow prevention assembly used to protect against high-health hazard.

RPDA: Reduced Pressure Detector Assembly; a type of backflow prevention assembly used to protect against high-health hazard. Generally installed on fire systems that require metering.

Table 9 hazards:

Test Report: a report completed by a BAT that denotes the current condition of a backflow prevention assembly.

WAC: the Washington Administrative Code; rules and regulations adopted by State agencies.

CITY, STATE, AND FEDERAL PROGRAM HISTORY

The requirement for the City to have a Cross Connection control Program (Program) is not something new. State regulations administered by DOH, dating back to 1970, require the City's water system be protected from backflow and cross connection contamination. Though the federal Safe Drinking Water Act (SDWA) passed by Congress in 1974 does not specifically address the topic of cross connection control, it does state water purveyors are responsible for the water quality delivered to the customer's meter. The Environmental Protection Agency, which administers the SDWA, developed a series of nine "white papers" (2001) on distribution system issues of potentially significant public health concern. One of the papers is titled *Potential Contamination Due to Cross Connections and Backflow and the Associated Health Risks*. Water industry experts expect future federal rule making will require water purveyors to develop and implement a cross connection control program. The City is well positioned to meet any future federal requirements pertaining to having a Program given the years DOH has had state regulations requiring one.

The City's Program was developed in the mid-1990s. The City has made great progress over the last few years in our efforts to develop and implement an effective Program. These efforts include updating DMC, creating and implementing a backflow device tracking system, having dedicated administrative support, and protecting against the most severe and high health risk premises.

AUTHORITY

Legal Authority to Establish a Program (ELEMENT 1)

The control or elimination of cross connections is done according to the most current revisions of state and local rules and regulations. State regulations include:

- Chapters 51-56 and 51-57 WAC, Uniform Plumbing Code and Uniform Plumbing Code RCW 18.106,
- Washington State Plumbers Code,
- RCW 19.27, Washington State Building Code,

- RCW 43.20.050, Washington State Powers and Duties of the State Board of Health,
- RCW 70.119A.060, Washington State Public Water Systems Mandate, and
- WAC 246-290-490, Cross Connection Control (Appendix A).

The City has an adopted cross-connection control ordinance in *Section 9.02.040(c), Water Systems, Cross Connections and Back Flow Prevention* of the DMC (Ordinance 1071, adopted in 2008) (Appendix B). This code establishes the City's authority in implementing a cross-connection program, prohibits cross-connections, gives the City authority to discontinue water service until correction is made, and details penalties for non-compliance. Where cross connections cannot be eliminated, they are controlled by installation of an approved backflow assembly preventer(s) which are appropriate to the degree of hazard it is protecting against.

ROLES AND RESPONSIBILITY

The City has the responsibility for cross connection control and it shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter (e.g. premises isolation). The City is responsible for protecting its public water supply from contamination from backflow of pollutants through water service connections. If the City determines that a backflow prevention device is necessary at a customer's premise, the City will notify the customer to install an approved backflow device on the premise. Installation of said backflow device(s) shall be a condition of continued water service from the City.

The water customer is responsible for providing the necessary information, scheduling, and providing access for inspection of cross connection potential and the necessary control methods. The water customer is responsible for notifying the City's Cross Connection Control Specialist (CCS) of any assembly the customer believes is no longer required. Finally, the water customer is responsible for all costs associated with the inspection, testing, repair, and replacement of backflow prevention assemblies. Upon installation, the customer shall provide the City with a "Backflow Prevention Assembly Inspection Report" completed by a certified Backflow Assembly Tester (BAT) showing satisfactory inspection and testing of said device(s). The customer will be responsible for all applicable testing and inspection fees.

The City's Program consists of premises isolation to protect the City's water system from contamination. The functions of the Program are primarily carried out by the City's CCS and include survey, inspection, notification, enforcement, and record keeping. The minimum City certification requirements for the position include DOH certifications as a CCS.

The inspection, repair, and annual testing of backflow prevention assemblies for all City facilities is contracted out with a certified BAT.

FAILURE TO COMPLY

Any person, firm, or corporation who violates any of the provisions of this document or *DMC Section 9.02.040(c)*, may be punished in accordance with the rules stated in the DMC. Any person, firm or corporation who violates any provisions and requirements of this document shall

be subject to discontinuance of supply of City water to the premise. Discontinuance of the City potable supply to the premise shall remain in effect until corrective action, as required by the City, is completed, tested and approved.

CROSS-CONNECTION CONTROL PROGRAM

PROGRAM IMPLEMENTATION

Procedures and Schedule for Hazard Evaluations, Eliminating or Controlling Cross Connections (ELEMENTS 2 AND 3)

Several guidance, policies, and procedures exist for determining the appropriate level of protection. The evaluation for the appropriate level of protection shall be in accordance with the most current editions of the following:

- *Cross Connection Control Manual, Accepted Procedure and Practice* published by the Cross Connection Control Committee of the Pacific Northwest Section of the American Water Works Association,
- *Manual of Cross Connection Control* published by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California,
- *Recommended Practice for Backflow Prevention and Cross Connection Control, AWWA M14*, published by the American Water Works Association,
- *Development Design Standards Manual, Chapter 2 (Water)*, City of Duvall, and
- *Group A Design Standards*, Washington State Department of Health.

The City also enacted various policies to ensure the safety and quality of drinking water for all its customers. Many of these policies are referenced in the approved 2012 Water Comprehensive Plan.

The City prioritizes its backflow prevention efforts based on acceptable risk (probability of occurrence), category of contaminant, degree of hazard, and the reliability of the backflow preventer. The City developed an action plan in 2008, identifying unprotected Table 9 hazards and inspected these water customers of backflow prevention requirements.

For customers requesting new service connections, an initial evaluation of the premises' planned or future water service is done by the City's CCS during the plan review process. Proper selection and installation of a backflow prevention assembly, as determined by the City's CCS, shall be a condition of allowing new water service connection. Installation and testing by a certified BAT is required. If the initial test fails, it is the responsibility of the applicant/contractor/customer to immediately have the assembly repaired and retested by a certified BAT. All assemblies must be tested at least annually thereafter by a certified BAT.

Approved backflow prevention assemblies are those which appear on DOH's Approved Assemblies List, developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research. This institute is currently the only one which the

DOH recognizes as having the authority to approve backflow prevention assemblies. The backflow prevention assemblies include:

1. Atmospheric Vacuum Breakers (AVB),
2. Reduced Pressure Principle Backflow Assembly (RPBA),
3. Double Check Valve Assembly (DCVA),
4. Pressure Vacuum Breaker Assembly (PVBA), and
5. Spill-Resistant Vacuum Breakers (SVBA).

All backflow assemblies shall operate as designed and approved by the approval agency having jurisdiction. Assemblies not meeting design standards shall be considered unapproved and will require repair or replacement.

The City's CCS becomes aware of possible cross connections associated with existing service connections through the course of doing City business. Periodic reevaluations are done by the City's CCS in response to remodels, notification by city inspectors, fire department personnel, or water quality complaints. An emphasis is placed on severe and high health premises (Table 9) followed by low hazard premises. The City notifies the customer of the outcome of the hazard assessment by letter and in some cases by email. Timelines for corrections are based on the degree of hazard and are generally completed within 30 days. Larger and more complex premises can require additional time (six months or longer) due to securing adequate funding to complete the installation(s). The assemblies must also be on DOH's Approved Assemblies List and be installed in the correct orientation, and by a certified BAT.

Unless otherwise approved by the City's CCS, installation of the appropriate type of backflow prevention assembly or air gap system for premises isolation is required at the meter (e.g. premises isolation). Any deviation from this must be pre-approved by the City's CCS. Below is a summary of requirements based on the evaluation of acceptable risk, degree of hazard, and the reliability of the backflow preventer:

Commercial/Industrial Service: The degree of hazard for these types of services is a high health cross connection hazard. An approved premise isolation cross connection control assembly of a RPBA, RPDA or approved AG.

Multi-Family Service: The degree of hazard for this type of service is a high health cross connection hazard. A residential development having one or more metered connections serving more than two living units per meter will be treated as a commercial service.

Fire Service: The degree of hazard for this type of service may be high or low, depending on the type of system installed. For example, backflow protection is not required for residential flow through or combination fire protection systems. However, dry fire suppression systems require a DCDA while a fire suppression system using chemicals requires an RPDA.

Single-Family Residential Service: The degree of hazard for this type of service is generally low. However, premises isolation with a RPBA is required if high health hazards exists.

Irrigation Only Service: The degree of hazard for this type of service is generally low. An approved DCVA is required as long as no chemicals are involved, otherwise an RPBA is required.

Designate at Least One Person Certified as a CCS (Element 4)

WAC 246-290-490 requires that personnel, including one certified Cross-Connection Control Specialist (CCS), are provided by the purveyor to develop and implement a CCC program. The certified operator in “responsible charge” as the CCS for the City’s Program currently resides in the Public Works Department and includes the Public Works Director, Public Works Superintendent, and City Engineer. These individuals have the authority and responsibility to develop and implement the Program. There are 3 additional City personnel who also hold CCS certifications.

Procedures and Schedules for Backflow Preventer Inspection, Testing and Repairs (Element 5)

There are over 228 backflow assemblies installed in the City’s service area which require annual testing. The yearly due date for testing is September 1. Notification of annual testing is sent out approximately June 1st and reminders to those not received again August 1.

The Program developed a tracking system utilizing Excel in 2010 to maintain an inventory of all these assemblies and test history data. This data also generates custom reports (e.g., DOH Annual Summary Report), annual testing notification letters, and repair letters to customers. The testing frequency of backflow assemblies and approved air gaps, used in place of assemblies, are done:

- At Initial installation,
- After the assembly is repaired or moved,
- Immediately after a backflow incident occurs,
- Annually after the initial installation, and
- As required by the CCS, if testing indicates repeated failures.

The test procedures used are those specified in the most recent edition of the Manual of Cross Connection Control, published by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research, currently the 10th edition, and approved by DOH. There are no alternate test procedures allowed.

The testing notification to customers are done by mailing notification letters annually by June 1. Customers are sent up to three notification letters (first notice – 30 days; second notice – 30 days, final notice – 14 days) informing them annual testing is due. Prior to shut off of water, courtesy phone calls are made and where necessary, a site visit is made. This same notification process is used for dealing with installations and repairs.

The majority of completed test reports are emailed within 10 days from the date the test was performed. If the premises involves a separate irrigation line, the meter shall be locked, or the hazard eliminated by removing piping so a connection is not possible. The City’s notification letters provide the website address to Washington Certification Services, where customers can obtain a public listing of certified BATs to have their testing completed by.

No appeals process is necessary prior to turning off water service because customers are given adequate notification of testing requirements and staff is flexible in working out schedules with them.

BATs can use their own test report form provided it includes the minimum test reporting elements found in the City of Duvall's Form (Appendix C). If the minimum test reporting elements are not provided, then the test report will be denied, and the City's CCS may require the re-testing of the assembly utilizing the City of Duvall's Form or the testing be completed in front of him / her. Test results are to be emailed, mailed or faxed to the CCS within 10 days and contain the signature and printed name of the BAT. The results are then hand entered into the excel database. When the field test report shows an assembly has failed its test, the City requires the customer to repair the assembly and return it to proper working condition in an amount of time to be determined on a case-by-case basis, depending on the hazard.

Multiple assembly failures of an assembly will result in the property owner having the assembly repaired or replaced by a certified BAT with an assembly appropriate for the degree of hazard.

The City will notify the DOH, Office of Drinking Water when it suspects a test report is falsified for their follow-up.

Retesting may be required, at the City's discretion, on backflow assemblies which have questionable test results or on assemblies which have test report information which has changed (e.g., the serial number, model number, location, or other information does not match information provided at the time of installation) and no prior notice was given.

QUALITY ASSURANCE PROGRAM (ELEMENT 6)

BATs are required to submit in a copy of their current certification card and current test kit calibration information annually. BAT certifications are also verified prior to entering test results into the Excel tracking spreadsheet. The BAT certification information is checked against information provided from Washington Certification Services.

BATs are notified immediately if the test report contents are incomplete or incorrect. Correction generally occurs within a week.

The City requires BATs to submit current copies of their DOH certification (or renewal) and test kit verification of accuracy every January. The City also requires minimum test report content, which can be found in Appendix C.

RESPONDING TO BACKFLOW INCIDENTS (ELEMENT 7)

In the event of a cross connection incident, which contaminates the City's water supply, or occurs within the premises of a consumer served by the City, the City will notify DOH, and the King County Health Department as soon as possible after the incident, but no later than the end of the next business day. The City's response includes an onsite inspection to determine the extent of the backflow event and depending on the nature of the event, samples may be taken, the water line flushed, or the water turned off to contain the contamination. If the incident occurs after hours, staff will contact DOH using their emergency after hours phone number (1-877-481-4901). The City will document the details of the backflow incident using DOH's Backflow Incident Report Form found in Appendix D. Additional supporting information such as photographs and sampling results (if taken) are attached to the report. Generally, there is a follow-up meeting with DOH staff to discuss the incident and actions taken. Also, the City will include all backflow incident report(s) as part of the Annual Summary Report (ASR).

Outline of City response to a backflow incident:

Emergency Condition: Water System Contamination Due to a Backflow Incident

Impact on System: Potentially major impact. Water not suitable for potable use - loss of supply.

Emergency Response:

1. Notify the City CCS personnel of the incident.
2. Shut down the affected mains, if possible, to contain the affected contaminants.
3. Notify DOH of the backflow incident.
4. Notify all customers of the problem and instruct them to boil all water to be used for consumption and cooking or issue a no-drinking warning.
5. Flush affected water mains to remove contaminants.
6. Disinfect reservoirs and water mains, as necessary, to remove contaminated residuals.
7. Analyze water quality in other parts of the distribution system to ensure that all contaminants were contained.

PUBLIC EDUCATION (ELEMENT 8)

The City's primary educational effort involves using the annual Consumer Confidence Report to convey the importance of preventing cross connections and maintaining backflow prevention assemblies through annual testing. The City's website and occasionally reminders in the City's monthly newsletter is also another avenue used to inform the public about the importance of preventing cross connections. Lastly the City has brochures available to contractors, businesses, and used at various City events promoting water conservation and backflow prevention. The City will continue to provide CCC program information with bill inserts, handouts distributed to customers, or other CCC program handouts.

RECORD KEEPING AND REPORTING (ELEMENT 9)

Original records, such as project submittals, correspondence, plans, etc., are kept on file, either directly with the City's CCS, or if in conjunction with a larger project, on file with Building Department. Eventually these files are archived according to retention schedules set forth in chapter 40.14 RCW and chapter 246-290 WAC. Records are kept both in paper and electronic format. As mentioned previously, annual test results are emailed, faxed or mailed, and results entered into the Excel database. Notification and violation letters along with emails are records which are also kept. These records will form the basis of any enforcement action or legal defense by the City. The master list, inventory information, list of approved AVBs, and ASR records are available to DOH upon request.

Master List

The Excel database maintains a master list of service connections of severe, high and low hazards for as long as the hazard exists. It is from this database the annual notification letters are generated and sent.

Inventory of Backflow Prevention Assemblies

The Excel database maintains the inventory of active and inactive assemblies including the exact assembly location, assembly description (type, manufacturer, model, size and serial number), and the assessed degree of hazard, the installation date, history or inspection, tests and repairs, test results and the person performing the inspection. Approved air gaps installed in lieu of approved

assemblies will include the same information as that of mechanical backflow prevention assemblies. The City does not allow atmospheric vacuum breakers (AVBs) for irrigation protection, therefore, there is no record keeping associated with AVBs. However, AVBs are allowed for in-premise use but a higher form of backflow protection is required upstream at the meter.

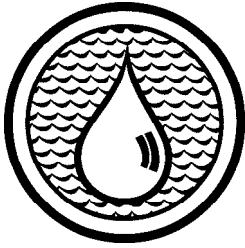
Annual Test Report Results Retention: State regulations require retention of all test results for five years.

SPECIAL REQUIREMENTS FOR RECLAIMED WATER (ELEMENT 10)

Additional cross-connection control requirements may be imposed by DOH for systems that distribute or receive reclaimed water within their water service area in accordance with Chapter 90.46 RCW. The City currently does not distribute or receive reclaimed water within its service area; therefore, these requirements are not applicable. However, if reclaimed water is used in the future, then the City will follow all requirements of the permits issued under Chapter 90.46 RCW.

The degree of hazard for this type of service is a high health hazard. A RPBA will be required on the water service to properties which both potable and reclaimed water are present. Where potable water is being used for makeup water for reclaimed water uses, the potable water supply must be protected with an air gap system.

APPENDIX A: DOH Cross Connection Control Requirements



Cross-connection control rules and definitions

Extracts from Group A Public Water Supplies, chapter 246-290 WAC

The full rule is online at <http://www.doh.wa.gov/ehp/dw/publications/331-010.pdf>

WAC 246-290-010 Definitions.

"**Approved air gap**" means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel. To be an air gap approved by the department, the separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and:
- Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

Acronyms

AG	air gap
AVB	atmospheric vacuum breaker
AWWA	American Water Works Association
BAT	backflow assembly tester
CCS	cross-connection control specialist
DCDA	double check detector assembly
DCVA	double check valve assembly
EPA	U.S. Environmental Protection Agency
IAPMO	International Association of Plumbing and Mechanical Officials
PVBA	pressure vacuum breaker assembly
RPBA	reduced pressure backflow assembly
RPDA	reduced pressure detector assembly
SVBA	spill resistant vacuum breaker assembly
UPC	Uniform Plumbing Code
WAC	Washington Administrative Code

"**Approved atmospheric vacuum breaker (AVB)**" means an AVB of make, model, and size that is approved by the department. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the department.

"**Approved backflow preventer**" means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.



"Approved backflow prevention assembly" means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the department. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the department are considered approved by the department.

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

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

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

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

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

"Combination fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection; and
- Is constructed of approved potable water piping and materials that serve both the fire sprinkler system and the consumer's potable water system.

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

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

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

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

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

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

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

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

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

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

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

"Flow-through fire protection system" means a fire sprinkler system that:

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

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

"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.

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

"Potable" means water suitable for drinking by the public.

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

"Public water system" is defined and referenced under WAC 246-290-020.

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

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

"Severe health cross-connection hazard" means a cross-connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material processing plants, nuclear reactors, or wastewater treatment plants.

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

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

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

"Used water" means water which has left the control of the purveyor.

WAC 246-290-490 Cross-connection control.

(1) Applicability, purpose, and responsibility.

- (a) All community water systems shall comply with the cross-connection control requirements specified in this section.
- (b) All non-community water systems shall apply the principles and provisions of this section, including subsection (4)(b) of this section, as applicable to protect the public water system from contamination via cross-connections. Noncommunity systems that comply with subsection (4)(b) of this section and the provisions of WAC 51-56-0600 of the UPC (which addresses the installation of backflow preventers at points of water use within the potable water system) shall be considered in compliance with the requirements of this section.
- (c) The purpose of the purveyor's cross-connection control program shall be to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections.
- (d) The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right of way or utility-held easement.
- (e) Under this section, purveyors are not responsible for eliminating or controlling cross-connections within the consumer's water system. Under chapter 19.27 RCW, the responsibility for cross-connection control within the consumer's water system, i.e., within the property lines of the consumer's premises, lies with the authority having jurisdiction.

(2) General program requirements.

- (a) The purveyor shall develop and implement a cross-connection control program that meets the requirements of this section, but may establish a more stringent program through local ordinances, resolutions, codes, bylaws, or operating rules.
- (b) Purveyors shall ensure that good engineering and public health protection practices are used in the development and implementation of cross-connection control programs. Department publications and the most recently published editions of references, such as, but not limited to, those listed below, may be used as guidance for cross-connection program development and implementation:
 - (i) *Manual of Cross-Connection Control* published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual);
 - (ii) *Cross-Connection Control Manual, Accepted Procedure and Practice* published by the Pacific Northwest Section of the American Water Works Association (PNWS-AWWA Manual); or
 - (iii) Guidance document: *Cross-Connection Control for Small Water Systems* published by the department.
- (c) The purveyor may implement the cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the department.
- (d) The purveyor shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.
- (e) The purveyor shall include a written description of the cross-connection control program in the water system plan required under WAC 246-290-100 or the small water system management program required under WAC 246-290-105. The cross-connection control program shall include the minimum program elements described in subsection (3) of this section.
- (f) The purveyor shall ensure that cross-connections between the distribution system and a consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This can be accomplished by implementation of a cross-connection program that relies on:
 - (i) Premises isolation as defined in WAC 246-290-010; or
 - (ii) Premises isolation and in-premises protection as defined in WAC 246-290-010.
- (g) Purveyors with cross-connection control programs that rely both on premises isolation and in-premises protection:
 - (i) Shall comply with the premises isolation requirements specified in subsection (4)(b) of this section; and
 - (ii) May reduce premises isolation requirements and rely on in-premises protection for premises other than the type addressed in subsection (4)(b) of this section, only if the following conditions are met:
 - (A) The in-premises backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;
 - (B) Backflow preventers which provide the in-premises backflow protection meet the definition of approved backflow preventers as described in WAC 246-290-010;

- (C) The approved backflow preventers are installed, inspected, tested (if applicable), maintained, and repaired in accordance with subsections (6) and (7) of this section;
 - (D) Records of the backflow preventers are maintained in accordance with subsections (3)(j) and (8) of this section; and
 - (E) The purveyor has reasonable access to the consumer's premises to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premises protection is adequate to protect the purveyor's distribution system.
- (h) The purveyor shall take appropriate corrective action as authorized by the legal instrument required by subsection (3)(b) of this section, when:
- (i) A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by the purveyor; or
 - (ii) A consumer fails to comply with the purveyor's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by this chapter.
- (i) The purveyor's corrective action may include, but is not limited to:
- (i) Denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the purveyor;
 - (ii) Requiring the consumer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; or
 - (iii) The purveyor installing an approved backflow preventer for premises isolation commensurate with the degree of hazard.
- (j) Except in the event of an emergency, purveyors shall notify the authority having jurisdiction prior to denying or discontinuing water service to a consumer's premises for one or more of the reasons listed in (h) of this subsection.
- (k) The purveyor shall prohibit the intentional return of used water to the purveyor's distribution system. Used water includes, but is not limited to, water used for heating, cooling, or other purposes within the consumer's water system.

(3) Minimum elements of a cross-connection control program.

- (a) To be acceptable to the department, the purveyor's cross-connection control program shall include the minimum elements identified in this subsection.
- (b) **Element 1:** The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument that:
 - (i) Establishes the purveyor's legal authority to implement a cross-connection control program;
 - (ii) Describes the operating policies and technical provisions of the purveyor's cross-connection control program; and
 - (iii) Describes the corrective actions used to ensure that consumers comply with the purveyor's cross-connection control requirements.
- (c) **Element 2:** The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the consumer's premises to the purveyor's distribution system and notifying the consumer within a reasonable time frame of the hazard evaluation results. At a minimum, the program shall meet the following:

- (i) For connections made on or after April 9, 1999, procedures shall ensure that an initial evaluation is conducted before water service is provided;
 - (ii) For all other connections, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and
 - (iii) For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.
- (d) **Element 3:** The purveyor shall develop and implement procedures and schedules for ensuring that:
- (i) Cross-connections are eliminated whenever possible;
 - (ii) When cross-connections cannot be eliminated, they are controlled by installation of approved backflow preventers commensurate with the degree of hazard; and
 - (iii) Approved backflow preventers are installed in accordance with the requirements of subsection (6) of this section.
- (e) **Element 4:** The purveyor shall ensure that personnel, including at least one person certified as a CCS, are provided to develop and implement the cross-connection control program.
- (f) **Element 5:** The purveyor shall develop and implement procedures to ensure that approved backflow preventers relied upon to protect the public water system are inspected and/or tested (as applicable) under subsection (7) of this section.
- (g) **Element 6:** The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program, including, but not limited to, documentation of BAT certification and test kit calibration, test report contents, and time frames for submitting completed test reports.
- (h) **Element 7:** The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.
- (i) **Element 8:** The purveyor shall include information on cross-connection control in the purveyor's existing program for educating consumers about water system operation. The public education program may include periodic bill inserts, public service announcements, pamphlet distribution, notification of new consumers and consumer confidence reports.
- (j) **Element 9:** The purveyor shall develop and maintain cross-connection control records including, but not limited to, the following:
- (i) A master list of service connections and/or consumer's premises where the purveyor relies upon approved backflow preventers to protect the public water system from contamination, the assessed hazard level of each, and the required backflow preventer(s);
 - (ii) Inventory information on backflow preventers that protect the public water system including:
 - (A) Approved air gaps installed in lieu of approved assemblies including exact air gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;
 - (B) Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and

- (C) Approved AVBs used for irrigation system applications including location, description (manufacturer, model and size), installation date, history of inspection(s), and person performing inspection(s).
- (iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.

(k) Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

(4) Approved backflow preventer selection.

- (a) The purveyor shall ensure that a CCS:
 - (i) Assesses the degree of hazard posed by the consumer's water system upon the purveyor's distribution system; and
 - (ii) Determines the appropriate method of backflow protection for premises isolation as described in Table 8.

TABLE 8

APPROPRIATE METHODS OF BACKFLOW PROTECTION FOR PREMISES ISOLATION

Degree of Hazard	Application Condition	Appropriate Approved Backflow Preventer
High health cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, or RPDA
Low cross-connection hazard	Backsiphonage or backpressure backflow	AG, RPBA, RPDA, DCVA, or DCDA

- (b) Premises isolation requirements.
 - (i) The purveyor shall ensure that an approved air gap, RPBA, or RPDA is installed for premises isolation for service connections to premises posing a high health cross-connection hazard including, but not limited to, those premises listed in Table 9, except those premises identified as severe in (b)(ii) of this subsection.
 - (ii) For service connections to premises posing a severe health cross-connection hazard including wastewater treatment plants, radioactive material processing plants, and nuclear reactors, the purveyor shall ensure that either an:
 - (A) Approved air gap is installed for premises isolation; or
 - (B) Approved RPBA or RPDA is installed for premises isolation in combination with an in-plant approved air gap.
 - (iii) If the purveyor's CCS determines that no hazard exists for a connection serving premises of the type listed in Table 9, the purveyor may grant an exception to the premises isolation requirements of (b)(i) of this subsection.
 - (iv) The purveyor shall document, on a case-by-case basis, the reasons for granting an exception under (b)(i) of this subsection and include the documentation in the cross-connection control program annual summary report required in subsection (8) of this section.

TABLE 9

**SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES
REQUIRING PREMISES ISOLATION BY AG OR RPBA**

Agricultural (farms and dairies)

Beverage bottling plants

Car washes

Chemical plants

Commercial laundries and dry cleaners

Premises where both reclaimed water and potable water are provided

Film processing facilities

Food processing plants

Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers

Premises with separate irrigation systems using the purveyor's water supply and with chemical addition⁺

Laboratories

Metal plating industries

Mortuaries

Petroleum processing or storage plants

Piers and docks

Radioactive material processing plants or nuclear reactors^{*}

Survey access denied or restricted

Wastewater lift stations and pumping stations

Wastewater treatment plants^{*}

Premises with an unapproved auxiliary water supply interconnected with the potable water supply

⁺ For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

^{*} RPBA's for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.

(c) Backflow protection for single-family residences.

- (i) For single-family residential service connections, the purveyor shall comply with the premises isolation requirements of (b) of this subsection when applicable.
- (ii) If the requirements of (b) of this subsection do not apply and the requirements specified in subsection (2) (g)(ii) of this section are met, the purveyor may rely on backflow protection provided at the point of hazard in accordance with WAC 51-56-0600 of the UPC for hazards such as, but not limited to:
 - (A) Irrigation systems;
 - (B) Swimming pools or spas;
 - (C) Ponds; and
 - (D) Boilers.

For example, the purveyor may accept an approved AVB on a residential irrigation system, if the AVB is properly installed under the UPC.

(d) Backflow protection for fire protection systems.

- (i) Backflow protection is not required for residential flow-through or combination fire protection systems constructed of potable water piping and materials.
- (ii) For service connections with fire protection systems other than flow-through or combination systems, the purveyor shall ensure that backflow protection consistent with WAC 51-56-0600 of the UPC is installed. The UPC requires minimum protection as follows:
 - (A) An RPBA or RPDA for fire protection systems with chemical addition or using unapproved auxiliary water supply; and
 - (B) A DCVA or DCDA for all other fire protection systems.
- (iii) For connections made on or after April 9, 1999, the purveyor shall ensure that backflow protection is installed before water service is provided.
- (iv) For existing fire protection systems:
 - (A) With chemical addition or using unapproved auxiliary supplies, the purveyor shall ensure that backflow protection is installed within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard or in accordance with an alternate schedule acceptable to the purveyor.
 - (B) Without chemical addition, without on-site storage, and using only the purveyor's water (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall ensure that backflow protection is installed in accordance with a schedule acceptable to the purveyor or at an earlier date if required by the code official administering the State Building Code as defined in chapter 51-04 WAC.
 - (C) When establishing backflow protection retrofitting schedules for fire protection systems that have the characteristics listed in (d)(iv)(B) of this subsection, the purveyor may consider factors such as, but not limited to, impacts of assembly installation on sprinkler performance, costs of retrofitting, and difficulty of assembly installation.

- (e) Purveyors may require approved backflow preventers commensurate with the degree of hazard as determined by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:
 - (i) Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impracticable to assess whether cross-connection hazards exist;
 - (ii) A repeated history of cross-connections being established or reestablished; or
 - (iii) Cross-connection hazards are unavoidable or not correctable, such as, but not limited to, tall buildings.

(5) Approved backflow preventers.

- (a) The purveyor shall ensure that all backflow prevention assemblies relied upon by the purveyor are models included on the current list of backflow prevention assemblies approved for use in Washington state. The current approved assemblies list is available from the department upon request.
- (b) The purveyor may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:
 - (i) Were included on the department and/or USC list of approved backflow prevention assemblies at the time of installation;
 - (ii) Have been properly maintained;
 - (iii) Are commensurate with the purveyor's assessed degree of hazard; and
 - (iv) Have been inspected and tested at least annually and have successfully passed the annual tests.
- (c) The purveyor shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:
 - (i) Does not meet the conditions specified in (b)(i) through (iv) of this subsection;
 - (ii) Is moved; or
 - (iii) Cannot be repaired using spare parts from the original manufacturer.
- (d) The purveyor shall ensure that AVBs meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-010.

(6) Approved backflow preventer installation.

- (a) The purveyor shall ensure that approved backflow preventers are installed in the orientation for which they are approved (if applicable).
- (b) The purveyor shall ensure that approved backflow preventers are installed in a manner that:
 - (i) Facilitates their proper operation, maintenance, inspection, in-line testing (as applicable), and repair using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;
 - (ii) Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and
 - (iii) Ensures compliance with all applicable safety regulations.

- (c) The purveyor shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.
- (d) When premises isolation assemblies are installed at an alternate location acceptable to the purveyor, the purveyor shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of the connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.
- (e) The purveyor shall ensure that approved backflow preventers are installed in accordance with the following time frames:
 - (i) For connections made on or after April 9, 1999, the following conditions shall be met before service is provided:
 - (A) The provisions of subsection (3)(d)(ii) of this section; and
 - (B) Satisfactory completion of the requirements of subsection (7) of this section.
 - (ii) For existing connections where the purveyor identifies a high health cross-connection hazard, the provisions of (3)(d)(ii) of this section shall be met:
 - (A) Within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard; or
 - (B) In accordance with an alternate schedule acceptable to the purveyor.
 - (iii) For existing connections where the purveyor identifies a low cross-connection hazard, the provisions of subsection (3)(d)(ii) of this section shall be met in accordance with a schedule acceptable to the purveyor.
- (f) The purveyor shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:
 - (i) Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and
 - (ii) Complies with all applicable requirements of this section.

(7) Approved backflow preventer inspection and testing.

- (a) For backflow preventers that protect the public water system, the purveyor shall ensure that:
 - (i) A CCS inspects backflow preventer installations to ensure that protection is provided commensurate with the assessed degree of hazard;
 - (ii) Either a BAT or CCS inspects:
 - (A) Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition; and
 - (B) Backflow prevention assemblies for correct installation and approval status.
 - (iii) A BAT tests approved backflow prevention assemblies for proper operation.

