

City of Arlington

2019 Amendment to the

2015 Comprehensive Water System Plan





Prepared by:

City of Arlington

Water System ID 02950K

With assistance from:

RH2 ENGINEERS PLANNERS SCIENTISTS

and

FCS GROUP Solutions-Oriented Consulting

January 2016

Amended October 2017

Amended December 2019

Cover photos:

Foreground photo shows the Stillaguamish River and the Northern Pacific railroad trestle at confluence of the North and South Forks at Arlington. The River is one of three water sources used by the City of Arlington and can produce more than 90 percent of its annual water supply. Background photo shows the Pacific Keystone filter trains within the Water Treatment Plant. Water from riverbank wells is filtered through up to three trains with filtration media consisting of sand and anthracite. The WTP can treat 1700 gpm, or more than 2.4 MGD.

Recommended citations:

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City of Arlington Certification

Chapters 1, 2, 3, 4, 5, 6, and 8 of the 2015 Comprehensive Water System Plan (WSP), and the 2017 Amendment to the WSP, were prepared by City of Arlington staff under the direction of the following registered professional engineer. Chapter 10 was prepared for the 2015 WSP by FCS Group under the direction of the same, and City of Arlington staff made minor modifications to Chapter 10 in the 2017 Amendment. City of Arlington staff received support from RH2 Engineering on Chapter 4 in both the 2015 WSP and the 2017 Amendment.

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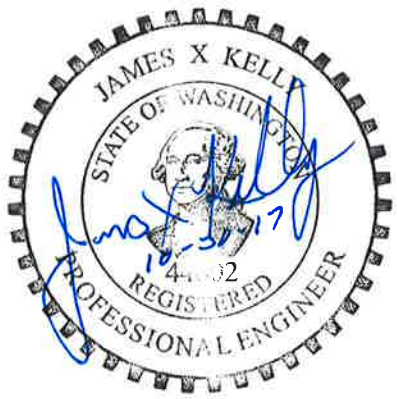

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RH2 Engineering Certification

Chapters 4, 7, and 9 of the 2017 City of Arlington Water System Plan Amendment were prepared under the direction of the following registered professional engineers.



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Reviser's Note Regarding The 2019 Amendment

A Water System Plan (WSP) is required under WAC 246-290-100 to: demonstrate a purveyor's capacity to provide potable water; identify its approach to handling increased demand and system expansion; assure consistency with applicable laws and plans; and establish eligibility for State funding.

The WSP of a Group A community water system like the Arlington Water Department may be *updated* on a 10 year cycle, and it may need to *revised or amended* more frequently for various reasons identified in WAC 246-290-100. The 2015 WSP was completed in January 2016, and is due for a complete WSP Update again by April 20, 2026. The City amended the 2015 WSP in 2017 in order to maintain consistency with the comprehensive plans required of the City of Arlington and Snohomish County under the Growth Management Act. That amendment was initiated by the retraction of the City's plans to grow (and serve water to) west of I-5. Numerous modifications to the text and tables of the 2015 WSP made during the 2017 Amendment were described in the Reviser's Note which follows this one.

This 2019 amendment is much simpler, and stems from the expansion of the City's water service area (WSA) beyond that boundary identified in the 2017 amendment [WAC 246-290-100 (2)(e)(i)]. In September 2017, as the 2017 WSP amendment was going to press, the Cities of Arlington and Marysville completed the exchange of several, contiguous Smokey Point parcels totaling approximately17.89 acres to the Arlington WSA, consistent with procedures established in the 2012 North Snohomish County Coordinated Water System Plan. The exchange was precipitated by the need of a developer for water pressures which the City of Marysville could not provide. As development progressed in 2019, the parcels were served within the 342 pressure zone by the installation of about 2,136 feet of 12-inch ductile iron water main and various valves and hydrants, consistent with all COA construction standards and guidelines for water systems.

The 2019 amendment consists of the following replacement pages in duplex format: binder cover; inside cover; Table of Contents; Expanded Table of Contents; 2019 Reviser's Note (2017 Reviser's Note moved back one page); and the Appendix L cover page. It also includes a five-page insert, referred to as L.5, to be placed at the back of Appendix L. *No other modifications to text, tables, figures, or maps have been made as a result of this WSA boundary adjustment.* Only those pages above may have a header and/or footer which reflect they are part of the 2019 Amendment.

Reviser's Note Regarding The 2017 Amendment

The City of Arlington 2015 Water System Plan (WSP) planned for the expansion of the City's Urban Growth Area (UGA) and its water distribution system west of I-5. This effort reflected the City's intent to develop west of the freeway in order to accommodate its 2035 population targets established under the Growth Management Act (GMA). The City acted on this intent in the 2014 filing of a petition with Snohomish County for the westward expansion of its UGA.

Planning for the expansion of the water distribution system also assured consistency of the WSP with the City's 2015 GMA Comprehensive Plan. Snohomish County's Planning and Development Services reviewed the 2015 WSP but could not find it consistent with the County's own 2015 GMA Comprehensive Plan, which did not include the City's proposed UGA expansion. Later in 2016, the City withdrew its petition and began revision of its GMA Comprehensive Plan in order to plan for an alternative population placement that was consistent with Snohomish County's plan. For purposes of consistency among all plans, this 2017 Amendment to the 2015 WSP also drops expansion of the distribution system west of I-5, and evaluates the re-allocation of additional population across the City, and its effect on the capacity of the water supply to meet the additional demand.

These planning modifications did not result in revisions to WSP Chapters 4 and 5, nor to most of the appendices. Chapters 1, 2, 6, 7, 8, and 9 in this amended WSP had relatively minor revisions, and these are documented in this publication using underlined insertions and strikeout deletions to quickly and clearly show the effects of the amendment.

Although many portions of Chapter 3 (Land Use) have not changed, there are enough revisions that complete re-printing of the chapter is appropriate. Where changes may be significant, the amended text describes the change. Tables and figures which have substantial changes are also completely replaced, and the word "amended" follows the table and figure numbers in parentheses.

Changes to Chapter 10 (Financial Plan) are relatively minor, but individual revisions are not shown. The primary changes to the Financial Plan are the replacements of Tables 10-4 and 10-5.

The only appendices containing modifications are Appendix C (Hydraulic Model Node Diagram), Appendix N (Consistency Review Checklist), and Appendix Q (SEPA). Agency review comments and responses will be included in Appendix T in the final WSP.

Executive Summary

ES.1 PURPOSE OF THE PLAN



The City of Arlington's (City) water production, treatment, and distribution systems form a complex infrastructure. Just as intricate are the monitoring and management procedures, industry best practices, and regulatory requirements intended to make that infrastructure an instrument for public health and fire protection. The City's water utility matches skilled and qualified staff to the operational and maintenance (O&M) requirements of these systems, implements a capital improvement program (CIP) to schedule replacements of necessary components to keep the systems working optimally, and assures compliance with all federal and state laws and permit conditions. When these efforts occur conscientiously within the context of a Comprehensive Water System Plan (WSP), customers' water taps serve as a lifeline of health and wholeness, and the water distribution system doubles as a generous fire suppression system.

This update to the City's WSP is intended to achieve the following objectives. In doing so, it will comply with Washington State Department of Health (DOH) regulations for WSPs under Washington Administrative Code (WAC) 246-290-100.

- Prepare the water system and personnel to meet the City's future growth,
- Set CIP goals and priorities to match City Comprehensive Plan,
- Evaluate current service levels
- Evaluate current O&M activities,
- Review compliance with City policies and state/federal regulations,
- Identify any deficiencies which threaten public health and fire safety,

- Identify corrective measures which ensure a safe and reliable supply of water to current and future customers, and
- Develop and evaluate Water Utility funding requirements.

ES.2 CHANGES SINCE THE LAST COMPREHENSIVE WATER SYSTEM PLAN

The City's last WSPs were completed in 2004 and 2011. The following digest includes some of the changes or events that have occurred since the 2011 WSP update that affect water system planning for the City.

ES.2.1 Water Rights and Water Law

- Completed three water right transfers totaling 471 gpm and 215 acre-feet.
- Pre-purchased up to 150 gpm and 60 acre-feet from the City's cemetery for transfer at a later date.
- Developing case law, including Washington Supreme Court decisions, upheld the Municipal Water Law, and overturned the Skagit Instream Flow Rule (IFR) (with influence on the similar Stillaguamish IFR), etc.

ES.2.2 Planning Efforts

- Expanded the City's water service area (WSA) through the acquisition of the National Food Corporation's property south of 172nd Street, west of 51st Avenue, and east of 43rd Avenue from the City of Marysville.
- Prepared the City's 2015 Update of its Comprehensive Plan concurrently with this WSP.
- Decreased population projection in previous WSP significantly from 30,500 by 2025, to 24,937 in the City by 2035.
- Submitted application in 2014 to Snohomish County to extend its UGA for residential growth west of I-5, then withdrew the application in 2016 (hence this amendment).
- Regional recognition of the proposed Airport Manufacturing Industrial Center (MIC), which is anticipated to bring the employment of up to 12,000 persons in the City's WSA.

ES.2.3 Physical Infrastructure Changes

- Converted the services along 91st Avenue and the WSA southeast the intersection of SR9 and SR531 from the 520 Pressure Zone (PZ) to the 710 PZ.
- Took Burn Road Reservoir (342 PZ) off-line in 2014 and decommissioned it in 2016.
- Completed replacement of nearly all high priority Asbestos-Concrete water main, resulting in the proportion of the distribution network in AC pipe at 10.4 percent

- Constructed filter train backwash discharge line from the WTP to the constructed wetland, added dechlorination, and now discharge the majority of the WTP backwash to the wetland—and potentially the Stillaguamish River as well (thus, NPDES General WTP permit compliance is also new).

ES.2.4 Limitations with Aging Physical Infrastructure

- Well 3, the oldest well in the Haller wellfield, is more than 100 years old. The second oldest well, Well 2, is more than 50 years old. At 14 years old, Well 1R is the youngest, but is not used for water quality reasons. A 2012 rehabilitation effort to regain some declining capacity at Well 2 was unsuccessful, and resulted in even greater drawdown per unit rate of production, and in reduced raw water quality.
- Formerly 185 feet deep, the Airport well has collapsed twice in the last decade, and the pump has been raised to 100 feet below ground surface, closer to the potential contaminants of the industrial area around the airport.
- Active replacement programs in a historically small city that is recently burgeoning with growth have resulted in predominately young age distributions for water meters and mains. As a result, the City is well-positioned to maintain a sustainable, structurally sound distribution infrastructure.

ES.2.5 Integrated Water Resource Management Actions

- Obtained Reclaimed Water Reuse Permit for irrigation of constructed wetland using reclaimed water.
- Obtained NPDES General Water Treatment Plant Discharge Permit to discharge backwash water to the constructed wetland.

ES.2.6 Emergency Response and Climate Change Experience

- The Oso Landslide occurring on March 22, 2014 created immediate—and at the time unknown—impacts to the quantity and quality of flows in the Stillaguamish River. Staff relied on the trending of real-time data (river stage, river turbidity, well water depth, raw water turbidity), river water quality from grab samples, the diversity of the City's water sources, communications with emergency management personnel, and professional judgement to continue production from the well field at reduced rates without contaminating the surrounding formation, affecting the treatment process, or increasing risks to public health.
- During the Oso Landslide response, the City of Arlington was a key hub for emergency response. Many hundreds of personnel from local, state, and federal agencies, and many more volunteers and journalists from around the world provided additional demand while relying on the City's water system for relief and recovery.
- The combination of the low snowpack from winter 2015 and the drought of summer 2015 tested the ability of the City's supply infrastructure to meet demands under harsh conditions—and under what could be *common* conditions with continuing climate change.

The City's sources met customers' needs without the requiring any drought restrictions. Quantities and levels of water supplies at each of the City's sources are continuously monitored and recorded using SCADA to identify emerging trends associated with climate change.

ES.2.7 Changing Supply and Demand Scenario

- Based on a water supply study conducted by Brown and Caldwell in 2011, the City made the decision to increase production from its wells in lieu of increasing purchases of wholesale water.
- Several planning parameters are significantly different from those used in the previous 2011 WSP. Peaking factors (MDD/ADD) are reduced and per capita consumption has declined. Water losses, or distribution system leakage (DSL), has increased.
- The City's greatest peak day (3 MGD on 7/4/2015) and month (67 MG in July 2015) ever occurred with the "least water" climatic extremes of the 2015 drought. The Stillaguamish River at its confluence recorded 321 cfs, one of its lowest discharges on record. (At the same time, the North Fork measured 171 cfs, and its lowest-ever measurement of 117 cfs occurred on 9/23/1938.) Although concerned, the City did not have trouble meeting demand under drought conditions.

ES.2.8 Water Quality Observations

- The non-repeatable detection of a very small quantity of 1,4-dioxane at the Airport Wellfield during the UCMR3 study, though not considered a health risk in itself, has prompted staff to consider anew the military and industrial influence on the aquifer. Alternatives to the wellfield are considered in this WSP.
- Several observations have caused uncertainty around the ability of the Haller Wellfield to provide consistent, redundant and perhaps increased supplies to the water system. These include the increasing frequency of manganese detections, the inability of bringing the reserve well online without the risk of contaminating the treated water in the clearwell with iron, and a failed effort to rehabilitate Haller Well 2 and increase its specific capacity, which has declined in recent years.

ES.3 WHAT HAS NOT CHANGED SINCE THE LAST COMPREHENSIVE WATER SYSTEM PLAN

The following sections of this Water System Plan have not changed or have had only minor and/or formatting changes since the 2011 WSP Update:

- Appendix F – Watershed and Wellhead Protection Program;
- Appendix G – Cross Connection Control Program;
- Appendix I – Integrated Water Resources Management Program; and
- Appendix M – Snohomish County PUD No. 1 Wholesale Water Agreement.

ES.4 SUMMARY OF KEY ELEMENTS

This WSP contains: a description of the existing water system and service area; a forecast of future water collection and treatment demands; policies and design criteria for water system operation and improvements; water system hydraulic analyses; the operations and maintenance program; staffing requirements; a schedule of improvements; and a financial plan to accomplish the improvements. A summary of the key issues related to these elements is provided in the following sections.

ES.4.1 Customers within the Water Service Area (WSA)

The City provides water service to approximately 16,245 residents and more than 600 businesses and institutions through 5,458 customer accounts within its existing WSA boundary, which extends well beyond the City's corporate limits to cover approximately 25.3 square miles. The City is responsible for providing public water service, utility management and water system development within the WSA. The City will provide water service within the retail WSA if the following conditions can be met.

- The City has sufficient capacity to serve water in a safe and reliable manner.
- The applicant is in compliance with all applicable local plans, development regulations, and utility standards and policies.
- Sufficient water rights and supply are available.
- The City can provide such service in a timely and reasonable manner.

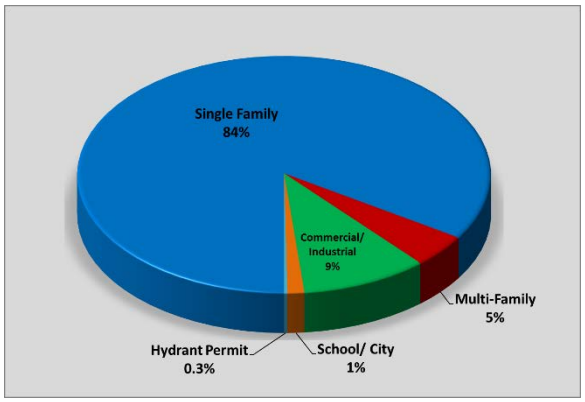
The project must also be in compliance with the City's utility standards and policies, WSP and water rights; and Snohomish County's adopted land use plan and zoning and development regulations.

For water service applications outside of the City limits, the applicant must first obtain a water utility service agreement from the City. The City will review the agreement and determine the availability of water.

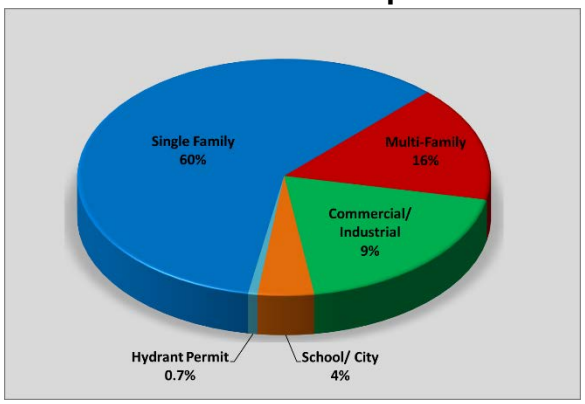
In 2014, the City provided water service primarily to its 16,245 residential customers, which make up approximately 89 percent of all customer accounts and use approximately 76 percent of all water supplied.

DRAFT

2014 Water Connections



2014 Water Consumption



ES.4.2 Infrastructure

The Water Department manages assets with a replacement value of approximately $137 million allocated as follows:

Facility	Value (2015)
Haller Wellfield	$2,500,000
Airport Wellfield	$1,100,000
Water Treatment Plant	$28,000,000
Distribution--Water Mains	$91,469,040
Distribution-_All Other	$12,399,500
Administrative Office/Shop	$1,750,000
Total	**$137,218,540**

Components within the water utility include wells yielding groundwater under the influence of surface water, a groundwater well, a water treatment plant (WTP), a master meter at the intertie with a wholesale purchase connection, water mains, reservoirs, a pump station, pressure reducing stations, and numerous hydrants, valves, and other supporting equipment.

The Haller wellfield has produced water via riverbank filtration in one or more wells for over 100 years. It is consistent and remains the City's "work horse" for water supply, pumping at up to 1,700 gpm. It produced 1.17 MGD in 2014, or about 85 percent of the City's total water supply. Aquifer production measured as specific capacity has declined somewhat in recent years, and a rehabilitation effort on one of the wells in 2012 was unsuccessful.

The Airport wellfield currently consists of a single groundwater well that has been in production since it and other wells were installed in the 1940s. The well has collapsed (and pumped sand) on more than one occasion, and the pump has been raised from about 185 feet bgs to about 110 feet bgs. It is pumped at less than its capacity, approximately 200 gpm, in order to minimize further

damage to the well and aquifer. In 2014, the Airport well produced 0.08 MGD, or about 5 percent of the City's total water supply.

The City purchased about 10 percent of its water in 2014 under a wholesale contract with the Snohomish County PUD. Although the contract allows up to 1,000 gpm, the City has been drawing only about 50 gpm.

The WTP is a rapid sand filtration plant with chlorine disinfection because of the surface water influence of the Stillaguamish River on the Haller wellfield. The WTP performs extremely well, and the facility has earned recognition under the Department of Health's Treatment Optimization Program in all 15 years of the program's existence. It is only one of four filtration plants in the State of Washington to earn this distinction. Design capacity of the WTP is 1,710 gpm. However, clearwell pump efficiency has declined in recent years, and the WTP can currently send about 1,500 gpm to distribution. Operators are monitoring pump performance.

The water utility maintains approximately 96.2 miles of mains throughout its service area. The mains are composed primarily of cement mortar-lined ductile iron (89.2 percent). Asbestos-concrete (AC) pipe composes about 10.4 percent of the distribution network. The diameter of most water mains (88 percent) is between 8 and 12 inches. Two-thirds of the pipe in the distribution network is 30 years old or less and generally in good condition. About 10 percent of the system was constructed in the 1950s and 1960s and is reaching its life expectancy of about 75 years. Most of the main breaks are in older, AC pipe laid in wetter soils. The City has an active main replacement program, and recently replaced the last segment of pipe with what it considers to be the highest risk for breaking and leaking.

Eight pressure reducing and flow control valves serve to maintain four pressure zones in the service area. A single pump station helps assure that 98 percent of its water demand can be served from multiple sources located both up-gradient and down-gradient.

ES.4.3 Historic and Forecast Demand

Average daily demand (ADD) for water over the last ten years (2005 to 2014) ranged from 1.28 to 1.57 MGD, with an average flow of 1.41 MGD (980 gpm). Average per capita demand declined from about 106 to 78 gpd/person by 2011, but then rose to 97 gpd/person in 2014. An average per capita demand of 90 gpd/person and an average demand per equivalent residential unit (ERU) of 187 gallons per day were used to quantify existing conditions.

Maximum day demands were evaluated and a peaking factor (MDD/ADD) of 1.75 was selected. MDD in 2014 was calculated to be 2.75 MGD, or 1,912 gpm. Peak hour demand (PHD) based on observations was calculated to be 4.97 MGD, or 3,451 gpm. Peak hour factors for PHD/MDD and PHD/ADD were 1.81 and 3.16, respectively.

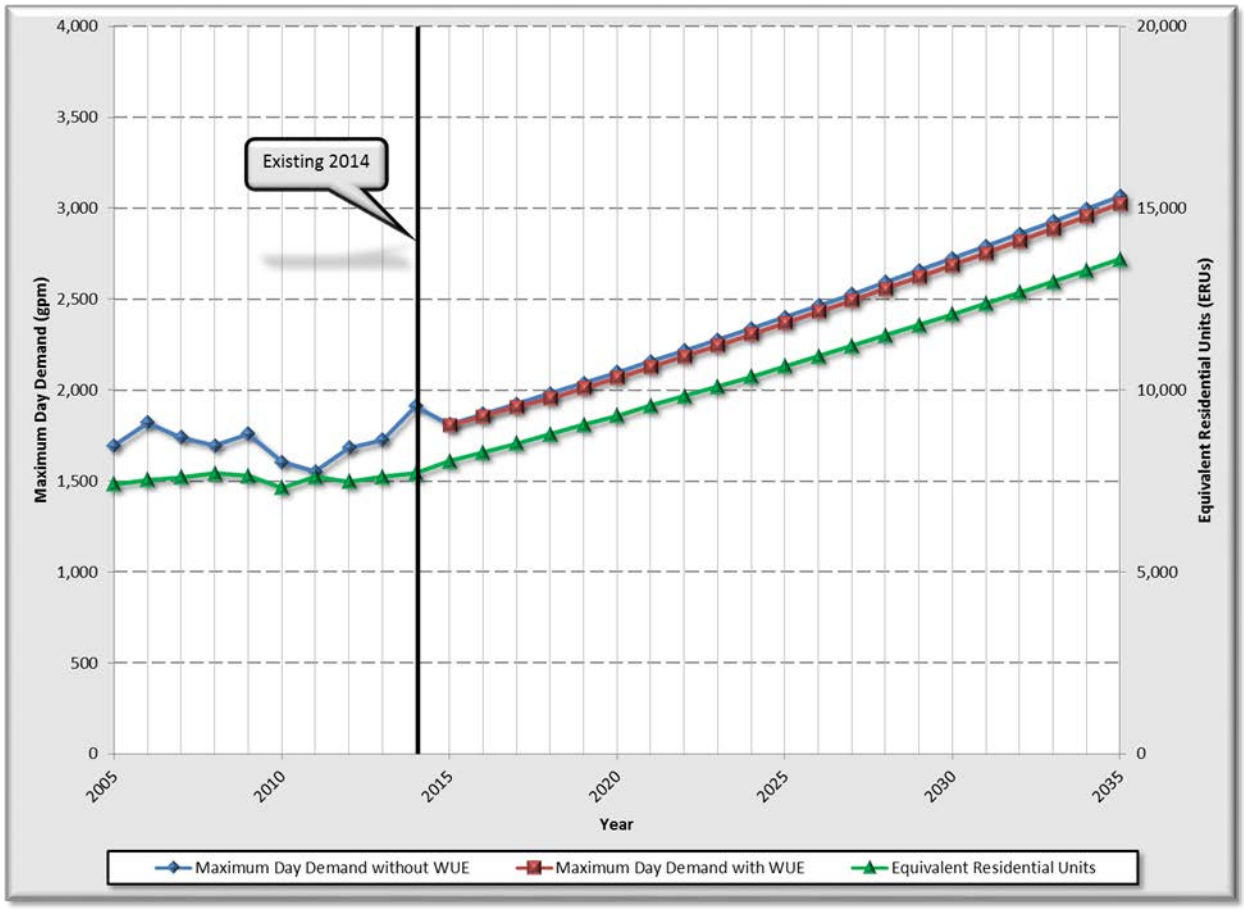
Demand forecasts were developed based on population growth allocated to the City of Arlington by Puget Sound Regional Council (PSRC) and Snohomish County during the comprehensive

planning effort required by the Growth Management Act and due in 2015. In the prior 2011 WSP update, the City had anticipated growth to 20,590 by 2014, and to 30,500 by 2025. Due in part to delayed recovery after the economic recession, this WSP update estimated the 2014 population at 18,360 and established growth to 24,937 by 2035. Because a portion of the City's Smokey Point neighborhood is outside of the City's WSA, the population served by the utility is 16,245 in 2014. The WSA population is forecast to grow in 6, 10, and 20 years to 18,157, 19,431, and 22,617, respectively.

In addition, the PSRC and other planning authorities have recognized the Arlington-Marysville Manufacturing Industrial Center and its influence on regional employment forecasts. Employment within the WSA may increase by as much as 12,000. This WSP update endeavors to accommodate the additional demands of manufacturing processes and the labor force by increasing the existing per capita demand of 90 gpd/person to 110 gpd/person by 2035.

Based on these and other planning assumptions, ADD is forecast to increase to 1,198 gpm, 1,336 gpm, and 1,712 gpm for the 6-, 10-, and 20-year horizons, respectively. MDD is forecast to increase to 2,097 gpm (9.7 percent), 2,338 gpm (22.2 percent), and 2,996 gpm (56.7 percent) for the 6-, 10-, and 20-year horizons, respectively. See the chart below.

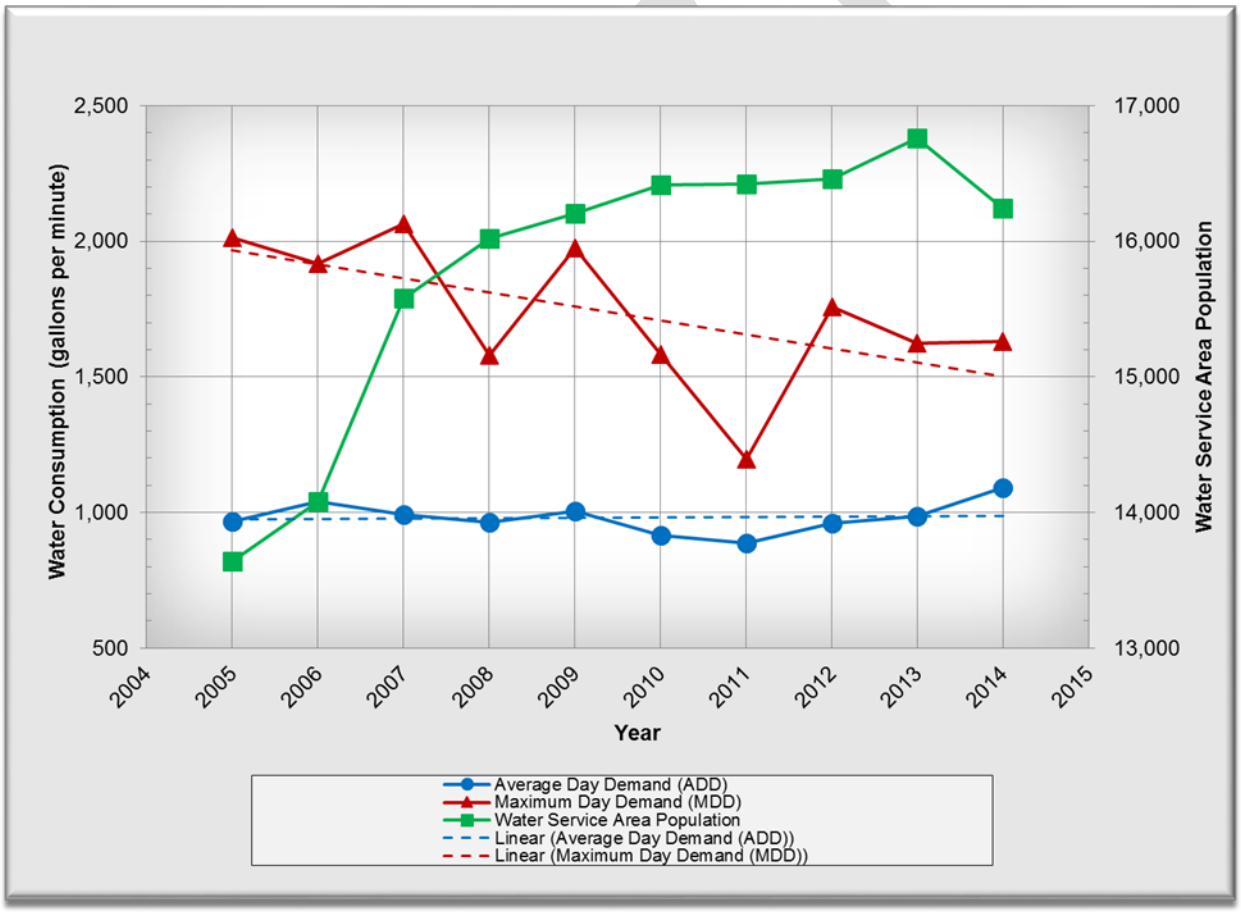
Past and Future Water Demands and ERUs



ES.4.4 Water Use Efficiency

The City's WUE efforts since the 1990s are described and evaluated in detail in Appendix E. One goal has been to maintain a gradual reduction in the average demand per individual customer (per connection, per capita, per ERU). This WSP evaluates these individual parameters against the goal, but success may be more telling using the figure below. The WSA population has *increased* by 2,069 persons, or more than 19 percent in the last 10 years. During this same time, the system-wide average daily demand (ADD) has basically *stayed the same*. In addition, the observed maximum day demand (MDD) over the same period has *declined* by about 383 gpm (19 percent).

Average and Maximum Day Demands
by Population in the Water Service Area
2005 to 2014



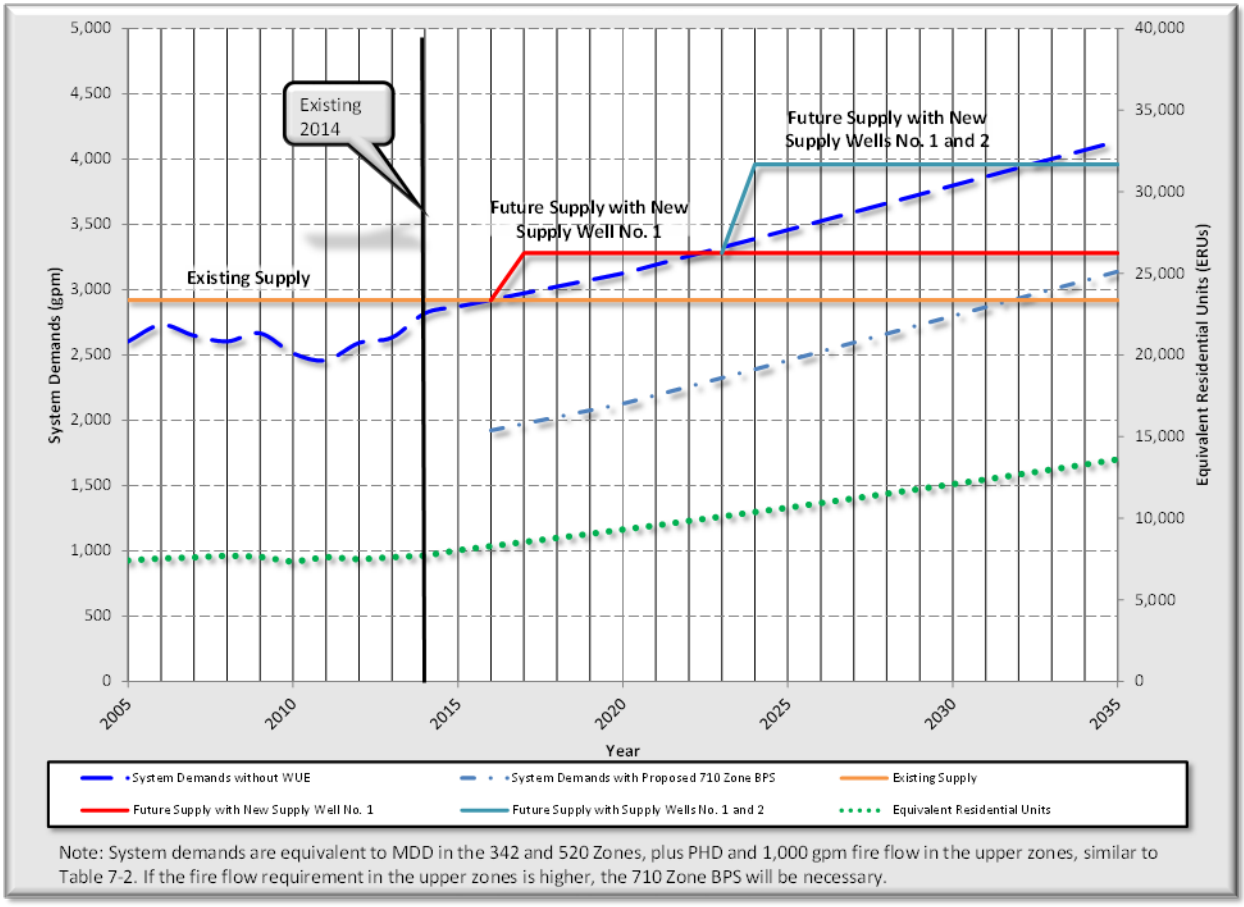
Another supply-side goal of the utility has been to reduce real and apparent losses of water from the system (also referred to as distribution system leakage, or DSL) and maintain it at less than 10 percent. The City was successful for a number of years, but beginning in 2012, annual DSL values increased 11 to 15 percent through 2014. Using a 3-year rolling average for DSL directed by DOH, the City's DSL increased to 13.2 percent in 2014. The City has prepared a Water Loss Control Action Plan as part of Appendix E in order to return DSL to less than 10 percent. Because

of a change in 2012 in the financial management software which handles meter reading and utility billing functions, it is anticipated that apparent (not real) losses in the form of accounting errors are the most likely cause of much of the elevated DSL.

ES.4.5 Future Water Demands and Water Supply

Overall water demand within the City's system is expected to increase by nearly 10 percent within the next 6 years and by more than 56 percent within the next 20 years, depending on the amount of future water use reductions from the City's Water Use Efficiency Program. The City has sufficient water supply from its water treatment plant, groundwater wellfields and wholesale water supply to meet the existing demand and fire flow requirements. The City also has sufficient water rights and secured wholesale supplies to meet the 20-year demand requirements and beyond (nearly 50 years). However, the poor condition of the Airport Well, concerns for the Airport and Haller Wellfield indicate the City is unable to meet projected demands and is need of securing additional production (supply) wells in the near future. Following increased source capacity at the Haller and Airport Wellfields and the construction of a booster pump station to supply fire flows in the highest pressure zones (summarized in the next section), the City will have sufficient supply capacity to meet the demand requirements until beyond 2050.

Future Water Supply and Demand Projections



Note: System demands are equivalent to MDD in the 342 and 520 Zones, plus PHD and 1,000 gpm fire flow in the upper zones, similar to Table 7-2. If the fire flow requirement in the upper zones is higher, the 710 Zone BPS will be necessary.

ES.4.6 Staffing for Operations and Maintenance

The City's Water Department staff are well-qualified, technically trained personnel equipped to operate and maintain the existing infrastructure. City staff regularly participates in safety and training programs to keep abreast of the latest changes in the water industry and to ensure a smooth and safe operation of the source, treatment, distribution, and metering systems. The current staff of nine (one supervisor and eight field crew), is one shy of the 10 estimated in a labor analysis during the 2011 WSP (not revised for this update). However, the Water Department has consistently demonstrated it is capable of adequately operating the water system, complying with the minimum DOH public health requirements, and conducting preventive maintenance tasks at the desired frequency. The City will add staff in the future, as necessary and as allowed by budget, to meet the increasing requirements of system operation and maintenance, due to customer growth and increased regulatory requirements.

ES.4.7 Water System Evaluation

The existing water system was evaluated to determine its ability to meet the policies and design criteria of the City and those mandated by DOH. The results of the evaluation are summarized below.

- The City has sufficient water supply from its water treatment plant, groundwater wellfields and wholesale water supply to meet the existing demand and fire flow requirements. The City also has sufficient water rights to meet the 20-year and nearly the 50-year demand requirements. It is increasingly unlikely, however, that improvements to the Haller and Airport Wellfields would allow the City to increase the available source capacity at these sites to take full advantage of the water rights to meet future demands.

- The existing Airport Well needs to be abandoned or relocated related to a well casing collapse, aging structure, and general safety issues. The City intends on evaluating alternative locations within its service area at which one or more wells may be sited.

- A booster pump station is needed to improve back-up and fire flow supply to the 710 Zone and the proposed 615 Zone (currently 540 Zone).

- Existing storage is adequate for 10 years, but additional storage will be required prior to the 20-year horizon for redundancy and for future storage requirements related to growth. A 1.0 million gallon reservoir is proposed to provide water storage to the City's 520 Zone and to resolve the projected 20-year system-wide storage deficiency. If the booster pump station (identified above) and additional supply wells are delayed, the reservoir would need to be built sooner.

- The Burn Road Reservoir was taken off-line in 2014 and demolished in 2016. The old WTP also requires demolition.

- General structural (roof) and ventilation improvements are necessary at the Gleneagle Reservoir.

- Several areas of the system require replacement of existing water main to resolve deficiencies related to low fire flows, aging water main and undesirable materials.
- The existing 540 Zone along Burn Road has moderately low pressures and will be divided and converted to the 520 Zone and the 615 Zone by modifying (installing and removing) two pressure reducing stations.
- The lower elevations of the existing 710 Zone along 107th Avenue have high pressures and will be converted to a 560 Zone by installing a pressure reducing station on 107th near 184th Street.
- The lower 710 Zone along Burn Road west of McElroy Road also has high pressures and will be converted to a 615 Zone by installing a pressure reducing station on Burn east of McElroy.

ES.5 PROPOSED WATER SYSTEM IMPROVEMENTS AND FINANCING PLAN

This WSP identifies a capital improvement program (CIP) with annual expenditures over the first 11 years (2025), and lump sum expenditures over the second decade (2035). The 20-year CIP total is ~~$56.836~~ $36.156 million in 2015 dollars. CIP projects preliminarily scheduled for the first 11 years total of ~~$20.693~~ $24.386 million, including ~~$14.635~~ $19.308 million borne by the City, and ~~$6.058~~ $5.078 million funded by developers. The remaining ~~$36.143~~ $11.770 million in projects slated to occur in the second decade are composed primarily of main replacement projects and construction of the future 1.0 MG reservoir in the 520 Zone. The actual implementation of these improvements will be predicated on growth.

A financial strategy to fully fund the CIP and operating expenses and service existing debt is also presented. The plan relies primarily on cash funding from rates and connection charges and does not forecast the need to issue any new debt. Rates are proposed to be held at current levels through 2017, followed by annual rate increases of 3.25 percent through 2025. In addition, a reinvestment strategy is proposed where revenues from reserves augment rate revenues. This plan would completely fund the 20-year CIP and projected O&M expenses, and meet policy objectives for funding system reinvestment. The operating fund would end each year with a minimum of 90 days of O&M expenses. Existing debt service would also be retired after two years of payments in 2015 and 2016.

A study is underway at the time of this writing to evaluate costs of service and rates by customer class. Preliminary indications suggest decreases in both rates and connection charges are feasible prior to the implementation of the financing plan described herein. Chapter 10 of this WSP may be amended in the foreseeable future depending on the final recommendations of the rate study.

1 Introduction

1.1 WATER SYSTEM OWNERSHIP AND MANAGEMENT

The City of Arlington (City) is a municipal corporation that owns and operates a public water system within and outside of its City limits. Day-to-day operations of the water system are performed by the Water Utility Department. Water system data on file at the Department of Health (DOH) for the City's system is shown below in **Table 1-1**. The most recent copy of the Water Facilities Inventory (WFI) form maintained by the Department of Health is include in **Appendix A**.



Table 1-1

Water System Ownership Information

Information Type	Description
System Type	Group A - Community - Public Water System
System Name	Arlington Water Department
County	Snohomish
DOH System ID Number	02950K
Owner Number	200
Address	154 West Cox Avenue, Arlington, WA 98223
Contact	Mr. Don Smith, Water Utility Supervisor
Contact Phone Number	(360) 403-3507

1.2 OVERVIEW OF EXISTING SYSTEM

In 2014, the City provided service to approximately 5,458 customer connections, or 7,705 equivalent residential units (ERUs), within the City's retail water service area (WSA), which

extends beyond the City limits as defined in the *2010 North Snohomish County Coordinated Water System Plan*. The City limits comprise an area of approximately 9.7 square miles, and the existing retail WSA is approximately 25.3 square miles. The 2014 population within the City limits was 18,360, while water service was provided to approximately 16,245 people.

Water supply to the City is provided by: one treatment plant that receives water from three groundwater wells within the Haller Wellfield, which are under the influence of surface water; a groundwater well within the Airport Wellfield; and wholesale water purchased from the Snohomish County PUD No. 1 (PUD). Water storage is provided by two reservoirs that have a total capacity of 4.0 million gallons (MG). In addition, the City's water system has four pressure zones with eight pressure reducing stations, one booster pump station and approximately 96.22 miles of water mains. A summary of 2014 water system data for the City's system is shown below in **Table 1-2**.

Table 1-2

2014 Water System Data

Description	Data
Population in City Limits	18,360
Water Service Population	16,245
Water Service Area	25.2 square miles
Total Connections	5,548
Total ERUs	7,705
Demand per ERU	187 gallons per day
Annual Production	574,120,924 gallons
Average Day Demand	1,092 gpm
Per Capita Demand	90 gal/day/capita
Distribution System Leakage (3-Year Rolling Average)	13%
Maximum Day/Average Day Demand Factor	1.75
Peak Hour/Maximum Day Demand Factor	1.81
Number of Pressure Zones	4
Number of Wells & Total Capacity	4 (1,920 gpm)
Treatment Plant Capacity	1,710 gpm
PUD Wholesale Source Capacity	1,000 gpm
Number of Pump Stations & Total Capacity	1 (790 gpm)
Number of Reservoirs & Total Capacity	2 (4.0 MG)
Number of Pressure Reducing Stations	8
Total Length of Water Main	96.2 miles

1.3 AUTHORIZATION AND PURPOSE (AMENDED)

In April 2014, the City authorized RH2 Engineering, Inc. (RH2) to assist the City in preparation of a *Comprehensive Water System Plan* (WSP) as required by State law under WAC 246-290-100. In accordance with WAC 246-290-100, the plan shall be updated and submitted to DOH every six years (DOH intends to allow a 10 year update cycle effective 2015). The previous WSPs were prepared for the City and released in 2004 and 2011. The purpose of this updated WSP is as follows.

In February 2014, the City initiated an update to its *Comprehensive Water System Plan* (Plan, WSP). RH2 Engineering (RH2) was retained in April 2014 to provide modeling and analytical support. FCS Group was also retained to provide financial planning assistance for the utility, including financial analyses for this WSP and conducting a utility rate study. The City previously prepared WSPs in August 2004 and October 2011. The purpose of this updated Plan is to:

- Comply with all requirements of a Water System Plan (WSP) under WAC 246-290-100.
- To evaluate existing water demand data and project future water demands.
- To analyze the existing water system to determine if it meets minimum requirements mandated by DOH and the City's policies and design criteria.
- To evaluate past water quality and identify water quality improvements, if necessary.
- To document the City's operations and maintenance program.
- To prepare water use efficiency, emergency response, cross connection control, wellhead and watershed protection, and water quality monitoring plans.
- To comply with all other DOH water system plan requirements.
- To identify water system improvements that resolve existing system deficiencies and accommodate future needs of the system for at least 20 years into the future.
- To prepare a schedule of improvements that meets the goals of the City's financial program.

Further, this Amended WSP Update serves, by adoption, as a critical element of the 2015 Update to the City of Arlington's *GMA Comprehensive Plan, as amended* in 2017. Consistency between the plans, and the 2015 Update to Snohomish County's Plan, has been assured during their concurrent preparation. Arlington is forecast to accommodate a total of 24,937 citizens and at least 12,224 jobs by 2035. As stated in its ~~2015~~ *amended GMA Comprehensive Plan* ~~update~~, the City is taking a proactive role in attracting developments to meet the needs of its citizens, prioritizing alternative uses of land and public resources, and identifying in explicit terms the impact proposed developments will have on the community. ~~Six~~ Five focus area were identified in Arlington's ~~2015~~ *GMA Comprehensive Plan, as amended*, as being the most suitable for future residential, industrial and retail growth; these same focus areas were evaluated in this WSP

to assure adequate water infrastructure to assure a high level of service to existing customers, and to facilitate the growth of new customers. See chapter 3 for additional Land Use discussion.