- (b) The purveyor shall ensure that inspections and/or tests of approved air gaps and approved backflow assemblies that protect the public water system are conducted:
 - (i) When any of the following occur:
 - (A) Upon installation, repair, reinstallation, or relocation of an assembly;
 - (B) Upon installation or replumbing of an air gap;
 - (C) After a backflow incident involving the assembly or air gap; and
 - (ii) Annually thereafter, unless the purveyor requires more frequent testing for high hazard premises or for assemblies that repeatedly fail.
- (c) The purveyor shall ensure that inspections of AVBs installed on irrigation systems are conducted:
 - (i) At the time of installation;
 - (ii) After a backflow incident; and
 - (iii) After repair, reinstallation, or relocation.
- (d) The purveyor shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published edition of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of USC test procedures, the purveyor may allow, on a case-by-case basis, the use of alternate (non-USC) test procedures acceptable to the department.
- (e) The purveyor shall ensure that results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to the purveyor.
- (f) The purveyor shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.
- (g) The purveyor shall ensure that an approved air gap, whenever found to be altered or improperly installed, is properly replumbed or, if commensurate with the degree of hazard, is replaced by an approved RPBA.

(8) Recordkeeping and reporting.

- (a) Purveyors shall keep cross-connection control records for the following time frames:
 - (i) Records pertaining to the master list of service connections and/or consumer's premises required in subsection (3)(j)(i) of this section shall be kept as long as the premises pose a cross-connection hazard to the purveyor's distribution system;
 - (ii) Records regarding inventory information required in subsection (3)(j)(ii) of this section shall be kept for five years or for the life of the approved backflow preventer whichever is shorter; and
 - (iii) Records regarding backflow incidents and annual summary reports required in subsection (3)(j)(iii) of this section shall be kept for five years.
- (b) Purveyors may maintain cross-connection control records in original form or transfer data to tabular summaries.
- (c) Purveyors may maintain records or data in any media, such as paper, film, or electronic format.

- (d) The purveyor shall complete the cross-connection control program summary report annually. Report forms and guidance on completing the report are available from the department.
 - (e) The purveyor shall make all records and reports required in subsection (3)(j) of this section available to the department or its representative upon request.
 - (f) The purveyor shall notify the department, authority having jurisdiction, and local health jurisdiction as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the purveyor to have:
 - (i) Contaminated the public water system; or
 - (ii) Occurred within the premises of a consumer served by the purveyor.
 - (g) The purveyor shall:
 - (i) Document details of backflow incidents contaminating the public water system on a backflow incident report form available from the department; and
 - (ii) Include all backflow incident report(s) in the annual cross-connection program summary report referenced in (d) of this subsection, unless otherwise requested by the department.
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APPENDIX B: DMC *Section 9.02.040(c)* Ordinance No. 1071

**CITY OF DUVALL
WASHINGTON**

ORDINANCE NO. 1071

**AN ORDINANCE OF THE CITY OF DUVALL,
WASHINGTON, AMENDING DUVALL MUNICIPAL CODE
CHAPTERS 9.02, 9.03 AND 9.04 TO UPDATE UTILITY
BILLING PROCEDURES**

WHEREAS, the City of Duvall Municipal Code prescribes the policies and procedures for billing of the water and sewer utilities in Chapters 9.02, 9.03 and 9.04; and

WHEREAS, employee titles and minor procedures within these Code chapters have been revised to promote efficiency and improved customer service, and such revisions should be incorporated into the City Code; and

WHEREAS, some spelling and grammatical errors have been identified in these Code chapters and need to be corrected;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF DUVALL, WASHINGTON, DO ORDAIN AS FOLLOWS:

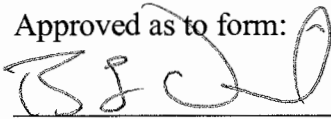
Section 1. Amend Duvall Municipal Code. The Duvall Municipal Code Chapters 9.02, 9.03 and 9.04 are hereby amended as shown in the attached Exhibits A and B.

Section 2. Severability. Should any section, paragraph, sentence, clause or phrase of this Ordinance, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Ordinance be pre-empted by state or federal law or regulation, such decision or pre-emption shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section 3. Effective Date. This Ordinance shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after the date of publication.

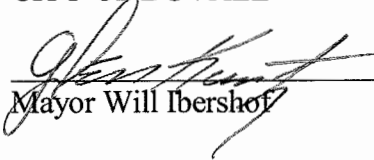
ADOPTED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 24th DAY OF APRIL, 2008.

Approved as to form:



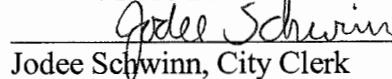
Bruce L. Disend, City Attorney

CITY OF DUVALL



Mayor Will Ibershof

ATTEST/AUTHENTICATED:



Jodee Schwinn, City Clerk

EXHIBIT A

Chapter 9.02 WATER UTILITY

9.02.010 Billing procedures.

A. Metered Service Established. The consumption and use of all water taken from the city water system, or from the water system of any water district or association which obtains its water from the city water system, shall be metered at each individual connection to the city water system. The rates for such water shall be fixed from time to time by resolution of the City Council. The rates for private fire protection service shall also be fixed from time to time by resolution of the City Council.

B. Bills Due, Delinquency, Penalty.

1. All charges for water supplied shall be due and payable to the city on the first day of each month, and such charges shall be billed monthly.

2. "User," as stated in this subsection, means a person, firm, corporation, entity, user, owner, occupant of a building, property, or premises using or having available for use water service connected to the water system of the city from which water service is available and can be withdrawn or used, and also means the person or entity responsible for paying for water connection charges as shown on the records of the city. Charges for water furnished remaining unpaid at the close of business on the 20th day of the month in which billed (or the close of the next regular business day if the 20th should fall on a Saturday, Sunday or a legal holiday) shall be considered delinquent and shall call for a delinquent charge of ten (10) percent of the total combined utility amount due. Any checks returned due to insufficient funds shall incur a penalty in an amount to be fixed from time to time by resolution of the City Council. If the delinquent charges and penalties remain unpaid at the close of business on the 14th day of the succeeding month (or the close of the next regular business day if the 14th should fall on a Saturday, Sunday or a legal holiday) a shut-off notice will be mailed to the user. This notice will inform the user that water service will be discontinued and shut off following five working days from the date of the notice unless all delinquent charges and penalties are paid within said period of time. The notice will also inform the user of the opportunity to meet with the City Clerk or other designated city official in charge of billings to determine the accuracy of the delinquent charges and penalties prior to the discontinuance of water service as herein provided. Service will not be resumed until all delinquencies and penalties, together with a water turn-on fee of thirty-five dollars (\$35.00), have been paid.

It shall be the obligation of the user of a building, property or premises using or having available for use water service connected to the water system of the city from which city water is available and can be withdrawn or used, to provide to the city a name and mailing address for the purposes of billing for water service and for the notices described above. No water service shall be provided to any premises unless such a billing name and address is provided. In the event water service is being provided to any premises and a billing name and address is not provided, the city will post the premises with a notice requiring that such information be provided. This notice shall state that water service will be discontinued and shut off following five working days from the date of the notice unless a mailing name and address is provided within said period of time. The notice will also inform the user of the opportunity to meet with the City Clerk or other designated city official in charge of billings to determine the accuracy of any delinquent charges and penalties then in existence and stated in the notice prior to the discontinuance of water service as provided in this section. Service will be resumed after a billing name and address is provided to the city, payment of water turn-on fees as provided in this section, and payment of all delinquent charges and penalties as provided in this section if applicable.

3. The first monthly bill of a new owner and the final bill of the previous owner will be pro-rated based upon the property closing date. If the city is notified of the sale after the closing date has passed, the billing will begin on the first business day that notification is received by the city. The owner will be liable for any unpaid bill from rentals and for a monthly minimum charge if the house remains unoccupied and the water has not been shut off at the owner's request. The back bill must be paid before the billing can be made to a new renter.

4. All charges for water and penalties in this section of after stated shall be a lien against the property to which such water service is furnished, superior to all other liens and encumbrances whatsoever, except those for general taxes and local and special assessments. Such liens shall be enforced by the city in the manner provided by law. Billings may be made in the name of a tenant or other occupants of the premises to which water service is furnished at the mailing address provided in subsection (B)(2) of this section, but such billing shall not relieve the owner of the premises from liability for the payment of the charges for furnishing water nor in any way affect the lien rights of the city against the premises to which water service is furnished. Failure to receive mail properly addressed to the mailing address provided above shall not be a valid defense for failure to pay the delinquent charges and penalties. Any change in the mailing address provided in this section must be properly filed with the office of the utility billing clerk before it will become effective. In the event the city must bring legal action to collect water service charges and/or penalties, the city shall, in addition, recover its attorney's fees and other costs incurred in connection with such collection.

5. An account set-up fee will be charged to all new billing customers to the utility billing system. The amount of this fee shall be fixed from time to time by resolution of the City Council.

6. It shall be the obligation of a water user to provide clear access to their water meter(s) so that reading the meter(s) is not impeded by landscaping, furniture, structures, debris or otherwise. In the event that the city meter reader cannot obtain reasonable access to the meter(s), a written notice shall be mailed to the user and placed at the property notifying the user that:

a. Access to the meter(s) must be provided; and

b. If access is not provided within fourteen (14) days, the city will clear an access to the meter(s) and charge the user for all costs incurred to provide the access.

7. A fee shall be charged to all utility billing customers requesting a re-read of their meter; provided, the fee shall not be charged if the original read was incorrect, if there is a leak associated with the read, or if the utility customer lacks the ability to re-read the meter without assistance due to physical, sensory or mental disability. The amount of this fee shall be fixed from time to time by resolution of the City Council. (Ord. 984 § 1, 2003; Ord. 980 § 1, 2003; Ord. 977 §§ 1--2, 2003; Ord. 962 § 1, 2002; Ord. 949 § 1, 2002; Ord. 948 § 1, 2002; Ord. 343 (part), 1982)

9.02.020 Connections.

(a) Service Installation, Water Meters, Capital Improvement Charge.

(1) Each separate residence (excluding mobile homes located in mobile home parks), multiple housing building, or commercial building using water from the city water system shall have a separate, direct connection to a water main. Each separate residence, multiple housing building, or commercial building shall have a separate shutoff. A general facilities charge shall be made, in an amount to be determined from time to time by resolution of the City Council. Pursuant to Washington State Department of Ecology guidelines, in conjunction with the Duvall comprehensive plan, one general facilities charge is required for each single-family detached dwelling unit, as defined in Section 14.34.360 of this code. Eighty-five (85) percent of one general facilities charge is required for each single-family attached (Section 14.34.350), senior citizen assisted (Section 13.34.340), multiple-family and mixed use (Section 14.34.330), or accessory (Section 14.34.320) dwelling unit that will draw water from the city's water system. Any other development desiring to draw water from the city's water system shall pay a general facilities charge calculated in the following manner:

(i) Anticipated monthly use shall be determined by the city engineer based upon anticipated property use, water supply line size, and plumbing fixture count, in accordance with state and federal manuals; and

(ii) The amount of anticipated use shall be converted to a ratio with the use utilized as the basis for calculating the single-family detached dwelling unit connection charge, or, in the event no such number exists, with an average use amount as established by the department of ecology for single-family detached dwelling unit; and

(iii) The ratio established shall be multiplied by the connection charge dollar amount as set by resolution of the City Council for a single-family detached dwelling unit.

In the event connection with the city water system requires the crossing of a street, roadway, railroad or river, there shall be an additional charge equal to the costs incurred in the installation of that portion of the connection crossing the street, roadway, railroad or river. The basic service

installation charge for customers outside the city limits shall be fixed from time to time by resolution of the City Council. The service installation charge shall be due prior to issuance of a building permit or, if no building permit is required in conjunction with the water service connection, prior to connection to the water system. In the event the building permit expires or the water service connection is not made ready by the applicant for connection by the city within one hundred twenty (120) days after the fees are paid and the connection is authorized by the city, the city shall retain that portion of the fee necessary to recover the city's administrative and other costs, and refund the balance, if any, to the applicant. The entire fee shall be re-collected, as provided in this section, prior to the reissuance of the building permit or connection to the water system.

2. Developers of all new subdivisions who expect to connect to a city water main shall be required to install all the service connections at such time the water main is installed. A service installation charge, for installation of the water meter on these developer installed service connections shall be due prior to issuance of the building permit for the residence. This service installation charge shall be fixed from time to time by resolution of the City Council. In the event the building permit expires the city shall retain that portion of the fee necessary to recover the city's administrative and other costs, and refund the balance, if any, to the applicant. The entire fee shall be re-collected, as provided in this section, prior to the issuance of the building permit.

3. In addition to the service installation charge representing the actual cost of connection outlined in Section 9.02.020(1)(a) and (b), there shall be an additional connection charge for new water service connections outside the boundaries of LID No. 1 in order that such property owners shall bear their equitable share of the cost of the water system. This charge shall be due prior to issuance of the building permit, or if a building permit is not required in conjunction with the water service connection, prior to connection to the water system. The amount of the capital improvement connection charge shall be fixed from time to time by resolution of the City Council. In the event the building permit expires or the water service connection is not made ready by the applicant for connection by the city within one hundred twenty (120) days after the fees are paid and the connection is authorized by the city, the city shall retain that portion of the fee necessary to recover the city's administrative and other costs, and refund the balance, if any, to the applicant. The entire connection charge shall be re-collected, as provided in this section, prior to the reissuance of the building permit or connection to the water system.

(b) Application for Water Service

1. All persons who desire to connect to the city water system, within the city limits or outside the city limits, must make written application to the permit coordinator. This application to contain at least, but not be limited to, the following information: Name and address of applicant/applicants and owner, occupation, location, legal description and address of property where water service is desired; approximate date water service is requested (notification of this date to be at least one week before water service is required). The service installation charge and connection charges, as stated above, and any charge hereinafter set forth, shall be paid prior to issuance of the building permit, or if no building permit is required in conjunction with the water service application, prior to connection to the water system.

2. If, within sixty (60) days of the date of conveying, by bill of sale, of a newly constructed water main to the city the developer presents a recovery contract accepted by the city, the city pledges itself to collect, to the extent provided in this section during a period of time consisting of fifteen (15) years, the prorated front footage cost of this newly constructed water main from any property owner who did not contribute to the original cost of the installation and who subsequently connects to said water main. This period shall commence from the date the contract has been recorded in the county auditor's office. These collections shall be paid to the original developer of said water main, his/her personal representative or assign, within sixty (60) days after each collection. There shall be a charge of ten dollars (\$10.00) for making each collection, which charge is to be paid by the applicant for such collection and shall belong to the city water system.

It shall be the duty of the City Clerk, upon acceptance by the City Council of a bill of sale, to notify each developer of his right to enter into a recovery agreement with the city. If no action is taken by the developer within the sixty (60) days provided for above, his right to enter into a recovery agreement shall be forfeited.

(i) Each owner requesting such collections in his behalf shall submit to the city for acceptance the following: A contract, to be known as a "recovery contract," describing the mains to which such

contract applies, stipulating those properties which shall be required to pay front footage charges, stating the fair pro rata share per foot of frontage to be collected from other properties fronting on said main, and stating that the city agrees to make such collections.

(ii) The "fair pro rata share" for recovery contracts is defined as the total cost of construction, including engineering and legal fees related to construction or conveyance of the mains to the city, divided by the number of feet of frontage on the main of property which may reasonably be expected to connect thereto for water service (benefited frontage). If a corner lot abuts a new system on both front and side, and if both sides are affected by the same recovery contract, only the least dimension of said lot shall be subject to recovery charges.

(iii) In addition to the submission of the recovery contract, it shall be the responsibility of the owner requesting such contract to show on the as-built drawings for the system what frontages are considered to be paid for by the construction of extension. If any of the tracts subject to recovery are irregularly shaped so as to make determination of frontage difficult, a fair "equivalent frontage" shall be used in computations of fair pro rata share and shall be so stated in the drawings.

(iv) Each recovery contract shall be prepared by, or reviewed by, the city attorney with the assistance of the city engineer. For this purpose the owner shall submit all necessary data on the cost of construction, as well as the conveyance and affidavit required. The attorney and engineer shall request such changes of the contract as they deem necessary and shall recommend acceptance of the contract by the City Council only after such changes, if any, have been made. (Ord. #695, 1993, amending Ord. #343 and 9.02.020(a) and (b))

3. The minimum fee for a water service application shall be adopted by resolution and governed by the provisions of DMC Section 1.04.120. (Subsection (b)(3) added by Ord. #832, 1997)

(c) Unauthorized connections; violations and penalties.

1. Any person/persons tapping into the water system of the City of Duvall, other than under the supervision of authorized personnel, or without paying the connection charges, and any person/persons turning on a water service that has been shut off pursuant to Section 9.02.020(b)2, and without paying all delinquencies and penalties, and any person/persons who shall cause injury to any portion of the city water system intentionally, or who shall take any water from said water system without paying for same, shall be guilty of a misdemeanor and, upon conviction thereof, shall be subject to a fine, or imprisonment, or both fine and imprisonment, to the maximum extent provided by law for each violation and conviction.

This section shall not limit the city's civil remedies for damages.

2. The city may refuse to supply, or may discontinue service to any customer for violation of any provision of the water system code, or for failure to pay bills when due. The city may refuse, or discontinue, service to any customer who requires, or uses, such volume of water that water service to any other customer may be thereby impaired. The city shall discontinue service to any customer who makes an unauthorized connection to the city water system, by-passes a city water meter, or in any other way misappropriates city water.

3. Discontinuance of service for any cause stated in this ordinance shall not release the customer from his obligation to the city for payment of bills and/or charges.

4. Whenever service is discontinued, as provided above, or elsewhere in this ordinance, the customer shall be charged a fee as set from time to time by city council resolution for discontinuance. Restoration of service, at the customer's request, and after payment of all delinquent bills and/or charges due, shall be done at the convenience of the water department.

5. A customer who wishes to terminate water service shall give at least three days notice to the utility billing clerk's office. No charge will be made for the shutting off of the water. A customer who terminates water service and requests restoration of service at the same location within sixty (60) days shall be charged sixty-five dollars (\$65.00) for such restoration of service.

(d) Water Meter and Water Service connection sizes and lengths.

1. Connection sizes;

(i) The size of a service connection and meter shall be determined by the number of dwelling units and shall not be less than the following:

Units	Meter Size	Meter Minimum Rated Capacity
1 & 2	3/4"	30 gpm

3 to 6	1"	50 gpm
7 to 20	1 1/2"	100 gpm
50 to 100	3"	300 gpm
Over 100	Submit design for approval.	

(ii) All multiple unit residences, apartments, trailer courts and motels shall be serviced by one connection and one meter, except that the owner may elect to treat each unit as a separate single residence and in such case there shall be installed and individual meter for each unit at the owners expense.

(iii) The pipe size for a service connection shall not be less than the size of the meter as set forth in the water application. At the discretion of the water superintendent, larger pipes may be installed to provide water to more than one meter from a single connection.

2. Length of water service connections;

(i) The maximum allowable distance from the water main to the meter shall be sixty (60) feet. Any service connection of greater length is considered a variance and shall be designed by a professional engineer and approved by the city engineer prior to installation. Also this applicant/applicants must follow the procedures for variance as listed elsewhere in this chapter.

(ii) The city reserves the right to meter any and all water users.

(iii) A private water line from the meter to the building to be served must not have a length of more than five hundred feet under any circumstances.

3. If the property to be served has not been platted a complete legal description of the property to be served must be given and verified by the city engineer. Water mains served by the city water system shall extend across the full frontage of the legally described property whose owner desires a permanent connection, and across the full frontage of any property that may lie between the said legally described property to be served and the street or road along which said mains lie. If the property has been platted and the plat recorded with the King County assessors office the water mains serving or about to serve the plat must be laid across the full frontage of all lots for which the service is requested before any water service connections will be made to any of said lots.

(e) Contractor's Restoration and Performance Bond Requirements and Insurance.

1. All individuals, businesses, and corporations who make application to install water lines, systems, or any part thereof, in any street in the city or the county, whether public or private, which are to be connected with the City of Duvall's water system, and whether the area is inside or outside of the city limits of the City of Duvall, shall post with the City of Duvall:

(1) Washington state contractor's license, and (2) a performance bond, if requested by the city, to guarantee for one year the aforesaid work actually performed, including but not limited to the actual installation of lines. Such bonds are conditions precedent to the commencement of work.

2. The restoration of street bond outside the city limits shall be in a reasonable sum for the restoration, which shall be determined by the development review committee and further, the bond shall be given by a company acceptable by the city.

3. Any individual, business, or corporation who receives a permit to install water lines as described in subsection (e)(1) of this section hereof, agrees by acceptance of such permit that he, his successors or assigns, will protect the City of Duvall and save it harmless from all claims, actions, or damages of every kind and description which may accrue to or be suffered by any person or persons or property by reason of the performance of such work, character of materials used, manner of installation, or by improper occupancy of rights-of-way or public place or public structure. In case any suit or action is brought against the City of Duvall for damages arising out of, or by reason of any of the above cases, the permittee, his successors or assigns, will, upon notice to him or them of commencement of such action, defend the same at his or their own sole costs and expense, and will satisfy any judgment after said suit or action shall have been determined, if adverse to the City of Duvall, and further, shall reimburse the City of Duvall for reasonable attorney's fees expended by the city in such actions.

4. All work contemplated to be done herein under shall be done satisfactory to the engineer and/or utility superintendent of the City of Duvall before any one individual or business is released from said restoration bond and before the one year term of the performance bond commences.

5. Insurance. The amounts of insurance required for any contractor performing such work shall be

determined from time to time by the development review committee. All required insurance policies shall name the City of Duvall as an additional insured. Such insurance must be obtained before any work may begin.

(f) Assessments for Main and Hydrant Installation.

1. All persons outside the original LID #1 and all persons partially inside and partially outside the original LID who are now served by the city with a temporary water line, shall be required to pay their proportionate share of the cost of installation of a six inch (or larger, if required) water main when said main passes their property and said temporary line is disconnected, and shall be obliged to pay the connection charges set forth in subsections (a) or (a)(2) of this section.

(g) Temporary Termination of Water/Sewer Service.

1. A customer who wishes to temporarily terminate water and sewer shall give at least three business days notice to the utility billing office. Effective January 1, 2002, a fee of sixty-five dollars (\$65.00) shall be imposed for each temporary termination. There shall be no limit upon the number of times a request for temporary termination may be made, provided that the customer's account is current. These procedures and fees also apply to water-only customers.

2. Effective January 1, 2002, and annually thereafter, the Finance Director shall adjust the temporary termination fee by the same percentage as the percentage increase in the Seattle/Tacoma CPI-U (June-June) rounding the fee to the nearest dollar. (Ord. 940 § 1, 2001; Ord. 902 § 1, 1999; Ord. 892 § 1, 1999; Ord. 343 (part), 1982)

9.02.030 Fire hydrants and fire protection.

(a) Definitions. The definitions following are a part of this chapter. Whenever the following terms are used in this chapter, they shall have the meaning as defined. The definitions given shall not necessarily be limited to the meaning given herein whenever the term is one of common usage in which case the definition shall be augmented by the accepted use of the term.

(1) Approving authority--the approving authority for the several conditions of this chapter shall be the mayor, City Council, utilities superintendent of the City of Duvall or their appointee/appointees.

(2) Fire department--the term "fire department" shall mean the fire authority normally responsible for fire protection in the area.

(3) Water authority--shall mean the water department, water district or other body legally supplying water to fire hydrants in the area.

(4) U.L.--shall mean Underwriters Laboratories, Inc.

(5) U.B.C.--shall mean the Uniform Building Code of King County as adopted by the City of Duvall.

(6) Public hydrant--a public hydrant is a fire hydrant so situated and maintained to provide water for fire fighting purposes without restriction as to use for that purpose. The location is such that it is accessible for immediate use of the fire authority at all times.

(7) Private hydrant--a private hydrant is a fire hydrant so situated and maintained to provide water for fire fighting purposes with restriction as to use. The location may be such that it is not readily accessible for immediate use of the fire authority for other than certain private property.

(8) Flush type hydrant--a flush type hydrant is a hydrant installed entirely below grade.

(9) Fire flow--shall mean the flow of water available for fire fighting a fire at a specific building or within a specific area.

(10) Commercial and industrial properties-- Commercial and industrial properties shall include, but not necessarily be limited to retail and wholesale store, warehouses, service stations, manufacturing facilities, garages, theaters, hotels, motels, restaurants, bars and taverns, banks, showrooms, barber and beauty shops.

(11) Institutional Properties--Institutional properties include, but are not necessarily limited to, places of worship, private schools, parochial schools, institutions of higher learning, public and private hospitals, nursing homes, lodges and fraternal orders, unless the structure contains a function of a commercial or industrial nature.

(12) Public Properties--Public properties shall include civic buildings, public schools, playgrounds, public parks and appurtenances.

(13) Residential Properties--Residential properties are those intended for human habitation.

Whenever the words "single-family dwelling" are used herein, they shall also include the structure known as a "duplex" two-family dwelling. A residence constructed and equipped for occupancy by more than two families shall be defined as a multifamily dwelling or high density dwelling, the terms

being identical in meaning.

(b) Building Served By Hydrants. All buildings constructed in the City of Duvall or areas served by the Duvall water system shall be served by fire hydrants installed as required by the ordinance codified in this section. Such fire hydrants shall be served by the city or by other adequate means as approved by the city engineer and fire department.

(c) Exceptions. The following buildings not served water by the city, are exempt from the requirements of this the ordinance codified in this section.

(1) Detached single-family dwellings.

(2) Other buildings not exceeding twenty-five hundred (2500) square feet in floor area.

Buildings in areas with existing hydrants spaced not more than one thousand (1000) feet apart except as required in Section 9.02.030(g) of the ordinance codified in this section.

(d) Testing of Fire Hydrants. All fire hydrants shall be subject to testing and inspection by the fire department.

(e) The installation of flush type hydrants is prohibited.

(f) Installation of Fire Hydrants. Standard fire hydrants shall be installed as follows: Maximum spacing between fire hydrants is six hundred (600) feet. In addition, hydrant spacing shall be predicated upon hydrants being located at street intersections. Public buildings, including schools, located in single-family residential areas shall be classified as commercial for fire protection services.

(g) Size of Main for Hydrants. All hydrants newly installed in a single-family residential area shall be supplied by not less than eight inch circulating mains. Dead-end mains supplying fire hydrants must be at least eight inches in diameter, except hydrant leads up to fifty (50) feet long may be six inches in diameter.

(h) Application of Section 9.02.030. This part applied to all buildings located so that a portion is more than two hundred (200) feet from a street property line as measured by vehicular travel.

Exception: Detached single-family dwellings.

(1) Buildings having required fire flows of less than two thousand five hundred (2500) gpm, may have fire hydrants on one side of the building only.

(2) Then the required fire flow is over two thousand five hundred (2500) gpm, the fire hydrants shall be served by a main which loops around the building or complex of buildings and reconnects back into the distribution main.

(3) The number of fire hydrants shall be determined on an average spacing of three hundred (300) feet computed on an imaginary line parallel to and not less than fifty (50) feet from the structure. All hydrants are to be accessible to fire department pumpers over roads capable of supporting such fire apparatus. The city engineer shall determine the location of the fire hydrants depending on utility, topography and building location. Hydrants shall be a minimum of fifty (50) feet out from the building, minor deviations may be granted.

(4) The lead from the service main to the hydrant shall be no less than six inches in diameter. Any hydrant leads over fifty (50) feet in length from service to the hydrant shall be no less than eight inches in diameter. The provisions of this part shall apply without exception and regardless of the size of the service main.

(i) Requirements for Fire Hydrants. Standard hydrants shall have: Two two and one-half inch hose outlets and one four inch I.D. pumper port outlet. All outlet ports shall be approved by the fire department having jurisdiction, and have city of Seattle thread. Main valve opening shall be no less than five inches. Hydrants shall meet current A.W.W.A. standards for public hydrants and meet U.L. standards for private hydrants.

(j) Additional Requirements for Fire Hydrants. Fire hydrants shall be installed to meet sound engineering practices. There shall be an auxiliary gate valve installed between the service main and the hydrant sufficient to permit repair and replacement of the hydrant without disruption of water service. The location of all valves and fire hydrants installed shall be properly and accurately marked on identifiable plans or drawings, two copies of which shall be furnished the city engineer.

(k) Setting Hydrants. Hydrants shall stand plumb, be set to the finished grade with the lowest outlet of the hydrant no less than eighteen (18) inches above grade and no less than thirty-six (36) inches of clear area about the hydrant for clearance of a hydrant wrench on all outlets and on the control valve. The pumper port shall face the street. Where the street cannot be clearly defined or recognized, the port shall face the most likely route of approach and location of the fire truck while

pumping as determined by the city engineer.

(l) Dead End Lines. Fire hydrants shall be installed at the ends of dead end lines which are more than three hundred (300) feet in length. Said hydrants may later be moved to conform to standard spacing requirements when the main is again extended, under supervision of the superintendent.

(m) Blow-off Valves. Blow-off valves shall be installed at the end of all dead-end lines less than three hundred (300) feet in length unless a fire hydrant is provided at that point. A blow-off assembly shall conform to Duvall standard specifications.

(n) Installation Required. The installation of fire hydrants in accordance with this Ordinance shall be required of the owner and/or developer of any future business, commercial, institutional or industrial facility, dwelling or dwelling development.

(o) City to Serve. All fire hydrants installed as required by this Ordinance shall be served by the City of Duvall unless conditions warrant a waiver of this provision.

(p) Private Hydrants. The installation of private hydrants as defined herein shall be limited to those cases when the number of public hydrants installed under the distance provision of the ordinance codified in this section shall be insufficient in number. Private hydrants shall meet city requirements for public hydrants and shall be located as designated by the approving authority. The City of Duvall shall have the right to go upon the premises and to use the private hydrant for public purposes, including testing, flushing and emergency uses.

(q) Adequacy. All commercial, industrial, institutional and public properties shall provide adequate fire protection as prescribed in the ordinance codified in this section. As recommended by the approving authority, any or all of the above properties shall have a looped fire protection line around the property. The loop may be a part of the existing supply system. The size of the loop shall be no less than eight inches and shall be sized to the fire flows estimated according to the Washington Surveying and Rating Bureau.

(r) Obscuring Hydrants. No one shall plant any vegetation, erect any structure or perform any action which results in obstructing the view of a fire hydrant for a distance of fifty (50) feet. The owner and/or occupant of any area in which a hydrant is located shall be responsible for removing weed and tree growth from around the hydrant for a distance of not less than ten (10) feet. The purpose of this part is to maintain a clear visual area around the hydrant.

(s) Fire Hydrant Use. No water for purposes other than firefighting shall be taken from any city fire hydrant without first obtaining permission from the city water department. Applications for temporary use shall be made to the City Clerk in writing. This application to be approved by the water superintendent. The charges of Section 9.02.030(t) shall apply at the time the permit is issued.

(t) Sale of Water From Fire Hydrants. The sale of water from fire hydrants shall be through a hydrant meter or by other accurate means of measurement acceptable to the water superintendent. A deposit must be collected before permission will be granted to remove water from any fire hydrant. The amount of the deposit, along with a rental fee, and a price per hundred cubic feet, will be fixed from time to time by resolution of the City Council. The sale of water, hydrant deposit and hydrant rental charge to the state, county, or other governmental bodies shall be at the discretion of the water superintendent.

(u) Water lines for fire sprinklers shall be individually tapped and metered. The connection will include a water meter equaling the size of the supply line and shall comply with minimum backflow requirements.

All fire departments and fire districts shall be excluded from the above charges. (Ord. 903 § 1, 1999; Ord. 343 (part), 1982)

9.02.040 Water service specifications.

(a) Responsibility for Costs. Responsibility for costs of bringing water service to applicants whether inside city or outside (rural) of the corporate limits of the City of Duvall.

1. Costs for Labor and Material. All labor and material costs incurred in connecting to the Duvall water system and the water line required to convey water from the city water main to the property of the applicant/applicants, shall be borne by the property owner/owners making application for water. Upon completion of the work the applicant/applicants shall file with the City Clerk the final statement of costs, and copies of receipts for payments made on the installation of the water system, and upon verification of same, and with the signing of a water agreement (Recovery Contracts 9.02.020(2)). The ownership of the system shall be accepted by the City Council on behalf of the city,

subject to the terms of said water agreement, after a period of ninety (90) days has elapsed from the completion of the work and subject to there being no liens upon the installation. All water lines shall be put in, in accordance with the city specifications and inspection procedures set forth in this chapter.

2. Pressure Reducing Valve. A pressure reducing valve (herein referred to as a PRV) shall be required on the customer's side of the meter on all new construction, with a water hookup, inside or outside the city limits of Duvall. The size of the PRV will be determined by the water superintendent according to meter size.

(b) Water System Specifications. Water systems specifications for the water systems inside and outside the City of Duvall.

1. Property Owner Responsibility. In the event the installation of a water line shall be made by, or under the direction of, property owner/owners, the owner/owners shall be responsible for all maintenance and repairs for a period of one year from the date of the initial meter installation. No hookup shall be made unless water lines meet with city specifications and have been inspected as provided for in this chapter. The city specifications shall consist of, and conform to, the special provisions and detail specifications of A.W.W.A. Standard Specifications, as supplemented by the City of Duvall Developer Extension Manual, prepared by the development review committee.

2. Size of Mains. All distribution mains shall be eight inches, or larger, as required by the comprehensive plan, or by "Washington Survey and Rating Bureau" standards, and there shall be a fire hydrant installation as described elsewhere.

3. Plan Check. Plans shall be checked by the water superintendent and/or the city engineer. They shall determine whether the plan is adequate and conforms to the overall water system of the city water system. The tract or area to be served shall be inspected by the water superintendent.

4. Corrections. Any corrections, or additions, deemed necessary by the water superintendent and/or the city engineer, will be indicated on the proposed plan, and one copy returned to the applicant/applicants for correction of the original and resubmission with the application. The amount of any recovery contract payment and city connection charges due will also be indicated on the print returned.

5. Approval. If no corrections were required to the plans submitted, and the applicant/applicants agree to the charges indicated by the water superintendent and/or the city engineer, the application will then be submitted to the development review committee for approval.

6. Registered Engineer Required. The design and construction of the water main/mains, which are to be connected to the city water system, shall be supervised by a registered professional engineer of the state of Washington. Details and methods of construction shall conform to the Duvall Standard Specifications. Responsibility for providing line and grade, and taking measurements for as-built drawings rest with the owner/owners engineer.

7. Testing. Upon completion of construction, the mains and appurtenances shall be inspected by the water superintendent, shall be tested in accordance with Duvall Standard Specifications, and be sampled for satisfactory disinfection. The cost of this sampling shall be at the owner/owners expense.

8. As-Built Drawings. As-built drawings of the completed installation of the water main/mains to be connected to the city water system shall be submitted to the water superintendent and/or the city engineer, and be approved by him/them, before the City Council of Duvall shall consider accepting the said water main/mains. These as-built drawings shall be drawn, subject to approval of the city engineer as to quality. They shall be drawn to a scale not larger than one inch equals fifty feet, nor smaller than one inch equals one hundred feet. They must show the location of all mains, valves, hydrants and fittings, giving sizes and types of each. The distance from main/mains to property lines must also be given.

9. Conveyance to City. Upon completion of the water main/mains to be connected to the city water system, title to said main/mains, shall be conveyed to the city, together with an affidavit that there were no unsatisfied liens, or unpaid bills of any kind, for any of the materials used in construction, or installation, of said water main/mains. An affidavit must be submitted to the city from the contractor and his engineer stating that all labor used by them in connection with the installation of said water main/mains has been paid, and that they themselves have been paid in full in accordance to the contract.

10. Acceptance. When all the stipulations and requirements, as set forth in this section, have been

fulfilled, the city engineer, and/or water superintendent and the councilmember for the water of the City Council of Duvall, shall recommend to said council that the title for said main/mains, along with all franchises, permits, easements and affidavits be accepted, and that individual applications for water service from the above mentioned main/mains be considered.

(c) Water Systems, Cross Connections and Back Flow Prevention.

1. Interpretation and Intent. The regulations set out in this section are to be reasonably interpreted. It is their intent to recognize the varying degrees of hazard and to apply the principal that the degree of protection should be commensurate with the degree of hazard.

2. Conformance to Rules and Regulations. Any customer, regardless of whether residing within or without the city limits, who is now receiving water from the city system or who will in the future receive water from the city, shall comply with the rules and regulations contained in this section.

3. Organization and Conformance. Any water district, municipal organization, or other organization, which is connected to the city water supply and/or which is furnished to people or members within said district or organization, shall cause all the people or members within said district or organization as well as the district or organization itself, to comply with the rules and regulations contained in this section.

4. Definitions. Definitions as used in this section, unless the context states otherwise, the following definitions shall apply.

(A) "Air gap separation" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device, and the flood level rim of the receptacle, and shall be at least double the diameter of the supply pipe measured vertically above the flood level rim of the vessel. In no case shall the gap be less than one inch.

(B) "Auxiliary supply" means any water source or system, other than the public water supply, that may be available in the building or premises.

(C) "Back flow" means the flow, other than the intended direction of flow, of any foreign liquids, gases, or substances, into the distribution system of a public water supply.

(D) "Back flow prevention device" means a device to counteract back flow pressures or prevent back siphonage.

(E) "Back pressure" means back flow caused by a pump, elevated tank, boiler, or other means that could create pressure within the system greater than the supply pressure.

(F) "Back siphonage" means a form of back flow due to a negative or subatmospheric pressure within a water system.

(G) "Cross connection" means any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture or other device which contains, or may contain, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water supply as a result of back flow, bypass arrangements, jumper connections, removable sections, swivel or change over devices, and other temporary, or permanent, devices through which, or because of which, back flow could occur.

(H) "Customer" means any person, family, business, corporation, partnership or firm connected to the city water supply.

(I) "Double check valve assembly" means an assembly composed of two single, independently acting check valves, including tightly closing shut-off valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve.

(J) "Reduced pressure principal back flow prevention device" means a device incorporating two or more check valves and an automatically operating differential relief valve, located between the two checks, two shut-off valves, and equipped with necessary appurtenances for testing. The device shall operate to maintain the pressure in the zone between the two check valves, less than the pressure on the public water supply side of the device. At the cessation of normal flow, the pressure between the check valves shall be less than the supply pressure. In the case of leakage of either check valve, the differential relief valve shall operate to maintain this reduced pressure by discharging to the atmosphere. When the inlet pressure is two pounds per square inch or less, the relief valve shall open to the atmosphere, thereby providing an air gap in the device.

5. Cross-connection Prohibited--Exceptions. Except as provided in Section 9.02.040(5), all cross-connections, as defined in Section 9.02.040(c)(G), whether or not such cross-connections are

controlled by automatic devices such as check valves or by hand operated mechanisms such as a gate valve or stopcocks, are prohibited.

6. Cross-connection--Failure To Discontinue. Failure on the part of persons, firms, or corporations to discontinue the use of any and all cross-connections, will be sufficient cause for the discontinuance of the public water service to the premises on which the cross-connection exists.

7. Cross-connection--Removal. The water superintendent shall, in cooperation with the health officer or the local plumbing inspector, make periodic inspections of the premises served by the public water supply to check for the presence of cross-connections. Any cross-connection found in such inspection shall be ordered removed by the responsible agency or authority. If an immediate hazard to health is caused by the cross-connection, water service to the premises shall be discontinued until it is verified that the cross-connection has been removed.

8. Back Flow Prevention Device--Installation. Back flow prevention devices shall be installed at the service connection or within any premises wherein the judgment of the water superintendent, the nature and extent of the activities, or the materials used in connection with the activities on the premises, or materials stored on the premises, would present an immediate and dangerous hazard to health should a cross-connection occur, even though such cross-connection does not exist at the time the back flow device is required to be installed. This shall include, but not be limited to, the following situations.

(A) Premises having an auxiliary water supply, unless the quality of the auxiliary supply is in compliance with the rules and regulations of the state.

(B) Premises having internal cross-connections that are not correctable, or intricate plumbing arrangements which make it impractical to ascertain whether or not a cross-connection exists.

(C) Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency, or at sufficiently short notice, to assure that cross-connections do not exist.

(D) Premises having a repeated history of cross-connections being established, or reestablished.

(E) Premises on which any substance is handled under pressure so as to permit entry into the public water supply, or where a cross-connection could reasonably be expected to occur. This shall include the handling of process waters and cooling waters.

(F) Premises where material of a toxic or hazardous nature are handled such that if back siphonage should occur, a serious health hazard may result.

(G) The following types of facilities will fall into one of the above categories where a back flow prevention device shall be installed at these facilities as set forth in this section, unless the water superintendent determines no hazard exists:

1. Hospitals, mortuaries, clinics;
2. Piers and docks;
3. Laboratories;
4. Sewage treatment plants;
5. Food and beverage processing plants;
6. Chemical plants using a water process;
7. Petroleum processing or storage plants;
8. Radioactive material processing plants or nuclear reactors;
9. Others specified by the secretary of the department of social and health services;
9. Back Flow Prevention Device--Degree of Hazard. The type of protective device required shall depend on the degree of hazard which exists, as follows:

(A) An air gap separation or a reduced pressure principle back flow prevention device shall be installed, where the water supply may be contaminated with sewage, industrial waste of a toxic nature or other contaminant which would cause a health or system hazard.

(B) In the case of a substance which may be objectionable but not hazardous to the health, a double check valve assembly, air gap separation, or a reduced pressure principle back flow prevention shall be installed.

10. Back Flow Prevention Device--Location. Back flow prevention devices required in this section shall be installed at the property line of the premises or at the meter, where meters are used, or at a location designated by the secretary of social and health services, or by the water superintendent.

11. Back Flow Prevention Device--Installation. Back flow prevention devices required in this section shall be installed under the supervision of, and with the approval of the city.

12. Protective Device--Approval Required. Any protective device required in this section shall be a

model approved by the secretary of the department of social and health services. A double check valve assembly or a reduced pressure principle back flow prevention device will be approved if it has successfully passed performance tests of the University of Southern California engineering center or other testing laboratories satisfactory to the secretary of the Department of Social and Health Services.

13. Back Flow Preventions Device--Inspection, Tests. Back flow prevention devices installed under this section shall be inspected and tested annually, or more often where successive inspections indicate failure. The devices shall be repaired, overhauled, or replaced whenever they are found to be defective. Inspection, tests, repairs and records thereof shall be done under the city's supervision.

14. Failure to Comply--Termination. Failure of any customer, or any district, or any organization to cooperate in the installation, maintenance, testing of back flow prevention devices, or the requirements of an air gap separation, shall be grounds for the termination of the water service at a point where such flow, which is to be terminated by the city, would best prevent possible contamination of the public water supply.

(d) Variances.

1. No variance from the minimum requirements outlined in the ordinance codified in this section shall be granted by the development review committee until the following have been complied with:

(A) Application for Variance. The owner/owners, requesting a variance shall make written application to the development review committee setting forth the name/names of the owner/owners of the properties in a plat of the properties, and a dimensioned sketch showing the proposed installation. The application shall state the reasons for requesting the variance and the agreement of the applicants to pay all costs and expenses incurred by the city in processing the application.

(B) Filing Fee. The application for a variance shall be accompanied by a fee, which shall not be refundable, but which shall be applied to the costs and expenses of the city in processing the application. The amount of this fee will be fixed from time to time by resolution of the City Council.

(C) Factors to be Considered. In considering the application for variance, including temporary lines, the development review committee shall consider the following factors:

1. Whether or not the variance would have an adverse effect upon the accomplishment of the comprehensive water plan;

2. Whether or not the proposed variance is consistent with the comprehensive water plan;

3. Whether or not there would be adverse effects upon the adjoining or neighboring properties;

4. Any benefits to the city generally resulting from the proposed variance;

5. Whether or not the applicant/applicants will be deprived of a use of his property/properties enjoyed by other property owners similarly situated;

6. The minimum standards for public water systems, as published by the Division of Social and Health Services, Department of Health of the State of Washington shall be met.

(D) The city may require as a condition of granting the variance:

1. The applicant/applicants must agree to replace the temporary line or substandard improvement with facilities meeting city standards within two years or less without the right of reimbursement.

2. A bond or other adequate security shall be required in the amount of two times the current estimated cost, said bond running to the city and the adjoining property owners.

3. If an intermediate property owner desires to install a permanent line, the temporary line shall be replaced and the properties benefitted by the temporary line shall pay one half of the cost of the permanent line installation and a lien shall be filed in favor of the city and adjoining property owners to insure payment prior to water hookup.

(E) Informing City Council. Before any variance may be granted, the development review committee must inform the City Councilmember in charge of water, and the Mayor, of the pending application for variance.

9.02.050 Water services outside the city limits.

(a) Intent to Annex.

1. No water service shall be provided to any property contiguous with the city limits of the City of Duvall until the property is annexed to the city. In the case of any owner of property not contiguous with the city limits of the City of Duvall, who desires to connect to the city water system, the owner will sign a statement of intention to annex to the city and shall agree in said statement to petition for

and consent to such annexation immediately upon any request by the city at any date after the owner's property becomes contiguous with the city limits or becomes contiguous with property of which an annexation request has been filed with the City of Duvall. This statement shall recite that it is binding upon the owner, his/her heirs, successors and assigns, and shall be construed as a covenant running with the land. The form of this statement must receive the approval of the city attorney, and shall be recorded in the official records of the King County Auditor at the expense of the owner prior to connection of the subject property to the city water system. Any reasonable attorney fees connected with this statement must also be paid by the owner prior to connection of the subject property to the city water system.

2. Facilities owned and managed by the federal, state, county, and local school, fire and library districts, are excluded from the provisions of Section 9.02.050(a)1.

(b) Temporary Lines.

1. All lines constructed outside the city limits of Duvall must conform to "Duvall standard specifications" as outlined elsewhere in this chapter. Applicants outside the city may request a variance from the standard specifications under Section 9.02.040(d). (Amended Ord. 671, 1993)

2. No new connections shall be permitted to existing lines smaller than four inches, outside the city limits.

9.02.060 City not responsible.

A. Discontinuance of Service.

The city reserves the right at any time, without notice, to shut off the water supply for repairs, extensions, nonpayment of rates, for any reason relating to the health, safety, or welfare of the residents of Duvall or others served by the city water system, and for any noncompliance by any property owner served by the city water system relating to obligations incumbent upon said owner in return for water service under the ordinance codified in this chapter and the city shall not be responsible nor liable for any damage such as bursting of boilers supplied by direct pressure; the breaking of any pipes or fixtures; stoppage or interruption of water supply; or any damage resulting from the shutting off of water.

9.02.070 Prohibited acts.

A. Water Supply to Additional Premises. Permission required. It is unlawful for any person whose premises are furnished with city water to furnish water to additional premises unless he shall first make application in writing to do so at the city office and shall be granted permission to do so.

B. Water Supply to Additional Premises—Double Charge. Water supply to additional premises double charge—charge for shutting off and turning on. When additional premises are connected without the application prescribed in Section 9.02.070(a) such premises may be charged double the rate for the time they are in use and the service may be shut off by the utilities superintendent. In case the water is turned off as provided in this section, the same shall not be turned on until all charges against said premises including a turn on/turn off charge as provided by resolution of the City Council, have been paid in full.

C. Unlawful Connections to Mains. It is unlawful for any person to attach or detach from any water main, any service pipe or other connection through which water is supplied by the city or to interfere in any manner with such pipes or connections without first having obtained written permission from the utilities superintendent.

D. Unlawful Connections to Hydrants. It is unlawful for any person to connect with or remove water from any hydrant owned or used by the city, provided however that the provisions of this section do not apply when permission has been granted to do so under Section 9.02.030(a)1 of the ordinance codified in this section.

E. Damage to Waterworks Property. It is unlawful for any person, unless duly authorized by the utilities superintendent, to disturb, interfere with or damage any water main, water pipe, machine, tool, meter, fire hydrant, or other appliances, buildings, improvements, lawns, grass plots, flowers, vines, bushes or trees belonging to or used in connection with or under the control of the municipal water supply system of the city.

F. Obstructing Fire Hydrant. It is unlawful for any person to obstruct access to any fire hydrant by placing around or thereon any vegetation, stone, brick, lumber, dirt or other material, or to willfully or carelessly injure the same.

G. Unlawful to Turn On Water Meter After Turned Off. It shall be unlawful for any person to turn on a city water meter after it has been turned off by the city for any reason.

H. Damages—Additional Damages. The City of Duvall shall be reimbursed for all time expended by city officials or employees in attending to violations of subsections A through G of this section, and for any and all costs and materials incurred in remedying any problems occurring due to such violations. This reimbursement shall be due within ten (10) days after billing by the city. If the reimbursement is not paid within the ten (10) day period, then the amount of the reimbursement shall commence accruing interest at the maximum statutory rate. In the event the city must bring legal action to collect the reimbursement charges, the city in addition to such charges shall recover its attorney's fees and the other costs incurred in connection with such collection. In the case of any property owner who violates subsections A through G of this section, with the violation being in connection with the service of water to the property of the owner, then the reimbursement charges, when unpaid as defined above, shall constitute a lien against the property to which city water service is provided, and shall be processed in the manner provided in Section 9.02.010(B).

The reimbursement charges provided in this section shall be additional to any other charges to which the city is entitled under the ordinance codified in this chapter, and shall be additional to the double water rate provisions of Section 9.02.010(B).

I. Prohibited Acts Considered Misdemeanors. The prohibited acts referred to in subsections A through H of this section will be considered misdemeanors, and will be punishable by maximum ninety (90) days in jail, and/or a fine of five hundred dollars (\$500.00).

J. The prohibited acts set forth in subsections A through H of this section shall also be considered civil infractions. Civil infractions under this section shall be processed as set forth in Chapter 2.24. It shall not be necessary for the code enforcement officer to issue a notice of violation prior to issuing a notice of civil infraction for violations of this section. (Subsection J added in Ord. 839, 1997)

9.02.080 Severability.

Severability. If any provision of the ordinance codified in this chapter or its application to any person or circumstance is held invalid, the remainder of the ordinance codified in this chapter or the application of the provisions to other persons or circumstances is not affected.

9.02.090 Adoption of comprehensive plan.

The City of Duvall adopts by reference the comprehensive water system plan prepared by RH2 Engineering, Inc. dated November 22, 2004 and on file with the City Clerk. (Ord. 1004 § 1, 2004: Ord. 996 § 1, 2004: Ord. 227, 1977)

Chapter 9.03 WATER USAGE RESTRICTIONS

9.03.010 Authority.

In case of shortage of water the Department of Public Works is authorized to impose water use restrictions in order to efficiently safeguard the safety and health of the general public or to provide for the public convenience. The use of water for irrigation, cooling, or other uses may be forbidden, restricted or regulated and such regulations may be made effective as to all customers. Rationing may be imposed during any shortage of water, either in lieu of or in addition to other measures hereby authorized.

9.03.020 Power.

The Director of Public Works shall conduct public education efforts regarding the benefits and necessity of conservation by the public, and is authorized to promulgate such rules and regulations as may be necessary to implement water use restriction. The Director of Public Works is further authorized to make exceptions to such restrictions in specific cases as he finds reasonable (such as, but not limited to, watering newly seeded or sodded lawns, alleviating unnecessary economic hardship to commercial or industrial activities, or preventing possible damage to health, safety or welfare).

9.03.030 Penalty.

It is unlawful for any person to violate water use restrictions. In addition to other lawful remedies, the Director of Public Works is authorized to impose a surcharge of fifty dollars (\$50.00) for each day a customer's water usage practices exceed water conservation restrictions as provided for in this chapter. The surcharge will be added to and become part of the water bill for the customer in addition to any service rate amount. Prior to the imposition of a surcharge, the Public Works Department shall send a notice to the billing address or deliver or post a notice at the service address advising of the customer's water usage practices in excess of mandatory water shortage restrictions and advising that a surcharge may be imposed for any further violations.

9.03.040 Enforcement.

A. Each police office of the city and the director or any employee of the City of Duvall Public Works Department and Building Department shall have the authority to enforce the provision of this chapter.

B. In addition to penalties otherwise provided, the Director of Public Works is authorized to install a water restricting device on the waterline or line serving any person who commits a second or subsequent violation of any of the provisions of this chapter. Alternatively, after such notice of a violation as may reasonably be given based on the circumstances, the Director of Public Works may cause water service to be terminated for subsequent or continuing violation of water conservation restrictions.

9.03.050 Severability.

If any section, subsection, sentence, clause, phrase, part or portion of this chapter is for any reason held to be invalid or unconstitutional by any court of competent jurisdiction, such decision shall not affect the validity of the remaining portion of this chapter. (Ord. 573, 1990)

EXHIBIT B

Chapter 9.04 SANITARY SEWER UTILITY*

9.04.010 Definitions.

Unless the context specifically indicates otherwise, the meaning of the terms used in this chapter shall be as follows:

"Building drain" means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning five feet outside the inner face of the building walls.

"Building sewer" means the extension from the building drain to the public sewer or other place of disposal.

"Garbage" means solid wastes from the preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce.

"Industrial wastes" means the liquid wastes from industrial process as distinct from sanitary sewage.

"Natural outlet" means any outlet into a watercourse, pond, ditch, lake or other body of surface or ground water.

"Properly shredded garbage" means the wastes from the preparation, cooking, and dispensing of food that has been shredded to such degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half inch in any dimension.

"Public sewer" means a sewer in which all owners of abutting properties have equal rights, and is controlled by public authority.

"Sanitary sewer" means a sewer which carries sewage and to which storm, surface, and ground waters are not intentionally admitted.

"Sewage" means a combination of the water-carried wastes from residences, business buildings, institutions, and industrial establishments.

"Sewage treatment plant" means any arrangement of devices and structures used for treating sewage.

"Sewer" means a pipe or conduit for carrying sewage.

"Suspended solids" means solids that either float on the surface of, or are in suspension in water, sewage, or other liquids; and which are removable by laboratory filtering.

"Watercourse" means a channel in which a flow of water occurs either continuously or intermittently. (Ord. 209 (part), 1976)

9.04.020 Use of public sewers required.

- A. It is unlawful for any person to place, deposit or permit to be deposited in any unsanitary manner upon public or private property within the city, or in any area under the jurisdiction of the city, any human or animal excrement, garbage, or other objectionable waste.
- B. It is unlawful to discharge to any natural outlet within the city, or in any area under the jurisdiction of the city, any sanitary sewage, industrial wastes, or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this chapter.
- C. Except as herein provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, or other facility intended or used for the disposal of sewage.
- D. The owner of each house, building, or property used for human occupancy, employment, recreation, or other purpose, situated within the city and abutting on any street, alley or right-of-way in which there is now located or may in the future be located a public sanitary or combined sewer of the city, is hereby required at his/her expense to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this chapter, within ninety (90) days after date of official notice to do so, provided that said public sewer is within one hundred (100) feet of the property line; provided, however, such connection shall not be required prior to one year from the acceptance of the city's sewage treatment plant. If any owner fails, refuses or neglects to so connect to the public sewer within said ninety (90) day period, then thereupon the city may post said structure and prohibit occupancy thereof until such time as such

connection has been made; furthermore, the city may cause any existing water meter to be disconnected or removed until such time as the connection to the public sewer has been accomplished at which time any such water meter shall be reconnected or re-installed as the case may be. (Ord. 209 (part), 1976)

9.04.030 Building sewer permits.

A. No unauthorized person shall uncover, make any connections with or openings into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Public Works Superintendent or his/her duly authorized representative. There shall be three classes of building sewer permits:

1. For residential service;
2. For commercial service;
3. For industrial service.

B. In each case the owner or his/her duly authorized agent or representative shall make application in writing on a special form furnished by the city for said purposes. The permit application shall be supplemented by any plans, specifications or other information considered pertinent in the judgment of the public works superintendent or his duly authorized representative. The permit and inspection fees shall be adopted by resolution and governed by the provisions of Section 1.04.120 of this code. The minimum fee shall be paid to the city at the time the application is filed.

C. Permit applications shall be filed with the Public Works Superintendent with the following information:

1. Owner's name;
2. Address to be served;
3. Owner's mailing address;
4. Side sewer contractor's name and side sewer license number;
5. Legal description of property to be served;
6. All outside dimensions of building to be served;
7. Location of buildings on property to be served;
8. Purpose of building;
9. Full course of the proposed sewer.

D. No work shall be commenced until the permit has been issued. The permit card must be posted on the job. Permits may be issued to the owner or occupant of any property and the owner or occupant need not employ a licensed side sewer contractor to perform the work if the owner or occupant employ another person to make the installation of the side sewer, it must be a licensed side sewer contractor and such contractor shall secure the permit. All side sewer contractors must show their state contractor's license card to the Public Works Superintendent or his representative prior to the granting of the permit. (Ord. 831, 1997; Ord. 294; Ord. 209 (part), 1976)

9.04.040 Independent sewers--Cost.

A separate and independent building sewer shall be provided for every building; except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer.

Old building sewers may be used in connection with new buildings only when they are found, on examination and tests by the Public Works Superintendent, to meet all requirements of this Ordinance.

All costs and expense incident to the installation and connection of the building sewer shall be borne by the owner or applicant of the premises in question. The owner shall indemnify the city against any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. Any connection to a cesspool or similar installation shall be removed, direct connection from the house to the public sewer shall be made, and the cesspool or similar installation shall be disinfected and filled with fresh earth.

9.04.050 Specifications for building sewers.

All materials and workmanship in connection with the installation of any building sewers shall be as

required by standard plans and specification of the City of Duvall.

Pipe may be cast iron, WWP 401, concrete ASTM C 14, asbestos cement WPOA SS (ACSP); plastic A.B.A. or P.V.C. when installed as per manufacturer's specifications. (Asbestos cement cast iron with approved rubber gaskets or approved plastic pipe shall be used wherever the side sewer is below the high water table as established by the Public Works Superintendent).

All excavations required for the installation of a building sewer shall be open trench work unless otherwise approved by the Public Works Superintendent. Pipe laying and back fill shall be performed in accordance with ASTM specification C12-19 except that no back fill shall be placed until the work has been inspected.

The size and slope of the building sewer shall be subject to the approval of the Public Works Superintendent, but in no event shall the diameter be less than four inches (4"), except in the case where two (2) buildings are served, in which case the diameter shall not be less than six inches (6") below the second connection. The minimum slope of the sewer pipe shall be not less than two (2%) percent and shall be measured over a minimum length of thirty inches (30") at each checkpoint. If the minimum grade cannot be obtained and the Duvall Public Works Superintendent approves a connection at a lesser grade, a document approved by the City shall be signed by the recorded owners and shall be notarized and recorded with the County Auditor. This document shall release the City of Duvall from all future claims for damages due to this connection and will be referred to as a "Grade Release." The Grade Release shall be procured before the pipe is laid if there is any doubt about securing proper grade. If found lacking in grade upon inspection, the Grade Release shall be recorded before any pipe is backfilled.

After approval and recording of location by the Public Works Superintendent, backfill of selected material shall be carefully tamped around and over the pipe crown to a minimum depth of twelve inches (12") so as not to damage pipe or joints. This back fill will contain no rocks over one inch (1") diameter, frozen chunks, wood or other deleterious material. The balance of the back fill on the City of Duvall property right-of-way shall be placed in twelve-inch (12") tamped layers. (In certain soil conditions, water settlement may be approved if requested.) This balance of back fill will contain no rocks over six inches (6") in diameter, frozen chunks, wood or other deleterious material. Finish with six-inch (6") minimum of one and one-half inch (1 1/2") minus gravel in traveled roadway for temporary surfacing.

Pipe joints shall prevent infiltration in excess of City specifications. All joint materials shall be previously approved by the Public Works Superintendent.

(a) Cement mortar joints will not be acceptable.

(b) Rubber gaskets of approved type, manufactured from oil resistant synthetic rubber stock, shall be used to join all non-metallic pipe except where specific prior approval for other type or types of joints has been obtained from the Public Works Superintendent.

(c) Lead for cast iron bell and spigot pipe jointing shall be commercial grade manufactured from long fiber asbestos, cross laminated or woven and shall be suitably impregnated. Bolts and nuts shall be of best commercial grade machine bolts, American Standard Regular.

(d) Jointing materials of approved type shall be installed in strict accordance with their manufacturer's specifications.

(e) Asbestos cement pipe cast iron pipe with approved rubber gaskets, or approved plastic pipe shall be used in all cases where installations are below high water mark.

(f) Connections from cast iron pipe to concrete pipe shall be made in an approved manner. Joints shall be installed in accordance with manufacturer's recommendations.

The pipe run and bedding requirements are as follows:

(1) Changes in line or grade shall be made with wyes.

(2) No 90 degree bends, consecutive 45 degree bends or tees will be allowed.

(3) When laying around a corner, a wye and bend (maximum 45 degree) combination shall be used with the end of the wye left as a cleanout.

(4) Increases or wyes shall be used when changing the sizes of pipe.

(5) No grafts on four-inch (4") or six-inch (6") pipe shall be allowed.

(6) Pipe shall be laid on firm bedding and in a dry trench. Rock shall be excavated to three-inch (3") minimum below grade, and the trench back-filled to grade with suitable material, such as sand or moist earth firmly tamped in place or pea gravel.

(7) Sewer pipe shall not be laid closer than two and one-half (2 1/2') from the foundation wall, and if

there is no foundation wall, then the outer line of any footings, pilings, building supports or porch shall be considered the foundation wall.

(8) All side sewers sixty feet (60') or shorter shall be four inches (4") or larger. (9.04.050 (8)-- (11) amended by Ord. 364, 1983)

(9) All side sewers two hundred feet (200') or shorter shall be six inches (6") or larger and shall have a cleanout installed at its termination point.

(10) All side sewers longer than two hundred feet (200') shall be constructed as mainline additions to the sanitary sewer systems, eight inch (8") pipe side deeded to the City for operation and maintenance on a public easement or right of way.

(11) All eight inch (8") sewer mains shall terminate with an approved clean-out if the length is less than two hundred feet (200'). If the length is greater than two hundred feet (200') it shall terminate in a manhole.

9.04.060 Inspection.

The applicant for the building sewer permit shall notify the Public Works Superintendent when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the Public Works Superintendent or his/her representative. All sewer pipe and fittings shall be kept uncovered and protected until inspected and approved by the Public Works Superintendent. An accurate "as-built" drawing of the side sewer, indicating location and depth of cleanouts, pipe size, and other details, must be supplied by the person installing the side sewer prior to acceptance.

Building sewers shall be tested as follows or by other methods approved by the Public Works Superintendent. Building sewers shall be tested for visible leakage before backfilling by inserting a removable plumber's plug at the lower end of the line and filling the line with water to its highest point. The contractor shall make this test before calling for inspection so that the inspector can observe and approve in one visit. A tee or wye at the property line shall be provided in the sewer for insertion of the plug, to be capped tightly and secured against back pressure or infiltration upon completion of the test.

9.04.070 Precautions while building.

All excavations for building sewer installation shall be guarded with barricades and lights and such other precautions as are reasonably adequate to protect the public from accident and injury. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the City. During the course of the work, the following restrictions shall apply:

- (a) Gutters along the curb must be kept open for drainage at all times during construction.
- (b) All timbers and lumber must be removed from the excavation before backfilling.
- (c) All improved streets are to be kept as free of mud as practicable and are to be restored to their original condition. Special care should be taken in stockpiling material in graveled and oiled streets to facilitate adequate restoration. Where excavated material is of a muddy consistency, an adequate depth below surface of roadway shall be left to be backfilled by the contractor with crushed rock or similar materials, so as to prevent a "muddy" or "chuck hole" condition.

A surety bond in an amount deemed sufficient and determined by the Public Works Superintendent, but in no event less than One Thousand Dollars (\$1,000.00), shall be furnished and deposited with the City to indemnify the City against any loss, damage, liability in connection with such sewer work. If the work is not properly performed or properly completed and the owner fails to correct or complete the required work within five (5) days after written notice is mailed to the owner, or in the case an emergency, without notice to the owner, the City may perform such work as may be necessary and all costs and expenses incurred by the City shall be charged to the owner.

9.04.080 Discharge restrictions into a sanitary sewer.

No owner shall discharge, or cause to be discharged, any storm water, surface water, roof runoff, subsurface drainage, cooling water or unpolluted industrial process waters into any sanitary sewer owned by the City.

Also, no owner shall discharge, or cause to be discharged into any sanitary sewer, the following:

- (a) Any liquid or vapor having a temperature higher than 150 F.