Finally, in addition to these regulatory requirements, this WSP maintains unchanged the City's Integrated Water Resources Management Program (IWRMP), first drafted in the 2011 WSP. The IWRMP seeks to integrate the management of the City's multiple water uses within the framework of the natural climate, water resources and other water uses of the Stillaguamish and Quilceda basins. The IWRMP develops policies and actions that flexibly manage the City's water resources to improve water availability, reliability and environmental quality in a cost-effective manner.

1.4 SUMMARY OF PLAN CONTENTS

The following is brief summary of the content of the chapters in the WSP.

- The **Executive Summary** provides a brief summary of the key elements of this WSP.
- **Chapter 1** introduces the reader to the City's water system, the objectives of the WSP and the WSP's organization.
- **Chapter 2** presents the WSA, describes the existing water system and identifies the adjacent water purveyors.
- **Chapter 3** presents related plans, and land use and population characteristics.
- **Chapter 4** identifies existing water demands and projected future demands.
- **Chapter 5** presents the City's operational policies and design criteria.
- **Chapter 6** discusses the City's water source and water quality monitoring program.
- **Chapter 7** discusses the water system analyses and existing system deficiencies.
- **Chapter 8** discusses the City's operations and maintenance program.
- **Chapter 9** presents the proposed water system improvements, and their estimated costs and implementation schedule.
- **Chapter 10** summarizes the financial status of the water utility and presents a plan for funding the water system improvements.
- The **Appendices** contain additional information and plans that supplement the main chapters of the WSP.

1.5 DEFINITION OF TERMS

The following terms are used throughout this WSP.

Consumption: The true volume of water used by the water system's customers. The volume is measured at each customer's connection to the distribution system.

Connection Fee: A charge for a share of the City's potable water system that each service connection must pay as a condition of being allowed to connect to the City's potable water system.

Cross-Connection: Any physical connection, actual or potential, between a water system and any source of non-potable substance that presents the potential for contaminating the public water system, as determined by the City's cross-connection control specialist.

Demand: The quantity of water required from a water supply source over a period of time necessary to meet the needs of domestic, commercial, industrial and public uses, and to provide enough water to supply firefighting, system losses and miscellaneous water uses. Demands are normally discussed in terms of flow rate, such as million gallons per day (MGD) or gallons per minute (gpm), and are described in terms of a volume of water delivered during a certain time period. Flow rates pertinent to the analysis and design of water systems are as follows.

- **Average day demand (ADD):** The total amount of water delivered to the system in a year divided by the number of days in the year.
- **Maximum day demand (MDD):** The maximum amount of water delivered to the system during a 24-hour time period of a given year.
- **Peak hour demand (PHD):** The maximum amount of water delivered to the system, excluding fire flow, during a one-hour time period of a given year. A system's peak hour demand usually occurs during the same day as the maximum day demand.

Distribution System Leakage: Water that is measured as going into the distribution system but not metered as going out of the system.

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

Fire Flow: The flow rate of water required during firefighting, which is usually expressed in terms of gallons per minute (gpm).

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

Head Loss: Pressure reduction resulting from pipeline wall friction, bends, physical restrictions or obstructions. Falling reservoir levels also head losses affecting water pressure.

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

Maximum Contaminant Level (MCL): The maximum permissible level of contaminant in the water that the purveyor delivers to any public water system user, measured at the locations identified under WAC 246-290-300, Table 3.

Meter Installation Fee: A fee charged for the costs associated with the physical installation of a water meter, including costs of materials, labor, and equipment. The fee is dependent on the size of the meter installed.

Potable Water: Water suitable for human consumption.

Pressure Zone: A portion of the water system that operates from sources at a common hydraulic elevation. For example, 342 Zone refers to the City's pressure zone that has reservoirs with an overflow elevation of 342 feet.

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

Supply: Water that is delivered to a water system by one or more supply facilities, which may consist of supply stations, booster pump stations, springs and wells.

Storage: Water that is stored in a reservoir to supplement the supply facilities of a system and provide water supply for emergency conditions. Storage is broken down into the following five components, which are defined and discussed in more detail in **Chapter 7**: 1) operational storage; 2) equalizing storage; 3) standby storage; 4) fire flow storage; and 5) dead storage.

1.6 LIST OF ABBREVIATIONS

The abbreviations listed below in **Table 1-3** are used throughout this WSP.

Table 1-3

Abbreviations

Abbreviation	Description
AC	Asbestos-cement (water main material)
ADD	Average Day Demand
AMC	Arlington Municipal Code
AWWA	American Water Works Association
BPS	Booster Pump Station
CCC	Cross-connection Control
CCR	Consumer Confidence Report
cfs	cubic feet per second
CIP	Capital Improvement Project/Program
City	City of Arlington
County	Snohomish County
CWA	Clean Water Act
CWSSA	Critical Water Supply Service Area
CWSP	Coordinated Water System Plan (for the CWSSA)
DBP	Disinfection By-Product
DI	Ductile Iron (water main material)
DNS	Determination of Non-significance (SEPA decision)
DOH	Department of Health
DSL	Distribution System Leakage
EPA	Environmental Protection Agency
ERU	Equivalent Residential Unit
FCV	Flow Control Valve
fps	feet per second
GMA	Growth Management Act
gpcd	gallons per capita per day
gpm	gallons per minute
GWC	Groundwater Certificate (water right)
GWI	Groundwater under the influence of surface water
ICI	Industrial, Commercial, and Institutional (connections)
IFR	Stillaguamish Instream Flow Rule
IWRMP	Integrated Water Resources Management Program
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDD	Maximum Day Demand
MG	Million Gallons

Continued

Table 1-3
Abbreviations, Continued

Abbreviation	Description
MGD	Million Gallons per Day
mg/l	milligrams per liter
MIC	Manufacturing Industrial Center (Arlington-Marysville)
MWL	Municipal Water Law
NPDES	National Pollutant Detection and Elimination System (CWA)
O&M	Operations and Maintenance
OSHA	Occupational Safety & Health Administration
PDS	Snohomish County Dept. of Planning and Development Services
PHD	Peak Hour Demand
PRV	Pressure Reducing Valve
psi	pounds per square inch
PSPL	Puget Sound Power and Light
PSRC	Puget Sound Regional Council
PUD	Snohomish County Public Utility District No. 1
RCW	Revised Code of Washington
RUTA	Rural-Urban Transition Area
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
SOC	Synthetic Organic Chemical
SSMA	Satellite System Management Agency
SWC	Surface Water Certificate (water right)
SWTR	Surface Water Treatment Rule
TDR	Transfer of Development Rights
THM	Trihalomethane
UGA	Urban Growth Area
USGS	United States Geological Survey
VOC	Volatile Organic Chemical
WAC	Washington Administrative Code
WFI	Water Facilities Inventory (DOH Form)
WISHA	Washington Industrial Safety & Health Act
WRF	Water Reclamation Facility (formerly the WWTP)
WSA	Water Service Area
WSP	Comprehensive Water System Plan
WTP	Water Treatment Plant
WUCC	Water Utility Coordinating Committee (CWSSA member utilities)
WUE	Water Use Efficiency

2 Water System Description

2.1 INTRODUCTION

This chapter describes the City of Arlington's (City) existing and future water service areas (WSAs) and water service agreements and provides a thorough description of the water system and its individual components. The results of the evaluation and analyses of the existing water system are presented later in **Chapter 7**.



2.2 WATER SERVICE AREA (WSA)

2.2.1 History

The City of Arlington was incorporated in 1903. After early efforts to provide a reliable water supply through its wood stave mains floundered, the City granted a franchise in 1916 to Puget Sound Power and Light Company (PSPL) to provide the City with water. The City purchased the water system back from PSPL in 1939, including the water filtration plant, distribution system, potable water well and water rights. Since 1939, the City has renovated the water treatment system, supplemented the system with additional supply and storage facilities, and expanded the distribution network.

Much of the downtown area water system that remains today consists of Asbestos Cement (AC) water main and was constructed in the 1950s and 1960s. The remaining water system is relatively new, with the majority of the construction occurring within the last 30 years.

2.2.2 Geology

The City is located in northwestern Snohomish County, Washington, at the confluence of the North Fork and South Fork of the Stillaguamish River. The City is located primarily on upland areas and terraces above the alluvial Stillaguamish River floodplain. Upland areas are situated on the

Getchell Plateau, with its northern terminus at Old Town Arlington, and continuing to the south-southeast (Burn Rd and SR 9 are predominately on the Getchell Plateau). The terraces are associated with the Marysville Trough, with its northern terminus at Old Town Arlington and the bluff above the floodplain near Island Crossing. The Marysville Trough is the a broad low-lying region between the Getchell and Tulalip Plateaus that forms, at the Arlington Municipal Airport, the low divide between the Stillaguamish and Snohomish River basins.

The City's WSA overlies a variable and complex sequence of hydrogeologic units, each with distinct characteristics. Soils developed from parent geologic units contain widely variable percentages of silt and gravel content. Shallow groundwater occurs at or near the surface adjacent in the Stillaguamish floodplain. Deep groundwater occurs at depths of tens to hundreds of feet below the Marysville Trough. Groundwater from two distinct aquifers provides much of the City's water supply as described below.

Hydrogeologic Units

The complex geology of the WSA can be grouped into seven units or formations, most of which are the result of the glacial and interglacial depositional processes in the region (Pacific Groundwater Group (PGG), 2007). These units can be envisioned as strata, or layers, that are youngest near the surface and older with increasing depth. Not all the units are found continuously beneath the WSA; however, their distribution changes with the landforms across the WSA. Units that are relatively coarse-grained (sands and gravels) store and release groundwater more efficiently and may be considered as water sources called aquifers. Fine grained units (silts and clays) may function as confining beds overlying aquifers (United States Geological Survey (USGS), 1997). The seven hydrogeologic units are discussed below in order from the youngest to the oldest.

Alluvium (Qal). The youngest hydrogeologic unit, the alluvial aquifer (Qal) is primarily associated with the floodplain of the mainstem Stillaguamish River and its tributaries, Portage Creek and March Creek. It is also found to a lesser extent along the South Fork of the Stillaguamish River and its tributary, Eagle Creek. This unit consists of sand and gravel with cobbles and boulders, and is typically between 0 and 30 feet thick in the area, but does reach up to 100 feet below the Stillaguamish floodplain. Groundwater within the aquifer is unconfined and in hydrologic continuity with surface water, meaning that groundwater and surface water readily exchange with each other at different rates and directions throughout the year. The alluvial aquifer is a significant water source for domestic and municipal uses and represents the City's largest source of water at the Haller Wellfield.

Vashon Recessional Outwash (Qvr). The Vashon recessional outwash aquifer (Qvr) is the next youngest hydrogeologic unit, consisting of loose gravel and sand deposited at the terminus of the retreating glaciers. The Qvr occurs extensively at the surface in the Marysville Trough, including middle segments and tributaries of Portage Creek, Old Town Arlington and the headwaters of Quilceda Creek near the Arlington Airport (Airport). Recessional outwash has been eroded and/or

overlain by alluvium along the river floodplain. The recessional sand and gravel in this unit is typically about 100 feet thick, reaching 130 feet thick in some areas. The aquifer is commonly used as a water source for domestic and agricultural uses, although thinner layers may dry up during summer months.

Vashon Glacial Till (Qvt). The Vashon till (Qvt) consists of unsorted, gray, silt, sand and gravel deposited directly beneath the advancing glacier and compacted to form a very dense "hardpan." The density and silt content of the till impedes the vertical movement of water and confines underlying groundwater. The till thickness ranges from 70 feet thick beneath the City to 100 feet thick on the Getchell Plateau. Locally, till either underlies younger alluvium and outwash, or exists at the surface on uplands, such as on the Getchell Plateau. The till is not a significant groundwater source.

Vashon Advance Outwash (Qvr). Vashon advance outwash (Qva) was deposited by meltwater streams at the terminus of the advancing glacier that subsequently over-rode and consolidated the sediment. The Qva either underlies the till where present, or, if absent, underlies alluvium in the Stillaguamish floodplain and recessional outwash in the Marysville Trough. The Qva is typically 200 feet thick but ranges from 100 to 350 feet thick. The Qva is exposed on slopes such as the base of the Getchell Plateau, and locally within incised stream channels. Groundwater in the Qva is generally confined; unconfined the unit is exposed at the surface. The aquifer is a significant water source for domestic and municipal uses, including the Airport Wellfield.

Quaternary Transitional Beds (Qtb). The Qva is underlain by transitional beds (Qtb) deposited at the onset of the Vashon glaciation. The Qtb is typically comprised of approximately 100 feet of sandy to silty clay and interpreted as interglacial lakebed sediments. These widespread deposits are not exposed at the surface and underlie the Qva, but are exposed locally along the western slopes of the Getchell Plateau south of 172nd Street NE. The Qtb is not a source of groundwater supply.

Quaternary Undifferentiated Units (Qu). Deeper undifferentiated units (Qu) underlie the transitional beds and overlay bedrock. This complex consists of both glacial and interglacial deposits and contains clay to gravel-sized deposits. These deposits are not exposed in the WSA. The undifferentiated unit is relatively thick, ranging from 500 to 1,000 feet in the area. PGG (2007) identifies the Quaternary Older Gravel (Qog), a subset of Qu, as a relatively coarse grained deposit that is thought to be 100 feet thick. The deeper groundwater is used less than shallow groundwater, but is tapped where shallow groundwater quantity or quality is insufficient to meet demand.

Bedrock (Br). Basal bedrock (Br) underlies the glacial and interglacial units in the area. The bedrock is locally comprised of volcanic and sedimentary rock. Minor exposures of the bedrock occur in the Getchell Plateau in the southeast portion of the WSA. The bedrock is not considered a groundwater source.

Groundwater Characteristics

Shallow groundwater occurring in the Qal, Qvr and Qva are typically recharged directly by precipitation and in hydrologic continuity with surface water and adjacent groundwater systems, resulting in groundwater elevations that resemble adjacent surface water elevations. Glacial till (Qvt), particularly on the Getchell Plateau, restricts recharge into and confines underlying groundwater in the Qva. Deeper groundwater in the Qu is recharged by groundwater seepage from overlying units and is separated from shallow groundwater by the intervening Qtb unit.

Groundwater flow direction and rates within shallow groundwater systems are controlled by topography and the hydrogeologic unit characteristics. Groundwater in the Qal and Qvr beneath the floodplain flows sub-parallel with the rivers. Within the Qvr, groundwater generally follows topographically to the north or south within the Marysville Trough. Groundwater in the Qva under the Getchell Plateau flows to the north and east. Deeper groundwater discharges to the west off the Getchell Plateau into Qvr.

A groundwater divide in Qvr of the Marysville Trough is an indistinct demarcation where groundwater on the northern side of the divide flows northerly toward the Stillaguamish River and on the southern side of the divide flows southerly toward Quilceda Creek and Ebey Slough. The divide is identified based on groundwater elevations in Qva wells and occurs near (approximately 0 to 1 mile south of), and roughly parallel to, 172nd Street NE. The divide is approximately 2 miles south of the topographic divide in the vicinity of the Arlington Airport at approximately 188th Street NE. Consequently, precipitation and infiltration within the headwaters of the State recognized Water Resource Inventory Area (WRIA) 7 (Snohomish basin) boundary may recharge groundwater in WRIA 5 (Stillaguamish basin).

2.2.3 Topography

The topography of the City's WSA varies greatly in elevation. The lowest elevations within the service area are located near Interstate 5 at Island Crossing where the elevation is approximately 40 feet above mean sea level (NAVD 88). A majority of the WSA is on the Marysville Trough above the Stillaguamish River floodplain. Ground elevations range from 40 feet near the crossing of Interstate 5 and State Route 530 to 400 feet near the crossing of State Route 9 and State Route 531. The highest areas served are in the eastern portion of the service area where elevations along Burn Road reach approximately 600 feet. Steep slopes are located along the Stillaguamish River, where elevations drop 80 to 100 feet, and along transitions between the Getchell Plateau and the Marysville Trough, and between the Marysville Trough and the alluvium of the Stillaguamish floodplain.

Sharply incised areas with highly variable terrain along the perimeter of the Getchell Plateau make serving some neighborhoods difficult, and to do so would require additional development expenses. Accordingly, a number of neighborhoods use alternative water supplies despite expressing interest, historically, in obtaining water service from the City. Examples include Arlington Terrace and McPherson Hills, which rely on private distribution systems, and Brekhus-

Beach, whose properties rely on private wells. Crown Ridge is an example of a topographically-constrained neighborhood which does receive water service, but where the mains are not adequately looped and flushing and additional measures are required to maintain water quality.

2.2.4 Water Service Area (WSA)

The City is located in northwestern Snohomish County, Washington, at the confluence of the North Fork and South Fork of the Stillaguamish River. The City's corporate boundary encompasses an area of approximately 9.7 square miles, as shown in **Figure 2-1**. The *existing* water distribution system generally extends south to State Route 531, north to either the Stillaguamish River or SR 530, east to either SR 9 or Old Town Arlington, and west to Interstate 5. The City's existing water distribution system also extends beyond the City limits west of the Arlington cemetery and along Burn Road as shown in **Figure 2-1**.

The City's *future* WSA boundary is authorized under the Public Water System Coordination Act (RCW 70.116), and is defined in the *2010 North Snohomish County Coordinated Water System Plan* (CWSP), as amended. The future WSA encompasses an area of approximately 25.3 square miles and extends 1 to 2 miles beyond the existing distribution system as shown in **Figure 2-2**. It extends north to the Stillaguamish River and its South Fork, east to 115th Avenue NE, south to 152nd Street NE, and approximately one to two miles west of Interstate 5 to the Burlington Northern Santa Fe Railway. The future WSA adjoins, but currently does not include: the City's Smokey Point neighborhood served by the City of Marysville (Marysville); the Marysville remote WSA containing one service connection to Arlington Christian School; the Silvana Water Association; and several smaller systems to be discussed later in this chapter.

The CWSP allows for revision of future service areas through an established process. Most recently, during the preparation of this WSP update in 2015, the City of Arlington acquired from the City of Marysville that portion of Arlington city limits situated west of 43rd Avenue, east of 51st Avenue, and south of 172nd Street to the municipal boundary (Appendix L).

The City's retail WSA is coincident with the City's future WSA or CWSP boundary. This is the area where the City has a duty to serve new connections when it has the capacity to do so, consistent with regulations, from sources with sufficient water rights, in a timely and reasonable manner. The City's policies for meeting these obligations are contained in **Chapter 5**. In accordance with CWSP procedures, residents and business owners within the City's retail WSA who desire water service must first apply to the City. However, the City has the "right of first refusal" and may decline if it cannot (financial or otherwise) provide the service in accordance with its policies.

According to the Municipal Water Law, the place of use for the City's water rights is defined as the retail service area. Thus, the City can use their water rights outside of their corporate limits if the use is within the retail service area and all legal requirements defined in RCW 90.03.386(2) have been met. The City's service area is consistent with the legal requirements since it does not

conflict with other adopted plans or regulations (see **Chapter 3**). With this WSP, the City is therefore expanding the water right place of use to be the retail WSA in accordance with the Municipal Water Law.

2.3 WATER SERVICE AGREEMENTS

2.3.1 Critical Water Supply Service Area Agreement

All water purveyors located within a Critical Water Supply Service Area (CWSSA) are required to have a WSA agreement that identifies the external boundary of their WSA. North Snohomish County was declared a CWSSA on October 19, 1988. The City prepared and signed a WSA agreement during the development of the CWSP, which was originally finalized in 1991. The City also actively participated in the 2010 CWSP revision process, which was approved by Snohomish County Council in December 2010, and approved by DOH in February 2011. It includes a process for revision of service area maps as may be needed from time to time. The future WSA shown in **Figure 2-2** is consistent with the CWSP-approved map at the time of this WSP update. A copy of the 1991 and 2010 agreements are contained in **Appendix L**.

At the time of this writing, the City is investigating the acquisition of portions of the Marysville WSA that are either within Arlington City limits (e.g., Smokey Point), or otherwise contained within the City's WSA (Arlington Christian School).

2.3.2 Snohomish County PUD No. 1 Wholesale Water Agreement

A July 1998 wholesale water agreement between the City of Arlington and the PUD provides water from the City of Everett's regional surface water supply and groundwater from two PUD wells to the City's water supply portfolio. The agreement allows the City to purchase wholesale water from the PUD at rates up to 1,000 gallons per minute (gpm) for resale to the City's water utility customers. The agreement extends through "2018 and thereafter", and PUD staff have indicated their intent to maintain the agreement indefinitely. A copy of the agreement is contained in **Appendix M**.

2.3.3 Former Interlocal Agreements with City of Marysville Utilities

Prior updates to this WSP documented two interlocal agreements for utility interties between the City and the City of Marysville. Both are no longer effective.

A March 1978 interlocal agreement granted Marysville an easement for construction of water transmission main from Marysville's Ranney Well on the Stillaguamish River through the City. In return, the City was granted three connections for providing water to then-remote portions of the City's water system (west of the airport), and an emergency intertie. All have been abandoned. The two cities no longer have any connections under this agreement. The final connection under this agreement, serving the Stillaguamish Athletic Club and Weston High School, was removed when these facilities connected to the City's distribution system in 2014. Marysville continues to

operate its transmission main and WTP through an easement and fee simple ownership, respectively.

A separate August 1998 agreement transferred the Island Crossing water system (aka the Petunia water system) and all water services north of 180th Street NE along Smokey Point Boulevard from Marysville to the City. It also provided water to serve these customers. Improvements to the City's water distribution system allowed the City to close the intertie valve at Smokey Point Boulevard and 180th Street NE and directly serve this area since February 2005.

Marysville purchases water from the City to serve one connection (Arlington Christian School) in a remote portion of the Marysville WSA through an 8-inch water main under Interstate 5 (the school was excluded from the 1998 sale described above). The City initiated negotiations with Marysville in March 2015 to purchase this last remaining connection and directly serve the Arlington Christian School.

2.4 SATELLITE SYSTEM MANAGEMENT

A Satellite System Management Agency (SSMA) is defined as a person or entity that is certified by DOH to own or operate more than one public water system without the necessity for a physical connection between such systems. SSMAs were created to stop the proliferation of small water systems, many of which could not meet federal and state water quality and water system planning regulations. Based on the success of SSMAs, DOH made recommendations to the legislature to include rules for designating entities as qualified SSMAs.

In July 1995, Senate Bill 5448 became law, governing approval of new water systems and setting forth requirements for SSMAs. The goal of the law is to ensure that the people of Washington State will receive safe and reliable water supplies in the future from professionally managed or properly operated water systems. SSMAs can provide three different levels of service:

1) Ownership of the satellite system;
2) Operations and management of the satellite system; or
3) Contract services only.