- (b) Any water or waste which may contain more than one hundred (100) parts per million by weight of oil, fat or grease.
- (c) Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquid, solid or gas.
- (d) Any garbage that has not been properly shredded to a size of one-half (1/2") in any direction.
- (e) Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure or any other solid or viscous substance capable of causing obstruction to the flow in the sewers or other interference with the proper operation of the sewage treatment system.
- (f) Any waters or wastes having a "pH" lower than 5.5 or higher than 9.0 or having any other property capable of causing damage or hazard to structures, equipment or personnel of the sewage system or to the sewage treatment process.
- (g) Any waters or wastes containing a toxic or poisonous substance in a sufficient quantity to injure or interfere with any sewage treatment process or constitute a hazard to humans or animals or create any hazard in the receiving waters of the sewage treatment system.
- (h) Any waters or wastes containing more than 350 parts per million by weight of suspended solids.
- (i) Any noxious or malodorous gas or substance capable of creating a public nuisance.
- (j) A five (5) day Biochemical Oxygen Demand greater than 300 parts per million by weight.
- (k) Any waters or wastes having an average daily flow greater than two percent (2) of the average daily sewage flow of the Public Sewage System into which the waters or wastes are about to be discharged.

9.04.090 Sewer charges.

The monthly rates and charges for sewer disposal service shall be set by resolution. The rates and charges shall be reviewed annually, in the month of December, and shall be adjusted to reflect changes in the Consumer Price Index, all urban customers, for metropolitan Seattle for the previous twelve (12) month period ending in July of the current year. (§ 9.04.090 amended by Ord. 575, 1990 and Ord. 631, 1991)

9.04.100 Billings and collections.

"User" as stated herein means a person, firm, corporation, entity, user, owner or occupant of a building, property, or premises using or having available for use sewer service connected to the sewer system of the City of Duvall, and also means the person or entity responsible for paying for sewer charges as shown by the records of the City of Duvall.

All bills for sewer disposal service shall be as set forth in Ordinance No. 209 or as the same may be amended from time to time. Charges for sewer disposal services remaining unpaid at the close of business on the twentieth day of the month in which billed (or the close of the next regular business day if the twentieth should fall on a Saturday, Sunday, or a legal holiday) shall be considered delinquent and shall call for a delinquent charge of ten (10) percent of the total combined utility amount due. Any checks returned due to insufficient funds shall incur a penalty in an amount to be fixed from time to time by resolution of the City Council. Said delinquent charges and penalties shall become a lien upon the real property so furnished as provided by Washington state law, and shall be enforced as a real property lien and shall be superior to all other liens and encumbrances whatsoever, except those for general taxes and local and special assessments, and concurrently enforced by discontinuing and shutting off city water services as provided herein and as provided by Washington state law. If the delinquent charges and penalties remain unpaid at the close of business on the fourteenth day of the succeeding month (or the close of the next regular business day if the fourteenth should fall on a Saturday, Sunday, or a legal holiday), a notice shall be mailed to the user setting forth the lien described above and further informing that water service will be discontinued and shut off following five working days from the date of the notice unless all delinquent charges and penalties prior to the discontinuance of water service as provided herein. Water service will not be resumed until all delinquencies and penalties, together with a water turn-on fee of thirty-five dollars (\$35.00), have been paid.

It shall be the obligation of the user of a building, property, or premises using or having available for use sewer service connected to the sewer system of the City of Duvall to provide to the City of Duvall a mailing address for the purposes of billing for sewer disposal services and for the notice above-described. No water service shall be provided to any premises unless such a billing address is provided. In the event sewer disposal services are being provided to any premises and a billing

address is not provided, then the City of Duvall will post the premises with a notice requiring that such address be provided. This notice shall state that water service will be discontinued and shut off following five working days from the date of the notice unless a mailing address is provided within said period of time. The notice will also inform official in charge of billings to determine the accuracy of any delinquent charges and penalties then in existence and stated in the notice prior to the discontinuance of water service as herein provided. Service will be resumed after a billing address is provided to the City of Duvall, payment of water turn-on fees as provided herein, and payment of all delinquent charges and penalties as provided herein if applicable. Billings may be made in the name of a tenant or other occupants of the premises which are provided sewer disposal services at the mailing address provided above, but such billings shall not relieve the owner of the premises from liability for the payment of the charges for furnishing of such sewer disposal services nor in any way affect the lien rights of the city against the premises to which said sewer disposal services are furnished. Failure to receive mail properly addressed to the mailing address provided above shall not be a valid defense for failure to pay the delinquent charges and penalties. Any change in the mailing address provided above must be properly filed in writing with the office of the Utility Billing Clerk before it will become effective.

In the event the city must bring legal action to collect sewer disposal charges and/or penalties, the city shall, in addition, recover its attorney's fees and other costs incurred in connection with such collection. (Ord. 1044 § 1, 2007; Ord. 467, 1987; Ord. 209 (part), 1976)

9.04.110 General facilities charge.

A. There is imposed upon each person connecting to the Duvall sewer system payment of a sewer general facilities charge. The general facilities charge shall be made, in an amount to be determined from time to time by resolution of the City Council. Pursuant to Washington State Department of Ecology guidelines, in conjunction with the Duvall comprehensive plan, payment of the general facilities charge is required for each single-family detached dwelling unit as defined in Section 14.34.360 of this code. Provided the general facilities charge for each single-family attached (Section 14.34.350), senior citizen assisted (Section 13.34.340), multiple-family, and mixed use (Section 14.34.330), or accessory (Section 14.34.320) dwelling unit that will add wastewater to the Duvall sewer system shall be eighty-five (85) percent of the regular charge.

B. Any other development desiring to connect and add wastewater to Duvall's sewer system shall pay a hook-up charge calculated in the following manner:

1. Anticipated monthly flow shall be determined by the City Engineer based upon anticipated property use, water supply line size, and plumbing fixture count, in accordance with state and federal manuals; and
2. The amount of anticipated flow shall be converted to a ratio with the flow utilized as the basis for calculating the single family detached dwelling unit connection charge; and
3. The ratio established shall be multiplied by the current general facilities charge.

C. The sewer general facilities charge shall be collected at the time of final plat approval, or, where no plat is involved, at the time of building permit application. (Ord. 995 §§ 1, 2, 2004; Ord. 974 §§ 1, 2, 2003; Ord. 917 § 3, 2000; Ord. 901 § 1, 1999; Ord. 891, 1999; Ord. 714, 1994; Ord. 703; Ord. 632, 1991; Ord. 507 (part); Ord. 489 (part); Ord. 418, 1985; Ord. 324; Ord. 270; Ord. 209 (part), 1976)

9.04.115 Sewer equalization charge.

A. There is imposed upon the owners of properties which have not been previously assessed or charged under the city ULID No. 1, as formed by Ordinance No. 200, a sewer equalization charge in the amount calculated as follows:

The number of square feet of the property multiplied by \$.0455.

B. The sewer equalization charge shall be collected at the time of final plat approval, or, where no plat is involved, at the time of building permit application. (Ord. 917 § 4, 2000)

9.04.120 Connection to city owned sanitary sewer lines.

All connection charges for service from sanitary sewer lines owned by the city outside of the boundary of ULID No. 1 and not subject to a recovery contract shall be computed at the rate of six dollars and fifty cents per foot of frontage for all installations completed prior to January 1, 1980. For

sewer lines constructed after January 1, 1980 and not subject to recovery contracts, the connection charge shall be based on the actual construction cost per front foot. These front footage charges are declared to represent a fair pro rata share of the cost of construction for an eight inch sewer line with appurtenances, without regard to the actual size of line constructed.

Where the city has participated in a project financed by the method of "cash contributions" the connection charge shall be the fair share of the actual construction costs. Said connection charges shall not apply to premises which (1) have been previously connected without payment of connection charges, (2) are served by lines constructed for the purpose of serving said premises and donated to the city or (3) are situated on property for which connection charges have been previously paid. (Ord. 327; Ord. 209 (part), 1976)

9.04.125 Sewer installation charge.

All direct city expenses incurred by inspecting or installing the connection of a private side sewer, or other appropriate sewer, to the city-owned sewer line shall be reimbursed. The amount of city expense shall be figured by applying the city's normal adopted developer billing rates. All sewer installation charges shall be paid before the issuance of a certificate of occupancy. (Ord. 917 § 5, 2000)

9.04.130 Responsibility for maintenance.

The property owners served shall be responsible for maintenance of the building sewer. A permit shall not be required for maintenance or repairs inside the private property line, except where a change in location or arrangement is planned. Prior to making repairs, notice of repairs shall be given to the Superintendent of Maintenance where no permit is required. A regular permit shall be required for work in the public right-of-way. (Ord. 489 (part); Ord. 209 (part), 1976)

9.04.135 Civil infraction.

It shall be a civil infraction for any person, firm, corporation, business or other entity to violate the provisions of Chapter 9.04. Civil infractions under this section shall be processed as set forth in Chapter 2.24. It shall not be necessary for the Code Enforcement Officer to issue a notice of violation prior to issuing a notice of civil infraction for violations of Chapter 9.04. (Ord. 839 (part), 1997)

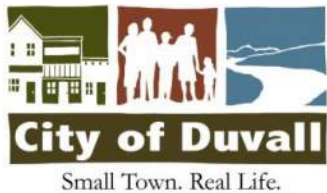
9.04.140 Severability.

If any section, sentence, clause, or phrase of this chapter or any amendments thereto shall be held to be invalid or unconstitutional 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 chapter.

Based on the explosive growth occurring in the city and upon the city's budget needs to fully capture the proportionate share of sewer capital improvement charges for property being developed in the city, the City Council declares that an emergency exists in the city with respect to the imposition of the increased sewer capital improvement fees outlined in this section. Wherefore there being a state of emergency, and this chapter being designed to protect the public health, safety and welfare of the citizens of the city, the ordinance codified in this chapter shall be immediately effective upon adoption by the City Council and approval by the Mayor. In the event a court of competent jurisdiction should declare that the ordinance codified in this chapter could not have immediate effect as outlined in this section, it shall then be effective five days after its publication as provided by law. (Ord. 507 (part); Ord. 209 (part), 1976)

APPENDIX C: City of Duvall Backflow Prevention Assembly Test Report Form

APPENDIX C: City of Duvall Backflow Prevention Assembly Test Report Form



**BACKFLOW PREVENTER
INSPECTION AND FIELD TEST**

City of Duvall
14525 Main St NE
PO Box 1300
Duvall, WA 98019
425.788.3434
FAX 425.788.0311
CoDbackflow@duvallwa.gov

ASSEMBLY MANUFACTURER _____	MODEL _____	SERIAL NUMBER _____	SIZE _____	<input type="checkbox"/> Commercial <input type="checkbox"/> Residential
<input type="checkbox"/> New <input type="checkbox"/> Existing		<input type="checkbox"/> Replacement - Old Serial No.: _____		
		<input type="checkbox"/> Removed from Service <input type="checkbox"/> Premise <input type="checkbox"/> In-Premise		

For New Installations:
City of Duvall Permit No.: _____ City of Duvall Inspector: _____

Facility Name: _____ Contact Person: _____ Phone : _____
Facility Address: _____ Email: _____

Preventer Physical Location: _____ Hazard Type / Downstream Process: _____
 DCVA RPBA PVBA AG OTHER _____ Water Service Restored: Yes No Line Pressure: _____ psi

Record Detector Meter Reading – When Applicable USC Approved Proper Installation Proper Orientation Confined Space
 Gal CuFt Yes No Yes No Yes No Yes No

Initial Test	DCVA	RPBA	PVBA / SVBA
<input type="checkbox"/> Passed <input type="checkbox"/> Failed	Check Valve 1 <input type="checkbox"/> Leaked _____ psid Check Valve 2 <input type="checkbox"/> Leaked _____ psid	Relief Valve Opened _____ psid <input type="checkbox"/> Not Open Check Valve 2 <input type="checkbox"/> Closed Tight <input type="checkbox"/> Leaked Check Valve 1 _____ psid Approved Air Gap <input type="checkbox"/> Yes <input type="checkbox"/> No	Air Inlet Valve Opened _____ psid <input type="checkbox"/> Not Open Opened Fully <input type="checkbox"/> Yes <input type="checkbox"/> No Check Valve _____ psid <input type="checkbox"/> Leaked

Cleaning, Repairs & Parts	DCVA	RPBA	PVBA / SVBA
	<input type="checkbox"/> Cleaned <input type="checkbox"/> Repaired <input type="checkbox"/> Disc <input type="checkbox"/> O-Ring(s) <input type="checkbox"/> Spring <input type="checkbox"/> Module <input type="checkbox"/> Guide <input type="checkbox"/> Rubber Kit <input type="checkbox"/> Seat <input type="checkbox"/>	<input type="checkbox"/> Cleaned <input type="checkbox"/> Repaired <input type="checkbox"/> Disc <input type="checkbox"/> O-Ring(s) <input type="checkbox"/> Spring <input type="checkbox"/> Module <input type="checkbox"/> Diaphragm <input type="checkbox"/> Rubber Kit/Guide <input type="checkbox"/> Seat <input type="checkbox"/>	<input type="checkbox"/> Cleaned <input type="checkbox"/> Repaired <input type="checkbox"/> Air Inlet Disc <input type="checkbox"/> Float <input type="checkbox"/> Air Inlet Spring <input type="checkbox"/> Diaphragm <input type="checkbox"/> Check Disc <input type="checkbox"/> Rubber Kit <input type="checkbox"/> Check Spring <input type="checkbox"/>

Final Test	Check Valve 1	Relief Valve	Air Inlet Valve
<input type="checkbox"/> Passed <input type="checkbox"/> Failed	<input type="checkbox"/> Leaked _____ psid Check Valve 2 <input type="checkbox"/> Leaked _____ psid	Opened _____ psid Check Valve 2 <input type="checkbox"/> Closed Tight Check Valve 1 _____ psid	Opened _____ psid Opened Fully <input type="checkbox"/> Yes <input type="checkbox"/> No Check Valve _____ psid

Air Gap Inspection Passed Failed Supply Pipe Diameter _____ " Air Gap Separation _____ "

Remarks *

By this signature I certify:

- I personally inspected and field-tested the backflow assembly using field test procedures meeting WAC 246-290-490 and test equipment meeting WAC 246-292-031; or I personally inspected the air gap or AVB.
- The information in this report is true, complete, and accurate.

Initial Test By (Print BAT Tester Name)	BAT Company Name	BAT Phone	BAT CERT #	Date Tested
BAT Signature	Test Kit Make & Model	Serial #		VER / Cal Date**

*Note unapproved Backflow preventer, missing defective components, repairs made, or conditions that may adversely affect assembly.
**The date of the most recent field test kit verification of accuracy or calibration, whichever is most recent.

APPENDIX D: DOH Backflow Incident Report Form

APPENDIX D: DOH Backflow Incident Report Form



**Cross-Connection Control Program
BACKFLOW INCIDENT REPORT FORM**

Note: Use this form to comply with WAC 246-290-490(8)(g).

Part 1: Public Water System (PWS) Information

PWS ID:	PWS Name:	County:
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Part 2: Backflow Incident Information

A. Incident Identification

Incident date:	Time of incident:	Incident ID (DOH use):
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B. Information on Premises where Backflow Originated

Name of premises:		
Premises physical address:		
City:	,WA	Zip:
Premises type: non-residential <input type="checkbox"/>	residential <input type="checkbox"/>	
Premises category/description (Table 9 category*, if applicable):		
Most recent hazard evaluation prior to incident (mm/dd/yyyy):		None <input type="checkbox"/>
PWS's assessed hazard level:	Premises isolation required by PWS? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Type of backflow preventer required by PWS:	PWS relies on <i>in-premises protection</i> ? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Other hazard evaluation information:		

*See WAC 246-290-490(4)(b)(i).

C. Method of Discovery of Backflow

How the backflow was discovered (check all that apply):	Direct observation	<input type="checkbox"/>	Water quality complaint	<input type="checkbox"/>
	Meter running backwards	<input type="checkbox"/>	Illness/injury complaint	<input type="checkbox"/>
	Water use decrease	<input type="checkbox"/>	Result of Investigation	<input type="checkbox"/>
	Disinfectant residual monitoring ...	<input type="checkbox"/>	Other (Describe):	<input type="checkbox"/>
	Water quality monitoring	<input type="checkbox"/>		
Incident reported to the public water system by:	PWS Personnel <input type="checkbox"/>	Premises Owner/Occupant <input type="checkbox"/>	Other PWS Customer <input type="checkbox"/>	
	Backflow Assembly Tester <input type="checkbox"/>	Other (Specify):		

D. Contaminant Information

Contaminant type (check all that apply):	Microbiological <input type="checkbox"/>	Chemical <input type="checkbox"/>	Physical <input type="checkbox"/>
Describe contaminant (for example, the organism name, chemical, etc.). Please attach lab analysis or MSDS, if available.			

E. Extent and Effects of Contamination

Estimated extent of contamination:	Contained within premises <input type="checkbox"/> Entered PWS distribution system <input type="checkbox"/>
Estimated number of connections affected:	Residential <input type="checkbox"/> Non-residential <input type="checkbox"/>
Estimated population affected or at risk:	Residential <input type="checkbox"/> Non-residential <input type="checkbox"/>
Number water quality complaints:	Describe water quality complaints:
Number illnesses reported:	Describe illnesses/irritation (specific illnesses, if known):
Number physical injuries(e.g. burns) or irritation(e.g. rashes) cases reported:	

Part 3: Cross-Connection Control Information at Backflow Site

A. Source of Contaminant

Source of contaminant or fixture type (check all that apply):	Air conditioner/heat exchanger	<input type="checkbox"/>	Industrial/commercial process water/fluid.....	<input type="checkbox"/>
	Auxiliary water supply	<input type="checkbox"/>	Medical/dental fixture	<input type="checkbox"/>
	Beverage machine	<input type="checkbox"/>	Reclaimed water system.....	<input type="checkbox"/>
	Boiler, hot water system	<input type="checkbox"/>	Swimming pools, spa	<input type="checkbox"/>
	Chemical injector/aspirator	<input type="checkbox"/>	Wastewater (sewage) system	<input type="checkbox"/>
	Fire protection system	<input type="checkbox"/>	Other (specify):	<input type="checkbox"/>
	Irrigation system (PWS supplied)	<input type="checkbox"/>	<input type="checkbox"/>

B. Distribution System Pressure Conditions in the Vicinity of the Backflow Incident

Type of backflow:	Backsiphonage <input type="checkbox"/>	Typical distribution system pressure in vicinity of incident (if range, enter lower end of range):	psi	
	Backpressure <input type="checkbox"/>			
Main/pressure status at time of incident (check all that apply):	Normal	<input type="checkbox"/>	Source/plant outage	<input type="checkbox"/>
	Main break	<input type="checkbox"/>	Scheduled water shutoff by PWS	<input type="checkbox"/>
	Fire fighting	<input type="checkbox"/>	Unscheduled/emergency shutoff	<input type="checkbox"/>
	Other high usage	<input type="checkbox"/>	Unknown	<input type="checkbox"/>
	Power outage	<input type="checkbox"/>	Other (specify)	<input type="checkbox"/>

Describe causes and circumstances leading to backflow:

C. Backflow Preventer Information/Installation/Approval Status at Site of Backflow

Complete the tables in C and D for the *premises isolation* preventer for either of the following situations:

- If a premises isolation backflow preventer is installed **and** the contaminant entered the PWS distribution system.
- If the premises isolation assembly is the only backflow preventer at the site.

In all other cases, complete tables in C and D for the *in-premises* backflow preventer installed at the fixture. If more than one backflow preventer was involved in the backflow incident, copy tables C and D and complete them for the additional preventer(s).

If no backflow preventer was installed at the time the incident occurred, check this box and go directly to Part 4. Don't fill out the tables below (in C and D).

Backflow preventer information:	Type installed:	Installed for:
	Make:	Model: Size:
	Serial number:	Date installed:
Installation status (check all that apply):	Properly installed/plumbed <input type="checkbox"/> Improperly protected bypass present <input type="checkbox"/> Improperly installed/plumbed <input type="checkbox"/> If so, explain:	
Commensurate with assessed degree of hazard?	Yes <input type="checkbox"/> No <input type="checkbox"/>	If not, explain:
DOH/USC-approved at time of backflow incident?	Yes <input type="checkbox"/> No <input type="checkbox"/>	If not, approved when installed? Yes <input type="checkbox"/> No <input type="checkbox"/>

D. Backflow Preventer Inspection/Testing Information at Site of Backflow

Most recent inspection/test information <i>prior</i> to backflow incident. Attach test report(s), if available.	No test report on record <input type="checkbox"/>
	Date tested/inspected: Passed test/inspection <i>without</i> repairs <input type="checkbox"/> Failed initial test/inspection, passed <i>after</i> repair <input type="checkbox"/> Failed test/inspection, no repairs made <input type="checkbox"/>
	Inspection/test information <i>after</i> backflow incident [per WAC 246-290-490(7)(b)]. Attach test report.
	Not tested/inspected <input type="checkbox"/> Date tested/inspected: Passed test/inspection <i>without</i> repairs <input type="checkbox"/> Failed initial test/inspection, passed <i>after</i> repair..... <input type="checkbox"/> Failed test/inspection, no repairs made..... <input type="checkbox"/>
Preventer failure information , if applicable (check all that apply):	Fouled check <input type="checkbox"/> Damaged seat <input type="checkbox"/> Debris <input type="checkbox"/> Other: <input type="checkbox"/> Weather-related damage <input type="checkbox"/>
If preventer failed inspection/test, did failure allow backflow?	Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, explain:

Part 4: Corrective Action/Notifications

Action taken by PWS to restore water quality (check all that apply):	None <input type="checkbox"/>	Other treatment (describe): <input type="checkbox"/>
	Flushed/cleaned mains <input type="checkbox"/>	Replaced mains <input type="checkbox"/>
	Flushed/cleaned plumbing... <input type="checkbox"/>	Replaced plumbing <input type="checkbox"/>
	Disinfected mains <input type="checkbox"/> Disinfected plumbing <input type="checkbox"/>	Other: <input type="checkbox"/>
Action ordered by PWS to correct cross-connection (check all that apply):	None <input type="checkbox"/>	Change existing preventer <input type="checkbox"/>
	Eliminate cross-connection... <input type="checkbox"/>	Repair/replumb <input type="checkbox"/>
	Remove by-pass <input type="checkbox"/>	Reinstall correctly <input type="checkbox"/>
	Install new preventer ... <input type="checkbox"/>	Replace with same type <input type="checkbox"/>
	For <i>premises isolation</i> <input type="checkbox"/> For <i>fixture protection</i> <input type="checkbox"/>	Upgrade type <input type="checkbox"/> Other: <input type="checkbox"/>
Action ordered accomplished?	Yes <input type="checkbox"/> Date: No <input type="checkbox"/> If no, explain:	
Agency notifications per WAC 246-290-490(8)(f) (check all that apply):	DOH <input type="checkbox"/> Local Health Agency <input type="checkbox"/> Local Adm. Authority <input type="checkbox"/> Issued by end of next business day:	
Notifications of consumers in area of incident (check all that apply):	Population at risk <input type="checkbox"/> Public notification (PN per DOH regs.) <input type="checkbox"/> Boil Water Advisory <input type="checkbox"/> Other (describe):	
Other enforcement/corrective actions (describe):		

Part 5: Cost of Backflow Incident (optional)

Item	PWS Personnel Hours Expended	Cost to PWS (\$)	Cost to Premises Owner (\$)
Investigation			
Restoration of water quality			
Correction of cross-connection situation			
Litigation and/or settlement			
Other not included in above			

Part 6: Further Information/Documentation

Additional information about this incident such as pictures, sketches, newspaper/journal articles, water quality analyses, epidemiological reports, etc. would be helpful. Information may be in electronic form or hard copy.

Part 7: Form Completion Information

Note: Form should be completed by a person currently certified as a Cross-Connection Control Specialist.

I certify that the information provided in this Backflow Incident Report is complete and accurate to the best of my knowledge.			
CCC Program Mgr. Name (print):		Title:	
Signature:	CCS Cert. Number:	Date:	
Phone:	E-mail:		
I have reviewed this report and certify that the information is complete and accurate to the best of my knowledge.			
PWS Mgr./Representative Name (Print):		Title:	
Signature:	Op. Cert. Number:	Date:	

Please send completed backflow incident form:

By mail to:

Washington State Department of Health
 Office of Drinking Water – CCC Program Manager
 P O Box 47822
 Olympia, WA 98504-7822

By email to: cccprogram@doh.wa.gov

Please send questions, comments, or suggestions about this form to us at the address above or e-mail them to cccprogram@doh.wa.gov

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).

Appendix J

Wellhead Protection Program

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CITY OF DUVALL

Wellhead Protection Program

1.0 INTRODUCTION

A wellhead protection program is a proactive and ongoing effort of a water purveyor to protect the health of its customers by preventing contamination of the groundwater that it supplies for drinking water.

Section 1428, of the 1986 Amendments to the federal Safe Drinking Water Act (SDWA), mandates that each state develop a wellhead protection program. In Washington State, the Department of Health (DOH) is the lead agency for the development and administration of the State's wellhead protection program. All federally defined Group A public water systems that use groundwater as a water source are required to implement a wellhead protection program. All required elements of a local wellhead protection program must be documented and included in either the Comprehensive Water System Plan (applicable to Duvall) or Small Water System Management Program document (not applicable to Duvall).

The State mandate for wellhead protection and the required elements of a wellhead protection program are contained in [WAC 246-290-135 Source Protection](#), which became effective in July of 1994. The minimum required elements of a wellhead protection program for water systems in Washington State that rely on groundwater are as follows:

- A completed susceptibility assessment of each water source.
- Delineation of wellhead protection areas for each water source.
- An inventory of known and potential contaminant sources located within the defined wellhead protection areas. This inventory list shall be updated every two years.
- Documentation of the purveyor's notification to all owners/operators of known and potential sources of groundwater contamination within defined wellhead protection areas.
- Documentation of the purveyor's notification to regulatory agencies and local governments of the defined boundaries of the wellhead protection areas and the findings of the contaminant source inventory.
- A contingency plan to ensure that customers have an adequate supply of water in the event that contamination causes a temporary or permanent loss of the system's principal source of supply.
- Documentation of the purveyor's coordination with local emergency spill responders (including police, fire, and health departments), including notification of wellhead protection area boundaries, results of susceptibility assessment, inventory findings, and contingency plan.

The City of Duvall is not required to prepare a Wellhead Protection Program, because all potable water supply is provided by Seattle Public Utilities. However, the City is taking a proactive

approach to protecting the Taylor’s Landing Well in the event that the City decides to use the well in the future as a source of potable water.

2.0 Past Protection Efforts

The City of Duvall currently holds a water rights claim to the Taylor’s Landing Well, which is located southwest of the intersection of Main Street NE and NE Allen Street. The well is an artesian well that was historically used to augment low or dry private wells in the unincorporated areas north of Duvall by hauling water from the well site. The Taylor’s Landing Well was closed to the public on May 31, 2000 and securely capped & locked at the time for liability reasons; and as a result, the well is not used for potable water supply. In or around 2017, the City cleared additional space around the wellhead, improved the well cap, poured a concrete slab, and enclosed the wellhead with chain-link fencing and signage.



Water from the well is still sporadically used in the summer by the City’s Public Works Department to fill water tanks for irrigation and other strictly non-potable purposes. The City is retaining the water rights and ownership of the well for possible future use. This wellhead protection plan has been prepared to protect the wellhead in the event that this effort is pursued in the future.

4.0 Water Quality

The Taylor’s Landing Well has a history of good water quality, both before and after public use of the well, which was terminated in May of 2000. Water quality samples were taken from the Taylor’s Landing Well in December of 2001 as part of the East King County Groundwater Monitoring Program. These were the second round of water samples for the well and were tested for a substantially larger number of parameters than the first round. Samples were collected by King County Water and Land Resources Division staff and analyzed by the King County Environmental Lab. The samples were tested for standard inorganic and organic compounds and were all found to be satisfactory in regard to the organic and inorganic parameters. Additionally, many of the organic compounds could not be detected because their concentrations were below the laboratory’s method detection limit (MDL). Though not required, in an effort to document water quality at the wellhead the City began annual water quality testing in 2011.

5.0 Susceptibility Assessment

In 1994, DOH developed the *Susceptibility Assessment Survey Form* for water purveyors to

complete for use in determining a drinking water source's potential for contamination. The results of the susceptibility assessment may provide monitoring waivers which allows reduced source water quality monitoring.

The City of Duvall has not performed a susceptibility assessment for this well in the past, since the well is not used for potable water supply and is not considered a source of drinking water. The City will complete and submit a susceptibility assessment of the Taylor's Landing Well to DOH if the City decides to use the well as a potable water source in the future.

7.0 Delineation of Wellhead Protection Areas

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

7.1 Wellhead Protection Area Zones

The first component of a wellhead protection area is the sanitary control area required by [WAC 246-290-135](#). This protective area should already be tightly controlled by the purveyor to minimize direct contamination at the wellhead. The minimum sanitary control area for a well shall have a radius of 100 feet around the wellhead. The construction, storage, disposal, or application of known or potential contaminants is prohibited within this area, unless permitted by DOH and the water purveyor. The City's only active well is located on City owned property that extends beyond the minimum required sanitary control area.

Wellhead protection areas are commonly based on 1-year, 5-year, and 10-year time of travel zones. For example, a 1-year time of travel zone represents an area around the well or well field in which contaminants could reach the well within one year. Each zone has different management strategies based on the urgency of response and characteristics of risks to public health posed by contaminants within the zones. An additional zone, called "buffer zone", may also be established to provide an area of added protection outside the 10-year time of travel zone for the wellhead protection area.

7.2 Delineation Methods

There are several delineation methods that can be used, but the simplest approach is the Calculated Fixed Radius (CFR) method. This method requires the least amount of technical data and is typically used for the initial delineation for identifying immediate threats to water quality. However, the major drawback of this method is that groundwater rarely behaves as simply as predicted with this method. Applying the CFR method yields a circular boundary around each of the wells or well fields, based on the data entered into a simple volumetric flow equation. Data input includes the annual volume pumped by the well, the open interval or length of well screen,

aquifer porosity, and the desired travel time (typically 6-month, 1-year, 5-year, and 10-year). Other more complex, but probably more accurate delineation methods utilize analytical models, hydrogeologic mapping, and computer flow models.

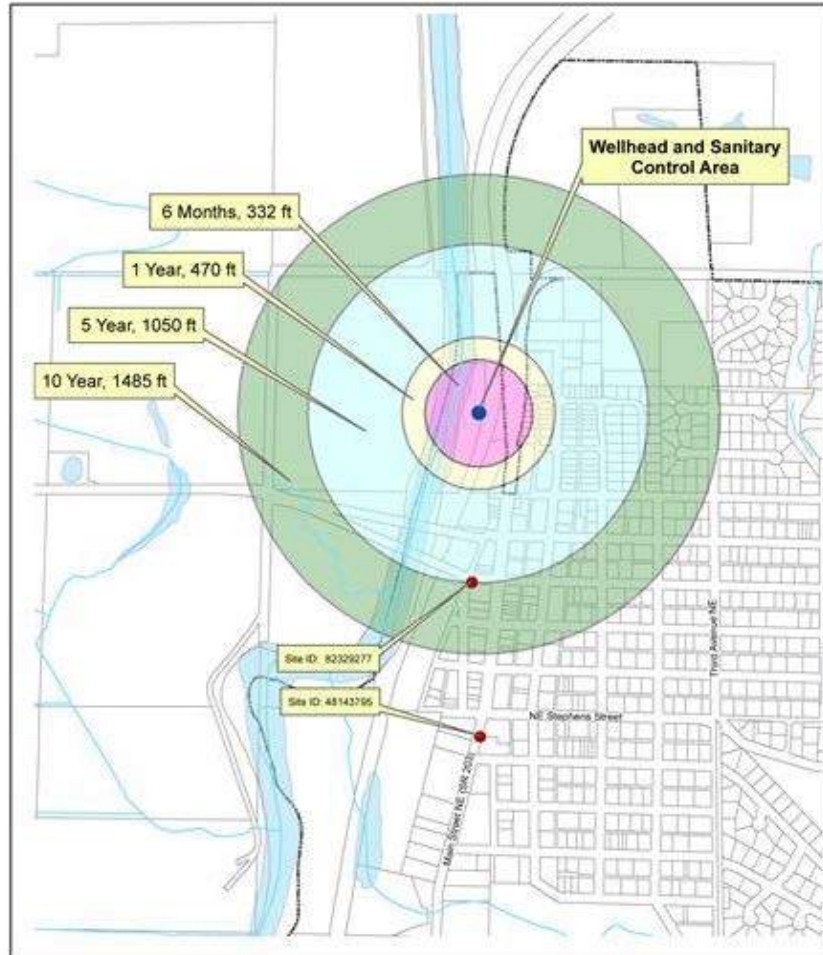
7.3 Delineation Results

The CFR method was utilized during preparation of the City’s 2004 Comprehensive Water System Plan to establish the wellhead protection area boundaries. **Table 1** presents data for the Taylor’s Landing Well and the results of the CFR computations, which are based on the well’s water rights information, since pumping rate information is not available. The wellhead protection area boundaries for the 6-month, 1-year, 5-year, and 10-year time of travel computations are presented in **Figure 1**.