The service can be provided to new systems, existing systems that are no longer viable or existing systems placed into receivership status by DOH.

The City does not own or operate any satellite systems and is not currently a SSMA. Under the CWSP, the City may elect to serve smaller systems within its CWSP boundary either directly or as an SSMA. Outside and adjacent to the City's CWSP boundary (aka its future WSA boundary), the CWSP authorizes the PUD to function as the SSMA, giving it first right of refusal when a new or failing system desires management oversight.

2.5 INVENTORY OF EXISTING WATER FACILITIES

This section provides a detailed description of the existing water system and the current operation of the facilities. The analysis of the existing water system is presented in **Chapter 7**.

2.5.1 Pressure Zones

The City currently serves customers within an elevation range of approximately 40 feet near the crossing of Interstate 5 and State Route 530 to approximately 605 feet along Burn Road in the eastern portion of the system. The wide range of elevations requires that the water pressure be increased or reduced to maintain pressures that are safe and sufficient to meet the system's flow requirements. The City achieves this by dividing the water system into four distinct pressure zones, as shown in **Figure 2-1**.

The pressures in the 520 and 342 Zones are regulated by reservoir levels, as illustrated in the hydraulic profile, **Figure 2-2**. Pressures in the 342 Zone, which has a maximum hydraulic elevation of 342 feet, are established by the range of surface water levels in Gleneagle Reservoir. The 342 Zone is primarily located in Old Town Arlington and the areas surrounding the Arlington Airport on the Marysville Trough and Stillaguamish floodplain. Service elevations in the 342 Zone range from approximately 40 to 260 feet.

Pressures in the 520 Zone, which has a maximum hydraulic elevation of 520 feet, are established by the surface water level in the 520 Zone Reservoir. The 520 Zone serves neighborhoods on the Getchell Plateau, including the Gleneagle and Crown Ridge neighborhoods.. Service elevations in the 520 Zone range from approximately 190 to 420 feet.

The 540 and 710 Zones are located at even higher elevations on the Getchell Plateau, are supplied with water directly from the PUD through an intertie located east of the City on Burn Road. The hydraulic elevation of the PUD master meter is approximately 710 feet and pressures must be reduced with pressure reducing valves (PRV) along Burn Road and 186th Street to achieve satisfactory service pressures. Within the 710 Zone itself, service elevations range from approximately 340 to 605 feet.

The 710 Zone supplies the 540 Zone through the Upper Burn Road PRV. Maximum hydraulic elevation is 540 feet, and service elevations range from approximately 260 to 420 feet.

The 710 Zone also supplies the 520 Zone through the 186th Street flow control valve.

2.5.2 Supply Facilities

Introduction

The City's water supply is provided by three wells (plus one reserve well) and a wholesale purchase agreement with the PUD.

The primary source of water is the City's three wells in the Haller Wellfield near the Stillaguamish River. The first of these wells was reportedly hand-dug in the late 1890s to serve Haller City and shingle mills along the Stillaguamish River. The three wells withdraw groundwater from the Stillaguamish Alluvial Aquifer, which is in hydraulic connection with the river (also referred to as groundwater under the influence of surface water, or GWI). The Airport Wellfield includes a single well that withdraws groundwater from the Marysville Trough Aquifer. A summary of the well sources is shown in **Table 2-1**, and a detailed description of each source of supply is provided in the following sections.

The City's wholesale agreement with the PUD authorizes the purchase of up to 1,000 gpm of water. A master meter monitors and controls the supply of water into the City's distribution system. The master meter is located in a vault at the intersection of Burn Road and 172nd Street NE and is owned and maintained by the PUD. A summary of the PUD master meter is shown in **Table 2-2**.

As described earlier in this chapter, two former interlocal agreements with the City of Marysville which provided water supply to Arlington are no longer effective. The last two services in the Arlington WSA supplied by the City of Marysville began to be supplied from Arlington's other sources in 2014. The Marysville master meter has been removed from the meter summary in Table 2-2 effective with this WSP update.

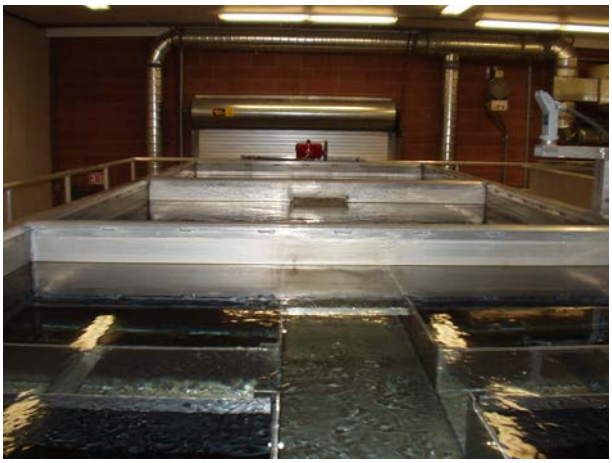
Table 2-1

Well Facilities Summary

Well	Pressure Zone	Year Drilled	Pumping Capacity (gpm)	Well Depth (feet)	Well Diameter (inches)	Pump Type	Pump Motor Size (hp)	Water Treatment[1]	Control Facility
Airport Well	342	1945, 1996	220	166	10	Vertical Turbine	60	NaOCl	Gleneagle Reservoir
Haller No. 1	342	~1963, 2002	570	36	16	Vertical Turbine	25	NaOH, NaOCl	Water Treatment Plant
Haller No. 2	342	1961, 2001	570	38	36	Vertical Turbine	25	NaOH, NaOCl	Water Treatment Plant
Haller No. 3	342	1906 or prior, 2001	570	38	72	(2) Vertical Turbine	(2) 25	NaOH, NaOCl	Water Treatment Plant

(1) NaOH: Sodium hydroxide corrosion control; NaOCl: chlorination.

Water Treatment



The water treatment plant, originally constructed in 1924 and replaced in 2001, is located within the City's utilities compound, and treats water from the Haller Wellfield. Filtration and disinfection of the Haller source is required because the wellfield is under the influence of the Stillaguamish River (as described earlier in this section, it is GWI). Water is pumped from the Haller wells through a single influent pipe to the direct filtration system, which consists of three filter beds. Primary coagulant and filter aid are added to the raw water, which is also chlorinated prior to filtration. The total capacity of the filtration system is 1,710 gpm. The plant operates with one or two filter beds in the winter and increases to three in the peak of the summer. Filtered water is then chlorinated by a 0.8 percent chlorine solution as it enters a 270,000 gallon clear well which provides adequate contact time for disinfection and provides storage. The chlorine solution is produced by an on-site sodium hypochlorite generation system. As the water exits the clear well, sodium hydroxide is added to adjust the pH level for corrosion control, and the water is disinfected in the distribution system as outlined below. Three pumps are available for pumping the water into the distribution system, although only two can operate simultaneously. The design pumping capacity with one pump operating is 910 gpm and is 1,710 gpm with two pumps operating. For unknown reasons, capacity was reduced to 1,650 gpm approximately 7 to 10 years ago. With just one pump running, capacity has declined to about 800 to 850 gpm. The City has scheduled one pump repair or replacement each year for 2016 through 2018. Two additional pumps are available for backwashing the filter beds.

The City's water is disinfected in the distribution system by flow-pacing diluted sodium hypochlorite during operation of the pump at the Airport Wellfield. Bulk 12.5 percent sodium hypochlorite is diluted and then injected into the pumped water through a metering pump feed system with a target dose of 0.5 milligrams per liter (mg/L).

Supplemental chlorination has taken place at the 520 Zone Pump Station. However, chlorine residual and disinfectant byproduct monitoring results have shown that supplemental chlorination is not generally required and may increase HAA5 and THM levels throughout the distribution system. Based on these monitoring results, supplemental chlorination was discontinued at the 520 Zone Booster Pump Station in December 2005.

Haller Wellfield

The Haller Wellfield is located within the 342 Zone near the confluence of the North and South Forks of the Stillaguamish River. Thanks in part to the high background water quality of the river and the use of riverbank filtration, the well field pumps clear water with only occasional concerns for manganese.

The well houses are located at Haller Park within a fenced area near the abandoned railroad trestle. Each well is housed in a separate building that contains the mechanical and electrical equipment. The telemetry and motor control center (MCC) equipment is also housed in Well No. 2's building.

Haller Well No. 1 was constructed between 1962 and 1964 and was abandoned in 2001 due to low yields. The well was relocated and reconstructed as Well No. 1R in 2002. The well's 570 gpm vertical turbine pump is powered by a 25 horsepower motor and is housed in a cement masonry unit (CMU) block building. The 16-inch-diameter, 36-foot-deep well has distinctly higher iron and manganese levels relative to Haller Well Nos. 2 and 3. A 2013 effort to purge the well and develop the surrounding formation through regular pumping resulted in very low turbidities in the pumped water at the wellfield. Upon pumping to the WTP, the filter trains were effective in further reducing turbidity in the mildly pre-chlorinated influent. Dosing with chlorine for disinfection, however, resulted in the rapid precipitation of iron and manganese in the clearwell, which was immediately discharged to the wastewater facility. Well No. 1R therefore remains off-line and suitable for water supply only on an emergency basis.



Haller Well No. 2 was constructed in 1961. It was rehabilitated in 2001 and is now housed in a CMU block building. The 36-inch-diameter, 38-foot-deep well is equipped with a 570 gpm vertical turbine pump powered by a 25 horsepower motor.

Haller Well No. 3 is understood to have been constructed by a shingle mill between 1897 and 1906. It provided portions of the City with water service prior to PSPL ownership of the water system. The City rehabilitated the well in 1939 upon purchasing the water system from the PSPL and again in 2001. The CMU block building houses two 570 gpm vertical turbine pumps, and each are powered by a 25 horsepower motor. The two pumps are installed in the 72-inch-diameter, 38-foot-deep well.

All three regularly operated pumps in Haller Wells No. 2 and No. 3 can alternate or run simultaneously depending on the volume of water required at the water treatment plant. Design

capacity for the wellfield pumps was about 1,710 gpm, matching the water rights of the wellfield and the capacity of the WTP when the WTP was constructed. The City initiated rehabilitation efforts on Haller Well Nos. 2 and 3 in 2012 in order to have a clear and current assessment of the reliability of the wellfield for long-term water supply. The City hoped that cleaning would help to increase well yield while reducing drawdown in the aquifer. Impulse technology (using Hydropuls®) was effective in cleaning impacted sediment and encrustations from the perforations and formation of Well No. 2, but also resulted in cracks in the concrete casing. It appeared to release a lot of iron and manganese laden sediments from the surrounding formation. A post-cleaning pump test on Well No. 2 (prior to cleaning of Well No. 3) observed a decline in well field production at the time from approximately 1,700 gpm to 1,500 gpm as a result of decreased specific capacity. Pumping at 1,700 would increase drawdown relative to the pre-rehabilitation effort. The City decided to postpone cleaning of Well No. 3 until the following year. When aquifer drawdown did not significantly improve, the City elected to not implement cleaning of Well No. 3.

All three wells feed into a 12-inch water supply or transmission main (a 10-inch segment was upgraded in 2012) that flows directly into the treatment trains at the water treatment plant. Additional data on the Haller Wellfield and the City's other sources is contained in **Appendix B**.

Airport Wellfield

The Airport Wellfield is located in the 342 Zone on fenced, Airport-owned property near 59th Avenue NE. It is within the airport/industrial area of the Marysville Trough. The City operated the Airport in the 1930s and early 1940s at which point it was purchased by the United States military. The military developed three or four wells in or around 1945. When the City re-acquired the Airport from the military in the 1960s, it gained control of any functional wells. The City supplied portions of the City with potable water for municipal use and irrigation from Airport Well No. 1 since before 1965. The City's Water Department continues to lease the property from the Airport. The well building also contains the well's mechanical, electrical and telemetry equipment. An emergency generator is located adjacent to the well building in a weather-tight enclosure.

The well's original water right was obtained in 1965 and increased in 1986 to allow for a maximum instantaneous rate of withdrawal of 580 gpm. The original pump in the 10-inch-diameter, 185-foot-deep well was replaced in 1996 with a vertical turbine pump equipped with a 60 horsepower motor. The City has increased the pump elevation twice since 1996 to avoid pumping sand deposits from the bottom of the well and due to a well casing collapse in 2009.



The well's supply rate has decreased from 580 gpm to approximately 220 gpm as a result of this well casing collapse.

Additional data on the Airport Wellfield and the City's other sources is contained in **Appendix B**.

Snohomish County PUD No. 1 Master Meter

The City has one connection to the PUD water system and has purchased water rights to withdraw a maximum of 1,000 gpm from this connection. A flow test performed by the City and PUD on April 28, 2011 resulted in at least 1,138 gpm being available at a hydrant in the City's 710 Zone. The static pressure on the City's side the PUD master meter was 75 psi prior to the flow test and the residual pressure at the same location was 33 psi during a flow rate of 1,138 gpm at the hydrant.

The primary source of PUD water is the regional supply provided by the City of Everett from reservoirs on the Sultan River. PUD also operates two groundwater wells near Lake Stevens which influence the water received at Arlington. Water supplied by the PUD is treated before it reaches the master meter and is not re-chlorinated or subjected to any additional treatment prior to entering the City's distribution system. The PUD master meter has a 6-inch main meter with a 2-inch bypass meter located within a below-grade concrete vault, which was constructed in 2000. A summary of the City's master meter is shown in **Table 2-2**. Additional data is also contained in **Appendix B**.

The PUD source provides "full fluoridated" water to the City since the City of Everett adds 0.7 mg/L of fluoride at its source. In comparison, water from the City's wells contains negligible amounts of fluoride. Fluoride and other quality considerations are addressed in Chapter 6.

Table 2-2

Master Meter Facilities Summary

Meter	Pressure Zone	Year Installed	Capacity	Master Meter Size (inches)	Operation Status	Contract Expiration Date
PUD Master Meter	710	2000	1,000 gpm	6 and 2	Active	12/31/2018

continued

2.5.3 Pump Station Facilities (Amended)

520 Zone Booster Pump Station



520 Zone Pump Station

The above-grade 520 Zone Booster Pump Station was constructed in 1998. The pump station and adjacent Gleneagle Reservoir are located on City-owned property in the Gleneagle residential neighborhood. The pump station is equipped with two end-suction pumps to pump water supplied from the 342 Zone Gleneagle Reservoir to the 520 Zone Reservoir. The two pumps operate on an alternating schedule to extend pump life and serve as a back-up for use when needed. The pumps are each rated at 395 gpm and powered by 40 horsepower motors. The normal pumping rate of the facility is approximately 430 gpm. The pump station is equipped with an emergency generator. A summary of the pump station is shown in **Table 2-3.**

The previous WSP described how the pump station was managed only to pump water from the lower to higher pressure zone during emergency conditions. The typical operation was to serve the 520 Zone through a flow control valve from the 710 Zone, which obtained water from the PUD. Subsequent to the WSP, the City conducted a water supply study which demonstrated economic benefits to greater reliance on its own water sources. The City's approach is now to serve the 520 Zone from the 342 Zone by operating the booster facilities on a regular basis. The City replaced one pump and electric motor in 2015, and ~~is scheduled to replace~~ the second pump in 2016. Additional data on the 520 Zone Booster Pump Station is contained in **Appendix B**.

Table 2-3
Booster Pump Station Facilities Summary

Pump Station	Suction Pressure Zone	Dischrage Pressure zone	Year Constructed	Existing Pumping Capacity* (gpm)	Number of Pumps	Pump Type	Pump Motor Size (hp)
520 Zone Booster Pump Station	342	520	1998	790	2	End Suction	40

* 395 gpm for each of two pumps; typically operated one at a time in alternating fashion

Water Treatment Plant

The City's water treatment plant has a pump room that houses five pumps. Three of the pumps are 910 gpm vertical turbine pumps with 100 horsepower motors that pump treated water from the clear well into the distribution system. Two pumps can operate simultaneously with a combined pumping capacity of 1,710 gpm. The other two 1,000 gpm vertical turbine pumps are backwash

pumps powered by 25 horsepower motors. A spare 100 hp pump motor and a 25 hp motor are held on reserve in the WTP. The treatment plant's emergency generator has the capacity to operate all of the pumps during an emergency event.

2.5.4 Storage Facilities (Amended)

The City's water system has two storage facilities that provide storage to the 342 and 520 Zones. A summary of the storage facilities is shown in **Table 2-4** and a detailed description of each facility is provided below. Additional data is also contained in **Appendix B**.

Table 2-4

Storage Facilities Summary

Reservoir	Location	Pressure Zone	Year Constructed	Material	Capacity (MG)	Diameter (feet)	Base Elevation (feet)	Overflow Elevation (feet)	Overflow Height (feet)
Gleneagle	17913 Oxford Drive	342	1975	Concrete	2	100	304.7	342.0	37.3
520 Zone	17003 91st Ave NE	520	1993	Steel	2.0	132	499.0	520.0	21.0

Burn Road Reservoir

Constructed in 1962 as the City's second reservoir, the 0.5 MG Burn Road Reservoir provided 52 years of service before being taken off-line in February 2014. The reservoir, located on a fenced site off a remote gravel road near the intersection of Burn Road and 207th Street NE, ~~is scheduled for demolition in this planning horizon (**Chapter 9**)~~ was completely demolished in 2016. At 48-foot-diameter and 37-foot-tall, the steel tank provided approximately 13,698 gallons of storage per foot of height. It served behind the Gleneagle Reservoir as redundant storage in the 342 Zone. It was decommissioned primarily because of slope stability concerns at and below the reservoir site, and because it is not anchored for seismic events.

520 Zone Reservoir

The 2.0 MG 520 Zone Reservoir is located on a fenced site in a residential area near the intersection of 172nd Street NE and 91st Avenue NE. The 132-foot-diameter, 21-foot-tall steel tank was constructed in 1993 and provides approximately 95,200 gallons of storage per foot of height. A single 16-inch-diameter water main serves as the reservoir's common inlet/outlet pipe. The reservoir is anchored for seismic events per 1993 standards. An adjacent building houses the reservoir's telemetry equipment and altitude valve. The altitude valve is not currently used because the reservoir is without an adequate drainage system. Additional data on the 520 Reservoir and the City's other reservoirs is contained in **Appendix B**.

Gleneagle Reservoir

The 2.0 MG Gleneagle Reservoir is located near the intersection of Eaglefield Drive and Oxford Drive and provides water storage to the 342 Zone. The 100-foot-diameter, 37-foot-tall concrete tank was constructed in 1975 and provides approximately 53,619 gallons of storage per foot of height. A single 14-inch-diameter water main serves as the reservoir's common inlet/outlet pipe. The reservoir is anchored for seismic events per 1975 standards. The Gleneagle Reservoir is equipped with telemetry. The reservoir's wooden roof is scheduled for replacement in the City's Capital Improvement Program shown in **Chapter 9**.



Gleneagle Reservoir

2.5.5 Distribution and Transmission System

The City's WSA contains approximately 96 miles of water main ranging in size from 2 inches to 16 inches. As shown in **Table 2-5**, half of the water main (approximately 50 percent) within the service area is 8-inch-diameter and 38 percent is 10 inches in diameter or larger. (Note: Unlike sections 2.5.3 and 2.5.4, where 2015 and 2016 improvement projects are mentioned in the 2017 WSP amendment, recent main replacement projects are not included in the amended WSP.)

Table 2-5

Water Main Diameter Inventory

Diameter (inches)	Length (feet)	Length (miles)	Percentage of Total
2	2,060	0.39	0.4%
4	18,985	3.60	3.7%
6	35,832	6.79	7.1%
8	254,350	48.17	50.1%
10	52,031	9.85	10.2%
12	138,973	26.32	27.4%
14	2,508	0.48	0.5%
16	2,835	0.54	0.6%
Unknown	445	0.08	0.1%
Totals	**508,017**	**96.22**	**100.0%**

Just over 89 percent of all water mains in the water system are constructed of ductile iron pipe (DIP). Most of the remaining mains are constructed of asbestos cement (AC). All new water main installations are required to use cement mortar lined, class 152 DIP with Field-Lok gaskets in accordance with the City's Public Works Design and Construction Standards and Specifications; a copy is contained in **Appendix D**. More than half (55%) of the asbestos cement pipe occurs in Old Town Arlington. Other areas where AC is concentrated are along Cemetery Road (22%) and the industrial area east of the Airport (16%). About a half-mile of main composed of other materials is distributed in 13 segments around Old Town. A detailed breakdown of the City's water main material inventory is shown in **Table 2-6**.

Table 2-6

Water Main Material Inventory

Material	Length (feet)	Length (miles)	Percentage of Total
Asbestos Cement	52,610	9.96	10.4%
Cast Iron[1]	0	0.00	0.0%
Ductile Iron	452,902	85.78	89.2%
Galvanized Iron	628	0.12	0.1%
Plastic[2]	1,432	0.27	0.3%
Unknown	445	0.08	0.1%
Totals	**508,017**	**96.22**	**100.0%**

[1] The previous WSP reported almost 10,000 feet of cast iron pipe in Smokey Point Boulevard. Subsequent investigations have shown the pipe to be ductile iron and in good condition.

[2] PVC and HDPE

Historically, the life expectancy of water main is generally 50 years. However, corrosion within water mains has been greatly reduced through the development of cement mortar lined ductile iron pipe, which has a life expectancy in excess of 75 years. Approximately 10 percent of water main within the system was constructed in the 1950s and 1960s and is reaching or has reached its life expectancy. The majority of this older water main is 4- and 6-inch diameter asbestos cement pipe and is located in the old town and airport areas. Two-thirds of the water main in the City's water system is primarily 30 years old or less and is generally in good condition. A detailed breakdown of the age of the City's water mains is shown in **Table 2-7**.

Virtually all of the City's water main breaks occur in AC pipe. Where soils are well drained and soil moisture is relatively low, such as in the Marysville Trough near the Airport, AC pipe has been examined and found to be in excellent condition. In wetter soils, such as in Old Town Arlington, AC pipe is much less competent and more prone to breaks. Accordingly, the City

implements an annual main replacement program with focus on upgrading AC mains around Old Town first.

Table 2-7

Water Main Installation Year Inventory

Year Installed	Age (years)	Length (feet)	Length (miles)	Percentage of Total
1950s	56 to 65	17,241	3.27	3.4%
1960s	46 to 55	34,414	6.52	6.8%
1970s	36 to 45	43,484	8.24	8.6%
1980s	26 to 35	41,695	7.90	8.2%
1990s	16 to 25	149,424	28.30	29.4%
2000s	6 to 15	120,839	22.89	23.8%
2010s	0 to 5	22,370	4.24	4.4%
Unknown	Unknown	78,551	14.88	15.5%
Totals		**508,017**	**96.22**	**100.0%**

2.5.6 Pressure Reducing Stations

Pressure reducing stations are connections between adjacent pressure zones that allow water to flow from the higher pressure zone to the lower pressure zone by reducing the pressure of the water as it flows through the station, thereby maintaining a safe range of pressures in the lower zone. A pressure reducing station is essentially a below-grade vault (typically concrete) that normally contains two pressure reducing valves, sometimes a pressure relief valve, piping and other appurtenances. The pressure reducing valve hydraulically varies the flow rate through the valve (up to the flow capacity of the valve) to maintain a constant set pressure on the downstream side of the valve for water flowing into the lower pressure zone.

Pressure reducing stations can serve multiple purposes. They can function as an active supply facility by maintaining a *continuous supply* of water from a higher pressure zone into a lower zone that has no other source of supply. Pressure reducing stations can also function as *standby supply* facilities that are normally inactive (no water flowing through them). The operation of this type of station is typically triggered by a drop in water pressure near the downstream or low pressure side of the station. A typical application of this function is a pressure reducing station that is only needed to supply additional water to a lower zone during a fire flow situation. The pressure setting of the control valve within the station allows it to remain closed during normal system operation and open only during high demand conditions, like fire flows, to provide the additional water supply needed.

The City's water system has a total of seven pressure reducing stations, as shown in the profile view in **Figure 2-3**. Five of the seven pressure reducing stations are located at the boundary

between the 342 and 520 Zones. All five of these pressure reducing stations only provide water to the lower zone on a *standby* basis—during fire flow situations and occasionally during peak demand events. The remaining two pressure reducing stations, located along Burn Road at 95th Avenue NE, and along Old Burn Road at 209th Street NE, are needed to bring higher pressure water from the PUD into the City's distribution system. The latter station supplies water from the 540 Pressure Zone to the 342 Zone on a *standby* basis, while the former reduces pressure from the 710 Zone to the 540 Zone while providing a *continuous* supply of water. A summary of these PRVs is shown in **Table 2-8** and a listing of all pressure reducing stations and related data is contained in **Appendix B**.

The City's water system also has one flow control valve (FCV) located on 186th Street NE near Arlington High School at the boundary between the 520 and 710 Zones. This FCV is manually operated by the City to provide *continuous* water service to the 520 Zone by reducing the pressure from the PUD's system. A summary of this FCV is also shown in **Table 2-8**.

Table 2-8

Pressure Reducing Station Inventory

Name	Location	Pressure Zone (From)	Pressure Zone (To)	Valve Size (inches)	Pressure Setting (psi)	Hydraulic Grade Setting (feet)
Pressure Reducing Valves						
PRV 1 (Highland View)	17700 Highland View Drive	520	342	6 and 2	38	340
PRV 2 (Woodlands Way)	6850 Woodlands Way	520	342	6 and 2	30	333
PRV 3 (Cedarbough Loop)	Cedarbough Loop and Woodbine Drive	520	342	6 and 2	35	340
PRV 4 (Woodbine Drive)	Woodbine Drive and Silverleaf Place	520	342	6 and 2	30	301
Bovee Acres PRV	6900 Bovee Lane	520	342	6 and 2	38	334
Lower Burn Road PRV	Burn Road and 209th Street NE	540	342	8 and 2	35	320
Upper Burn Road PRV	Burn Road and 95th Avenue NE	710	540	8 and 2	45	540
Flow Control Valves						
186th Street FCV	8756 186th Street NE	710	520	6	---	---

2.5.7 Water System Interties

Water system interties are physical connections between two adjacent water systems. Interties are normally separated by a closed isolation valve or control valve. Normal supply interties provide water from one system to another during non-emergency situations and are typically supplying water at all times. Emergency supply interties provide water from one system to another during emergency situations only. An emergency situation may occur when a water system loses its main

source of supply or a major transmission main and is unable to provide a sufficient quantity of water to its customers.

The City has one normal supply intertie with the PUD. This intertie provides the City with the capability to obtain a maximum of 1,000 gpm from the PUD. This supply source has value in that it is a sole source for much of the 540 and 710 pressure zones. (The 520 reservoir could back feed into the lower 540 zone—lower Burn Road area—with changes at the 186th Street flow control valve.) The flow control valve also regulates flow to a low, steady rate, but will open to pass fire flows in the event of a pressure drop in the 520 pressure zone. It also serves as a generous and reliable back-up supply should one of the City's production sources become unavailable. This was shown after the March 2014 Oso mudslide when withdrawals at the Haller wellfield were temporarily halted and then continued at a reduced rate for several months while turbid river water passed downstream. It is noted, however, as discussed in chapter 7, that operation of the intertie at flows above 100 gpm encroach on fire supplies for the 540 and 710 pressure zones. Flow rates in recent years have typically ranged from 40 to 80 gpm.

The City does not currently have an emergency intertie with an adjacent water system. An emergency intertie between Marysville's transmission main and the City's water system under the 1978 agreement along has been abandoned. A physical connection between the City and Marysville on Smokey Point Boulevard at 180th Street established under the 1998 agreement still exists but is valved closed. That agreement allowed certain flows during fire emergencies. Flows afforded to the City under the agreement are met or exceeded at higher pressure under the City's own operations. There is no benefit to the City to maintain the 1998 agreement only for a fire emergency.

The City currently has no plans for additional future interties with new parties, but may consider re-establishing an intertie with Marysville. Marysville's Stillaguamish River Water Treatment Plant, which is located within Arlington City limits, could provide supply directly to the City's 342 Zone with a booster pump station. The City could also directly supply Marysville's 240 Zone with a pressure reducing station.

2.5.8 Telemetry and Supervisory Control System

Successful operation of any municipal water system requires gathering and using accurate water system information. A telemetry and supervisory control system gathers information and can efficiently control a water system by automatically optimizing facility operations. A telemetry and supervisory control system also provides instant alarm notification to operations personnel in the event of equipment failure, operation problem, fire or other emergency situations.

The City's telemetry and supervisory control system was installed in 2001 and manufactured by Allen Bradley. The system consists of a master telemetry unit at the water treatment plant that operates the water treatment plant, Haller Wellfield, Airport Wellfield, 520 Zone Reservoir, 520 Zone Pump Station and Gleneagle Reservoir. Remote telemetry units are located at the Haller

Wellfield, Airport Wellfield, 520 Zone Reservoir and the 520 Zone Pump Station/Gleneagle Reservoir. The transmitting and receiving telemetry units communicate to each other using bridged circuit phone lines.

2.5.9 Water System Operation and Control

The City's system is supplied with water from the Haller and Airport Wellfields and through a metered connection from the PUD water system, as shown in **Figure 2-1**.

The 342 Zone is supplied with water from all three sources. The 342 Zone's main source of supply, the Haller Wellfield, supplies water to the water treatment plant. The main control panel (MCP) at the plant signals the remote control panel (RCP) at Haller Well No. 2 to operate the pumps. The number of pumps operating depends on the water treatment plant flow and the number of treatment trains operating, and reflects the operator's decision in anticipation of system demands. The telemetry system is programmed to alternate the pumps in operation at the Haller Wellfield and recognizes the source as four pumps instead of three wells (or three pumps instead of two wells, since Well 1R is off-line for water quality reasons and is used for emergencies only). Up to three pumps may run at any one time. The RCP will send a signal to the MCP if there are well problems (i.e. low water level, pressure problems, etc.) and the MCP will shut down the well. Treated water is supplied to the Gleneagle Reservoir. Water is pumped through the distribution system and to the reservoir when the water treatment plant clear well is full and disinfection contact time is satisfied. The amount of water pumped from the clear well to the system is set by the water treatment plant operator. A high reservoir level at the Gleneagle Reservoir will generate an alarm to signal an operator.

The 342 Zone is also supplied with water from the Airport Wellfield and the PUD. The Airport Well No. 1 is controlled by water levels in the Gleneagle Reservoir. The water treatment plant operator inputs reservoir operating set points into the MCP to operate the well as needed. Water is pumped directly into the 342 Zone from the Airport Well.

Water from the PUD can be transferred to the 342 Zone from the 540 Zone on a standby basis through the Lower Burn Road PRV. Additionally, the five pressure reducing stations between the 520 and 342 Zones do not normally supply water, but are set to supply water to the 342 Zone upon a suppressed level in the 342 Zone reservoirs or during a localized drop in pressure, such as during a fire flow.

The 520 Zone is primarily supplied by the 520 Zone Booster Pump Station, which operates using two alternating pumps. The 520 Zone is also supplied with water purchased from the PUD, through the 186th Street flow control valve (FCV) from the 710 Zone. The 186th Street FCV is a continuous source of supply to the 520 Zone and the 520 Zone Reservoir. At the present time, it typically operates at 40 gpm to 50 gpm. During periods of high demands, emergency conditions such as a fire event or an interruption in supply from the PUD, the pump station increases its supply

to the 520 Zone. The pump station can be controlled by the City's telemetry system and is dependent on the level of the 520 Zone Reservoir.

The City's connection to the PUD and a pressure reducing station located along Burn Road at 95th Avenue NE provide a continuous source of supply to customers in the 540 and 710 Zones along the Burn Road Transmission Line.

2.6 ADJACENT WATER SYSTEMS

The largest water systems adjacent to the City's WSA are Marysville and the PUD. Several smaller water systems are located within or in the vicinity of the City's WSA. Eighteen water systems located adjacent to or within the City's service area boundary are shown in **Figure 2-2**. A brief description of each water system is summarized from their Water Facilities Inventory (WFI) on DOH's Sentry Internet database in 2014.

2.6.1 Large, Expanding Group A Community Water Systems

Under the North Snohomish County Coordinated Water System Plan (CWSP), expanding systems like the City of Arlington are peer utilities which anticipate the ability to expand their infrastructure to add additional connections through time. Expanding systems have future WSAs which are clearly defined footprints within the Critical Water Supply Service Area (CWSSA). Future service area boundaries may themselves expand, consistent with established procedures, until the entire CWSSA is served.

Snohomish County PUD No. 1 – Lake Stevens (Water System ID 80907)

The Snohomish County PUD No. 1's (PUD) Lake Stevens water system (aka as PUD's Integrated System) abuts the City's eastern service area boundary, with most of its adjacent infrastructure near the southeastern corner of the service area.. The PUD's May 2014 WFI indicates it serves 18,782 total connections, including a residential population of 46,298 in 18,356 dwelling units. Industrial, commercial, and industrial (ICI) connections compose the remaining 415 services. A recent transfer of the Sunnyside neighborhood from the PUD to the City of Marysville reduced PUD's active water customers by about 20 percent to the levels given here.

The PUD receives most of its water from approximately eight interties with the City of Everett. However, it has recently begun increasing the amount of water it produces from two wells near Lake Stevens at up to 2,400 gpm. The City of Arlington receives water from the PUD via a wholesale water supply line. In 2013, about 6% of the City's supply was received from the PUD.

The City of Marysville (Water System ID 51900)

Marysville's water system is located south of the City's service area boundary. Marysville's WFI indicates approximately 20,683 water service connections. It serves a population of 62,115 in 19,395 dwelling units. The WFI indicates 1,288 additional industrial, commercial, and industrial (ICI) and other connections. However, a recent transfer of the Sunnyside neighborhood from PUD

to the City of Marysville is understood to have resulted in a significant increase in the number of Marysville's residential water customers.

Water is supplied to the Marysville system from Edward Springs, from three groundwater wells near the springs, from two other groundwater wells, from a Ranney well in the Stillaguamish River, and from an intertie with the City of Everett. A filtration plant for the Ranney well is located within Arlington city limits, but only serves City of Marysville customers. Although interties between the two cities formerly existed, no interties currently exist. The only exception is Arlington water purveyed to a single service in an isolated portion of the Marysville service area. As described elsewhere in this WSP, the City and Marysville are working to transfer this service to the City of Arlington.

Marysville has a large WSA that extends well beyond its city limits. As described previously, Marysville serves water to Arlington's Smokey Point neighborhood. The City has initiated negotiations with Marysville for some modifications to our mutual service area boundaries, but no plans currently exist for renewing interties between the two systems.

Seven Lakes Water Association (Water System ID 77660)

Seven Lakes Water Association operates a water system in the lakes region of the lower Stillaguamish basin, west of the BNSF railroad which marks the western margin of Arlington's WSA. Seven Lake's WFI indicates approximately 2,223 water service connections. It serves a permanent population of 5,557 in 2,215 dwelling units. The WFI indicates three additional industrial, commercial, and industrial (ICI) connections. It also serves five recreational camps and RV parks where transient populations range from 1,905 in January to 8,075 in July and August.

Water sources for the Seven Lakes Water Association include three deep wells (depths exceeding 150 to more than 330 feet) and one shallow well. Other reserve wells and an intertie with Marysville are maintained for emergency purposes.

Tulalip Reservation

The Tulalip Reservation water system is located southwest of the City's WSA. The water system serves an area of approximately 24 square miles. Water is supplied to the system by a surface water spring and interties with Marysville and Everett. There are no current plans for interties between the Tulalip system and the City.

2.6.2 Other Non-expanding Group A Community Water Systems

Under the CWSP, non-expanding systems formed to serve isolated communities or remote parcels with a public service function in areas where larger municipal systems did not exist. Under the CWSP, these systems remain autonomous, and their service area footprints are recognized but not permanent. They may exist within the future water service boundary of an expanding system (see 2.6.1). In the event of a failure of or request by the non-expanding system, the expanding system has an obligation and the first right of refusal to serve that system. If the expanding system chooses

to *not* integrate their systems or manage it as a satellite system, the non-expanding system may be managed by another satellite management agency.

Five non-expanding Group A systems exist within the City's future WSA. One, Arlington Terrace, is within City limits. Four systems abut or are very near city limits: Meadowbrook, McPherson Hills, New Start, and Stilli Ridge Estates. These five are the non-expanding systems the City may most likely consider acquiring in the future. The remaining non-expanding systems are identified because of their proximity and the opportunities to cooperate and coordinate in the future.

Arlington Terrace (Water System ID 27241)

Arlington Terrace is a small water system located at about 192nd Street between 67th Avenue and SR 9. It is east of the Arlington Airport and entirely within Arlington's city limits and WSA. The system serves about 104 people on approximately 28 of 29 approved service connections. Two groundwater wells provide water to the Arlington Terrace water system. Well No. 1 is 85 feet deep and produces 34 gpm. Well No. 2 is 76 feet deep and produces 50 gpm. While the topography poses challenges for the City to provide this neighborhood with water and sewer service, the City may acquire this water system in the future.

McPherson Hills (Water System ID 529307)

The McPherson Hills private water system is located southeast of the Arlington Airport just outside of city limits but within the City's WSA. The system uses all of its 11 approved service connections to provide water to 30 people. One 250 foot deep groundwater well discharging 26 gpm provides the sole water source for this system. The City has considered providing service to McPherson Hills in the past, but the topography makes it difficult to do so. Although there are no current plans for interties between McPherson Hills and the City, the City may acquire this system in the future.

Meadowbrook Homeowner's Association (Water System ID 03449)

Meadowbrook Homeowner's Association is a private water system within the City's WSA located immediately east of the City along Tviet Road. It abuts City limits. The system supplies 35 persons using all of its approximately 15 approved service connections with one 216 foot deep groundwater well that supplies 36 gpm. Although there are no current plans for interties between Meadowbrook and the City, the City may reasonably consider acquiring this system in the future.

New Start Landowners Water Association (Water System ID 22380)

Formerly the Top of the Hill Water Association, New Start is a private water system located southeast of the Arlington Airport just outside of city limits but within the City's WSA. It is immediately adjacent to the McPherson Hills system. The New Start system supplies water to an estimated 90 people on approximately 26 of 52 approved service connections. One 172 foot deep groundwater well is the primary water source, supplying 25 gpm. The City has considered providing service to Top of the Hill in the past, but the topography made it difficult to do so. Although there are no current plans for interties between New Start and the City, the City may acquire this system in the future.

Stilli Ridge Estates (Water System ID 187072)

Stilli Ridge Estates is a private water system located east of downtown Arlington along Tviet Road. It is within the City's WSA. The system supplies approximately 72 persons on 30 of 44 approved service connections with one active, shallow groundwater well. This well is approximately 40 feet deep and produces 31 gpm. Although there are no current plans for interties between Stilli Ridge and the City, the City may acquire this system in the future.

Arlington East Mutual Water Association (Water System ID 02948)

The Arlington East Mutual Water Association is a private water system located northeast of the City's WSA. The system supplies approximately 36 service connections with one groundwater well that is approximately 35 feet deep and produces 35 gpm. There are no current plans for interties between this system and the City.

Arlington Heights Water Company (Water System ID 111342)

The Arlington Heights Water Company is a private water system located northeast of the City's WSA. The system supplies approximately 20 service connections with one groundwater well that is approximately 30 feet deep and produces 15 gpm. There are no current plans for interties between this system and the City.

Arlington View Estates Water Association (Water System ID 02945)

The Arlington View Estates Water Association is a private water system located northeast of the City's WSA. The system supplies approximately 24 service connections with one groundwater well that is approximately 31 feet deep and produces 80 gpm. There are no current plans for interties between this system and the City.

Eagle Ridge Water Association (Water System ID 24731)

The Eagle Ridge Water Association is a private water system located north of the Stillaguamish River mid-way between I-5 and SR 9. It is outside of the City's WSA. Two shallow groundwater wells supply water to 250 people on approximately 137 of 146 approved service connections. Well No. 1 is approximately 52 feet deep and produces 140 gpm. Well No. 2 is approximately 38 feet deep and produces 160 gpm. There are no current plans for interties between this system and the City's water system.

Silvana Water Association (Water System ID 79050)

The Silvana Water Association is located adjacent to the northwest corner of the Arlington WSA. A spring provides its sole water source to 150 residents on 44 unapproved connections, and eight ICI connections. It also provides service to a transient population of about 78 persons from May through October. There are no current plans for interties with this system.

Sudden View (Water System ID 12451)

The Sudden View water system is a private water system which abuts the southeast corner of the City's WSA. The water system purchases water from the PUD to serve 60 people on 21 of 48

approved service connections. Sudden View maintains two groundwater wells for emergency supply. Well No. 1 is approximately 430 feet deep and produces 22 gpm, and Well No. 2 is approximately 20 feet deep and produces 40 gpm. When used, water from the groundwater wells is chlorinated prior to entering the distribution system. There are no plans for interties between this system and the City's water system. The City understands that Snohomish PUD has the first right of refusal to operate Sudden View in the event of a system failure.

2.6.3 Other Water Systems

Arlington Fuel Stop (Water System ID AA613)

Arlington Fuel Stop is a truck stop just west of the City's Island Crossing neighborhood on the west side of I-5. It abuts City limits and is inside of the City's WSA. Arlington Fuel Stop operates a Group A, Transient Non-Community water system serving approximately 900 customers each month from a single private well. Although there are no current plans for interties between Arlington Fuel Stop and the City, the City may reasonably consider acquiring this water system in the future.

Arlington LDS Church (Water System ID 36136)

Arlington LDS Church is located northeast of the City at the intersection of SR 530 and Arlington Heights Road. It outside City limits but within the City's WSA. The church operates a Group A, Transient Non-Community water system serving approximately 299 parishioners eight days each month. Its primary source is a 160 foot deep groundwater well producing just 2 gpm. Although there are no current plans for interties between Arlington LDS Church and the City, the City may reasonably consider acquiring this water system in the future.

Snohomish County PUD No. 1 – Otis (Water System ID 06956)

The PUD's Otis water system is a Group B system located southeast of Old Town and adjacent to the City's Brekhus-Beach neighborhood, within the City's WSA. The system is managed by the PUD as a SSMA and supplies 10 persons on 4 connections with one well. The well is 233 feet deep and produces 30 gpm. Although there are no current plans for interties between Otis and the City, the City may reasonably consider acquiring this water system in the future.