Table 1
Well Data and Calculated Fixed Radius Values

Description	Taylor’s Landing Well
Data	
Source No.	N/A
Sec-Twp-Rng	Govt Lot 4 13-26N-6E
Year Water Rights Granted	1940
Ground Elevation (ft)	48
Screened Open Interval (ft)	10
Current Pumping Rate (gpm)	0
Annual Water Right (gal)	11,404,008
Aquifer Porosity (estimated)	0.22
Calculated Fixed Radius (CFR) Value	
6 Month Time of Travel (ft)	332
1 Year Time of Travel (ft)	470
5 Year Time of Travel (ft)	1,050
10 Year Time of Travel (ft)	1,485

Figure 1
Wellhead Protection Area and Calculated Fixed Radius Values



7.4 Delineation Update Requirements

DOH recommends water systems with a low or moderate susceptibility rating upgrade their initial delineation using a more sophisticated groundwater flow model approach within five years following the initial delineation. If the water system has a high susceptibility rating, DOH recommends upgrading their initial delineation within two years following the initial delineation. In addition, wellhead protection area boundaries should be reviewed and revised when new wells are brought on-line or when there is a change in the annual volume pumped from a well. DOH recommends re-evaluation of the wellhead protection area boundaries during the update of the Comprehensive Water System Plan, which occurs on a 6-year, or now 10-year schedule.

There was been no appreciable change in either the use or demand of the wellhead, or the land uses and ownership adjacent to the wellhead. At this time the City is not proposing any revisions to the wellhead protection boundaries established in 2004.

9.0 INVENTORY OF POTENTIAL CONTAMINANT SOURCES

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination throughout the delineated wellhead protection areas. The purpose of the inventory is to identify past, present, and proposed activities that may pose a threat to the source of water supply (i.e., the aquifer). An initial inventory of a wellhead protection program should include, at a minimum, all potential sources of contamination within the 1-year time of travel zone and high risk potential contaminant sources within the 10-year time of travel zone.

9.1 Inventory Approach

An inventory of potential sources of groundwater contamination was conducted in 2011 during preparation of the City’s 2011 Comprehensive Water System Plan. Several databases maintained by the Washington State Department of Ecology (Ecology) and the United States Environmental Protection Agency (EPA) were searched for known and potential contaminant sources.

The inventory efforts completed to date have been somewhat limited, due to budget limitations and the inactivity of the well site. Prior to any future resumption of potable uses of the well site; the City will complete a more detailed inventory of potential sources of groundwater contamination.

9.2 Inventory Findings

The inventory that was performed revealed several potential sources of contamination located within a broad area around the well. The approximate location of two sites is shown in **Figure 1** and a list of the potential sources of contamination is shown in **Table 2**. Only one of these potential sources is located within the 10-year time of travel zone of the Taylor’s Landing wellhead protection area, as shown in **Figure 1**. All of the potential sources of contamination were found on the Ecology Leaking Underground Storage Tank List.

Table 2
Potential Sources of Contamination

Site ID	Name	Address	Material Stored	WHPA
82329277	Valley Shell	15729 Main St. NE Ste. A	Diesel/Unleaded Fuels	Inside 10 year
48143795	Farwest Petroleum Company	15410 Main St. NE	Unleaded Fuels	Outside 10 year
101082	Harding & Sons (INACTIVE) / Now Sherlock Storage	14441 Main St. NE	Diesel/Unleaded Fuels and Used Oil	Outside 10 year
618917	Safeway Fuel 1572	14020 Main St. NE	Diesel/Unleaded Fuels	Outside 10 year

Source: Department of Ecology Leaking and Underground Storage Tank Lists

Other typical potential sources of contamination that are not specifically shown in **Figure 1** or listed in **Table 2** are discussed below. A further investigation of these will be conducted during future inventory efforts.

Hazardous Spills on Highways – State Route 203 passes through the 6-month, 1-year, 5-year and 10-year time of travel zones of the Taylor’s Landing Well Wellhead Protection Area. Automobile accidents within this section of Highway 203 could result in spills of gasoline or other transported hazardous materials that would threaten the aquifer of the well.

Pesticide and Herbicide Use along Roads – Pesticides and herbicides are typically applied along county roads by King County and along state highways by the Washington State Department of Transportation. Although the chemicals in pesticides and herbicides are a potential source of contamination to the Taylor’s Landing Well, the proper application of them will most likely avoid contaminating the groundwater.

Septic Systems – Septic systems for wastewater disposal and treatment are found in areas of the City that are not served by the City’s sewage collection system. The ability to remove pollutants from the discharge of these systems depends on the type of the surrounding soil. In addition, septic systems may be unlawfully used for disposal of toxic materials. These onsite sewage disposal systems, which typically consist of a septic tank and drainfield, could pose a threat to the City’s groundwater source. However, the City’s existing map of properties served by septic systems shows that no septic systems are located within the 10-year time of travel zone.

Home Oil Furnace Tanks – Some residents in the Duvall area may be using oil furnaces to heat their homes. The number and location of these is unknown. The fuel for oil furnaces can be stored in above-grade or buried tanks. The City’s groundwater source may be threatened by heating oil that leaks out of the tanks into the underlying soil. The risk of this potential contaminant depends on the location of leaking tanks relative to the City’s wells, the amount and rate of leakage, and the type of underlying soil. Since no home oil furnace tanks are known to exist within the Wellhead Protection Area there is little risk of this type of contamination occurring.

Hazardous Household Materials – Almost all households have hazardous materials that are commonly used for a variety of cleaning and maintenance purposes. Some of these materials include cleaning solvents, paints, antifreeze, and engine oil. Improper use or disposal of these may result in contamination of the City’s groundwater source. The Taylor’s Landing Well is located in an area that has several single family residences within its wellhead protection area.

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

Stormwater – Stormwater runoff can potentially contaminate the City’s groundwater source. Runoff from industrial and commercial areas can contain high levels of metals and hydrocarbons. Runoff from residential areas is typically high in nutrients, pesticides, and metals. As development of new housing areas in Duvall occurs more stormwater will

need to be detained, likely through stormwater detention ponds. There are several areas of recent and upcoming land development within the Taylor’s Landing Well wellhead protection area.

Water Courses– Water courses located within wellhead protection areas can carry contaminants that may pose a threat to the City’s groundwater source. The Snoqualmie River is the largest water course within the Duvall area. The mainstream of the Snoqualmie River is located within the Taylor’s Landing Well’s 6-month, 1-year, 5-year, and 10-year time of travel zone.

Agricultural Practices– Ranches within the wellhead protection areas can be a threat to the City’s groundwater source. Inadequate cleanup of animal waste is the most likely source of potential contamination found on ranches.

9.3 Inventory Update Requirements

In accordance with [WAC 246-290-135](#), the inventory list of actual and potential groundwater contaminant sources located within the delineated wellhead protection areas must be updated every two years. The timing of the updates will be scheduled such that every third update is accomplished at the same time as the re-evaluation of the wellhead protection area boundaries that is required during each 6-year Comprehensive Water System Plan update. The inventory list of actual or potential groundwater contaminant sources was updated in July 2011.

11.0 NOTIFICATION OF INVENTORY FINDINGS

Owners and operators of known and potential sources of groundwater contamination will be notified of their location within the delineated wellhead protection areas. In addition, all water customers will be notified (via a billing insert) of the City’s potential groundwater source, the Wellhead Protection Program, and the importance of protecting the City’s potential sources. Regulatory agencies, local governments, and emergency response agencies will also be notified of the location of the wellhead protection areas, contaminant source inventory findings, contingency plans, and emergency response procedures. **Table 3** lists all of the recipients that will be receiving these notifications. An example of each of the four types of notification letters that will be sent is attached.

**Table 3
Notification Recipients**

Agency or Business	Mailing Address	City, State Zip
Businesses within Wellhead Protection Area		
Valley Shell, Owner	15729 NE Main Street	Duvall, WA 98019
Regulatory Agencies and Local Governments		
WA State Dept. of Health	20435 72nd Ave S, Suite 200	Kent, WA 98032
WA State Dept. of Ecology	3190 160th Ave SE	Bellevue, WA 98008
City of Duvall, Planning Dept.	PO Box 1300	Duvall, WA 98019

City of Duvall Water Customers		
As Appropriate	Varies	Duvall, WA 98019

13.0 CONTINGENCY PLANNING

With no active potable uses, and future use anticipated to primarily occur under emergent conditions; loss of this water source would have no impact on the City’s ability to provide water to its citizens. However, for the purposes of providing a framework for future use; the contingency plan for operation of the well in the event of water source contamination is as follows.

Emergency Condition : Aquifer Contamination

Impact on System : Minor impact. Water not suitable for potable use - loss of supply. The City currently uses two connections to Seattle Public Utilities Tolt Supply Line for supply. Taylor’s Landing Well would most likely be used to supplement water received from the Tolt Supply Line. If the aquifer were to be contaminated, the well could be shut down with minimal impact to the City’s water customers.

Emergency Response :

1. Shut down any well pumps or access to the contaminated water source.
2. Notify DOH of the aquifer contamination.
3. Notify the public of the problem and instruct them to boil any water obtained from the water source.
4. Analyze water quality of water within reservoirs (if applicable) and dispose of properly if contaminated.
5. Disinfect reservoirs and water mains, as necessary, to remove contaminated residuals.
6. Adjust control of system facilities, as necessary, to provide supply from storage facilities if water within them is not contaminated.
7. Monitor water quality at affected well field and investigate cause of contamination.
8. Contact Seattle Public Utilities to request additional supply from the Tolt Supply Line, if required.
9. Implement water use reduction measures, as necessary, to ensure an adequate supply of water.

14.0 Program Implementation and Recommendations

The City of Duvall Wellhead Protection Program is an ongoing effort that requires staffing and resources to ensure its effectiveness in protecting a potential source of future drinking water. As

discussed previously in this document, the regulations require that the City complete a *Susceptibility Assessment Survey Form* as well as perform an inventory of all potential sources of groundwater contamination throughout the delineated wellhead protection areas every two years. In addition, DOH recommends water systems using the calculated fixed radius method, like the City of Duvall, upgrade their initial delineation using a more sophisticated groundwater flow model approach within two or five years following the initial delineation, depending on their susceptibility rating. At a minimum, the City must re-evaluate the wellhead protection area boundaries during the Comprehensive Water System Plan update process, which occurs every six or ten years.

The following tasks will be pursued as part of the City's on-going Wellhead Protection Program and completed prior to utilizing the well for potable purposes:

- Develop and adopt a wellhead protection ordinance that addresses permitted uses and performance standards for properties located within designated wellhead protection areas.
- Complete and submit a *Susceptibility Assessment Survey Form* to DOH.
- Perform a more accurate delineation of the wellhead protection area boundaries utilizing analytical models, hydrogeologic mapping, and computer flow models.
- Perform a more detailed inventory of potential sources of groundwater contamination.
- Confirm location, condition, and proper closure of abandoned private wells, especially those within 1-year time of travel zones.
- Distribute the required notifications of delineations and inventory findings.
- Develop and distribute public education materials within the wellhead protection areas to address groundwater protection and household, landscape, and gardening practices that could affect groundwater quality. Coordinate with and utilize existing information developed by King County and DOH.
- Establish a Wellhead Protection Committee to promote public education and awareness of the City's groundwater source and contaminant prevention. Coordinate these efforts with the regional agencies.
- Restrict land uses in the 1-year time of travel zones that pose a high risk to groundwater, such as gas stations, oil recycling, dry cleaners, fuel storage facilities, high density animal keeping, high density septic systems, and golf courses. Coordinate these efforts with King County.
- Develop signage at the perimeter of and at strategic locations around the wellhead protection areas to inform people that they are entering an area that contains a potential drinking water source that is vulnerable to surface activities.

Appendix K

Water Rights Certification and Self-Assessment

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Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

<u>Water Right Permit, Certificate, or Claim #</u> <small>*If water right is interruptible, identify limitation in yellow section below</small>	<u>WFI Source #</u> <small>If a source has multiple water rights, list each water right on separate line</small>	<u>Existing Water Rights</u> <small>Qi= Instantaneous Flow Rate Allowed (GPM) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold</small>				<u>Current Source Production – Most Recent Calendar Year</u> <small>Qi = Max Instantaneous Flow Rate Withdrawn (GPM) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold</small>				<u>10-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>				<u>20-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>			
		<u>Primary Qi</u> <small>Maximum Rate Allowed</small>	<u>Non-Additive Qi</u> <small>Maximum Rate Allowed</small>	<u>Primary Qa</u> <small>Maximum Volume Allowed</small>	<u>Non-Additive Qa</u> <small>Maximum Volume Allowed</small>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate Withdrawn</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume Withdrawn</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qa</u>
1 674 D*	N/A	65	--	35	--	65	--	35	--	65	--	35	--	65	--	35	
2																	
3																	
4																	
5																	
6																	
TOTALS =		63		35	--	65	--	35	--	65	--	35	--	65	--	35	

Column Identifiers for Calculations: A B C =A-C D =B-D E =A-E F =B-F G =A-G H =B-H

<u>PENDING WATER RIGHT APPLICATIONS:</u> 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

<u>INTERTIES:</u> 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 <small>Current quantity purchased through intertie</small>				10-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>				20-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>			
	<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Maximum Qa</u> <small>Annual Volume</small>		<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>Annual Volume</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>
1 Seattle Public Utilities	Not Restricted		01/01/2062	748	N/A	575	N/A	1,129	N/A	867	N/A	1,311	N/A	1,007	N/A
2															
3															
TOTALS =		Not Restricted		748	N/A	575	N/A	1,129	N/A	867	N/A	1,311	N/A	1,007	N/A

Column Identifiers for Calculations: A B C =A-C D =B-D E =A-E F =B-F G =A-G H =B-H

<u>INTERRUPTIBLE WATER RIGHTS:</u> Identify limitations on any water rights listed above that are interruptible.		
Water Right #	Conditions of Interruption	Time Period of Interruption
1		
2		
3		

<u>ADDITIONAL COMMENTS:</u>

Appendix L

Water Quality Monitoring Plan

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CITY OF DUVALL

Water Quality Monitoring Plan

1.0 Introduction

This Water Quality Monitoring Plan presents the requirements for monitoring water quality in the City of Duvall’s (City) distribution system in accordance with the drinking water regulations contained in [WAC 246-290-300](#). This plan also provides a summary of the existing water system facilities and system operation.

2.0 Existing Water System Description

2.1 Water System Information

The City is a municipal corporation that owns and operates a public water system within its corporate boundaries. Water system data on file at the Department of Health (DOH) for the Duvall system is as follows:

System Type	Group A - Community - Public Water System
System Name	City of Duvall
County	King
DOH System ID Number	207508
Owner Number	1625
Address	15525 Main Street NE Duvall, WA 98019
Contact	Steven Leniszewski, P.E.; Public Works Director
Contact Phone Number	425-788-3434

2.2 Water System Operation and Control

The existing water system is divided into five pressure zones, due to the wide range of elevations that are served (between 55 feet and 500 feet). All water supply is provided through two metered connections from Seattle Public Utilities (SPU) Tolt Pipeline No. 1 that follows an alignment directly south of the City. The Tolt 1 Supply Station provides water to the 615 Zone and indirectly fills the 0.5 MG Crestview Estates Reservoir in the 555 Zone through an altitude control valve at the reservoir site. Water from the Tolt 1 supply station can also indirectly fill the 450 Zone’s 2.2 MG Big Rock Road Reservoir through an altitude control valve at the reservoir site. The Tolt 2 Supply Station provides water directly to the 450 Zone and the Big Rock Road Reservoir. The settings of the supply facilities and water usage throughout the system dictate the amount of water either flowing into or out of the reservoirs. When necessary the 615 Zone

Booster Pump Station can draw water from the 450 Zone Big Rock Road Reservoir and pump it into the closed 615 Zone (i.e., no storage within the zone). This process allows the 615 Zone to both meet demands and to supply water to the 0.5 MG Crestview Estates Reservoir when the altitude valve opens for filling the reservoir. The 485 Zone and the 330 Zone are supplied by pressure reducing stations with water that originates from the 555 and 450 Zones, respectively. As planned, the 485 Zone will be incorporated into the 555 Zone to improve looping and service.

2.3 Pressure Zones

A list of the City’s existing pressure zones, average day demand (ADD), and their respective total percent of demand is presented in **Table 1** and further described in Chapter 4. The maximum hydraulic elevation is reflected in the name of each pressure zone.

Table 1. Pressure Zones

Pressure Zone	2019 Annual Supply (gallons)	Average Day Demand (gpm)	Average Day Demand (MGD)	Percent of Total Demand (%)
330	52,108,473	99	0.14	27.8%
450	24,912,998	47	0.07	13.3%
485	1,462,251	3	0.00	0.8%
555	46,650,979	89	0.13	24.9%
615	62,436,860	119	0.17	33.3%
Total	187,571,561	357	0.51	100.0%

2.4 Water Sources

The City’s existing active water source is presented below in **Table 2**. All of the City’s water is currently purchased from Seattle Public Utilities.

Table 2. Water Sources

DOH No.	Source Name	Category	Use
S01	77050Y/Seattle	Purchase – Treated	Permanent

2.5 Water Storage

A list of the City’s existing water storage facilities is presented below in **Table 3**.

Table 3. Water Storage

Name	Pressure Zone	Material	Volume (gallons)	Overflow Elevation (feet)	Current Status
Big Rock Road	450	Steel	2,200,000	450	Active
Crestview Estates	555	Steel	500,000	555	Active

2.6 Water Treatment

All water treatment is currently provided by SPU. The City’s water is chlorinated to disinfect and

kill harmful bacteria that may be present in the water and fluoridated to assist in the prevention of tooth decay. Additionally, filtration and ozonation of SPU’s Tolt River source is provided by SPU at the Tolt Treatment Facility.

2.7 Pump Stations

The 615 Zone Booster Pump Station pumps water from the 450 Zone to the closed 615 Zone.

2.8 Pressure Reducing Stations

A list of the City’s existing pressure reducing stations is presented below in **Table 4**.

Table 4. Pressure Reducing Stations

PRV Name	Upper Pressure Zone	Lower Pressure Zone	Ground Elevation (feet)	Normal Pressure		Station Status
				Inlet (PSI)	Outlet (PSI)	
Kennedy Drive	450	330	213	99	54	Active
26500 NE 145th	450	330	168	118	73	Active
3rd & Virginia	450	330	222	95	50	Active
143rd & 268th	450	330	235	89	44	Removed (2020)
NE Big Rock Road	450	330	173	116	71	Active
Stephens St & Broadway	450	330	188	110	65	Active
272nd & 143rd	555	450	300	106	63	Removed (2020)
Sunset Heights 144th	555	450	292	109	67	Active
Millers Homestead	555	450	317	98	56	Active
Bruett Road	555	450	320	97	55	Active
Kasper Heights	555	485	360	80	56	Active
275th & 141st	555	485	336	90	66	Active
150th & 278th	615	555	436	77	49	Active
Manion & 156th	615	555	434	78	50	Active
282nd & 140th	615	555	406	90	62	Active

3.0 Source Water Quality Monitoring

The quality of drinking water in the City’s water system is regulated by the requirements that are contained in [Chapter 246-290](#) of the Washington Administrative Code (WAC). Since all water is supplied to Duvall from SPU, the City relies on the personnel and procedures of SPU to provide a reliable and high-quality supply of water to the City’s system. SPU is responsible for the quality of the water from the source to the City’s two metered supply connections, whereas the City is responsible for the quality of the water within the City’s water distribution system.

SPU is required to perform water quality monitoring at each of the two active sources for inorganic chemical and physical substances, organic chemicals, unregulated inorganic and organic chemicals, and radionuclides. The water quality laboratory of SPU routinely monitors the

quality of water at the Cedar and Tolt River sources for these substances and subsequently reports the results to Duvall and its other regional supply customers.

4.0 Distribution System Water Quality Monitoring

The City is required to perform water quality monitoring within the distribution system for coliform bacteria, disinfectant (chlorine) residual concentration, lead and copper, and trihalomethanes in accordance with WAC 246-290. However, most of the City’s required monitoring and testing is accomplished by SPU.

Table 5. Water Quality Monitoring Requirements

Test	Location	Schedule	SPU’s Responsibilities	City’s Responsibilities
Routine Coliform	Distribution System	Monthly	SPU collects and tests 5 samples per month by agreement with DOH.	City to provide follow-up samples if required (WAX 246-290-320).
Chlorine Residual	Distribution System	Monthly	SPU collects and tests samples in conjunction with coliform sampling.	City voluntarily completes weekly supplemental testing at 2.2 MG reservoir.
Lead and Copper	Customer Taps	Every 3 years (last in 2018)	City collects and SPU tests samples.	City participates following SPU notification.
Disinfection By-Products	Distribution System	Every 90 days	SPU collects and tests 4 samples at pre-determined locations.	Coordinate with SPU to collect samples and complete testing.
Asbestos	Distribution System	NA	None	Not required due to less than 10% asbestos pipe in system, waiver in place through 2028.
General Disinfection	Distribution System	As needed	None	Laboratory water quality suite testing.

4.1 Monitoring Requirements and Procedures

Coliform Bacteria Routine Sampling – SPU provides coliform monitoring of the City’s water system as part of its regional monitoring program. Specific requirements are contained in [WAC 246-290-300](#). Duvall receives all its water from SPU, which has an agreement with DOH that allows purveyors using water supplied by SPU to collect 70 percent of the samples required. Based on the population served by the City, a minimum of six (6) coliform samples are required each month; however, SPU’s agreement with DOH reduces the minimum number of samples per month to five (5). If a coliform presence is detected in an SPU sample, repeat samples must be taken by the City in accordance with the repeat sampling discussion below.

Table 6 lists the addresses of the City’s routine sampling locations, including upstream and downstream sampling locations if repeat sampling is necessary. A total of five samples are collected at each location for DU-1 and DU-2 each month.

Table 6. Coliform Monitoring Sample Locations

Number	Address	Pressure Zone
DU-1	Intersection of 3rd Ave NE and NE Stewart St	450
DU-2	28522 NE 151st St	615
DU-3	27620 NE 158th PL	555
DU-4	16406 270th Ave NE	330
DU-6	14300 275th Ave NE	555
DU-7	14300 3rd Ave NE	450
DU-8	26425 NE Cherry St	330
DU-9	PW Shop	330
DU-10	2.2 MG Reservoir	615 / 555
<i>*Repeat sampling sites</i>		

Coliform Bacteria Repeat Sampling – The City is responsible for follow-up or repeat sampling if samples collected by SPU test positive for coliforms. If a sample tests positive for coliform, a repeat sample shall be taken at the same location as the suspect sample and two additional samples shall be taken within five service connections upstream and downstream of the suspect sample. These repeat samples shall be taken by the end of the next business day after receiving the unsatisfactory results. If the results conclude that a maximum contaminant level (MCL) is exceeded (i.e., coliform are present in two or more samples for the month, including repeat samples), the City shall proceed with public notification in accordance with Part 7 of WAC 246-290.

Disinfectant Residual Concentration – Specific requirements are contained in [WAC 246-290-662](#) for disinfectant residual concentration monitoring. The samples collected by SPU for coliform analysis are also analyzed for residual disinfectant concentration by the SPU Water Quality Laboratory. The minimum residual disinfectant concentration entering the City’s distribution system should be at least 0.2 mg/L. Samples taken within the distribution system are required to have a residual disinfectant concentration that is detectable in at least 95% of the samples taken each calendar month.

Asbestos – Specific requirements are contained in [40 CFR 141.23\(b\)](#). The current maximum contaminant level for asbestos is seven million fibers per liter and greater than ten microns in length. The City has been granted an asbestos monitoring waiver by DOH because the system has less than 10% asbestos cement (AC) pipe and all water is purchased from SPU.

Fluoride Concentration – Specific requirements are contained in [WAC 246-290-460](#) for systems that are fluoridating drinking water. SPU currently fluoridates the City’s water supply and is therefore required to maintain fluoride concentration in the range of 0.8 through 1.3 mg/L. Determinations of fluoride concentrations shall be made daily by SPU, and reports of the analyses shall be submitted to DOH within ten days of the end of the reporting month. Monthly check samples shall be taken downstream of each fluoride injection point by SPU, at the first sample tap where adequate mixing has occurred.

Disinfection By-Products – SPU provides disinfection by-products monitoring of the City’s water

system as part of its regional water quality monitoring program. Specific requirements are contained in [WAC 246-290-300](#).

Lead and Copper – Specific requirements are contained in Title 40, Parts [141.86](#), [141.87](#), and [141.88](#) of the Code of Federal Regulations (CFR). The City participates in SPU’s regional lead and copper monitoring program. The City regularly obtained samples within the water service area for the regional monitoring program between 2003 and 2008 and submitted the samples to the SPU Water Quality Laboratory for analysis. SPU is expected to resume lead and copper monitoring in the summer of 2011.

Duvall provides information on lead and copper to customers in their annual drinking water quality report to comply with public notification requirements for lead and copper.

The new Lead and Copper monitoring requirements implemented at the State level and becoming effective October 1, 2011 are not expected to affect the City. SPU currently performs Lead and Copper testing and the City already provides information to its customers in the annual Consumer Confidence Report (CCR).

5.0 Coliform & E. coli Response Plan

On April 1, 2016, the federal Revised Total Coliform Rule (RTCR) replaced the 1989 Total Coliform Rule (TCR). The Revised Total Coliform Rule requires systems vulnerable to contamination to “find and fix” problems and pathways that could allow pathogens to enter the distribution system. Routine coliform samples are to be collected from representative points in the distribution system at regular time intervals.

Public water systems are required to deliver safe and reliable drinking water to their customers 24 hours a day, 365 days a year. If the water supply becomes contaminated, consumers can become seriously ill. Fortunately, public water systems take many steps to ensure that the public has safe, reliable drinking water.

One of the most important steps is to regularly test the water for coliform bacteria. This coliform monitoring plan will enable water operators to use laboratory and economical tests to evaluate the microbial water quality of the water system. These tests help ensure the water provided to customers is free of disease-causing organisms.

5.1 Coliform Bacteria

Coliform bacteria are organisms that are present in the environment and in the feces of all warm-blooded animals and humans. Coliform bacteria will not likely cause illness. However, their presence in drinking water indicates that disease-causing organisms (pathogens) could be in the water system. Most pathogens that can contaminate water supplies come from the feces of humans or animals. Testing drinking water for all possible pathogens is complex, time-consuming, and expensive. It is relatively easy and inexpensive to test for coliform bacteria. If coliform bacteria are found in a water sample, water system operators work to find the source of contamination and restore safe drinking water. There are three different groups of coliform bacteria; each has a different level of risk. The three groups are; total coliform, fecal coliform and E. coli.

6.2 Total Coliform, Fecal Coliform, and E. coli

Total coliform, fecal coliform, and E. coli are all indicators of drinking water quality. The total coliform group is a large collection of different kinds of bacteria. Fecal coliforms are types of total coliform that mostly exist in feces. E. coli is a sub-group of fecal coliform. When a water sample is sent to a lab, it is tested for total coliform. If total coliform is present, the sample will also be tested for either fecal coliform or E. coli, depending on the lab testing method.

6.3 Coliform and E. coli Present

If routine sample or repeat sample shows “Unsatisfactory, Total Coliform Present” and “E. coli present” then:

1. Notify Water Lead, Water Manager, Public Works Director, DOH
2. FLUSH and “Find and Fix” source of contamination.
3. Take three repeat samples, (one from the same tap, one within 5 (five) connections upstream, one within 5 (five) connections downstream)
4. Conduct an Assessment: A water system evaluation done by a Water Distribution Manager 2 (WDM2) or higher, an Engineer, or Health staff, to “Find and Fix” the contamination source.
5. Public Notification, within 24 hours if 2 (two) related samples test positive for total coliform bacteria and there is E. coli bacteria in one or more of the samples. If sample shows “Unsatisfactory, Total Coliform Present” and “E. coli absent” then repeat items 1-3 listed above and repeat until samples tests “Satisfactory”.

The presence of E. coli bacteria in the distribution system will create significant challenges for us and our customers. We may be required or choose to advise our customers to boil their drinking water or use bottled water. Our customers may not be able to drink their tap water while we investigate the problem or pursue corrective action.

Appendix M

Annual Water Quality Reports

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Rate Assistance Program

During this declared COVID-19 emergency, the City of Duvall has temporarily suspended water disconnections for non-payment, and will not be adding any new late fees on accounts with past due balances. Account balances will continue to accrue. If you have questions, or need to set up payment arrangements, please contact stephanie.goodwin@duvallwa.gov. Current utility payment methods are outlined on the website. Please visit www.duvallwa.gov/132/Utility-Billing for detailed information. If you need financial assistance for utilities, you may consider contacting Hopelink by visiting www.hopelink.org/need-help/financial-assistance.

Community Participation

You are invited to participate in our public City Council meetings and voice any concerns or suggestions you have about your drinking water. The City Council meets the 1st and 3rd Tuesdays of each month at 7:00 p.m. At this time meetings are being held virtually. Please check the city website for current meeting location.

Making Sure This Report Reaches Our Customers

The EPA has informed water providers that having this report available on the City website meets delivery requirements as long as customers are notified of this option and those who would like a paper copy can request one. The City has decided to provide it in this way to conserve paper and save printing and mailing costs. If you would like to provide feedback about the delivery method or request a copy be mailed to you, please send an email to sara.ruhland@duvallwa.gov or call Public Works, 425.788.3434 ext. 8043.

Utility Billing News

Go paperless! Get your utility bill emailed to you. Register using your utility bill. It's free and easy! Just have your most recent utility bill with you for current information and go to <https://duvall.merchantransact.com/>. If you've already registered, sign in and go to My Profile. Under Your Accounts, click on your account number then: Select "NO, do not print and send my bill using the postal service" AND select "YES, send an electronic copy of my billing statement via email". Click on SUBMIT. Your utility bill will be emailed to the account you have registered with. **Please note:** any past due or pending disconnection notices will still be mailed.

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Duvall, WA 98019
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City Hall
15535 Main St NE
Phone: 425.788.1185

Utility Clerk
425.788.1185 ext.8090

Public Works
14525 Main St NE
425.788.3434



2019 Drinking Water Quality Report



Where your water comes from

Duvall is proud and pleased to provide you with our annual drinking water quality report. Duvall's water system contains two supply stations, 41 miles of water main, 15 pressure reducing stations, pump station and two water reservoirs totaling 2.7 million gallons (MG) of water storage. It takes much effort, care and expertise to manage your water system. Maintaining clean and reliable drinking water is an essential priority for Duvall. Ongoing testing and infrastructure improvements to our system help ensure that the quality of the City's water. We are committed to protecting this valuable resource - now and for future generations.

The City purchases all of its water from Seattle Public Utilities (SPU). SPU provides many cities and water districts with water from two watersheds, the Cedar and the Tolt. All of Duvall's water comes from the Tolt Watershed. Both SPU and Duvall monitor and test it to maintain high quality. There are seven sample stands throughout the city that SPU and Duvall use to test the quality of our drinking water every day.

Drinking Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Ensuring Safe Tap Water

To ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) and / or the Washington State Department of Health (DOH) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and / or the Washington State Department of Agriculture regulations establish limits for contaminants in bottle water that must provide the same protection for public health.

Special Health Needs

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 guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline.



Other Useful Tolt Data:

Water Hardness = 1.27 Grains / Gallon (this water is soft)

PH = 8.18

Alkalinity = 19.7 mg

Definitions:

1 ppm = 1000 ppb

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.

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.

MRDL: *Maximum Residual Disinfectant Level* - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG: *Maximum Residual Disinfectant Level Goal* - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: *Not Applicable*

ND: *Not Detected*

NTU: *Nephelometric Turbidity Unit* - Turbidity is a measure of how clear the water looks. The turbidity MCL that applied to the Cedar supply in 2019 is 5 NTU, and for the Tolt supply it was 0.3 NTU for at least 95% of the samples in a month. 100% of Tolt samples in 2019 were below 0.3 NTU.

ppm: *1 part per million = 1 mg/L = 1 milligram per liter*

ppb: *1 part per billion = 1 ug/L = 1 microgram per liter*

TT: *Treatment Technique* - A required process intended to reduce the level of a contaminant in drinking water.

Cross Connection Control Program

The purpose of a Cross Connection Control Program is to keep unsafe water from mixing with the potable water supply. Duvall maintains a database of assemblies installed throughout the City. We monitor all testing and send customers an annual reminder notice. Your efforts in performing required testing is essential to protecting our drinking water.

Backflow assemblies fail for a variety of reasons. That's why state law requires them to be tested annually by a certified tester - to ensure that the assemblies will function if there is a backflow event.

Garden Hoses can be hazardous to the water quality in your home. To prevent backflow and keep your water safe **DO NOT:**

- ◆ Submerge a garden hose into anything that you would not want to drink.
- ◆ Use hose-end applicators to apply garden chemicals to your yard.

When not in use, keep the hose bibs on the house in the "off" position. The spray nozzle at the end of the hose is not a safe shut off. If you have an automatic sprinkler system you most likely have a double check valve assembly that requires annual maintenance and testing. Anyone curious to find out more can call 425.939.8042 to discuss.



2019 Results

The results of monitoring in 2019 are shown in the following tables. These results are parameters regulated by federal and state agencies. For other water quality information please contact the Public Works Department. We can also send you a list of the more than 200 compounds for which we tested for but did not find in our drinking water supplies. Water quality data for non-regulated parameters are also provided on SPU's website: <https://www.seattle.gov/utilities/services/water/water-quality>.

Water quality monitoring data can be difficult to interpret. To make all the information fit into one table, we use many acronyms that are defined within this report.

2019 Water Quality Monitoring Results

Detected Compounds	Units	EPA's Levels in Tolt Water				Typical Sources
		MCLG	MCL	Avg.	Rng.	
Raw Water						
Total Organic Carbon	ppm	NA	TT	1.1	1.0 to 1.3	Naturally present in the environment
Finished Water						
Turbidity	NTU	NA	TT	0.03	0.01 to 0.17	Soil runoff
Arsenic	ppb	0	10	0.4	0.3 to 0.4	Erosion of natural deposits
Barium	ppb	2000	2000	1.3	1.1 to 1.5	Erosion of natural deposits
Bromate	ppb	0	10	0.2	ND to 2	By-product of drinking water disinfection
Nitrate	ppm	10	10	0.11	One sample	Erosion of natural deposits
Chromium	ppb	100	100	0.2	ND to 0.24	Erosion of natural deposits
Fluoride	ppm	4	4	0.7	0.6 to 0.8	Water additive, which promotes strong teeth
Coliform, Total	%	0	5%	0		Naturally present in the environment
Total Trihalomethanes	ppb	NA	80	29.0	21.2 - 35.7	By-products of drinking water chlorination
Haloacetic Acids(5)	ppb	NA	60	21.3	14.8 - 28.6	
Chlorine	ppm	MRDLG = 4	MRDL = 4	Avg = 0.87 Rng. = 0.76-1.01		Water additive used to control microbes

Report Illicit Discharges or Spills

All city storm drains flow into natural waterways. So it is very important to report illegal dumping or even accidental spills in our roadways, storm systems or natural waterways.

Business Hours 7:00 - 3:30 PM, M-F: 425.939.8040

After Hours: 425.419.3748 (Emergency Only)

Non-emergency information may also be sent to stormwater@duvallwa.gov.



Contaminants and Regulations

Washington's Source Water Assessment Program is conducted by the DOH Office of Drinking Water. According to the DOH, all surface waters in Washington are given a susceptibility rating of "High", regardless of whether contaminants have been detected or whether there are any sources of contaminants in the watershed. Information of the source water assessments is available from the DOH website at: <https://fortress.wa.gov/doh/swap/>.

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 EPA's Safe Drinking Water Hotline, **1.800.426.4791**.

Since both watersheds are publicly owned, SPU is able to vigorously protect its watersheds through a comprehensive watershed protection program. Even so, there is always some potential for natural sources of contamination. In Duvall's surface water supplies, the potential sources of contamination include:

- Microbial contaminants, such as viruses, bacteria, and protozoa from wildlife;
- Inorganic contaminants, such as salts and metals, which are naturally occurring; and
- Organic contaminants, which result from chlorine combining with the naturally occurring organic matter.



Appendix N

Hydraulic Model Calibration

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Technical Memorandum

Date: July 14, 2020

Project: Water Model Update and Steady State Calibration

To: Shaun Tozer
City of Duvall

From: Elisheva Walters, EIT
Stephanie Ard, PE
MurraySmith, Inc.

Re: Model Update & Steady State Calibration



Background

The City of Duvall's (City) hydraulic model is maintained on an on-call basis by MurraySmith and was last calibrated in 2011 for the 2012 Water System Plan. The hydraulic model is used for water system analyses and improvement-planning purposes. MurraySmith has periodically updated the model network with new GIS records; the last of these updates occurred in Fall 2018.

The City is growing at a fast pace; new customers and additional piping are added yearly to the system. As part of the City's 2020 Water System Plan update, MurraySmith updated and calibrated the model with the most recent GIS records, developer plat planning documents, field testing, and current operational settings.

The following memo documents the calibration of the hydraulic model according to the guidelines in **Section 6.1.3** of the Department of Health's (DOH) *Water System Design Manual*, dated October 2019.

Model Update

The model update included a facility and network updates, demand allocation, and steady-state calibration, as described in more detail in the following sections.

Facilities Update

No major changes were made to system facilities (pumps, supply stations, and tanks) since no improvements have been made to the facilities since the last model update.

Operational settings for system control valves were updated using City-provided settings.

Water System Pipe Network Update

To accurately represent the City’s current system in the model, new piping from the City’s GIS records dated December 19, 2019, were imported into the model and assigned a diameter, material, roughness, and date of installation using GIS data. A detailed list of major piping updates is shown in **Table 1**. Local contour data was used to assign elevations to pipe network junctions. Pipe connectivity was reviewed manually and using model network analysis tools; for example, to check for duplicate junctions at the same location or disconnected adjacent pipes. Pressure zone boundaries were manually reviewed to ensure pressure zones were discrete (not leaking); all pipes and isolation valves between pressure zones were closed.

Table 1
Major Pipe Updates

Description	Year Installed	Pressure Zone	Linear Feet	Diameter (in)	Material
Dietrich Jung Water Main Extension	1996*	450	715	8	DI
			240	4 to 6	DI
North Hill Development	2016	615	5,543	6 to 8	DI
			73	1 to 2	PVC
SR 203 Safety Improvements	2016	330	218	8 to 12	DI
Big Rock Road/Walden/Duv	2019-	330, 450, and	13,545	6 to 8	DI
Development	2020**				
Cedarcrest High School	1996*	615		4 to 12	DI

*Not included in previous model

**Portions of this development had not been installed at the time of calibration; these pipes were inactivated in the model for calibration.

Demand Allocation

Water consumption was allocated to accurately represent current system demands. The City’s 2019 annual billing records were spatially located by address using GIS street address data, and the average billed demand for each meter was allocated to the nearest junction in the model. Nodes were visually verified at zone boundaries to ensure demand was allocated to the correct zone. Billed demands were then scaled up to account for non-billed system demands and distribution system leakage using production data from the SPU Tolt Supply stations. The 2019 billed use was scaled until the total demand matched the amount purchased from SPU in 2019 (minus construction water use; see below). See **Figure 1** for a summary of demand allocation by pressure zone.

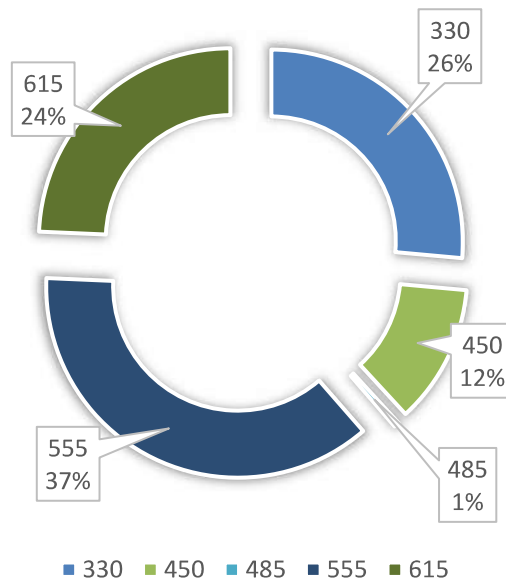


Figure 1
Demands by Zone

Due to the rate of growth and development in Duvall, construction water use through hydrants accounted for a large portion of water use in 2018 and 2019. Murraysmith elected not to include this demand in the model due to its inconsistent location and annual demand. Because water for construction is typically not pulled from hydrants during peak use, the absence of this demand in the model is not expected to affect system operations during worst case flow scenarios.

Aside from construction hydrant use, 90% of the water purchased from SPU was billed to customers in 2019. This difference between billing volume and production volume is considered to negligibly impact the accuracy of the model; however, several factors may contribute to the discrepancy:

- System leakage (6.2% of production for 2018)
- Any net storage difference over the year
- False meter reads
- Customer meters that could not be spatially associated (address was not found)
- Flushing

Steady State Calibration

During the steady state model calibration, system field data was compared to model simulation results and Murraysmith considered how the model might be updated to reflect reality. Static and residual pressures were measured at representative hydrants throughout the water system, and boundary conditions were reported for the time of the test (e.g. tank level, pump status, supply station head). A confidence level was assigned to each hydrant location based on how closely the pressures in the model matched field pressures.

Static Pressure and Flow Testing

Field testing was conducted in March 2020 at 23 hydrant locations for all pressure zones in the distribution system, except the 485 zone, which is a small zone supplied by other pressure zones. Continuous pressure monitoring was not conducted.

Each field test consists of the following. **Figure 2** illustrates the hydrant test setup.

- An initial static pressure reading is measured at the selected “pressure” hydrant. (“Pressure hydrant” refers to the hydrant that remains closed during the test.)
- Flow measurement equipment is installed on an adjacent “flow” hydrant. The small port of the hydrant is opened to measure flow. (“Flow hydrant” refers to the hydrant that is opened during the test.)
- Once pressures stabilize at the pressure hydrant and flow stabilizes at the flow hydrant, the residual pressure is measured at the pressure hydrant.
- The static pressure, flow rate, and residual pressure are recorded along with the date and time of the test, and system boundary conditions (e.g. tank level or pump status). Because Duvall does not have a working telemetry system, it was not feasible to record system boundary conditions for each test. Instead, each tank level and the downstream pressure at the Tolt 1 Supply Station was recorded before testing began (the Tolt 2 Supply Station was noted as out of service during testing). The 615 booster pump station was assumed to be off for the duration of the testing period.

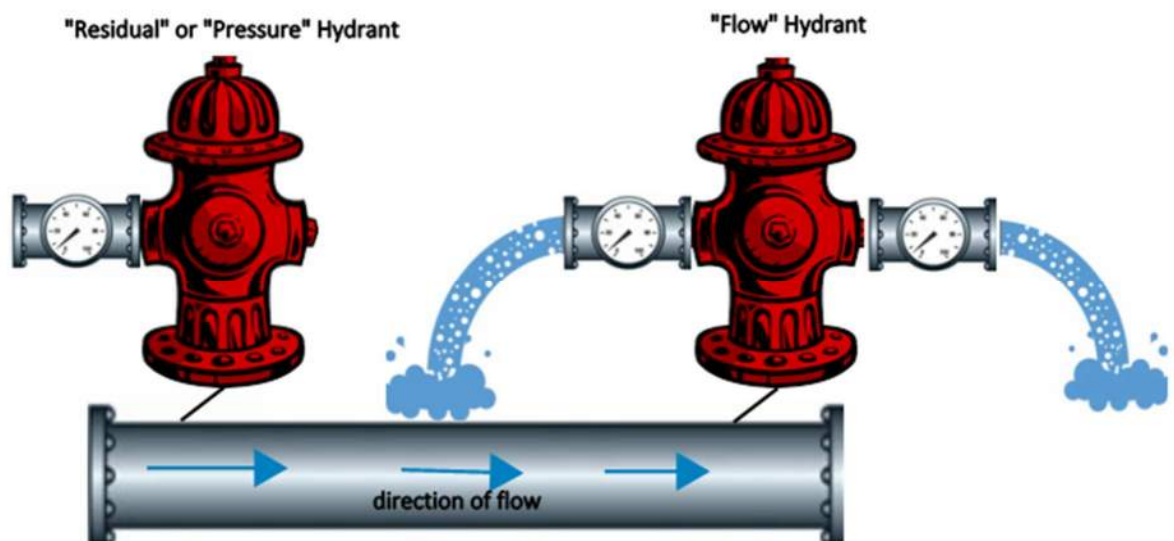


Figure 2
Hydrant Test Setup

Test locations were chosen to represent each pressure zone, favoring locations at the edge of a zone and/or on a dead end since these locations typically feel pressure changes before other

locations in the system during high flows. Representative locations at new developments or in areas with water quality issues were also tested. A map of test locations is shown in **Figure 3**.

Boundary Conditions and Operational Status

In addition to flow and pressure data, system boundary conditions are required to calibrate a model. “Boundary conditions” refer to the operational status of the system during the test (e.g. tank level, whether or not a pump is on, closed valve). The head and flow from the Tolt Supply Station 1 acted as a constant boundary condition for all zones in the system. In pressure zones 330, 485, and 555, the boundary conditions were dictated by pressure reducing valve (PRV) settings which remained unchanged during flow testing. The Tolt Supply Station 2 was not operational during the tests (a boundary condition for zones 450 and 330). In zones 450 and 555, tank water level was required to establish boundary conditions. For zone 615, the booster pump boundary condition was assumed to be “off” for all tests, which matched field conditions during the tests.

Because continuous telemetry was not available for the tests, tank levels and Tolt Supply head was approximated based on the condition measured before the tests began. Lower confidence levels may be expected for the calibration tests due to this approximation.

Calibration

During calibration, model attributes were adjusted according to available data and by trial and error until model results closely matched field tests. As a starting point, junction and facility elevations were reviewed against local contour data and updated where required. Pipe roughness factors were updated according to the values shown in **Table 2**.

Table 2
Updated Roughness Coefficients

Zone	DI Pipe	PVC/ABS Pipe	AC Pipe	Other
615	135	150	120	130
555	130	140	120	130
450	130	150	120	130
330	130	140	120	130

Where model pressure results did not match field test data, Murraysmith worked with the City to confirm nearby water main configurations, valve settings/statuses, and elevations. The following is a list of specific assumptions or findings made during the calibration.

- A minor loss of 50 was assigned at the Big Rock 2.2 MG tank to simulate head losses at the tank. The City is actively working to track down the causes of these losses.


- Field tests showed large losses in the Old Town neighborhood. A 4-inch pipe was added to Cherry St to simulate observed pressure losses for this location.
- The model showed large static pressure discrepancies using the City's provided PRV settings at the Tolt Supply Station 1. A pressure setting of 100 psi was used for the 4" PRV and a setting of 97 psi for the 8" PRV. This discrepancy could be due to a faulty elevation for the PRVs.
- The 12" pipe downstream (east) of Cedar Crest High School was changed to 8" pipe.
- The pressure setting on the pressure sustaining valve at the fill line for the Crestview 0.5 MG tank was changed to 52.9 psi to match field static pressures in the 615 zone.

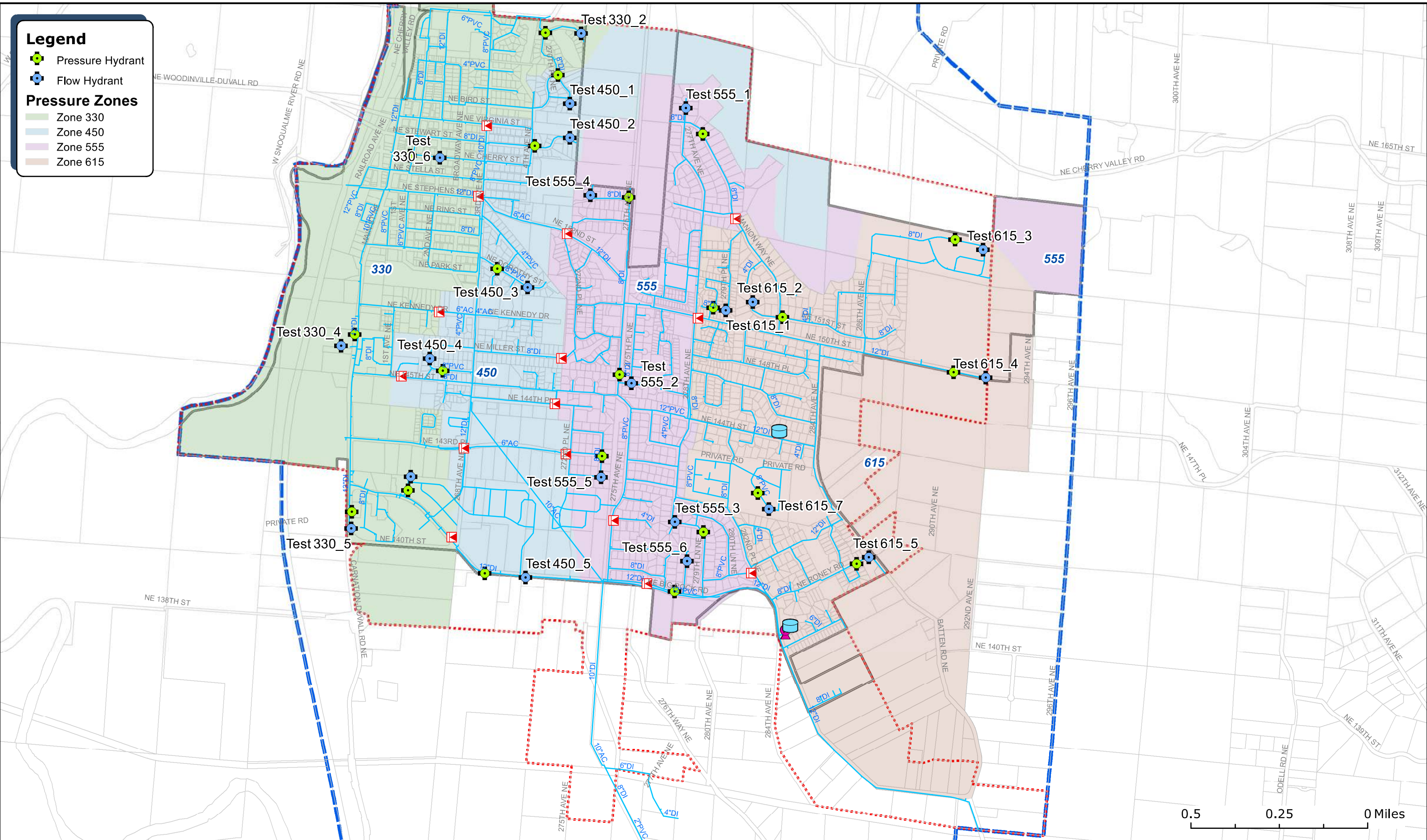
Any remaining calibration discrepancies were attributed to possible errors during field tests, such as improperly calibrated equipment, erroneous data readings, or from a test performed too quickly after the previous test without allowing time for the water system to stabilize.

Legend

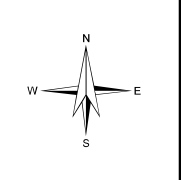
-  Pressure Hydrant
-  Flow Hydrant

Pressure Zones

-  Zone 330
-  Zone 450
-  Zone 555
-  Zone 615



\\ad.msa-ep.com\Tacoma\TAC_P\Projects\19\2631 - Duval\2019 Water System Plan\GIS\WXD\Calibration Memo Figures\Duval_HydrantTests_figure1.mxd 5/12/2020 2:43:30 PM elisheva.walters



**City of Duvall
Water Master Plan**

**Figure 3
Testing Location Map**

Confidence Level

The overall confidence in model performance based on calibration results is summarized for each zone according to the criteria listed in **Table 3**. High confidence in model results indicates less uncertainty in any identified deficiencies and improvement analysis used in system-wide master planning as well as localized development reviews.

The confidence level of the model can also be evaluated using a regression analysis of the field pressures vs. model pressures (or, for residual pressure changes, the pressure change in the field vs. the pressure change in the model). Because a linear model can be assumed for this analysis, an R-squared value closer to 1 indicates higher model accuracy. As shown in **Figures 4 and 5**, the static model configuration for Duvall is more reliable than when the system is made to handle large amounts of flow. This lower confidence level for high-flow conditions is partially because of the limited access to real-time boundary conditions (e.g. SCADA data) for the calibration scenario.

Table 3
Calibration Confidence Level

Confidence Level	Confidence Definition*
High	0 to 5psi difference
Medium	6 to 10 psi difference
Low	Greater than 10 psi difference

*The pressure difference refers to the difference between field and model static pressure as well as the difference between field and model residual pressure drop.

The results of the model calibration and confidence level are summarized by zone in **Table 4** for the 2010 and 2020 calibration efforts. The calibration confidence levels for each of the 2020 tests are shown in **Figure 4, Figure 5, and Table 5**.

Table 4
Summary of Calibration Confidence by Zone

Pressure Zone	Confidence (2010)	Number of Test Locations (2010)	Confidence (2020)	Number of Test Locations (2020)
330	Low	1	Medium	4
450	Medium	2	High	5
485	High	1	*	0*
555	Medium	2	Medium	6
615	Low	2	High	8

*No tests were performed in the 485 zone due to its small size.

Table 5
Steady State Calibration Testing Data

Test ID	Pressure Zone	Date & Time	Pressure Hydrant			Flow Hydrant		Absolute Static Difference model-field (psi)	Static Confidence	Absolute Residual Drop Difference model-field (psi)	Residual Drop Confidence
			Hydrant ID	Static Pressure (psi)	Residual Pressure (psi)	Hydrant ID	Flow Rate (gpm)				
330_2	330	3/4/2020 13:20	FHYD0199	115	95	FHYD0024	1163	0.2	High	2.3	High
330_4	330	3/4/2020 13:40	FHYD0283	130	115	FHYD0286	1400	5.3	Medium	9.2	Medium
330_5	330	3/4/2020 14:00	FHYD0109	104	96	FHYD0108	1365	3.1	High	1.9	High
330_6	330	3/9/2020 12:45	FHYD0228	100	55	FHYD0230	1121	6.9	Medium	1.3	High
450_1	450	3/9/2020 13:15	FHYD0202	110	80	FHYD0201	1297	6.5	Medium	2.7	High
450_2	450	3/4/2020 13:01	FHYD0220	85	77	FHYD0221	974	2.9	High	2.4	High
450_3	450	3/9/2020 11:09	FHYD0028	75	60	FHYD0249	1163	2.1	High	4.0	High
450_4	450	3/9/2020 10:50	FHYD0267	90	85	FHYD0011	1324	3.1	High	6.1	Medium
450_5	450	3/9/2020 10:30	FHYD0067	105	75	FHYD0068	1238	3.1	High	0.2	High
555_1	555	3/4/2020 11:00	FHYD0361	75	68	FHYD0362	1238	3.1	High	4.4	High
555_2	555	3/4/2020 11:24	FHYD0044	65	62	FHYD0153	1163	0.5	High	0.6	High
555_3	555	3/9/2020 10:16	FHYD0127	65	55	FHYD0039	1121	2.5	High	7.1	Medium
555_4	555	3/4/2020 12:41	FHYD0179	60	51	FHYD0180	1163	1.1	High	2.1	High
555_5	555	3/4/2020 11:43	FHYD0293	85	70	FHYD0294	1269	1.1	High	10.8	Low
555_6	555	3/9/2020 9:13	FHYD0034	75	55	FHYD0380	1121	1.5	High	8.3	Medium
615_1	615	3/9/2020 10:37	FHYD0084	84	65	FHYD0083	698	0.7	High	1.9	High
615_2	615	3/9/2020 10:18	FHYD0352	80	60	FHYD0353	604	3.1	High	1.2	High
615_3	615	3/4/2020 9:37	FHYD0384	110	85	FHYD0386	950	0.9	High	1.0	High
615_4	615	3/4/2020 9:59	FHYD0088	80	55	FHYD0087	974	0.3	High	2.3	High
615_5	615	3/4/2020 14:28	FHYD0113	82	64	FHYD0112	1163	0.7	High	2.0	High
615_7	615	3/9/2020 8:30	FHYD0339	90	75	FHYD0340	1269	2.2	High	10.0	Low

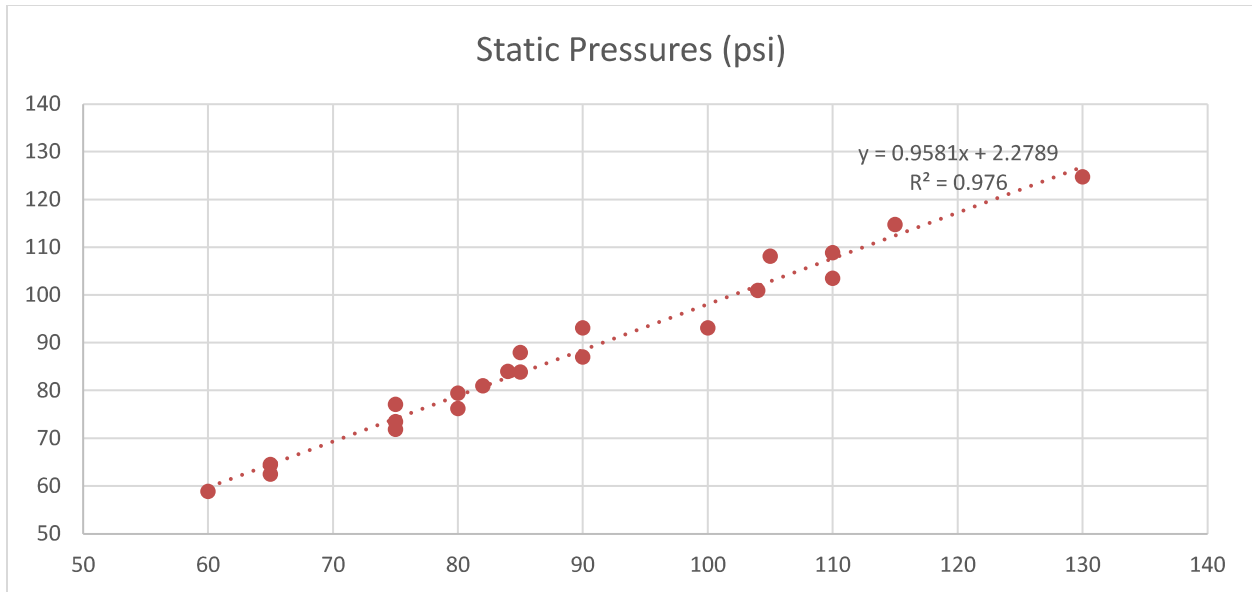


Figure 4
Regression Analysis for Static Pressures

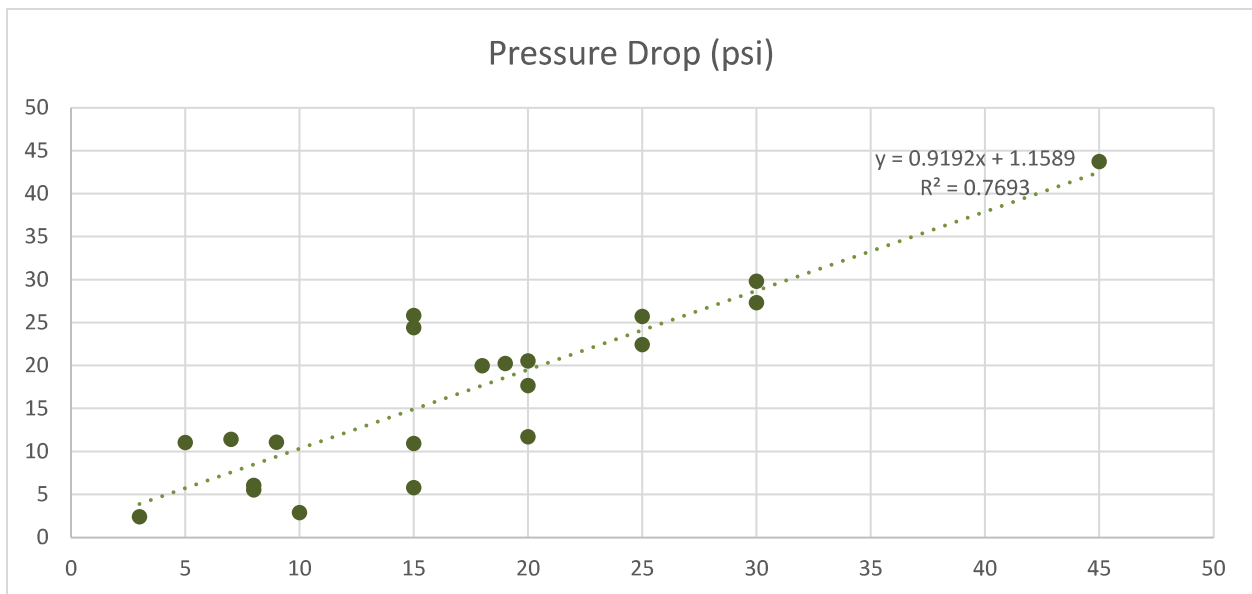


Figure 5
Regression Analysis for Residual Pressure Drop

Conclusion

Using the available data, the model was calibrated to reasonably correspond to field pressure and flow tests. Static pressures in the model show a high correlation with static pressures taken in the field, while residual pressures show a medium correlation with residual pressures taken in the field. These results show that while the model is well calibrated using existing data, there is room for improvement once better telemetry controls are installed and active within the City's system.

For this calibration, the model boundary conditions (tank levels, Tolt head, and pump flows) were determined based on a manual measurement at the beginning of the flow test day. Once live telemetry data is available, one will have a better understanding of how flow moves through the physical system and be better able to replicate this flow in the model.

The confidence level achieved for this model make it acceptable to use for planning-level analyses on the system. Furthermore, the simplicity of the system may increase the modeler's confidence level in the model since the lack of complexity reduces variables that could introduce model error.

Appendix O

Determination of Non-Significance

Waiting on SEPA Review

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Appendix P

Asset Management

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Technical Memorandum

Date: February 17, 2021

Project: Duvall Comprehensive Water System Plan

To: Shaun Tozer
City of Duvall

From: Stephanie Ard, PE
Mari Orama, PE

Re: City of Duvall Asset Management Best Management Practices



Introduction

MurraySmith, Inc. (MurraySmith) has prepared a technical memorandum (TM) summarizing Asset Management Best Management Practices (BMPs) for the City of Duvall (City) as part of the City's Comprehensive Water System Plan (WSP) Update. An asset management program can be an important tool for a water system to accurately plan and budget for the rehabilitations or replacement of its facilities. While the City does not currently have a formal asset management program, it performs many of the recommended asset management practices. This TM will recommend additional practices that the City can do to solidify its asset management program.

This TM provides a summary of Federal and State asset management regulations and recommendations, as well as a review of the City's current asset management practices. It then provides the City with recommended improvements to its asset management practices. These improvements can be incorporated to further assist the City in their long-term water system asset management plan.

Federal and State Asset Management Regulations and Recommendations

Both the United States Environment Protection Agency (EPA) and Washington State Department of Health (DOH) recommend that public water systems develop and maintain an asset management program. Asset management is a planning process used by water systems to provide safe and reliable drinking water to consumers while maintaining assets at the lowest life cycle cost (EPA, 2003). Asset management involves developing plans aimed to alleviate challenges posed by increasing water demands, emergencies due to asset failures and deficiencies, and determining

optimal timeframes to repair/replace aging assets while focusing on operations and maintenance to prolong asset service life (DOH, 2019, 2020).

Washington State regulations require water systems to include an asset inventory and analysis within their WSP (*WAC 246-290-100(4)(e)(iii)*). The asset inventory and analysis serve as the basis for a system's asset management program. The asset inventory reviews the physical condition and life expectancy of each asset, encouraging the system to plan for required rehabilitation or replacement. The asset analysis reviews assets critical to meeting water demands and regulatory requirements and identifies deficiencies to be addressed in the City's Capital Improvement Plan (CIP) (DOH, 2020).

DOH provides five core questions as an asset management framework for water systems. The five core questions assist water systems in addressing the major components of an asset management plan. DOH also provides recommended BMPs to further assist water systems in assessing and managing their assets (2019). The five core questions of asset management are explained below:

1. What is the current state of my system's assets?

Develop an inventory of all City-owned facilities and its condition, as well as information on each individual asset. This information may include location, useful life, value or replacement costs, and service history.