CITY OF ARLINGTON
COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 2-1 (AMENDED*)
EXISTING WATER SYSTEM

City of Marysville Ranney Well

Haller Wellfield and Water Treatment Plant 1,710 gpm

Airport Wellfield 220 gpm

Bovee Acres PRV

PRV 1 (Highland View Dr)

PRV 2 (Woodlands Way)

PRV 3 (Cedarbough Loop)

PRV 4 (Woodbine Dr)

Lower Burn Road PRV

Upper Burn Road PRV

186th Street FCV

520 Zone Booster Pump Station 790 gpm

Gleneagle Reservoir 2.0 MG Base Elevation: 305' Overflow Elevation: 342'

520 Zone Reservoir 2.0 MG Base Elevation: 499' Overflow Elevation: 520'

Snohomish County PUD No. 1 Master Meter 1,000 gpm

To Marysville Edward Springs Reservoir and Sources

Stillaguamish River

North Fork Stillaguamish River

South Fork Stillaguamish River

E Burke Ave

E Division St

E 5th St

E 3rd St

E 1st St

E Maple St

E Highland Dr

W Marion St

204th St NE

201st St NE

198th Pl NE

188th St NE

180th St NE

211th Pl NE

71st Ave NE

67th Ave NE

59th Ave NE

51st Ave NE

47th Ave NE

43rd Ave NE

N Olympic Ave

S Dunham Ave

Gifford Ave

S Stillaguamish Ave

S French Ave

S Cobb St

Old Burn Rd

Burn Rd

Burn Hill Rd

95th Ave NE

99th St NE

107th Ave NE

Smokey Point Blvd

530

531

5

9

Legend

City Limits

UGA Boundary

Future Water Service Area

Water Infrastructure

Pump Station

PRV

FCV

Well

Reservoir

Intertie

Meter

Water Main

Marysville Water Main

342 Zone

520 Zone

608 Zone

710 Zone

Pressure Zones

342 Zone

520 Zone

608 Zone

710 Zone

** The 2015 Water System Plan was amended in June 2017 to assure consistency with 2017 amendments to the City of Arlington's General Comprehensive Plan. Primary revisions include the City's decision to not expand its UGA west of I-5 at this time, and its approach to redistributing that population throughout the remainder of the City and its existing UGA.*

1 INCH = 1,250 FEET

0 1,250 2,500

DRAWING IS NOT TO SCALE IF BAR IS NOT 2" LONG

REVISION DATE: MAY 18, 2017

BY: ACALDERON

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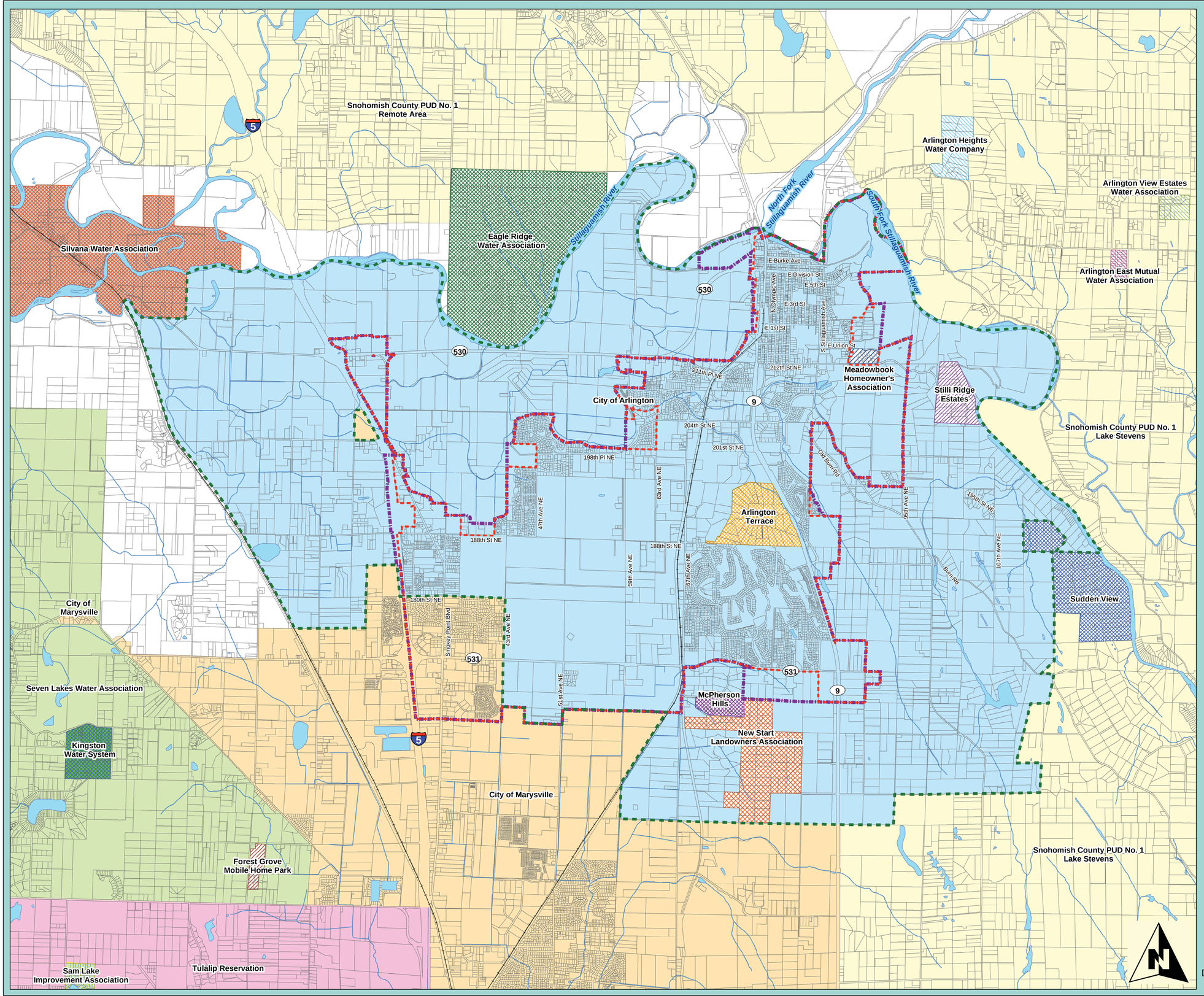


CITY OF ARLINGTON

COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 2-2
WATER SERVICE AREA AND ADJACENT WATER SYSTEMS

Legend

- City Limits
- UGA Boundary
- Future Water Service Area

Adjacent Group A Water Systems

- City of Marysville
- Arlington East Mutual Water Association
- Arlington Heights Water Company
- Arlington Terrace
- Arlington View Estates Water Association
- Eagle Ridge Water Association
- Forest Grove Mobile Home Park
- Kingston Water System
- McPherson Hills
- Meadowbrook Homeowner's Association
- New Start Landowners Association
- No Public Water Service
- Sam Lake Improvement Association
- Seven Lakes Water Association
- Silvana Water Association
- Snohomish County PUD
- Stilli Ridge Estates
- Sudden View
- Tulalip Reservation

1 INCH = 2,000 FEET

0 2,000 4,000

DRAWING IS NOT TO SCALE
IF BAR IS NOT 2" LONG

REVISION DATE: MAY 17, 2017

BY: ACALDERON

\\ARLINGTON\CITY\GIS\DATA\RH2_WATER\DECEMBER2015\WSP MAPS\MAPS UPDATED BY CITY 05.03.17\ARL-WSP-FIG-2-2.MXD

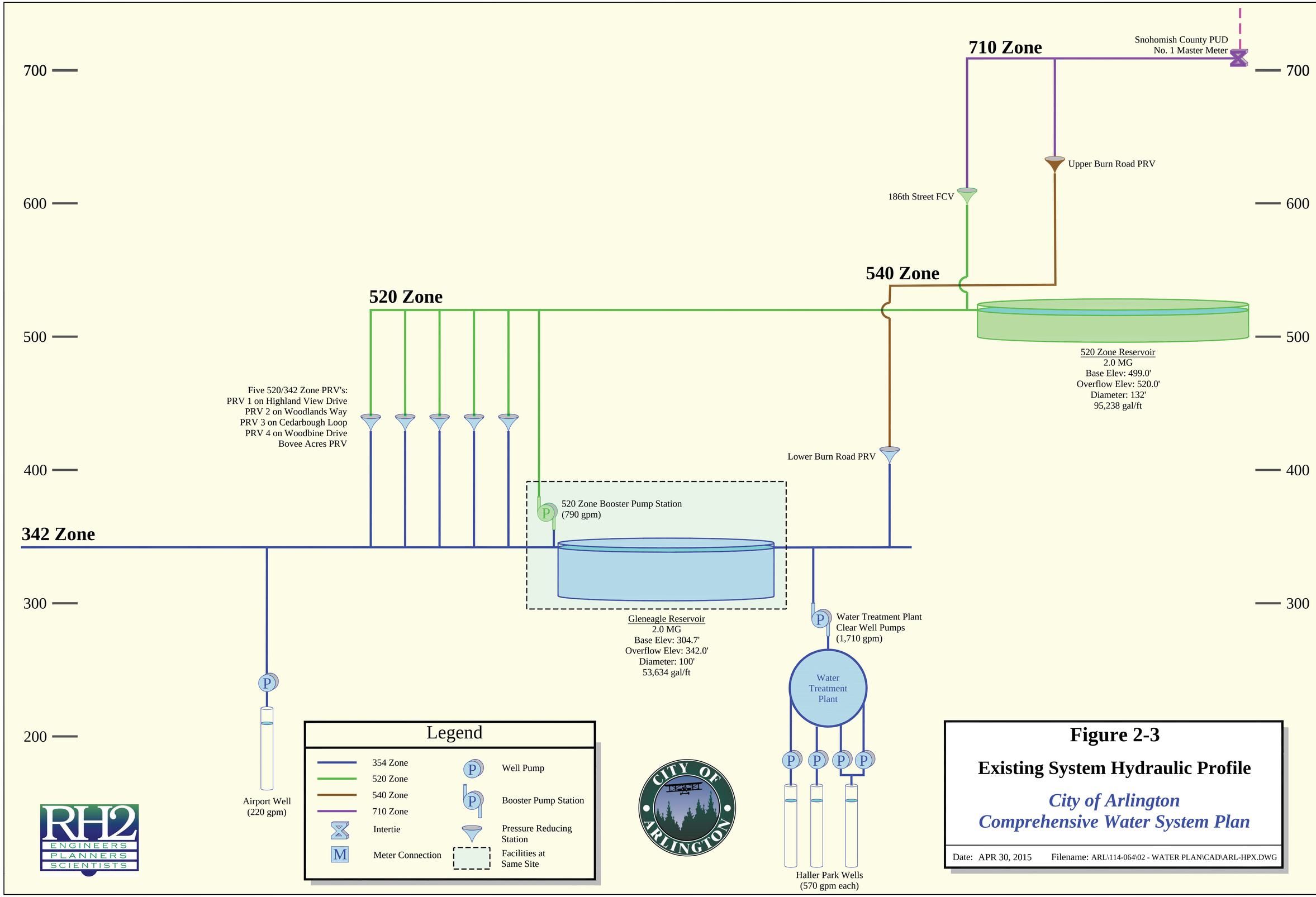


Figure 2-3

Existing System Hydraulic Profile

City of Arlington
Comprehensive Water System Plan

Date: APR 30, 2015 Filename: ARL\114-064\02 - WATER PLAN\CAD\ARL-HPX.DWG

3 Land Use and Population

REVISER'S NOTE:

This chapter, first published in the January 2016 WSP, has been revised in July 2017 to reflect the City of Arlington's decision not to expand west of I-5 at this time. Amendment is also necessary to maintain consistency with the City's GMA Comprehensive Plan, which is also being amended to reflect this change. Population growth previously targeted for a proposed UGA expansion area west of I-5 has been reallocated throughout the much of the City.

Many chapters in this amended WSP have been revised using underlined insertions and strikeout deletions to quickly and clearly show the effects of the amendment. However, although many portions of Chapter 3 have not changed, there are enough revisions that complete re-printing of the chapter is appropriate. Where changes may be significant, the amended text describes the change. Tables and figures which have substantial changes are also completely replaced, and the word "amended" follows the table and figure numbers in parentheses.

3.1 INTRODUCTION

The City of Arlington (City) *GMA Comprehensive Plan*, first completed in 1995 and updated in 2005, was updated once again in 2015. The 2015 plan is being amended and is scheduled for adoption by the City Council in summer 2017. The plan was developed to meet the requirements of the State of Washington Growth Management Act (GMA). The GMA requires, among other things, consistency between land use and utility plans and their implementation.



This Comprehensive Water System Plan (WSP) update was developed in 2015 concurrent with the citywide comprehensive planning process. It also is being amended in 2017 to remain consistent with the City's *GMA Comprehensive Plan*. This chapter demonstrates the compatibility of this WSP with the *GMA Comprehensive Plan* and with other plans, identifies the designated land uses within the existing and future service area, and identifies population projections within the City of Arlington's (City) planning area.

3.2 COMPATIBILITY WITH OTHER PLANS

3.2.1 Introduction

To ensure that the WSP is consistent with the land use policies that guide it and other related plans, the following planning documents were examined.

- Growth Management Act
- City of Arlington 2015 GMA Comprehensive Plan (*GMA Comprehensive Plan*), as amended in 2017
- Snohomish County 2015 GMA Comprehensive Plan
- Snohomish County Countywide Planning Policies
- North Snohomish County Coordinated Water System Plan (2010)

3.2.2 Growth Management Act

The State of Washington Growth Management Act of 1990 (GMA, and its multiple amendments) defines four goals relevant to this WSP.

1. Growth and services should be in urban areas.
2. There should be consistency between land use and utility plans and their implementation.
3. There should be concurrency of growth with public facilities and services.
4. Critical areas should be designated and protected.

Urban Growth Area

The GMA requires that Snohomish County (County) and the City cooperate in designating an Urban Growth Area (UGA). As part of the development of its 2005 *GMA Comprehensive Plan* update, the City and the County designated a UGA that would accommodate the City's projected population growth consistent with GMA and Countywide Planning Policies. The County completed its 2015 GMA Comprehensive Plan Update, maintaining the City's UGA without modification. (The City filed a petition in 2014 to expand the UGA west of I-5, but withdrew the petition in 2016.) The City limits and the current UGA— the one maintained in the County's 2015

plan,—are shown in **Figure 3-1**. This WSP update, as amended, allocates population growth and projects associated increases in water demand throughout the City and its UGA

Consistency

The GMA requires planning consistency from two perspectives. First, it requires external consistency of plans among jurisdictions. This means that plans and policies of the City and the County must be consistent (RCW 36.70A.100). Second, the GMA requires the implementation of the WSP be internally consistent with the City's *GMA Comprehensive Plan* (RCW 36.70A.120). While this WSP and the City's *2015 GMA Comprehensive Plan* were in development, Snohomish County was also updating its GMA Comprehensive Plan. Both were completed and adopted in June 2015. The City's *GMA Comprehensive Plan* is now being amended concurrent with this WSP amendment. In all instances, the City's Planning staff and its Public Works staff worked with their counterparts in Snohomish County Planning and Development Services (PDS) to assure they are aware of the City's service levels, capital development needs, and planning proposals. In addition, the Public Works Department coordinated with the City's Community and Economic Development Department to assure this WSP utilized the same growth projections, the same focus areas for residential and commercial/industrial growth, and other assumptions as were used in the City's *2015 GMA Comprehensive Plan, as amended*. Consistency Review forms completed by both the City and PDS in 2015 and again in 2017 are included in **Appendix N**. Ordinances and resolutions recently passed by the Arlington City Council are included in **Appendix O**.

Concurrency

Concurrency means that adequate public facilities and services be provided at the time growth occurs. For example, growth should not occur where schools, roads and other public facilities are overloaded. To achieve this objective, the GMA directs growth to areas already served or readily served by public facilities and services (RCW 36.70A.110). It also requires that when public facilities and services cannot be maintained at an acceptable level of service, new development should be prohibited (RCW 36.70A.110). This WSP complies with concurrency requirements because it has been developed with consideration of and consistency with the City's *amended GMA Comprehensive Plan*. The capital projects schedule (**Chapter 9**) and financial plan (**Chapter 10**) demonstrate the City's ability to provide water service when and where it is needed.

Critical Areas

The GMA requires that critical areas be designated and protected. Critical areas include fish and wildlife habitat, flood zones, aquifer recharge areas, streams, creeks, rivers, lakes, wetlands and other surface water, as well as geologic hazard areas such as steep slopes and liquefaction zones. Designated critical areas within the City's future water service area (WSA) are shown in **Figure 3-2**. **Appendix Q** contains a SEPA checklist that addresses other environmental concerns.

3.2.3 City of Arlington GMA Comprehensive Plan

The Land Use Element of the City's 2015 *GMA Comprehensive Plan, as amended* in 2017, is the City's vision of how growth and development should occur over a 20-year horizon.

While the Land Use Element goals and policies set forth general standards for locating land uses, the Zoning Map, which is shown in **Figure 3-1**, indicates geographically where certain types of uses may be appropriate.

The Land Use Element considers the general location of land uses, as well as the appropriate intensity and density of land uses given the current development trends. The utilities, transportation and capital facilities elements ensure that new development will be adequately serviced without compromising existing levels of service, similar to the principal of concurrency as defined in the GMA. The City's WSP is reviewed and taken into consideration during the development of revisions to the Capital Facilities Element of the amended *GMA Comprehensive Plan*. After review, the City's Planning Department will validate consistency of the WSP with the amended *GMA Comprehensive Plan* (**Appendices D, T**).

The 2017 amendments to the City's *GMA Comprehensive Plan* and this WSP were prompted primarily because of the City of Arlington's decision not to expand its UGA west of I-5 at this time. The 2015 plan recognized this area as one of six Focus Areas, and relied on the expanded UGA to accommodate a portion of its anticipated growth of 6,577 persons in the City by 2035. This amendment plans for no growth and no water system improvements west of I-5, and no longer recognizes the neighborhood as a Focus Area. The additional population growth is redistributed throughout much of the City as discussed later in this chapter.

The City has developed a new Mixed Use (MU) land use code, which is relied on to accommodate population growth within the City. MU is described in greater detail in the City's amended *GMA Comprehensive Plan* Land Use Element.

3.2.4 Snohomish County GMA Comprehensive Plan

The Snohomish County Council first adopted its Snohomish County GMA Comprehensive Plan in June 1995. Since that time, the plan has been amended numerous times to incorporate UGA changes, Capital Facility Plan changes and land use changes. The most recent update was adopted in June 2015. The plan consists of the following five sections.

1. General Policy Plan
2. Future Land Use Map
3. Transportation Element
4. Capital Facilities Plan

5. Park and Recreation Comprehensive Plan

The County's GMA Comprehensive Plan guides development in unincorporated Snohomish County and designates land use in the unincorporated UGA. Similar to the City's *GMA Comprehensive Plan*, the County's plan contains the following land use goals that "form the basis of the County's land use strategy and:

- provide for a supply and distribution of land use types to accommodate the majority of county population and employment growth within urban growth areas;
- reduce land consuming urban development patterns and provide structure for urban development within neighborhoods or urban centers;
- reduce development pressures and patterns of sprawl within rural areas;
- conserve agricultural, forest and mineral resource lands of long-term commercial significance; and
- preserve and protect open space, scenic and cultural resources."

3.2.5 Snohomish County Countywide Planning Policies (CPPs)

Countywide Planning Policies (CPPs) were established by the legislature to provide a framework for consistency between GMA, the County's GMA Comprehensive Plan, and the City's *GMA Comprehensive Plan, as amended*. Snohomish County CPPs assure coordination and interjurisdictional cooperation in comprehensive plans for regional issues and initiatives, and issues affecting common borders. Within the structure of established core principals and general policies, the CPPs encourage flexibility in local interpretations in several areas, including Development Patterns, Housing, Economic Development, Transportation, Natural Environment, and Public Services and Facilities. These and other areas are addressed holistically within city and county comp plans.

This WSP has been adopted by reference as one component of the City of Arlington *GMA Comprehensive Plan*, and as such does not attempt to address all of the CPPs in itself. For example, policies guiding Development Patterns are best addressed within the City's *GMA Comprehensive Plan*. The WSP, responsible for providing water service to these areas, are guided by CPPs focusing on Public Services and Facilities. CPPs were reviewed in the context of the WSP, and selected ones best addressed through the WSP are identified below. The list is not intended to be exhaustive.

- PS-1: Jurisdictions should support cities as the preferred urban service providers.
- PS-2 Cities shall determine the appropriate methods for providing urban services in their incorporated areas including any annexations thereto.

- PS-4: The County and cities should support the planned development of jobs and housing through strategic investment decisions and coordination of public services and facilities.

- PS-5: Public services and infrastructure provided by jurisdictions in rural and resource areas should be at a level, scale, and in locations that do not induce urban development pressures.

- PS-6 The County and cities should design infrastructure and public services to promote conservation of natural resources.

- PS-7 Jurisdictions should promote improved conservation and efficient use of water to ensure long-term water availability.

- PS-15 The County and cities should develop and coordinate compatible capital facility construction standards for all service providers in individual Urban Growth Areas.

- DP-5: The County and cities shall adopt GMA comprehensive plans and development regulations [to]:

    - Permit the urban growth that is projected to occur in the succeeding twenty-year period, and

    - Provide for urban governmental services and capital facilities sufficient to accommodate the broad range of needs and uses that will accompany the projected urban growth.

- DP-26: Domestic water supply systems may be developed in rural and resource areas to meet the needs of rural areas. Water sources and transmission lines may be developed in rural and resource areas to meet the needs of urban growth areas.

3.2.6 North Snohomish County Coordinated Water System Plan

The *North Snohomish County Coordinated Water System Plan* (CWSP), originally prepared in October 1991 and revised in 2010, is the result of a study performed by the Snohomish County Water Utility Coordinating Committee (WUCC) in conjunction with Snohomish County Department of Planning Services. The members of the WUCC represent all public water systems with more than ten service connections that provide service within the Critical Water Supply Service Area (CWSSA). The Snohomish County Council declared North Snohomish County a CWSSA on October 19, 1988.

The purpose of the CWSP is to assist the area's water utilities in establishing an effective process for planning and development of public water systems and restricting the proliferation of small

public water systems. The CWSP accomplishes this by establishing current and future service area boundaries, minimum design standards, service review procedures, appeals procedures, long-term regional water supply strategy, water conservation program and goals, and the satellite system management program. As can be seen in the following sections of this WSP, the City has established policies, design criteria and goals that meet or exceed the requirements and goals of the CWSP.

3.3 LAND USE

The City's future WSA is described in Chapter 2. The WSA totals approximately 16,176 acres, and includes areas within these recognized jurisdictions: City of Arlington, Arlington UGA, and Snohomish County. The City conducted a developable lands inventory of lands within its city limits and its UGA in preparation of the City's *GMA Comprehensive Plan*. This WSP Update is consistent with the City's *GMA Comprehensive Plan* through its use of the City's zoning map and the developable lands inventory for its development of population and water demand projections below and in Chapter 4. In addition, the Public Works Department conducted its own inventory of other parcels within its WSA—properties under County jurisdiction outside of the City's UGA—in order to develop population and demand projections and facilitate long term water supply and water right evaluations.

3.3.1 City of Arlington

The Arlington City limits currently encompass an area of approximately 6,215 acres (38 percent of WSA). The City's vision for its growth and development is incorporated in its Zoning Map, provided in **Figure 3-1**. Land use designations are summarized in **Table 3-1**. Within the City, residential allocations comprise most of the zoning (2,657 acres, 43 percent). About 72 percent of the residential area is zoned at moderate densities (6.05 dwelling units/acre). Higher density (>10.1 DU/ac) and lower density (4.5 DU/ac) zoning complete 15 percent and 13 percent of the City's residential areas, respectively. Approximately 1100 acres (18 percent) of the City is zoned commercially, primarily in General Commercial and Highway Commercial allocations. Industrial areas occupy this same amount of land within the City, primarily near the airport. The Arlington Municipal Airport and aviation-related commercial and industrial enterprise make up 737 acres of the Aviation Flightline District (12 percent of the City). The City has also three percent of its area for designated business-centric use. This includes 155 acres for a business park to be developed on the west side of the airport, and another 20 acres for Medical Services around the Cascade Valley Hospital. Finally, 450 acres (seven percent) of the City is dedicated to Public/Semi-Public uses, including parks, schools, and other government and community services.

3.3.2 City of Arlington Urban Growth Area (UGA)

The City's current UGA encompasses an additional 387 acres (2% of WSA) outside of City limits. The City's *GMA Comprehensive Plan* includes land use zoning to guide the transition of these parcels into the City, and direct their subsequent development (**Figure 3-1**). About two-thirds of the acreage in the UGA is designated for residential development (**Table 3-1**). One-fifth of the

area is designated as Public/Semi-Public. Twelve percent is zoned for commercial and additional business park development.

The City filed a petition with Snohomish County in 2014 to expand its UGA west of I-5 in an area referred to as the King-Thompson neighborhood, but the City withdrew the petition in 2016, deciding not to expand westward at this time. That decision, and the resulting reallocation of planned population growth to other areas of the City, required this amendment of the 2015 WSP.

3.3.3 Snohomish County

More than half (58 percent) of the Arlington WSA is currently under Snohomish County jurisdiction. About 56% of this land is zoned by the County as R-5 in order to preserve the rural character of non-resource lands. Some areas (44%, primarily on the Stillaguamish floodplain) are zoned A-10 for the protection of agricultural land and promote agriculture as critical to the regional economy. The Zoning Map, shown in **Figure 3-1**, identifies Snohomish County's jurisdiction and zoning classifications within the WSA as well as those of the City.

Prior versions of the WSP referenced a Transfer of Development Rights (TDR) program where development rights under county jurisdiction on the Stillaguamish River floodplain (the sending area) could be exchanged for increased development densities in selected receiving areas in the City. The City's 2015 *GMA Comprehensive Plan* and the 2015 WSP identified the area west of I-5 as a TDR receiving area. However, since the inception of TDR regulations, no market for development rights has developed, and no development rights have been sold. In the 2017 amendments to the City's plan, TDR will be formally relinquished as a development strategy and overlay on zoning allocations. This amendment to the WSP is consistent with the *amended GMA Comprehensive Plan*, and does not consider population forecasts with variable densities accommodated within TDR receiving areas. Flexibility afforded under the City's new MU overlay identified in Section 3.2.4 will allow densification through residential developments within selected commercial areas.

Table 3-1

Land Use Zoning Allocations by Jurisdiction (Amended)

Land Use Type	Area (Acres)				
	City	Existing UGA	Expanded UGA West of I-5[1]	Snohomish County	Total
Airport	737	0	0	0	737
Business Park	155	11	0	0	166
Commercial	1,088	34	0	29	1,151
Industrial	1,108	0	0	39	1,147
Medical	20	0	0	0	20
Public	450	81	0	0	531
Residential	2,657	261	0	0	2,918
Rural Residential	0	0	0	5,446	5,446
Agricultural	0	0	0	4,060	4,060
Total	6,215	387	0	9,574	16,176

[1] The 2017 amendment to the 2015 update of the WSP removes UGA expansion west of I-5.

3.4 POPULATION

3.4.1 Household Trends

The City is a residential community comprised of a full range of housing types. In 2013, the Office of Financial Management (OFM) estimated that two-thirds of 7,053 housing units (4,695) within the City limits were single family detached homes. Approximately one-fourth of the residences (1,773) had two or more units. The remaining 585 units (8 percent) were in mobile homes and special housing.

According to the U.S. Census Bureau, the average household size in the City was 2.70 persons per household in 2010, down slightly from 2.72 in 2000, but still above 2.51 in 1990. The average household size in all of Snohomish County was 2.65 persons per household in 2000, dropping slightly to 2.62 in 2010. The 2005 *GMA Comprehensive Plan* anticipated that the average household size for Arlington would decrease to approximately 2.50 persons per household by the year 2020. The average number of people per household in 2000 was 2.82 for owner-occupied housing units and 2.54 for renter-occupied units. The densities by housing type and the anticipated future trending could not be located in the 2010 census data at the time of this writing.

3.4.2 Existing and Future Population

The County has experienced rapid population growth and extensive physical developments since 1990. The County's population increased by more than 25 percent in the 1990s, and remained high at 17.7 percent from 2000 to 2010. It then increased 2.4 percent by 2013, totaling 730,500 people.

Including annexations, the City's population increased by 82 percent during the 1990s, and another 62.5 percent from 2000 to 2010. It increased another 3.9 percent by 2016, totaling 18,620 people. **Table 3-2** illustrates the City's historical population growth from 1990 through 2016.

Future population growth is established by county and regional planners under the direction of GMA. Snohomish County established a target population of 24,937 for the City of Arlington and its UGA in the year 2035. As a basis for projecting water demand, the City assumed linear annual residential growth of 313 persons per year in order to increase by an additional 6,577 persons, from 18,360 in 2014 to 24,937 in 2035 (21 years). For the purposes of long-term water supply only, this WSP assumes continued growth within the City of 1.35 percent through 2065 (51 years to obtain a water service population of more than 35,000. Further assumed annual growth of one percent and 0.5 percent each for 25 years provides a 100 year water service population estimate of nearly 52,000 persons. **Table 3-2** illustrates the City's projected future growth within the City limits and the WSA for 2020 (6 years), 2024 (10 years), 2034 (20 years), 2035 (21 years, and the target for the City's Comp Plan), 2064 (50 years), and 2114 (100 years).

The actual population served by the water system differs from the population that resides within the City limits. The City's existing and future population is modified by adding and subtracting various other population values to the annual series of City population described above.

There are areas within the City limits that obtain water service directly from other purveyors including the City of Marysville, which provides water service to the City's Smokey Point and Country Manor neighborhoods, and the Arlington Terrace Group A water system. The populations of these areas, as estimated by City planning staff, are subtracted from the City population values.

The City also provides water service to customers outside the City limits. Services outside the City and within the UGA include The Eagles' neighborhood and parcels west of the Arlington Cemetery. Services outside the City and the UGA include customers along Burn Road, and one non-residential customer west of Interstate 5. The populations of these services, as estimated by City planning staff, are added to the City population values.

The actual population served by the water system in 2014 was 16,245. The population served in 2035 is projected to be 22,936, as shown in **Table 3-2**. This is an increase in the water service population of 6,691 persons by 2035. Note that the population served by the water system apparently decreases from 2013 to 2014 because of a modification of (increase in) the estimated number of Arlington citizens residing in the Smokey Point area that is served by the City of Marysville. The estimate increased the assumed built-out population of the Smokey Point and Country Manor neighborhoods by 606 persons, from 1,633 to 2,239.

Table 3-2

Population Trends and Projections (Amended)

Year	Population	
	City Limits	Water System
Historical		
1990	4,037	0
1991	4,397	0
1992	4,614	0
1993	4,863	0
1994	5,167	0
1995	5,692	5,779
1996	6,019	6,131
1997	6,514	6,652
1998	7,188	7,452
1999	8,054	8,343
2000	11,927	12,269
2001	12,912	13,392
2002	13,676	12,921
2003	14,431	13,750
2004	14,838	14,119
2005	15,173	13,636
2006	15,693	14,083
2007	17,094	15,582
2008	17,527	16,018
2009	17,711	16,202
2010	17,926	16,417
2011	17,930	16,421
2012	17,970	16,461
2013	18,270	16,761
2014	**18,360**	**16,245**
2015	18,490	16,564
2016	18,620	16,882
Projected (from 2014 base year)		
2020 (+6 years)	20,239	18,157
2024 (+10 years)	21,492	19,431
2034 (+20 years)	24,624	22,617
2035 (+21 years)	24,937	22,936
2064 (+50 years)	36,790	34,789
2114 (+100 years)	53,898	51,897

3.5 POPULATION PLACEMENT

3.5.1 By Pressure Zone

The population projections are based on the growth projections prepared by the City's Planning Department. **Table 3-3** shows the projected additional population in the City's four pressure zones, with 2014 as the base year. Nearly two-thirds (63 percent) of the total expected growth would be accommodated within existing city limits in the 342 pressure zone. This is approximately the same percentage as before this amendment, since both the previously anticipated (and now retracted) UGA expansion, and the amended decision to accommodate growth by infill, are within the 342 pressure zone. The 520 Zone is expected to assimilate 18 percent of new growth during this planning cycle in the vicinity of the intersection of SR9 and 172nd Street NE. This is down from 30 percent prior to this amendment, but the change reflects an operational change and revision in the boundary between the 520 and 710 Zones after the 2015 WSP was produced. Growth in the 540, 615 and 710 Zones is expected to occur within currently undeveloped parcels along the Burn Road corridor, including the Quail Ridge, Parkwood, and Riverview East developments. The 710 Zone appears to increase from one percent of the new population before this amendment to 14 percent after, but this reflects the operational change referred to above rather than a change in placement. Approximate pressure zone boundaries for the City's future water system are described in **Chapter 9** and are shown in **Figure 9-1**.

The population projections, along with the historical per capita water use data presented in **Chapter 4**, form the basis for determining future water demands for the City's water system.

Table 3-4 places the growth projections provided in **Tables 3-2** and **3-3** into the land use context presented earlier in Chapter 3 and summarized in **Table 3-1**. Ignoring growth outside of city limits and its existing and future UGA, Arlington is projected to grow from 18,360 persons in 2014 to 24,937 people by 2035, an increase of 6,577 persons. The Arlington WSA is projected to grow by 6,691 people, from 16,245 persons in 2014 to 22,936 people by 2035. About 78 percent will occur as infill within existing City limits, and another 20 percent will occur within existing UGA. Since the petition to expand west of I-5 has been withdrawn, no growth will occur in that area. This WSA also assumes about two percent of the growth would be accommodated on existing vacant lots in rural cluster subdivisions along Burn Road.

Table 3-3

Projected Additional Population by Pressure Zone

Pressure Zone	2020 (+6 years)	2024 (+10 years)	2034 (+20 years)	2035 (+21 years)
342	1,215	2,025	4,050	4,253
520	581	968	1,936	2,033
540/615	94	157	314	329
710	22	36	72	76
Total	1,912	3,186	6,372	6,691

Table 3-4

Projected Additional Population in 2035 by Development Type[1] (Amended)

Pressure Zone	Existing City Limits	Existing UGA	UGA Expansion (W of I-5)[2]	City Limits in 2035	Additional Water Service Area	Totals
342	3,756	436	0	4,193	0	4,193
520	302	932	0	1,233	0	1,233
540/615	291	0	0	291	38	329
710	859	0	0	859	76	935
Totals	5,209	1,368	0	6,577	114	6,691

[1] Base year 2014 with population within existing city limits of 18,360

[2] The 2017 amendment to the 2015 update of the WSP removes UGA expansion west of I-5 and redistributes it within City Limits in the 342 and 520 pressure zones.

3.5.2 By Growth Centers

More than three-quarters of targeted residential population growth will be accommodated by infill within the city. Commercial and industrial growth associated with increased employment will also create land use changes with the potential for significant effects on the City's water system. Therefore, five general areas within our WSA, where concentrated growth is expected and where concentrated impacts to our water system area are likewise expected, have been defined to facilitate discussion. The five areas are shown in **Figure 3-1** and characterized in **Table 3-5**.

Table 3-5

Growth Center Attributes and Assumptions (Amended)

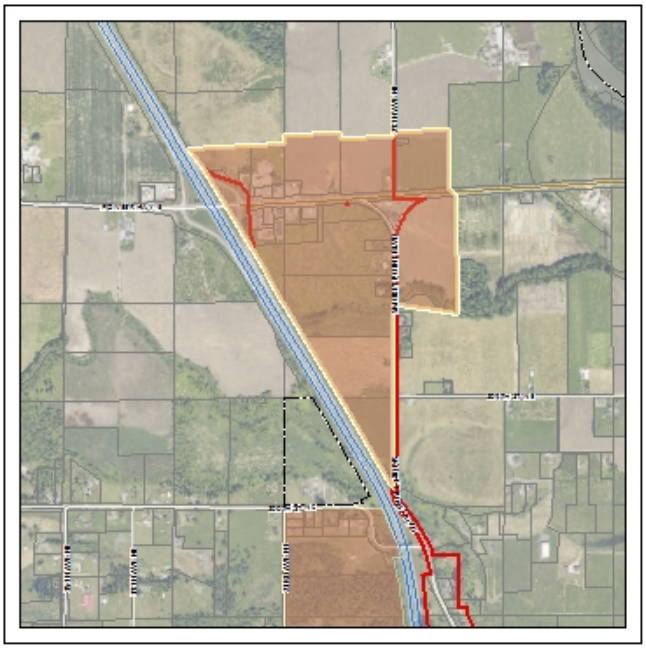
Focus Area	Area	Zoning Type[1]			Occupancy by Zoning		
		Residential	Commercial	Industrial	Residential[1]	Commercial[2]	Industrial[2]
	(acres)	(Percent)			(Persons)	(Facility Area, sq. ft.)	(Facility Area, sq. ft.)
Island Crossing	157	0%	100%	0%	0	2,735,568	0
AP Business Park	188	0%	95%	0%	0	3,118,896	0
MIC--South of 172nd	348	0%	57%	43%	0	3,484,800	3,223,440
SR9/SR531	227	65%	33%	0%	1,897	1,306,800	0
Central Industrial	343	8%	24%	68%	1,216	1,428,768	5,096,520

[1] City of Arlington data

[2] AWWA Commercial and Institutional End uses of Water indicate 40% and 50% of parcel areas are developed for water consumption in commercial and industrial facilities, respectively

Island Crossing

The Island Crossing focus area is situated at the northwest corner of the City, immediately west of I5 and entirely on the Stillaguamish River floodplain. It contains 157 acres of city and county land that is primarily in commercial and agricultural use. Current zoning anticipates that land use in 2035 will be 100 percent commercial. For planning purposes, this WSP update assumes 40 percent of the total area--about 2.7 million square feet--contributes to water demand. Capital projects within this focus area are assumed to occur in the second decade of the 20-year planning horizon.

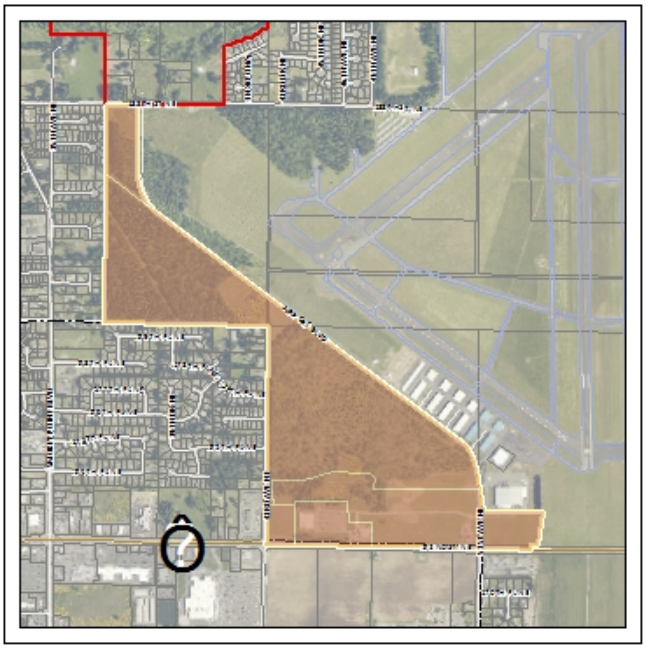


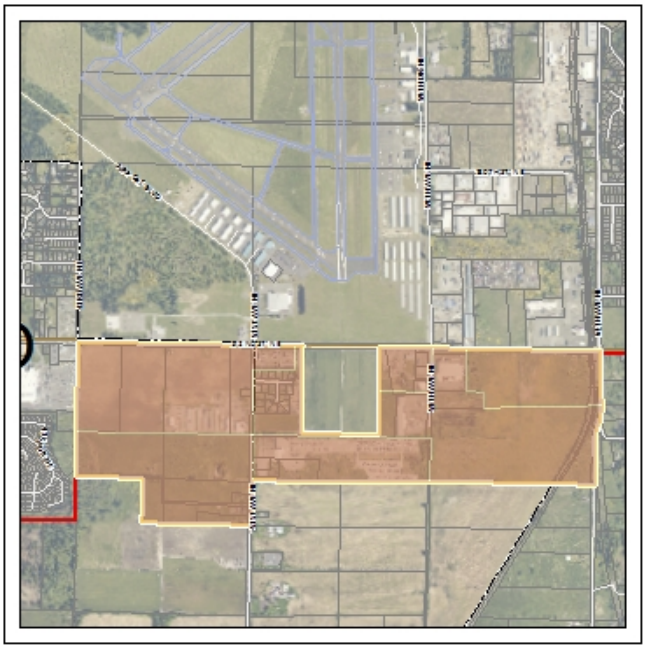
The county land included in this growth center is entirely within the City's WSA and is owned in part by the Stillaguamish Tribe. The Tribe has approached the City regarding utility service to these parcels, and although development approval is outside of the City's jurisdiction, the Water Department has an obligation to serve this

property and assumes it will develop within the design life of infrastructure necessary to serve neighboring City parcels to the west. We therefore include these parcels in the Island Crossing focus area.

Airport Business Park

The Airport Business Park includes parcels zoned for the formal business park southwest of the airport, and north of 172nd Street (SR 531) and west of Airport Blvd. It also contains additional commercially-zoned parcels further north along Airport Blvd toward 188th St. It is nearly entirely zoned for commercial and business use. About 5 percent is zoned for open space within the Airport Flightline. It is estimated that the area will contain about 3.1 million sq. ft. of facilities contributing to water demand in 2035. Capital projects within this focus area are assumed to occur in the first decade of the 20-year planning horizon.





Manufacturing Industrial Center (MIC) South of 172nd St

Arlington City Council and Community & Economic Development goals for the City in 2014 include emphasis on the development of a Manufacturing and Industrial Center (MIC) with the City of Marysville. The City is working with PSRC to have the Arlington-Marysville MIC recognized as a Regional Center, though full recognition has not yet occurred. PSRC is working on its Regional Center's Update Project and has identified the MIC in the Snohomish County Work Session. Snohomish County has already recognized the Arlington-Marysville MIC

as a Regional Center. Employment figures in this WSP are the same as those used in the City's *GMA Comprehensive Plan*.

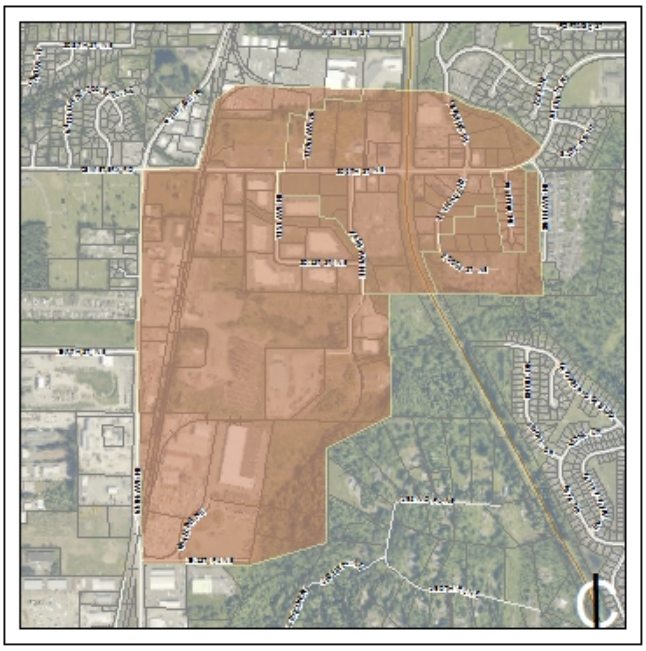
The MIC would develop primarily on areas zoned as General and Light Industrial. South of 172nd St, the MIC would contain about 57 percent commercial area, and 43 percent industrial area. For planning purposes, this WSP update assumes 40 percent of the commercial area contributes to water demand, or about 3.5 million square feet. Another 3.2 million square feet of industrial facilities would develop and draw water from the City. Capital projects within this focus area are assumed to occur in the second decade of the 20-year planning horizon.

The location of this portion of the MIC is consistent with FAA requirements for the Runway Protection Zone (RPZ) and the Object Free Area (OFA).

Hilltop (Vicinity of the SR9/SR531 Roundabout)

In addition to infill in existing lots across the City, one of two centers for greater residential development is on 227 acres within existing City limits—the vicinity of the intersection of SR 9 and 172nd Street (aka SR 531). Nearly two-thirds of this area is zoned for residential use at high and suburban densities. This area is also slated for mixed use with about one-third of the area zoned for General and Highway Commercial land use with a Mixed Use overlay. In addition to providing housing for up to 2,000 persons, the area may accommodate 1.3 million square feet of commercial retail facilities. Capital projects within this focus area are assumed to occur in the second decade of the 20-year planning horizon.





Central Industrial Area in the Vicinity of Arlington Valley Road

The sixth growth center is anticipated to be the existing central industrial area currently housed in Jensen Business Park. The area is anticipated to grow with access provided by construction of the Arlington Valley Rd. Capital projects within this focus area are assumed to occur in the first decade of the 20-year planning horizon.

The area is zoned to accommodate more than two-thirds industrial land use in 2035, along with about one-quarter in commercial use, and another eight percent in residential land use. The non-residential areas will also integrate limited residential development through the Mixed Use overlay. These developments will increase water demand through residential domestic use, industrial facilities totaling 5.1 million square feet, and another 1.4 million square feet in commercial facilities.