2. What is my required "sustainable" level of service?

Define the City's required level of service and associated system performance goals, both short- and long-term. Required sustainable level of service is determined by the level of service customers demand and regulators require, in addition to what the City can provide.

3. What assets are critical to sustained performance?

Analyze the City's assets by determining which assets are critical and which assets are required to sustain the required level of service. Critical assets have a high failure risk and will present major consequences to the City's system if the asset fails. Each asset may present a different failure risk and assets are not equally critical to the City's water system operations.

4. What are my minimum life cycle costs?

Determine minimum life cycle cost options for each asset. Current conditions, operations and maintenance (O&M) efforts, and repair history of the City's assets may help manage and optimize future O&M efforts and capital budget accounts, in addition to identifying when an asset should ideally be replaced.

5. What is my best long-term funding strategy?

Develop an effective long-term funding strategy to implement critical improvements and replacements of the City's assets while sustaining the required level of service. Determine the City's financial forecast by defining the economic cost of O&M within the system and generated revenue, and by identifying any external funding resources.

These EPA and DOH recommendations are used as guidelines in developing a water system's asset management plan.

Asset Management Analysis and Recommendations

The City currently performs several asset management practices, allowing it to actively plan for the maintenance, repair, and replacement of all its major facilities. The following discussion includes a description of the City's current asset management practices, and recommendations to assist the City in its asset management program. These recommendations also consider the City's current efforts to update their WSP and conduct a RRA of the City's system.

Question 1 - What is the current state of my system's assets?

Current Practices:

An important first step in any water system asset management program is an inventory of the water system assets. The City's major assets include its distribution mains, transmission mains, 15 PRV stations, two (2) storage facilities, one (1) booster pump facility, and two (2) source of supply facilities. The City currently manages an inventory of these assets using a geographical information system (GIS) database to tag each asset's type, location, and installation date.

As part of the City's WSP Update process, the City has defined expected service lives for its various assets. It assumes the expected service life for storage tanks, pump stations, and supply stations to be between 75 and 100 years, and the expected service life for watermains to be between 50 and 75 years. The City actively assesses and plans for the repair and replacement of its watermains, which they replace before the end of its expected service life. Additionally, the City assesses and plans for the maintenance, repair, and replacement of all its assets by building the cost into their annual budget.

Recommended Improvements:

As assets are replaced or new assets are installed, the City should continue to update the GIS data to maintain an accurate inventory. It is recommended that this information should be reviewed and updated by City staff at least annually to ensure that it continues to reflect current costs and facility conditions. It is also recommended that this information is used in the development of its capital improvement plan and annual budget.

In addition, the City should consider adding the following data fields to its GIS inventory. These fields would assist the City in tracking the conditions of its facilities:

- Condition assessment and rating – It is recommended that City staff develop a simplified condition assessment and rating system for staff to complete during their regularly scheduled maintenance. It is recommended that this rating be included in GIS. It may also be helpful to provide a link to the network folder storing O&M recorders, observations, and assessment data to GIS.
- Estimated useful life of the assets – City staff should determine the remaining service life of their water system assets based on historical repair and replacement records for the water system assets. Although industry standards recommend general design life for water facilities and water mains, developing remaining useful life estimates based on O&M and staff observations will be more accurate.
- Estimated replacement year – Using the estimated useful life, estimate the replacement year of each asset. Stating the estimated replacement year should help the City budget for the eventual replacement of each asset.

Question 2 - What is my required “sustainable” level of service?

Current Practices:

The City strives to continue to provide its customers with safe and reliable drinking water and a high level of service. It ensures that its system meets or exceeds all State and Federal requirements. To this end, the City has adopted levels of service for the water system as described in Chapter 5 of the WSP. These levels of service describe minimum and maximum water service pressures at customer nodes, fire suppression service levels provided at hydrants, and emergency storage held in its tanks. Chapter 6 of the WSP also details all water quality testing and procedures that the City uses to ensure that it continues to provide good quality water to all customers.

Recommended Improvements:

The City should continue to update its level of service standards as its system and regulatory requirements/recommendations change. The City may also want to determine level of service standards for emergency operations in addition to the established, normal operations level of service goals.

Question 3 - What assets are critical to sustained performance?

Current Practices:

The City is completing a Risk and Resilience Assessment (RRA) for their water system, in which the City will perform a vulnerability assessment. The City will identify the critical assets for the system.

The analysis will also calculate the probability and consequence of failure and the replacement costs for all critical assets.

Recommended Improvements:

As part of the RRA process, the City will identify critical assets and assign a criticality number to their assets. It is recommended that the City include these criticality numbers within the asset inventory in GIS. As changes are made to the system, it is recommended that the City review and update these criticality ratings to ensure that they reflect the current system. It is also recommended that the City regularly update its vulnerability assessment.

Question 4 - What are my minimum life cycle costs?

Current Practices:

The City has developed a preventative maintenance schedule for system components, including watermains, PRVs, hydrants, and the telemetry and control system when operational, that meet or exceed manufacturer's recommendations for maintenance. These practices prolong useful life of assets and prevent unscheduled repair costs that is often more expensive than scheduled maintenance. The City also has a software (work order) program to aid in estimating life cycle costs and long-range planning.

Recommended Improvements:

The City should track the operations, maintenance, rehabilitation, and repair costs for each water system asset so costs for each asset can be determined. By tracking these costs for each asset, improvements that lead to more cost-effective operations and management can be identified and implemented.

Question 5 - What is my best long-term funding strategy?

Current Practices:

As part of the City's WSP Update, the City, with the help of FCS Group, reviews its long-term funding strategies for its capital improvement programs. Currently the City funds projects through accumulated capital cash reserves, annual revenue collections from General Facilities Charges, annual transfers of rate-funded capital or excess cash (above minimum balance targets) from operating accounts, interest earnings on capital fund balances and other miscellaneous capital resources, and revenue bond financing. As part of the current WSP update, the City is reviewing and updating its long-term funding strategy.

Recommended Improvements:

The City should identify which funding program(s) will finance facility repair and/or replacement projects of the facility. It is recommended that the City develop a funding program to finance and

manage asset remaining life-cycle costs. Separate funding programs should also be established for the costs of rehabilitation and repair, as well as the eventual replacement of the City's storage, pump station, and supply facilities and watermains. It is also advised that the City explore external grant and public funding options that are feasible for the City and their long-term financial needs.

Conclusion and Recommendations

The City currently performs many activities that are good asset management practices. The City has a detailed inventory of its water system assets, which is a fundamental step in any asset management program. Additionally, the City has a regular maintenance program that keeps infrastructure in good working order and has adequate funding sources for its historical needs. The City should continue to leverage its GIS to integrate and track additional asset management practices described in this technical memorandum. It is recommended that the City consider adding the following items to its GIS database and reviewing and updating its GIS database at least annually:

- Condition assessment and rating of each asset
- Estimated useful life of each asset
- Estimated replacement year of each asset
- Criticality rating for each asset, determined as part of the RRA.

In addition to these GIS recommendations, the City should consider the following recommendations:

- Develop level of service standards for emergency operations.
- Track the operations, maintenance, rehabilitation, and repair costs for each water system asset so costs for each asset can be determined.
- Develop a funding program to finance and manage asset remaining life-cycle costs. Separate funding programs should also be established for the costs of rehabilitation and repair, as well as the eventual replacement of the City's storage, pump station, and supply facilities and watermains.

These recommended adjustments to the City's asset management practices would improve the City's ability to maintain its assets at reduced life cycle cost as well as alleviate challenges posed by increasing water demands, emergencies due to asset failures and deficiencies, and determining optimal timeframes to repair/replace aging assets while focusing on operations and maintenance to prolong asset service life .

References

Department of Health (DOH). (2019). *Asset Management for Small Water Systems* [Fact Sheet]. Retrieved from <https://www.doh.wa.gov/portals/1/Documents/pubs/331-445.pdf>

Department of Health (DOH). (2020). *Washington System Planning Guidebook: Planning and Financial Viability*. Retrieved from <https://www.doh.wa.gov/Portals/1/Documents/Pubs/331-068.pdf>

U.S. Environmental Protection Agency. (2003). *Asset Management: A Handbook for Small Water Systems*. Retrieved from <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U7T2.txt>

Washington Administrative Code (WAC) 246-290-100(4)(e)(iii).

Attachments

Attachment 1 – DOH Fact Sheet: Asset Management for Small Water Systems

Appendix Q Water Ordinances

To be inserted after November 2021 Council Meeting

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Appendix R

Agency Review Comments

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State of Washington

DEPARTMENT OF HEALTH

NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310 • Kent Washington 98032-2388

July 27, 2021

STEVE LENISZEWSKI
PUBLIC WORKS DIRECTOR
DUVALL CITY OF
PO BOX 1300
DUVALL WA 98017

RE: Duvall, City of (ID# 20750)
King County
Water System Plan
Submittal # 21-0505

Dear Mr. Leniszewski:

Thank you for submitting the Water System Plan (WSP) for the City of Duvall (the City), received in this office on May 18, 2021. We have reviewed the plan and offer the following comments. These comments must be adequately addressed prior to approval of the WSP.

Description of Water System

1. King County Utilities Technical Review Committee will review your WSP. Please respond to their issues. Adequate responses to their issues will be necessary in order to receive a WSP Adoption Ordinance from King County.
2. Some key figures are missing from the document. Figure 2-1, Water Service Area and Figure 2-2, Existing Hydraulic Profile, for example. Please include all figures in the final copy. With the dissolution of pressure zone 485, is a future hydraulic profile warranted?

Basic Planning Data

No comments.

System Analysis

No comments.

Water Use Efficiency / Water Rights

No comments.

Source Protection

No comments.



Water Quality

3. Regarding Table 6-3 City of Duvall Water Quality Requirements and section 6.5.2 Residual Disinfectant Monitoring, include the City's responsibility to monitor the distribution system chlorine residual at least once every calendar day. Daily residual monitoring includes the chlorine residual measured at the same time and place as routine coliform samples.
4. Please provide standard operating procedures for coliform routine and repeat sampling in the appendix with the Water Quality Monitoring Plan. Consider using the *E. coli* response plan checklists found in DOH publication 331-036 to supplement the water quality monitoring plan.

Operations & Maintenance

5. Have you adopted the Water Main Break Protocol for Chlorinated Systems? (DOH Publication 331-583 – 1/1/2017)
6. Section 7.5.1 Water Service Reliability. Include the City's emergency power capabilities and goals?

Distribution Facilities Design and Construction Standards

7. Please consider including the reference to AWWA C651-14 Disinfecting Water Mains in your policy or construction standards section.
8. Construction standards include a standard drawing for a double detector check valve. Are there any other backflow preventer types in the system or potential for addition of other types in the system? If so, please include in the construction standard set.
9. What are the construction standards for bedding and depth to bury new water main? What about separation between water and sewer lines? (reference Ecology's Criteria for Sewage Works)

Improvement Plan

No comments

Financial Planning

No comments.

Other Documentation

10. The water system must meet the consumer input process outlined in WAC 246-290-100(8). Please include documentation of a consumer meeting discussing the WSP, prior to DOH approval of the WSP.
11. Prior to DOH approval, the City's governing body must approve and adopt the WSP.
12. Please provide copies of any comments made by adjacent purveyors or other interested parties, along with the City's response to those comments. Has Seattle Public Utilities had the opportunity to review your WSP?

13. Provide A signed SEPA Checklist and a SEPA threshold determination with the final WSP submittal.
14. Please have your engineers sign and date the PE stamp page for the final copy submitted to the Department.
15. Is the (water system) a member of WARN?

Closing

We hope that you have found these comments to be clear, constructive and helpful in the development of your final draft WSP. We ask that you submit the revised WSP on or before **October 27, 2021**. In order to expedite the review of your revised submittal, please include a cover letter summarizing how each of the above comments was addressed in the revised WSP and where each response is located (i.e., page numbers, Appendices, etc.)

Regulations establishing a schedule of fees for review of planning, engineering, and construction documents have been adopted (WAC 246-290-990). The total cost is **\$3,705.00**. An itemized invoice for the review of this project has been sent to the primary contact on file for your water system. Please note that this fee covers our current review and one more submittal for this project. If additional submittals are required, then an invoice for additional fees will be included with our final approval letter. Please remit complete payment in the form of a check or money order within thirty days of the date of this letter in the enclosed envelope or mail payment to: WSDOH, Revenue Section, PO Box 1099, Olympia WA 98507-1099.

Thank you again for submitting your revised Water System Plan for our review. If you have any comments or questions concerning our review, please contact me at (253) 395-6771.

Sincerely,



Richard Rodriguez
Regional Planner

Enclosure (invoice)

cc: Jae Hill, King County UTRC
Seattle/King County Health
Ria Berns, WSDOE – NWRO
Mike Fisher, Public Works Superintendent, City of Duvall

ecc: Brietta Carter, PE, Regional Engineer, DOH

September 21, 2021

Steven Leniszewski
Public Works Director
City of Duvall
PO Box 1300
Duvall, WA 98019
(emailed steven.leniszewski@duvallwa.gov)

Re: Review of City of Duvall Comprehensive Water System Plan

Dear Mr. Leniszewski,

Thank you for the opportunity for Seattle Public Utilities (SPU) to review Duvall's agency review version of your Comprehensive Water System Plan. Our comments are provided below.

The nature of our review was limited to content related to SPU contracts, infrastructure, and programs. This translates to the following topics in your water system plan: wholesale water supply contract, SPU supply stations, demand forecast, water quality, and water conservation. SPU's comments reflect reviews of your water system plan by the following SPU staff: Kathy Curry, Terri Gregg, Eugene Mantchev, Elizabeth Garcia, Paige Igoe, and myself.

SPU's comments fall into two categories: 1) true corrections, and 2) suggestions for clarification or nuance. The comments below that are in the true corrections category are generally related to water quality.

As you know, our review was delayed by staffing issues on our end. We apologize for the delay and understand it may affect your ability to incorporate our comments into the final version of your plan.

1. Wholesale Water Supply Contract

- a. **Section 2.4.2 Seattle Water Supply Contract:** The description is technically accurate, however an acknowledgment of the current process of updating the wholesale water supply contracts by SPU and the wholesale customers would provide a fuller description.
- b. **Section 6.3 Water Rights and Supply Overview:** *Table 6-2 Intertie Agreements* characterizes SPU's two supply connections as "not restricted", which is accurate. As you know, Exhibit II of the supply agreement does specify maximum flow rates up to which the minimum hydraulic gradient is guaranteed. However, those are not currently in effect because the SPU Transmission System operates well below capacity.
- c. **Section 6.7 Summary:** The text characterizes the water supply contract with SPU as an "unlimited wholesale agreement". SPU uses the term "Full Water Requirements contract".

2. Demand Forecast

- a. **Section 4.5.1 Projected Demands:** The demand forecast shows a higher demand than SPU had projected for Duvall in our most recent demand forecast developed in 2017 and documented in SPU's 2019 Water System Plan. For example, in *Table 4-8 Future Retail Water Demand Projections*, Duvall is projecting an annual demand (with conservation) in 2040 of 283,742,000 gallons, where as SPU's demand forecast for Duvall in 2040 is 200,800,000 gallons.

The existence of a difference between demand forecasts developed by different utilities is not necessarily unexpected. This is because there are a variety of methodologies and data sources for demand forecasting and forecasting has inherent judgement calls and uncertainties.

The resulting differences in the two demand forecasts is not a concern for SPU because we have a wide cushion between our firm yield and the total demand we are forecasting from Seattle and all our wholesale water customers. That cushion can accommodate the demand Duvall is projecting, especially since Duvall's demand is a small portion of the total demand on SPU's regional water system.

3. Water Quality

- a. **Section 2.6.3 Water Treatment:** The summary of treatment provided by SPU's Tolt Treatment Facility does not mention that corrosion control is also provided. It would be useful to include text describing this important treatment process, which helps make the water less corrosive to piping and plumbing materials, in this section and any other relevant sections.
- b. **Section 6.5 Water Quality Monitoring:** In paragraph 2, the description of SPU's role is outdated. Each of SPU's wholesale customers are required to take the full number of coliform samples outlined in WAC 246 290 300. The reduced monitoring previously allowed under the regional plan is no longer applicable. In paragraph 3, in the last sentence the reference to Table 6-1 should be Table 6-3.
- c. **Section 6.5.1 Coliform Monitoring:**
 - i. The description of SPU's role is outdated. Each of SPU's wholesale customers are required to take the full number of coliform samples outlined in WAC 246 290 300. The reduced monitoring previously allowed under the regional plan is no longer applicable. This also applies to the related content in *Table 6-3 City of Duvall Water Quality Monitoring Requirements* and *Appendix L Water Quality Monitoring Plan*.
 - ii. For this row in *Table 6-3 City of Duvall Water Quality Monitoring Requirements* and in *Table 5 Water Quality Monitoring Requirements in Appendix L Water Quality Monitoring Plan*, "WAC" is misspelled as "WAX".
 - iii. Although Duvall's responsibility for repeat sampling (if a routine sample comes back positive) is mentioned in *Appendix L Water Quality Monitoring Plan*, the text and referenced table (*Table 6 Coliform Monitoring Sample Locations*) do not appear to be complete. It would be useful to update that info or include Duvall's Total Coliform Monitoring Plan in an appendix to the WSP.
- d. **Section 6.5.2 Residual Disinfectant Monitoring:** The description of SPU's role is outdated. Per the WAC updates implemented in 2017, Duvall should be monitoring chlorine residual in the distribution system daily (using either data from a grab sample or an online analyzer) and reporting daily residual data to DOH monthly. This also applies to the related content in *Table 6-3 City of Duvall Water Quality Monitoring Requirements* and *Appendix L Water Quality Monitoring Plan*.
- e. **Section 6.5.3 Disinfection Byproducts Monitoring:** The text related to SPU's role is accurate. However, the disinfection byproducts information in *Table 6-3 City of Duvall Water Quality Monitoring Requirements* in the "SPU Responsibilities" column is outdated and does not match the

text. Similarly, the disinfection byproducts information in *Appendix L Water Quality Monitoring Plan (Section 4.1 Monitoring Requirements and Procedures text and Table 5 Water Quality Monitoring Requirements)* are outdated and do not match the text in Section 6.5.3.

- f. **Section 6.5.4 Lead and Copper Monitoring:** The text related to SPU's role is accurate. However, the lead and copper information in *Table 6-3 City of Duvall Water Quality Monitoring Requirements* in the "Schedule" column is outdated and does not match the text. Similarly, the lead and copper information in *Appendix L Water Quality Monitoring Plan (Section 4.1 Monitoring Requirements and Procedures text and Table 5 Water Quality Monitoring Requirements)* are outdated and do not match the text in Section 6.5.4.

4. Water Conservation

- a. **Appendix G Water Use Efficiency (WUE) Program:** References to the Saving Water Partnership (SWP) regional water conservation that SPU administers on behalf of itself and its participating wholesale water customers, including Duvall, are generally accurate. There is one awkward aspect in that *Table 2 Summary of Water Use Efficiency Program Measures* appears to be structured around an outdated DOH document, that table appears to be utilized to show conservation compliance, and yet a few of the descriptions of the SWP programs are not fully accurate. The outdated document is the *Conservation Planning Requirements*, which has been replaced by DOH's *Water Use Efficiency Guidebook*, which the section does mention. Following are the measures where the description of the SWP program is not fully accurate:
 - i. **Program Promotion (pg 5):** While the SWP program does provide program promotion materials to Duvall staff for them to use in their service area, radio and television public service announcements are not provided.
 - ii. **Technical Studies (pg 6):** The SWP does not generally conduct technical studies. Note the description states this is required for large-sized systems.
 - iii. **Single Family/Multifamily Kits (pg 8):** The description says Duvall has access to kits for all water customers. While the SWP does have some ancillary materials to provide to residential customers, it does not have the quantity to supply all wholesale customers with sufficient quantity for all their customers. Note the description states this is required for medium-sized systems.

5. General

- a. **Section 4.2.5 Average Day Demand:** It is unclear whether the "Metered Retail Supply" in *Table 4-5 Average Annual System Demand* is intended to represent the amount of water SPU sold Duvall or the amount of water Duvall retails to its customers. The title of the column implies retail sales, however the text introducing the table says, "Table 4-5 summarizes the total amount of water supplied to the City's system...". And earlier text in that section distinguish between "water supply" as the amount of water purchased from SPU and "water consumption" as the amount used by customers and states that demand is based on water supply, rather than water consumption. Per the table below, the numbers in the "Metered Retail Supply" column appear to be SPU sales to Duvall, although they do not match 100% with SPU's own records. Years 2018 and 2019 are the only years where the differences are meaningful.

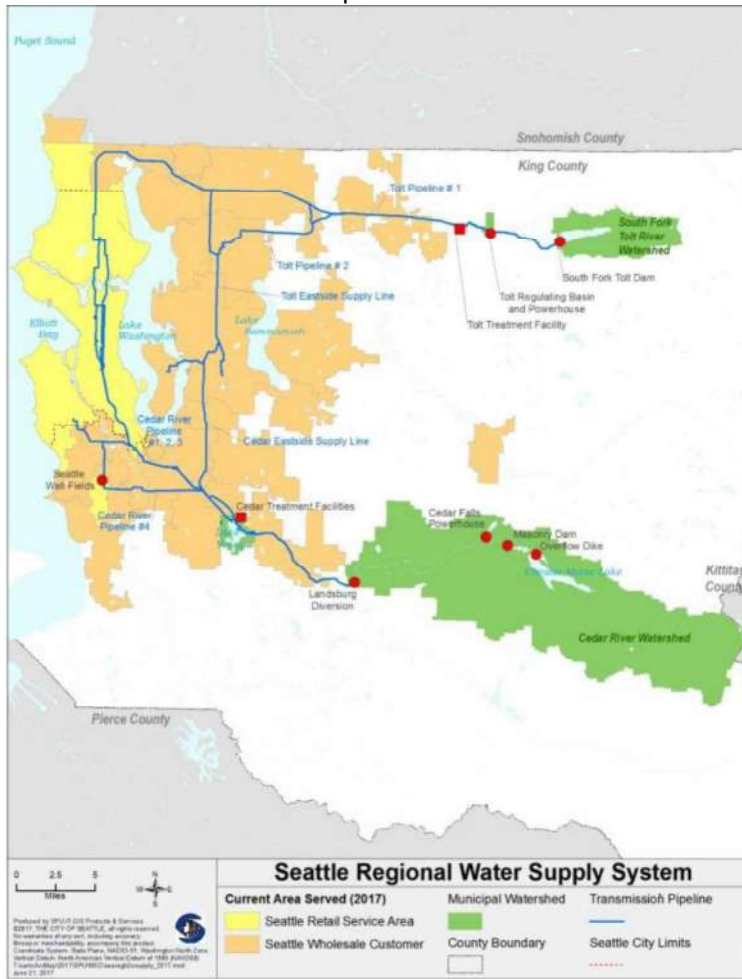
Year	SPU Sales to Duvall ¹ (ccf)	Duvall Retail Sales ² (ccf)	"Metered Retail Supply" ³		"Metered Retail Supply" as % of SPU Sales to Duvall	"Metered Retail Supply" as % of Duvall Retail Sales
			gpd	ccf		
2012	232,947	216,172	475,352	231,957	99.6%	107%
2013	235,508	213,225	480,561	234,498	99.6%	110%
2014	243,416	229,374	496,770	242,408	99.6%	106%
2015	260,014	228,157	528,681	257,979	99%	113%
2016	249,931	231,285	507,637	247,711	99%	107%
2017	260,769	240,887	531,370	259,292	99%	108%
2018	261,715	225,971	498,172	243,092	93%	108%
2019	265,875	242,548	511,667	249,677	94%	103%

1. Source is 2020 Annual Survey of Wholesale Customers: Summary of Results; Table 2.1 Direct Purchases from SPU 2005-2019.

2. Source is 2020 Annual Survey of Wholesale Customers: Summary of Results; Table 2.2 Retail Sales 2005-2019.

3. Source is Duvall WSP Table 4-5 Average Annual System Demand.

- b. **Section 6.2.1 SPU Source Description:** *Figure 6-1 SPU's Regional Water Supply System* is outdated. There is a reference on that figure to 2006. Below is a screen shot of the similar figure from our 2019 water system plan, which was created in 2017. Please let us know if you would like a high resolution version of the map.



Thank you again for the review opportunity.

Sincerely,

Kelly O'Rourke

Kelly O'Rourke, Water Conservation Manager

Cc: Paul Faulds, SPU Water Planning and Program Manager Interim Division Director (emailed)

Kathy Curry, SPU Wholesale Contracts Manager (emailed)

Terri Gregg, SPU Wholesale Contracts (emailed)

Tom Lindberg, Murraysmith, Inc. (emailed tom.lindberg@murraysmith.us)



City of Duvall Water System Plan – Initial Review

The City of Duvall submitted their draft Water System Plan for review by the King County Utilities Technical Review Committee (UTRC). On August 25, 2021, the UTRC held an open public meeting and deliberated the plan content, then directed Staff to issue this comment letter. The UTRC would like to see the following clarifications and revisions as detailed below.

With such a large document, it would be helpful to have the table of contents be live linked or for there to be more consistent navigation options within the PDF.

We will work to include these changes in the final version of the document.

Figure 2-1—No Future Water Service Area is depicted, though it is described in the legend.

Our apologies. The figures were not appropriately attached. That has been corrected and the Service Areas are shown in Figures 2-1 and 2-3

In October 2020, Stephanie Ard of Murraysmith had a meeting with Jae Hill of the UTRC to talk about boundary revisions for the City's future service area. No revisions are depicted, but are any proposed? On Page 2-2 the plan states: "At this time the City wishes to keep its Retail Service Area intact and requires service connections as they become timely and reasonable with future expansion of the Retail Water Service Area."

There are no substantive changes to the City's identified Future Service area. I am happy to explain our thought process on these service area types.

In Section 3.3 (Land Use) there's no discussion about the County's current zoning outside of city limits, the potential annexation areas, and timelines for annexation of the PAAs and how that could affect growth projections.

We are happy to discuss this further during the meeting. At this time there is no interest from the City in annexing in properties currently located in the County for residential purposes. The plan identified a small number of additional population gained through annexation. The effect of such a limited population is not of concern to the utility system.

Also, in Section 9-1, there are no system expansions identified for the PAAs, despite them having urban levels of service and density.

System expansion occurring as a result of approved development action, is the responsibility of the developer. At this time there is no interest from the City in annexing in properties currently located in the County for residential purposes. Project L-2 does have an ancillary benefit of accommodating growth in the City's identified UGA, and UGAR.

The Plan references only the PSRC goal of planning for climate change; this plan does not appear to contemplate increased usage through a warmer climate, or decreased supply from SPU Tolt Pipeline.

The City has demonstrated a history of reducing per capita consumption year over year through leak detection & conservation efforts along with higher efficiency fixtures. The City will continue to adapt to changing conditions and adopt mitigation measures as appropriate.

Per 2.6.9 and 2.8.1, there is a potential for intertie with 119, but neither district reportedly has interest. Couldn't this be an effective climate and resiliency issue?

As both utilities draw service from SPU's Tolt pipeline, and do not have independent source of water; an intertie would not have a significant beneficial effect.

The Plan only identifies two potential reclaimed users and uses, and identifies the municipal uses as a likely candidate. Are there other uses, even those further away (like the high school, etc.) which could drive a buildout of a "purple-pipe" system?

Some of the City's larger users have reduced consumption recently with changes to their sites and systems. Given the cost prohibitive nature of construction of a system for reclaimed water the City has traditionally made an assumption that potential sites would need to be located in close proximity to the source (WWTP). With recent development on nearby vacant parcels those potential sites for a large-volume reclaimed user have been further reduced. The City will continue to seek to identify a potential use and appropriate site for reclaimed water in the future.

King County requires a recycled water opportunities checklist for large purveyors, which can be found at: [Microsoft Word - FINAL 12 2011 WaterReclamationChecklist.doc \(kingcounty.gov\)](#)

Thank you. We will include this in the final plan.

Appendix S

Public Meeting Documentation

To be inserted after October 2021 Council Meeting

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Appendix T

Cost Estimating Methodology

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Appendix T

Cost Estimating Methodology

T.1 Introduction

This document summarizes the approach used in development of unit costs and project costs used in the Capital Improvement Plan (CIP) for the City of Duvall (City) Water System Plan (WSP).

T.2 Cost Estimating

The probable costs estimated for each improvement are based on average costs from the 2019 RSMMeans Heavy Construction Cost Data (RSMMeans), City input, construction costs for similar projects across the Northwest, and local contractor and supplier rates. All costs identified in this section reference U.S. dollars. The *Engineering News Record Construction Cost Index* basis is 11,392 (20-City Average, January 2020).

Project cost estimates are prepared in accordance with the guidelines of AACE International. (AACE International Recommended Practice No. 56R-08 Cost Estimate Classification System - As Applied For The Building and General Construction Industries - TCM Framework: 7.3 - Cost Estimating and Budgeting Rev. December 31, 2011). The project cost estimates in this WSP are categorized Class 5, as defined by AACE International:

Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner.

Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.

Typical accuracy ranges for Class 5 estimates are -20% to -30% on the low side, and +30% to +50% on the high side, depending on the construction complexity of the project, appropriate reference information and other risks (after inclusion of an appropriate contingency determination). Ranges could exceed those shown if there are unusual risks.

All project descriptions and cost estimates in this WSP represent planning-level accuracy and opinions of costs (+50 percent, -30 percent). During the design phase of each improvement project, project definition, scope, and specific information (e.g., pipe diameter and length) should be verified. The final cost of individual projects will depend on actual labor and material costs, site

conditions, competitive market conditions, regulatory requirements, project schedule and other factors. Because of these factors, project feasibility and risks must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

The project costs presented in this WSP include estimated construction costs and allowances for permitting, legal, administrative, and engineering fees. A contingency factor is also added to each cost to help account for any unanticipated components of the project costs. Construction costs are based on the preliminary concepts and layouts of the water system components developed during the system analysis.

Total estimated project costs were developed through a progression of steps and multiple methodologies. The steps included development of component unit costs, construction costs and, finally, project costs. The component unit cost includes the sum of materials, labor, and equipment of a project's basic features. The construction cost is the sum of component costs and mark-ups to determine the probable cost of construction (i.e., the contractor bid price). The project cost is the sum of construction costs with additional cost allowances for engineering, legal and administrative fees to determine the total project cost to the City.

The following costs are not included:

- Land or right-of-way acquisition
- Maintenance expenses
- Operation expenses

T.3 Component Unit Costs

T.3.1 Pipelines

The estimates for water system pipelines include the costs for pipe, valves, fittings, water connections, special pipe crossings, and appurtenances. The pipe material assumed for waterlines is ductile iron with non-restrained push on joints, fittings are assumed to have mechanical joints.

T.3.2 Pipe

For all pipeline installations including new and replacement projects, the base water pipeline costs per linear foot is based on a cover depth of 42 inches and includes:

- Excavation
- Waste of material associated with the trenching (which includes haul, load, and dump fees)
- Native backfill (which includes minimal haul and compaction of material)
- Testing and disinfection
- Trench box costs
- Removal of large rocks

The following potential costs were assumed to be negligible for projects in Duvall:

- Dewatering (most projects are planned for summer, and high groundwater is not typically observed)
- Rock excavation (shallow bedrock not observed in Duvall)
- Imported bedding and zone material

As the diameter of pipe and the trench width increase, the costs also increase. Therefore, a specific base cost has been identified for each pipe diameter. See **Table T-1** for base estimated construction costs per linear foot of pipe.

Table T-1
Water Pipeline Base Costs per Linear Foot (from supplier)

Pipe Diameter (inch)	Cost ¹ (\$/linear foot)
4	\$47
6	\$44
8	\$54
10	\$62
12	\$72
14	\$85
16	\$96

¹Costs do not include pavement or other add-ons; see T-5 for combined costs

T.3.2.1 Valves and Fittings

To account for fittings and valves an additional 25 percent of pipeline cost is added.

T.3.2.2 Water Connections

To account for connections to existing water mains, an additional 3 percent is added to pipeline costs. New and replacement service connections are estimated at \$2,000 per 50 linear feet of pipe.

T.3.2.3 Special Pipe Crossings

Special pipe crossings are required for crossing the river, railroads and highways, or areas where traditional open cut construction is not possible. To approximate the cost of trenchless construction for crossings, a factor of 1.75 is applied to the water pipeline cost per linear foot from **Table T-1** for the crossing length based on creek crossing costs provided by the City in July 2020.

A summary of additional pipeline costs is provided in **Table T-2**.

Table T-2
Additional Pipeline Costs

Additional Pipeline Cost Factor	Additional Factor
Valves and Fittings	25%
Water Service Connections	\$2,000 per 50 linear feet of pipe
Connections to Existing Mains	3%
Special Pipe Crossings	10 times pipe cost per linear foot for crossing length

T.3.3 Surface Restoration

Surface restoration of construction sites is required to complete every project. For all non-development projects located in a road, costs are assumed to include overlay of the full road. Per City standard details, both arterial and local road costs are estimated for a 6-inch asphalt section with 12 inches of crushed rock. A width of 40 feet is assumed for both local and arterial roads per City standards. **Table T-3** shows surface restoration costs by pipe diameter (restoration includes trench restoration, so costs increase with pipe diameter). The surface restoration is developed from local supplier and RSMMeans costs.

Table T-3
Restoration Construction Costs per Linear Foot

Pipe Diameter (inch)	Arterial Road Restoration Cost (\$/linear foot)	Local Road Restoration Cost (\$/linear foot)
4	\$85	\$80
6	\$86	\$81
8	\$87	\$82
10	\$88	\$83
12	\$88	\$84
14	\$89	\$85
16	\$90	\$86

T.3.4 Facility

Facility project costs were developed for each individual facility project based on previous City projects, other similar projects in the Northwest, and relevant planning documents. In particular, analysis referenced the following planning documents, each of which is attached, following this document:

- Big Rock Road Reservoir and Crestview Estates Reservoir Improvements, by Murray Smith & Associates (now Murraysmith), dated October 17, 2014
- City of Duvall Water System Telemetry & Controls, SCADA Master Plan, Draft Revision A, by Industrial Systems, dated July 2020.

For each facility, the project cost includes basic site, civil, mechanical, electrical, and instrumentation and control facilities.

T.4 Construction Cost Allowances

The construction cost is the sum of pipe cost and adders, labor, equipment, mobilization, contractor's overhead and profit, and contingency for each project.

T.4.1 Traffic Control

Traffic control will be required for all projects that occur in roadways. The cost and level of effort for traffic control should be evaluated based on the scope and size of each project and as local conditions at the time of construction dictate. For planning purposes, the cost of traffic control is estimated at 2 percent for low traffic control areas in local streets or 4 percent for high traffic control areas in arterial streets depending on project location. Traffic control mark-up accounts for the cost of signage, flagging and temporary barriers, street widening, pavement markings, lane delineators and lighting at flagging locations.

T.4.2 Erosion Control

Erosion control will be required for all projects. For planning purposes, the erosion control is estimated at 2 percent of the construction costs. Erosion control mark-up accounts for materials and practices to protect adjacent property, storm water systems, and surface water in accordance with regulatory requirements. The level of effort and cost for erosion control depends on the size and scope of a project, and the local conditions at the time of construction.

T.4.3 Contractor Overhead and Profit

A 10 percent mark-up accounts for the contractor's indirect project costs and anticipated profit.

T.4.4 Mobilization

A 10 percent mobilization mark-up accounts for the cost of the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the work site.

T.4.5 Contingency

A 25 percent increase is added in each project’s construction cost to account for a contingency factor to cover the uncertainties inherent to planning-level development. The contingency is provided to account for factors such as:

- Unanticipated utilities
- Relocation and connection to existing infrastructure
- Minor elements of work not addressed in component unit cost development
- Details of construction
- Changes in site conditions
- Variability in construction bid climate

The contingency excludes:

- Major scope changes such as end product specification, capacities, and location of project
- Extraordinary events such as strikes or natural disasters
- Management reserves
- Escalation and currency effects

A summary of construction mark-ups is provided in **Table T-4**.

Table T-4
Additional Construction Costs

Additional Cost Factor	Percent
Low Traffic Control	2%
High Traffic Control	4%
Erosion Control (pipe projects only)	2%
Contractor Overhead and Profit	10%
Mobilization	10%
Contingency	25%

T.5 Total Project Cost

The total project cost is the sum of construction cost with additional cost allowances for legal, tax, administrative, and engineering fees. **Table T-5**, shown below, presents the cost allowances for each additional project cost. The engineering costs include design and surveying. Construction administration is the cost associated with managing the construction of the project. **Table T-6** shows example project unit costs per linear foot of pipe, assuming new pipe, open-cut, high erosion and traffic control costs, and full road overlay.

Table T-5
Summary of Additional Costs

Additional Cost Factor	Percent
Legal/Admin. Coordination	10%
Engineering Design	15%
Sales Tax	8.8%
Construction Engineering	5%

Table T-6
Example Open-Cut Water Pipeline Project Costs per Linear Foot¹

Pipe Diameter (inch)	Arterial Project Cost (\$/linear foot)	Local Street Project Cost (\$/linear foot)
4	\$391	\$380
6	\$385	\$374
8	\$414	\$404
10	\$438	\$427
12	\$465	\$457
14	\$502	\$494
16	\$534	\$526

¹Assumes open-cut, full road overlay, new pipe, high traffic, and erosion control.

Appendix U

Financial Model Summary

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Appendix U: Financial Model Summary

Operating Revenues & Expenditures		2020 Actual	2021 Budget	2022 Budget	2023 Forecast	2024 Forecast	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast
Annual Rate Increases			1.60%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Single-Family Monthly Rate		\$54.03	\$54.89	\$56.27	\$57.67	\$59.12	\$60.59	\$62.11	\$63.66	\$65.25	\$66.88	\$68.56
Beginning Operating Balance		\$ 3,274,156	\$ 3,529,800	\$ 536,627	\$ 555,505	\$ 577,487	\$ 600,712	\$ 623,644	\$ 642,067	\$ 663,137	\$ 684,914	\$ 707,423
Operating Revenues												
Water Charges	401-00-343-40-00-00	\$ 2,093,574	\$ 2,184,052	\$ 2,297,058	\$ 2,414,004	\$ 2,538,198	\$ 2,660,550	\$ 2,749,423	\$ 2,841,076	\$ 2,935,594	\$ 3,033,062	\$ 3,133,568
Water Main/Hydrant Repairs	401-00-343-47-00-00	-	-	-	-	-	-	-	-	-	-	-
Water Hook-Up Fees	401-00-343-48-00-00	94,445	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
Misc Penalties	401-00-359-49-00-02	9,663	14,400	57,600	57,600	57,600	57,600	57,600	57,600	57,600	57,600	57,600
Rental of Hydrant	401-00-362-10-00-00	7,900	-	-	-	-	-	-	-	-	-	-
Sales of Scrap & Junk	401-00-369-10-00-00	3,733	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenues	401-00-369-91-00-00	6,049	-	-	-	-	-	-	-	-	-	-
Interest Earnings	401-00-361-11-00-00	33,755	17,649	2,683	2,778	2,887	3,004	3,118	3,210	3,316	3,425	3,537
Total Operating Revenues		\$ 2,249,119	\$ 2,238,101	\$ 2,379,341	\$ 2,496,381	\$ 2,620,686	\$ 2,743,154	\$ 2,832,141	\$ 2,923,886	\$ 3,018,509	\$ 3,116,086	\$ 3,216,705
		6.7%	-0.5%	6.3%	4.9%	5.0%	4.7%	3.2%	3.2%	3.2%	3.2%	3.2%
Budgeted Operating Expenses												
Salaries & Wages	401-25-534-80-11-00	\$ 442,951	\$ 508,000	\$ 547,000	\$ 563,410	\$ 580,312	\$ 597,722	\$ 615,653	\$ 634,123	\$ 653,147	\$ 672,741	\$ 692,923
Overtime and Buyouts	401-25-534-80-11-01	21,858	15,000	15,000	15,450	15,914	16,391	16,883	17,389	17,911	18,448	19,002
Personnel Benefits	401-25-534-80-21-00	190,301	240,500	267,500	280,875	294,919	309,665	325,148	341,405	358,476	376,399	398,983
Overtime and Buyout Benefits	401-25-534-80-21-01	5,713	3,500	3,500	3,675	3,859	4,052	4,254	4,467	4,690	4,925	5,220
Meters/Valves/Hydrant Supplies	401-25-534-50-35-00	12,209	58,725	58,725	60,193	61,698	63,240	64,821	66,442	68,103	69,806	71,551
Office & Operating Expenses	401-25-534-80-31-00	29,223	27,463	27,528	28,217	28,922	29,645	30,386	31,146	31,925	32,723	33,541
Fuel	401-25-534-80-32-00	4,545	-	-	-	-	-	-	-	-	-	-
City of Seattle Water Purchase	401-25-534-80-33-00	530,314	565,685	605,753	635,667	667,392	698,676	721,682	745,400	769,853	795,060	821,046
Small Tools & Minor Equipment	401-25-534-80-35-00	3,314	5,550	1,850	1,896	1,944	1,992	2,042	2,093	2,145	2,199	2,254
Computer Hardware & Equipment	401-25-534-80-35-02	-	2,600	500	513	525	538	552	566	580	594	609
Travel	401-25-534-40-43-00	8	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046
Training	401-25-534-40-49-00	500	4,500	4,500	4,613	4,728	4,846	4,967	5,091	5,219	5,349	5,483
Professional Services	401-25-534-80-41-00	63,908	69,520	64,520	66,133	67,786	69,481	71,218	72,998	74,823	76,694	78,611
Advertising	401-25-534-80-41-01	-	300	300	308	315	323	331	339	348	357	366
Water City Attorney Services	401-25-515-30-41-00	-	3,000	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655
Communications & Postage	401-25-534-80-42-00	12,376	12,642	13,265	13,596	13,936	14,285	14,642	15,008	15,383	15,768	16,162
Travel & Meals	401-25-534-80-43-00	-	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218
Insurance	401-25-534-80-46-00	42,335	31,952	34,519	35,382	36,267	37,173	38,102	39,055	40,031	41,032	42,058
Public Utilities	401-25-534-80-47-00	6,536	60,600	60,780	62,300	63,857	65,453	67,090	68,767	70,486	72,248	74,055
Janitorial/HVAC/Fac Maint	401-25-534-80-48-00	16,435	7,091	7,346	7,530	7,718	7,911	8,109	8,312	8,520	8,733	8,951
Memberships Dues / Fees	401-25-534-80-49-00	8,834	9,091	9,346	9,580	9,820	10,065	10,317	10,575	10,839	11,110	11,388
Miscellaneous - Note - do not use	401-25-534-80-49-01	-	-	-	-	-	-	-	-	-	-	-
Bank Fees/Charges	401-25-534-80-49-12	9,591	11,791	12,558	12,872	13,193	13,523	13,861	14,208	14,563	14,927	15,300
I/F to 501	401-99-534-80-41-01	25,495	53,021	53,183	54,512	55,875	57,272	58,704	60,171	61,676	63,217	64,798
I/F to IT 502	401-99-534-80-41-02	34,924	45,663	42,932	44,005	45,105	46,233	47,389	48,574	49,788	51,033	52,308
I/F to 503 Building	401-99-534-80-41-03	5,930	12,427	8,621	8,837	9,058	9,284	9,516	9,754	9,998	10,248	10,504
Transfer Out-001 Gen Admin	401-99-597-00-01-00	51,914	69,370	37,846	38,792	39,762	40,756	41,775	42,819	43,890	44,987	46,112
Sensus FlexNet System	401-25-594-34-63-01	3,665	28,000	28,000	28,700	29,418	30,153	30,907	31,679	32,471	33,283	34,115
State Excise and B&O Tax	401-99-534-10-44-00	97,338	123,184	130,004	136,200	143,491	148,589	144,772	149,535	154,446	159,510	164,732
City Utility Tax	401-99-534-10-44-06	197,452	218,405	229,706	241,400	253,820	266,055	274,942	284,108	293,559	303,306	313,357
Total Budgeted Operating Expenses		\$ 1,817,668	\$ 2,181,489	\$ 2,261,436	\$ 2,351,225	\$ 2,446,117	\$ 2,539,720	\$ 2,614,370	\$ 2,700,238	\$ 2,788,988	\$ 2,880,720	\$ 2,979,352
		0.6%	20.0%	3.7%	4.0%	4.0%	3.8%	2.9%	3.3%	3.3%	3.3%	3.4%
Other Activity												
New Debt Service		-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital		3,257,415	3,049,785	99,027	123,175	151,343	180,502	199,349	202,578	207,744	212,857	213,146
Total Other Activity		\$ 3,257,415	\$ 3,049,785	\$ 99,027	\$ 123,175	\$ 151,343	\$ 180,502	\$ 199,349	\$ 202,578	\$ 207,744	\$ 212,857	\$ 213,146
Revenues Less Obligations		\$ (2,825,964)	\$ (2,993,173)	\$ 18,878	\$ 21,982	\$ 23,226	\$ 22,932	\$ 18,422	\$ 21,070	\$ 21,777	\$ 22,509	\$ 24,208
Ending Operating Balance		\$ 448,192	\$ 536,627	\$ 555,505	\$ 577,487	\$ 600,712	\$ 623,644	\$ 642,067	\$ 663,137	\$ 684,914	\$ 707,423	\$ 731,631
<i>Target Minimum (120 Days of O&M)</i>		\$ 448,192	\$ 536,627	\$ 555,505	\$ 577,487	\$ 600,712	\$ 623,644	\$ 642,067	\$ 663,137	\$ 684,914	\$ 707,423	\$ 731,631

Operating Revenues & Expenditures										
	2031	2032	2033	2034	2035	2036	2037	2038	2039	
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
Annual Rate Increases	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Single-Family Monthly Rate	\$70.27	\$72.03	\$73.83	\$75.67	\$77.56	\$79.50	\$81.49	\$83.53	\$85.62	
Beginning Operating Balance	\$ 731,631	\$ 756,727	\$ 782,747	\$ 809,729	\$ 837,714	\$ 866,742	\$ 896,858	\$ 928,107	\$ 960,536	
Operating Revenues										
Water Charges	401-00-343-40-00-00	\$ 3,237,205	\$ 3,344,064	\$ 3,454,243	\$ 3,567,842	\$ 3,684,961	\$ 3,805,706	\$ 3,930,186	\$ 4,058,511	\$ 4,190,795
Water Main/Hydrant Repairs	401-00-343-47-00-00	-	-	-	-	-	-	-	-	-
Water Hook-Up Fees	401-00-343-48-00-00	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000
Misc Penalties	401-00-359-49-00-02	57,600	57,600	57,600	57,600	57,600	57,600	57,600	57,600	57,600
Rental of Hydrant	401-00-362-10-00-00	-	-	-	-	-	-	-	-	-
Sales of Scrap & Junk	401-00-369-10-00-00	-	-	-	-	-	-	-	-	-
Miscellaneous Revenues	401-00-369-91-00-00	-	-	-	-	-	-	-	-	-
Interest Earnings	401-00-361-11-00-00	3,658	3,784	3,914	4,049	4,189	4,334	4,484	4,641	4,803
Total Operating Revenues	\$ 3,320,463	\$ 3,427,448	\$ 3,537,757	\$ 3,651,490	\$ 3,768,750	\$ 3,889,640	\$ 4,014,270	\$ 4,142,751	\$ 4,275,198	
		3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Budgeted Operating Expenses										
Salaries & Wages	401-25-534-80-11-00	\$ 713,711	\$ 735,122	\$ 757,176	\$ 779,891	\$ 803,288	\$ 827,387	\$ 852,208	\$ 877,774	\$ 904,108
Overtime and Buyouts	401-25-534-80-11-01	19,572	20,159	20,764	21,386	22,028	22,689	23,370	24,071	24,793
Personnel Benefits	401-25-534-80-21-00	422,922	448,298	475,196	503,707	533,930	565,965	599,923	635,919	674,074
Overtime and Buyout Benefits	401-25-534-80-21-01	5,534	5,866	6,218	6,591	6,986	7,405	7,849	8,320	8,820
Meters/Valves/Hydrant Supplies	401-25-534-50-35-00	73,339	75,173	77,052	78,979	80,953	82,977	85,051	87,178	89,357
Office & Operating Expenses	401-25-534-80-31-00	34,379	35,239	36,120	37,023	37,948	38,897	39,869	40,866	41,888
Fuel	401-25-534-80-32-00	-	-	-	-	-	-	-	-	-
City of Seattle Water Purchase	401-25-534-80-33-00	847,834	875,446	903,908	933,244	963,481	994,646	1,026,765	1,059,867	1,093,981
Small Tools & Minor Equipment	401-25-534-80-35-00	2,310	2,368	2,427	2,488	2,550	2,614	2,679	2,746	2,815
Computer Hardware & Equipment	401-25-534-80-35-02	624	640	656	672	689	706	724	742	761
Travel	401-25-534-40-43-00	3,122	3,200	3,280	3,362	3,446	3,532	3,621	3,711	3,804
Training	401-25-534-40-49-00	5,620	5,760	5,904	6,052	6,203	6,358	6,517	6,680	6,847
Professional Services	401-25-534-80-41-00	80,577	82,591	84,656	86,772	88,942	91,165	93,444	95,780	98,175
Advertising	401-25-534-80-41-01	375	384	394	403	414	424	434	445	456
Water City Attorney Services	401-25-515-30-41-00	3,747	3,840	3,936	4,035	4,136	4,239	4,345	4,454	4,565
Communications & Postage	401-25-534-80-42-00	16,566	16,980	17,404	17,840	18,286	18,743	19,211	19,692	20,184
Travel & Meals	401-25-534-80-43-00	1,249	1,280	1,312	1,345	1,379	1,413	1,448	1,485	1,522
Insurance	401-25-534-80-46-00	43,109	44,187	45,292	46,424	47,585	48,774	49,994	51,244	52,525
Public Utilities	401-25-534-80-47-00	75,906	77,804	79,749	81,742	83,786	85,881	88,028	90,228	92,484
Janitorial/HVAC/Fac Maint	401-25-534-80-48-00	9,175	9,404	9,639	9,880	10,127	10,380	10,640	10,906	11,179
Memberships Dues / Fees	401-25-534-80-49-00	11,672	11,964	12,263	12,570	12,884	13,206	13,536	13,875	14,222
Miscellaneous - Note - do not use	401-25-534-80-49-01	-	-	-	-	-	-	-	-	-
Bank Fees/Charges	401-25-534-80-49-12	15,683	16,075	16,477	16,889	17,311	17,744	18,187	18,642	19,108
I/F to 501	401-99-534-80-41-01	66,418	68,078	69,780	71,525	73,313	75,146	77,024	78,950	80,924
I/F to IT 502	401-99-534-80-41-02	53,616	54,957	56,330	57,739	59,182	60,662	62,178	63,733	65,326
I/F to 503 Building	401-99-534-80-41-03	10,767	11,036	11,312	11,595	11,885	12,182	12,486	12,798	13,118
Transfer Out-001 Gen Admin	401-99-597-00-01-00	47,264	48,446	49,657	50,899	52,171	53,475	54,812	56,183	57,587
Sensus FlexNet System	401-25-594-34-63-01	34,968	35,842	36,738	37,657	38,598	39,563	40,552	41,566	42,605
State Excise and B&O Tax	401-99-534-10-44-00	170,117	175,668	181,392	187,294	193,378	199,650	206,116	212,782	219,653
City Utility Tax	401-99-534-10-44-06	323,720	334,406	345,424	356,784	368,496	380,571	393,019	405,851	419,080
Total Budgeted Operating Expenses	\$ 3,081,599	\$ 3,187,610	\$ 3,297,538	\$ 3,411,545	\$ 3,529,801	\$ 3,652,482	\$ 3,779,774	\$ 3,911,871	\$ 4,048,976	
		3.4%	3.4%	3.4%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Other Activity										
New Debt Service		-	-	-	-	-	-	-	-	-
Transfer to Capital		213,768	213,818	213,237	211,961	209,921	207,043	203,248	198,451	192,562
Total Other Activity	\$ 213,768	\$ 213,818	\$ 213,237	\$ 211,961	\$ 209,921	\$ 207,043	\$ 203,248	\$ 198,451	\$ 192,562	
Revenues Less Obligations		\$ 25,096	\$ 26,020	\$ 26,983	\$ 27,985	\$ 29,028	\$ 30,116	\$ 31,249	\$ 32,429	\$ 33,660
Ending Operating Balance	\$ 756,727	\$ 782,747	\$ 809,729	\$ 837,714	\$ 866,742	\$ 896,858	\$ 928,107	\$ 960,536	\$ 994,196	
<i>Target Minimum (120 Days of O&M)</i>	<i>\$ 756,727</i>	<i>\$ 782,747</i>	<i>\$ 809,729</i>	<i>\$ 837,714</i>	<i>\$ 866,742</i>	<i>\$ 896,858</i>	<i>\$ 928,107</i>	<i>\$ 960,536</i>	<i>\$ 994,196</i>	

Capital Expenditures	2020 Budget	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast
Beginning Capital Balance	\$ 1,648,069	\$ 2,550,063	\$ 4,820,809	\$ 4,505,196	\$ 3,422,199	\$ 3,162,150	\$ 3,713,679	\$ 3,599,026	\$ 2,839,779	\$ 2,708,492	\$ 3,101,898
Capital Revenues											
Rate Revenue for Capital Projects	\$ 3,257,415	\$ 3,049,785	\$ 99,027	\$ 123,175	\$ 151,343	\$ 180,502	\$ 199,349	\$ 202,578	\$ 207,744	\$ 212,857	\$ 213,146
GFC Revenue	1,462,120	726,341	748,131	766,120	825,807	765,523	292,033	300,794	309,818	319,112	328,685
Revenue Bonds	-	-	-	-	-	-	-	-	-	-	-
Investment Interest	17,896	12,750	24,104	22,526	17,111	15,811	18,568	17,995	14,199	13,542	15,509
AT&T Cell Tower Lease-Wtr Tank	34,130	35,870	35,858	36,754	37,673	38,615	39,580	40,570	41,584	42,623	43,689
Verizon Cell Tower Lease	22,757	29,310	24,143	24,867	25,613	26,382	27,173	27,988	28,828	29,693	30,584
Total Revenues with Rate Increases	\$ 4,794,318	\$ 3,854,057	\$ 931,263	\$ 973,442	\$ 1,057,547	\$ 1,026,831	\$ 576,703	\$ 589,925	\$ 602,172	\$ 617,828	\$ 631,614
Capital Expenditures											
<u>Budgeted Capital</u>											
407-99-534-10-40-00 Admin Fee - Cell Tower Leases	\$ -	\$ 6,017	\$ 6,365	\$ 6,556	\$ 6,753	\$ 6,956	\$ 7,164	\$ 7,379	\$ 7,601	\$ 7,829	\$ 8,063
401-25-594-34-63-01 Sensus FlexNet System	-	334,750	-	-	-	-	-	-	-	-	-
Water Meter (old) Replacements	-	-	-	-	-	-	-	-	-	-	-
<u>Watermain Replacement</u>											
12" Tolt 2 Supply Line from Tolt Supply Station to NE Big Rock Rd	-	286,443	885,109	810,366	-	-	-	-	-	-	-
8" Water Main in Bruett Rd from 3rd Ave NE to 3rd Pl NE	-	-	-	-	-	-	-	-	-	-	-
8" Water Main in 1st Ave from NE Stephens to NE Valley Street	-	-	-	-	-	381,401	-	-	-	-	-
12" Water Main in 266th Pl NE from 266th Pl NE to 266th Circle NE	-	-	-	-	-	-	-	-	-	-	-
<u>Looping</u>											
8" Water Main in 1st Ave from NE Virginia Street to NE Stephens	-	-	-	-	-	-	-	-	-	144,830	-
12" Water Main in Batten Rd NE from NE 140th Pl to Big Rock Rd	-	-	-	-	-	-	618,519	1,274,149	656,187	-	-
<u>Facilities</u>											
Remove 555/485 PRV's on NE Big Rock Road and 275th Ave NE	-	226,600	-	-	-	-	-	-	-	-	-
Crestview Estates Reservoir Improvements and Recoating	-	-	-	-	-	-	-	-	-	-	735,122
Big Rock Road Reservoir Re-coating and Inlet/ Outlet Improvements	-	-	233,398	1,049,746	540,619	-	-	-	-	-	-
615 Zone Pump Station Improvements	-	-	63,654	129,670	66,780	-	-	-	-	-	-
Tolt 1 Supply Station Improvements	-	-	-	-	327,523	-	-	-	-	-	-
Tolt 2 Supply Station Improvements	-	-	-	-	314,017	-	-	-	-	-	-
Telemetry and Control Improvements	-	412,000	-	-	-	-	-	-	-	-	-
Taylor's Landing Well Arsenic Treatment	-	-	-	-	-	-	-	-	-	-	-
Water Department Building	-	206,000	-	-	-	-	-	-	-	-	-
<u>Citywide Program</u>											
Conservation and Leak Detection	-	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048	13,439
Water Reclamation	-	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720
Cross Connection Control	-	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720
Comprehensive Plan	-	-	-	-	-	-	-	-	-	-	302,381
Risk and Resiliency Plan	-	-	-	-	-	23,185	-	-	-	-	26,878
GIS Asset Management Program	-	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048	13,439
Well Protection Program	-	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720
Service Line Repairs	-	20,600	21,218	21,855	22,510	23,185	23,881	24,597	25,335	26,095	26,878
<u>Other Capital</u>											
Comprehensive Plan	187,723	54,850	-	-	-	-	-	-	-	-	-
407-25-594-34-63-11 Various Capital Projects	48,467	-	-	-	-	-	-	-	-	-	-
407-25-594-34-63-12 Kennedy Watermain Replacement	481,783	-	-	-	-	-	-	-	-	-	-
407-25-594-34-64-00 Water System Telemetry	15,655	-	-	-	-	-	-	-	-	-	-
401-25-594-34-63-01 New Meter Installations	3,665	-	-	-	-	-	-	-	-	-	-
401-25-594-34-63-02 Water Meter Replacements	177,554	-	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	\$ 914,847	\$ 1,583,310	\$ 1,246,876	\$ 2,056,439	\$ 1,317,596	\$ 475,302	\$ 691,356	\$ 1,349,172	\$ 733,460	\$ 224,421	\$ 1,146,361
Revenues less Expenditures	\$ 3,879,471	\$ 2,270,746	\$ (315,613)	\$ (1,082,997)	\$ (260,049)	\$ 551,529	\$ (114,653)	\$ (759,247)	\$ (131,287)	\$ 393,407	\$ (514,747)
Ending Capital Balance	\$ 5,527,540	\$ 4,820,809	\$ 4,505,196	\$ 3,422,199	\$ 3,162,150	\$ 3,713,679	\$ 3,599,026	\$ 2,839,779	\$ 2,708,492	\$ 3,101,898	\$ 2,587,151
<i>Target Minimum</i>	\$ 708,611	\$ 740,277	\$ 765,215	\$ 806,343	\$ 832,695	\$ 842,201	\$ 856,029	\$ 883,012	\$ 897,681	\$ 902,170	\$ 925,097

Capital Expenditures	2031 Forecast	2032 Forecast	2033 Forecast	2034 Forecast	2035 Forecast	2036 Forecast	2037 Forecast	2038 Forecast	2039 Forecast
Beginning Capital Balance	\$ 2,587,151	\$ 1,126,955	\$ 372,409	\$ 937,559	\$ 1,514,524	\$ 544,935	\$ 1,104,373	\$ 1,706,108	\$ 2,317,583
Capital Revenues									
Rate Revenue for Capital Projects	\$ 213,768	\$ 213,818	\$ 213,237	\$ 211,961	\$ 209,921	\$ 207,043	\$ 203,248	\$ 198,451	\$ 192,562
GFC Revenue	338,546	348,702	359,163	369,938	381,036	392,468	404,242	416,369	428,860
Revenue Bonds	-	-	-	-	-	-	-	-	-
Investment Interest	12,936	5,635	1,862	4,688	7,573	2,725	5,522	8,531	11,588
AT&T Cell Tower Lease-Wtr Tank	44,781	45,901	47,048	48,224	49,430	50,666	51,932	53,231	54,561
Verizon Cell Tower Lease	31,501	32,446	33,420	34,422	35,455	36,519	37,614	38,743	39,905
Total Revenues with Rate Increases	\$ 641,532	\$ 646,502	\$ 654,730	\$ 669,234	\$ 683,415	\$ 689,419	\$ 702,558	\$ 715,324	\$ 727,476
Capital Expenditures									
<u>Budgeted Capital</u>									
407-99-534-10-40-00 Admin Fee - Cell Tower Leases	\$ 8,305	\$ 8,555	\$ 8,811	\$ 9,076	\$ 9,348	\$ 9,628	\$ 9,917	\$ 10,215	\$ 10,521
401-25-594-34-63-01 Sensus FlexNet System	-	-	-	-	-	-	-	-	-
Water Meter (old) Replacements	-	-	-	-	-	-	-	-	-
<u>Watermain Replacement</u>									
12" Tolt 2 Supply Line from Tolt Supply Station to NE Big Rock Rd	-	-	-	-	-	-	-	-	-
8" Water Main in Bruett Rd from 3rd Ave NE to 3rd Pl NE	-	275,172	-	-	-	-	-	-	-
8" Water Main in 1st Ave from NE Stephens to NE Valley Street	-	-	-	-	-	-	-	-	-
12" Water Main in 266th Pl NE from 266th Pl NE to 266th Circle NE	-	-	-	-	-	-	-	-	-
<u>Looping</u>									
8" Water Main in 1st Ave from NE Virginia Street to NE Stephens	-	-	-	-	-	-	-	-	-
12" Water Main in Batten Rd NE from NE 140th Pl to Big Rock Rd	-	-	-	-	-	-	-	-	-
<u>Facilities</u>									
Remove 555/485 PRV's on NE Big Rock Road and 275th Ave NE	-	-	-	-	-	-	-	-	-
Crestview Estates Reservoir Improvements and Recoating	2,017,290	1,038,904	-	-	-	-	-	-	-
Big Rock Road Reservoir Re-coating and Inlet/ Outlet Improvements	-	-	-	-	-	-	-	-	-
615 Zone Pump Station Improvements	-	-	-	-	-	-	-	-	-
Tolt 1 Supply Station Improvements	-	-	-	-	-	-	-	-	-
Tolt 2 Supply Station Improvements	-	-	-	-	-	-	-	-	-
Telemetry and Control Improvements	-	-	-	-	-	-	-	-	-
Taylor's Landing Well Arsenic Treatment	-	-	-	-	-	-	-	-	1,139,779
Water Department Building	-	-	-	-	1,557,967	-	-	-	-
<u>Citywide Program</u>									
Conservation and Leak Detection	13,842	14,258	14,685	15,126	15,580	16,047	16,528	17,024	17,535
Water Reclamation	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
Cross Connection Control	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
Comprehensive Plan	-	-	-	-	-	-	-	-	394,539
Risk and Resiliency Plan	-	-	-	-	-	32,094	-	-	35,070
GIS Asset Management Program	13,842	14,258	14,685	15,126	15,580	16,047	16,528	17,024	17,535
Well Protection Program	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
Service Line Repairs	27,685	28,515	29,371	30,252	31,159	32,094	33,057	34,049	35,070
<u>Other Capital</u>									
Comprehensive Plan	-	-	-	-	-	-	-	-	-
407-25-594-34-63-11 Various Capital Projects	-	-	-	-	-	-	-	-	-
407-25-594-34-63-12 Kennedy Watermain Replacement	-	-	-	-	-	-	-	-	-
407-25-594-34-64-00 Water System Telemetry	-	-	-	-	-	-	-	-	-
401-25-594-34-63-01 New Meter Installations	-	-	-	-	-	-	-	-	-
401-25-594-34-63-02 Water Meter Replacements	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	\$ 2,101,728	\$ 1,401,048	\$ 89,581	\$ 92,268	\$ 1,653,003	\$ 129,981	\$ 100,824	\$ 103,848	\$ 1,676,352
Revenues less Expenditures	\$ (1,460,197)	\$ (754,546)	\$ 565,150	\$ 576,966	\$ (969,589)	\$ 559,438	\$ 601,734	\$ 611,475	\$ (948,876)
Ending Capital Balance	\$ 1,126,955	\$ 372,409	\$ 937,559	\$ 1,514,524	\$ 544,935	\$ 1,104,373	\$ 1,706,108	\$ 2,317,583	\$ 1,368,707
<i>Target Minimum</i>	\$ 967,131	\$ 995,152	\$ 996,944	\$ 998,789	\$ 1,031,849	\$ 1,034,449	\$ 1,036,465	\$ 1,038,542	\$ 1,072,069