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CITY OF ARLINGTON

COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 3-1 (AMENDED*)
LAND USE

Legend

- City Limits
- UGA Boundary
- Future Water Service Area

City of Arlington Land Use

- SR = Suburban Residential
- RLMD = Low to Moderate Density Residential
- RMD = Moderate Density Residential
- RHD = High Density Residential
- OTRD = Old Town Residential District
- NC = Neighborhood Commercial
- OTBD - 1 = Old Town Business District 1
- OTBD - 2 = Old Town Business District 2
- OTBD - 3 = Old Town Business District 3
- GC = General Commercial
- HC = Highway Commercial
- BP = Business Park
- LI = Light Industrial
- GI = General Industrial
- P/SP = Public/Semi-Public
- MS = Medical Services
- AF = Aviation Flightline

- Transfer of Development Rights Sending Area
- Contract Rezone
- MPN - Master Planned Neighborhood
- Commercial Corridor Overlay
- Mixed Use Overlay

Snohomish County Land Use

- RCF = Riverway Commercial Farmland
- RFS = Rural Freeway Service
- RL = Recreational Land
- ROW = Rights-of-Way
- RR/10 = Rural Residential-10 (1 DU/10 Acres)
- RR/5 = Rural Residential-5 (1 DU/5 Acres)
- RR/5BASIC = Rural Residential (1 DU/5 Acres Basic)
- STILL = Stillaguamish Tribes

** The 2015 Water System Plan was amended in June 2017 to assure consistency with 2017 amendments to the City of Arlington's General Comprehensive Plan. Primary revisions include the City's decision to not expand its UGA west of I-5 at this time, and its approach to redistributing that population throughout the remainder of the City and its existing UGA.*

1 INCH = 2,000 FEET

0 2,000 4,000

DRAWING IS NOT TO SCALE
IF BAR IS NOT 2" LONG

REVISION DATE: JUN 15, 2017

BY: ACALDERON

\\ARLINGTON\CITY\GIS\DATA\RH2_WATER\DECEMBER2015\WSP MAPS\MAPS UPDATED BY CITY 05.03.17\ARL-WSP-FIG-3-1.MXD

CITY OF ARLINGTON

COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 3-2
CRITICAL AREAS

Legend

- City Limits
- UGA Boundary
- Future Water Service Area
- Wetlands (City Mapped)
- Type 1 Wetland (County Mapped)
- Type 2 Wetland (County Mapped)
- High Liquifaction Hazard
- Moderate Liquifaction Hazard
- FEMA Flood Hazard Area
- Steep Slopes (Greater than 33% Slope)

1 INCH = 2,000 FEET

0 2,000 4,000

DRAWING IS NOT TO SCALE
IF BAR IS NOT 2" LONG

REVISION DATE: MAY 11, 2017

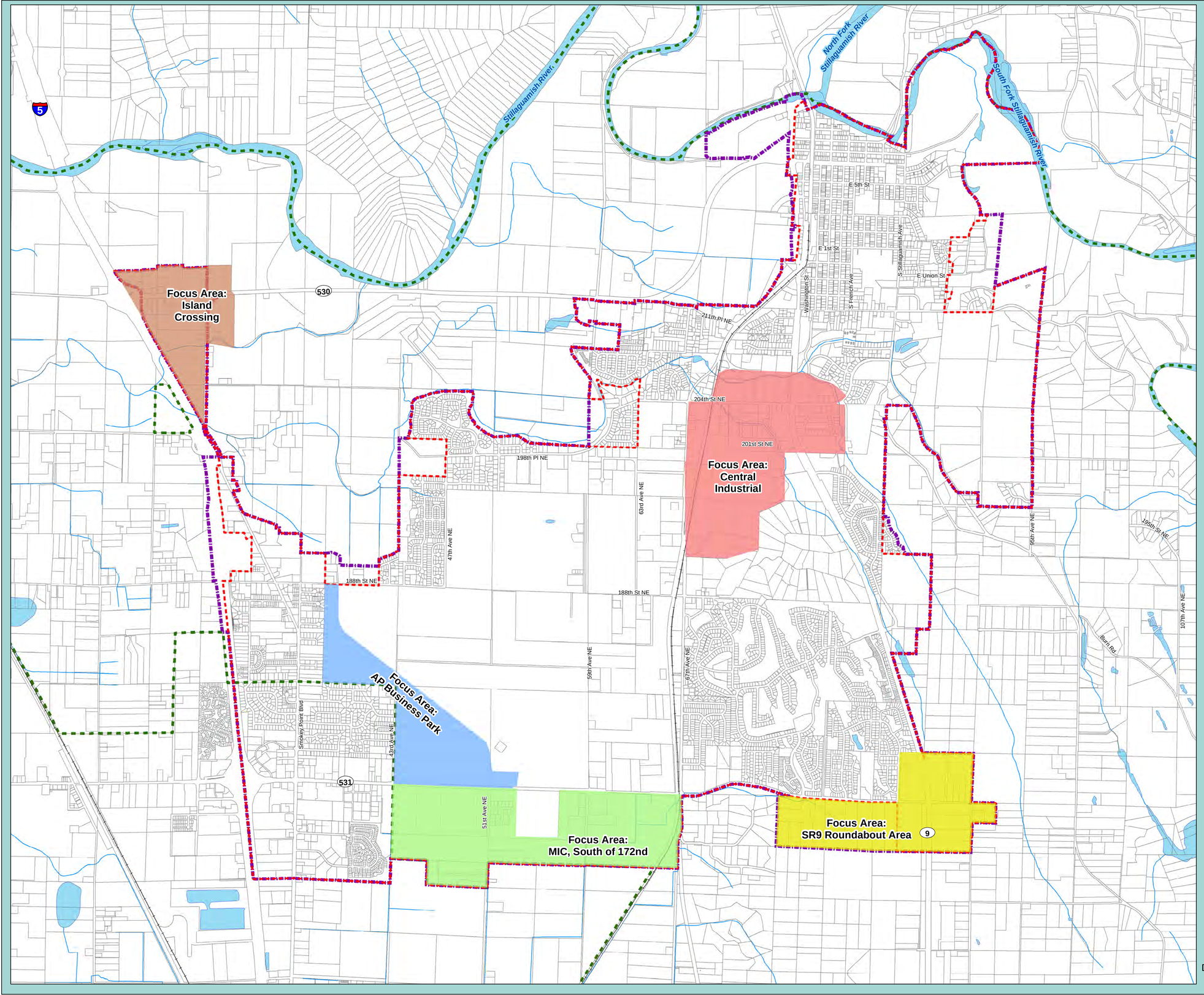
BY: ACALDERON

\\ARLINGTON\CITY\GIS\DATA\RH2_WATER\DECEMBER2015\WSP MAPS\MAPS UPDATED BY CITY 05.03.17\ARL-WSP-FIG-3-2.MXD

CITY OF ARLINGTON

COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 3-3 (AMENDED*) CAPITAL IMPROVEMENT PROJECT FOCUS AREAS



Legend

- City Limits
- UGA Boundary
- Water Service Area

Focus Areas

- Central Industrial
- AP Business Park
- Island Crossing
- SR9 Roundabout Area
- MIC, South of 172nd

** The 2015 Water System Plan was amended in June 2017 to assure consistency with 2017 amendments to the City of Arlington's General Comprehensive Plan. Primary revisions include the City's decision to not expand its UGA west of I-5 at this time, and its approach to redistributing that population throughout the remainder of the City and its existing UGA.*

1 INCH = 1,250 FEET

0 1,250 2,500

DRAWING IS NOT TO SCALE
IF BAR IS NOT 2" LONG

REVISION DATE: JUN 15, 2017

BY: ACALDERON

\\ARLINGTONCITY\GIS\DATA\RH2_WATER\DECEMBER2015\WSP MAPS\MAPS UPDATED BY CITY 05.03.17\ARL-WSP-FIG-3-3.MXD

4 Water Demands

4.1 INTRODUCTION



A detailed analysis of system demands is crucial to the planning efforts of a water supplier. A demand analysis first identifies current demands to determine if the existing system can effectively provide an adequate quantity of water to its customers under the most crucial conditions, in accordance with federal and state laws. A future demand analysis identifies projected demands to determine how much water will be needed to satisfy future growth of the water system and continue to meet federal and state laws.

The magnitude of water demands is typically based on three main factors:

1. Population;
2. Weather; and
3. Water use classification.

Population and weather have the two largest impacts on water system demands. Population growth has a tendency to increase the annual demand, whereas high temperatures have a tendency to increase the demand over a short period of time. Population does not solely determine demand because different populations use varying amounts of water. The use varies based on the number of users in each customer class, land use density and irrigation practices. Water conservation efforts also impact demands and can be used to accommodate a portion of system growth without increasing a system's supply capacity.

Demands on the water system determine the size of storage reservoirs, supply facilities, water mains and treatment facilities. Several different types of demands were analyzed and are addressed in this chapter, including average day demand, maximum day demand, peak hour demand, fire flow demand, future demands and a demand reduction forecast based on the proposed Water Use Efficiency program.

4.1.1 Certificate of Water Availability

In accordance with the requirements of the Growth Management Act (GMA), the City of Arlington (City) must identify that water is available prior to issuing a building permit. A Certificate of Water Availability (CWA) is issued if there is sufficient water supply to meet the domestic water service and fire flow requirements of the proposed building.

The requirement for providing evidence of an adequate water supply was codified in 1990 under Title 19.27.097 of the Revised Code of Washington (RCW) in the Building Code Section. To assist governments with implementing these requirements, the Washington State Department of Health (DOH) has developed a handbook titled *Guidelines for Determining Water Availability for New Buildings*.

4.2 CURRENT POPULATION AND SERVICE CONNECTIONS

4.2.1 Residential Population Served (Amended)

The population within the City limits was 18,360 in 2014. The City does not provide water service to all residents within the City limits. Outside the City limits, the City serves water to some customers, including west of the Arlington Cemetery and along Burn Road. The City of Marysville (Marysville) provides water service to many customers within the southwest portion of the City limits, west of 43rd Avenue NE and south of 180th Street NE. Marysville also serves a small residential area south of 172nd Street NE and east of 51st Avenue NE. The 2014 residential population served by the City is estimated to be approximately 16,245. The computation of this number is discussed later in this chapter, and a more detailed discussion of the City's population and household trends is presented in **Chapter 3**.

In 2014, the City provided water service to an average of 5,444 customer accounts of all types, up from 4,738 accounts in 2005. This is an increase of 706 accounts, increasing on average ~~at~~ 70 accounts per year.

4.3 EXISTING WATER DEMANDS

4.3.1 Water Use Classifications

The City has installed water meters at all permanent service locations (connections) for all revenue-generating customers. The customers purchasing water through each connection are assigned to one of six different water use classes for utility billing purposes. These consist of single family residential, multi-family residential, commercial/industrial, schools, City accounts and other. For

planning purposes, the water use classes have been combined into four different groups as shown in **Table 4-1**. With 2014 connection data, these are:

1) single family residential, 4,589 accounts (84 percent);
2) multi-family residential, 246 accounts (4.5 percent);
3) commercial/industrial, 538 accounts (10 percent); and
4) school/city (71 accounts, 2 percent).

Institutional users such as civic groups, churches and hospitals are included with commercial and industrial customers.

In addition to permanently metered service locations, the City makes available portable meters for short-term use of water by qualifying customers via hydrant permits. Typically, contractors in the construction and landscaping trades obtain a permit for each unique job from specified hydrants. For the purposes of this WSP, each permit is handled the same as each connection.

The demand analysis that follows will report on customer water use patterns by the four customer classes above. Hydrant permits are added as a fifth customer class. In doing so, all water consumption which generates revenue is evaluated in one location.

The City also tracks authorized, non-revenue water uses using a number of public works and fire department categories. This consumption will be evaluated later in this chapter under Distribution System Leakage.

4.3.2 Water Consumption

Water consumption is the amount of water used by water system customers as measured by the customer's meters. **Table 4-1** shows the historical average number of connections, annual consumption and average daily consumption per connection for each customer class from 2005 through 2014.

As shown in **Charts 4-1** and **4-2**, the single family residential class represents approximately 84 percent of all connections, but only about 60 percent of total system consumption. This is due to the lower consumption per connection of the single family residential customers as compared to other customer classes. As shown in **Table 4-1**, the single family residential customers use an average of approximately 158 gallons per day per connection, compared to the multi-family customers who use an average of 773 gallons per day per connection, the commercial/industrial customers who use an average of 600 gallons per day per connection, and the school and city customers who use an average of 644 gallons per day per connection. The higher consumption of non-single family residential customers is not unexpected. For example, multi-family residential customers generally have one connection serving several units, and may include irrigation. Some

commercial and industrial customers require large water demands in their production process or for the services they provide.

Table 4-2 shows the system's largest water users in 2014 and their total metered consumption for the year. The total water consumption of these 25 water accounts represented approximately 13 percent of the system's total consumption in 2014. The list of accounts in the table consists primarily of commercial and industrial facilities, schools, and multi-family residences. As with all water system customers, the City promotes water conservation efforts to the largest water users to ensure that water is used as efficiently as possible. The City's Water Use Efficiency Program is contained in **Appendix E**.

4.3.3 Water Supply (Amended)

Water supply, or production, is the amount of water supplied to the system as measured by the meters at each supply source. Water supply is different than water consumption in that water supply is essentially the measured amount of water put into the system and water consumption is the measured amount of water taken out of the system. The measured amount of water supply of any system is typically larger than the measured amount of water consumption due to non-metered water use and water loss (i.e. distribution system leakage), which will be described further in the **Distribution System Leakage** section. **Table 4-3** summarizes the total amount of water supplied to the City's system from its three sources from 2005 through 2014, and the calculated average day demand for each year.

Table 4-4 presents the computation of the existing system per capita demand for each of the last 10 years. The residential population served by the City's water system is derived from the City's annual April 1st population published by the Office of Financial Management, less the Arlington residents that are not provided water service by the City, plus the estimated population served outside of ~~city~~ City limits. Per capita demand is the annual raw water supply divided by that year's WSA population. The City's per capita water demand has generally declined over the last 10 years, with a high of 106 gpd/person in 2006, and a low of 78 gpd/person in 2011. Per capita demand increased to 97 gpd/person in 2014. This plan uses the 10-year average of approximately 90 gpd/person. The decline observed around 2010 and 2011 is thought to be in part related to the national recession and related economic changes, which saw the closing of some of the City's largest water users (e.g., Northwest Hardwoods mill, Bayliner Boats, etc.). Irrigation at the high school, another very large water use, declined in 2014 with conversion of the football field to artificial turf. Nevertheless, a 10-year average of 90 gpd/person remains a relatively low per capita demand compared to other systems in the Puget Sound area.

Table 4-5 shows the average demand of the City's four existing pressure zones based on 2014 water demand data. The City's largest pressure zone, the 342 Zone, accounts for approximately 74 percent of the total system demand. Like most other water systems, the City's water use varies seasonally. **Chart 4-3** shows the historical amount of water supplied to the City's system for each month from 2005 to 2014.

As shown in **Chart 4-3**, water supply increases significantly during summer months, primarily due to outdoor uses such as irrigation. The City's highest water use typically occurs in July and August. On average, the amount of water supplied during these months is approximately 24 percent of the total supply for the entire year. It is expected that the water supply in these months would be considerably higher if not for the City's current utility rates, which are designed to encourage water conservation. Water production from the Haller Park Well Field and Airport Well Field sources and the water supplied by Snohomish County PUD No. 1 is increased to meet the additional demand during these peak periods, as shown for 2014 in **Chart 4-4**.

Table 4-1
Average Annual Revenue Consumption and Service Connections

Year	Customer Class					Totals
	Single Family	Multi-Family	Commercial/ Industrial	School/ City	Hydrant Permits	
Average Number of Connections						
2005	4,075	177	383	105	96	4,836
2006	4,264	187	399	106	82	5,038
2007	4,342	192	426	106	95	5,161
2008	4,396	196	449	106	59	5,206
2009	4,375	236	496	71	11	5,189
2010	4,394	245	502	71	7	5,218
2011	4,434	245	507	71	7	5,264
2012	4,514	245	516	71	11	5,357
2013	4,577	246	529	71	10	5,432
2014	4,589	246	538	71	14	5,458
Average Annual Consumption (1,000 gallons)						
2005	244,109	60,507	115,415	24,012	3,604	447,647
2006	268,674	57,014	127,424	21,540	3,096	477,747
2007	267,645	56,954	125,945	18,184	873	469,602
2008	260,780	59,971	119,012	17,555	359	457,677
2009	245,196	60,357	100,792	21,856	220	428,421
2010	250,869	57,216	97,160	12,656	96	417,996
2011	245,400	68,454	85,274	22,463	221	421,812
2012	239,295	64,354	75,065	17,570	421	396,705
2013	249,729	65,833	76,240	19,150	4,494	415,446
2014	254,080	67,782	83,008	18,616	3,124	426,611
Average Daily Consumption Per Connection (gal/day/conn)						
2005	164	937	826	627	103	254
2006	173	835	875	557	103	260
2007	169	813	810	470	25	249
2008	162	836	724	453	17	240
2009	154	701	557	843	55	226
2010	156	640	531	488	37	219
2011	152	765	461	867	87	220
2012	145	718	397	676	105	202
2013	150	735	395	739	1,231	210
2014	152	755	423	718	611	214
2005-2014 Average	158	773	600	644	237	229

Chart 4-1

2014 Water Connections by Customer Class

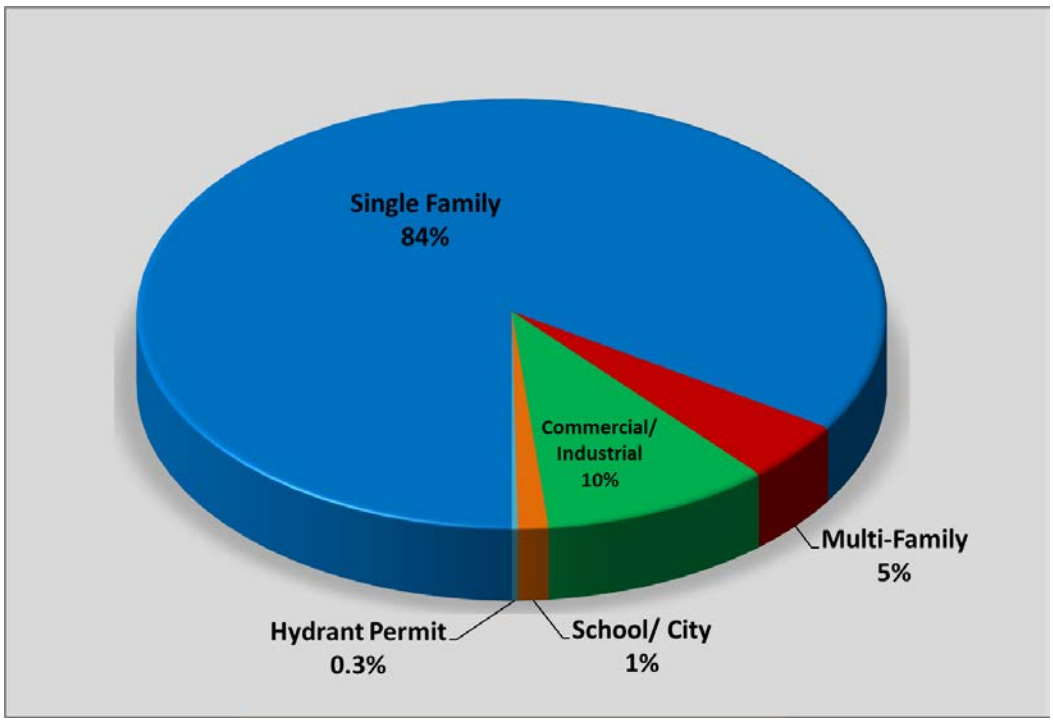


Chart 4-2

2014 Water Consumption by Customer Class

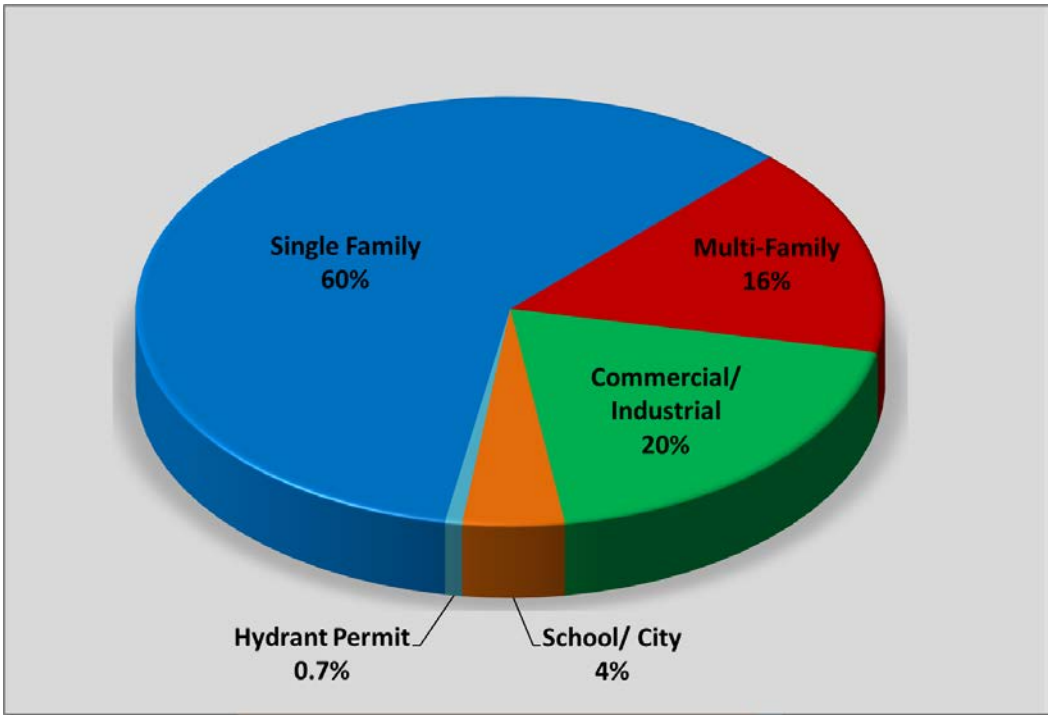


Table 4-2

2014 Largest Water Users

Name	Address	Customer Class	Annual Consumption (gallons)
WSDOT Smokey Point Rest Area	I-5 Smokey Pt Rest Areas	Commercial	4,450,974
Arlington School Dist, High School Irrig	18821 Crown Ridge Blvd Irr	Schools	3,824,524
McFarland Cascade	6520 188th St Pole Yard	Commercial	3,541,556
Puget Sound Kidney Cntr	18828 Smokey Point Blvd	Commercial	3,080,444
Rosecreek	625 Stillaguamish Ave S	Multi-Family	2,715,090
Cascade Valley LLC	8400 208th Pl	Multi-Family	2,701,103
City Of Arlington	59th Ave, Quake Field Irr	City	2,485,148
Arlington Health And Rehabilitation	620 Hazel	Commercial	2,441,173
Olympic Place Retirement	20909 Olympic Pl Bldg A	Multi-Family	2,336,004
Hidden Glen Mobile park LLC	20102 67th Ave	Multi-Family	2,274,324
Otto Investments LLC	6206 188th St	Multi-Family	2,250,582
Safeway #1522	20500 Olympic Pl	Commercial	2,144,067
Kent Prairie Apartments	7900 200Tth St -7960	Multi-Family	2,033,887
Stimach, Janet	105 E Cox	Multi-Family	1,931,186
Twin Ponds	8510 212th St Bldg L	Multi-Family	1,925,202
Wesley Point Apartments	1010 Wesley	Multi-Family	1,762,094
Cascade Valley Hospital	330 Stillaguamish Ave S	Commercial	1,604,333
Haggen Food/Pharmacy 23	20115 74th Ave	Commercial	1,593,853
Aerospace Mfg	20100 71st Ave NE	Commercial	1,492,036
Olympic Place Retirement	20909 Olympic Pl Bldg A	Commercial	1,398,932
McFarland Cascade	6520 188th St Pole Yard	Commercial	1,389,560
Denny's Restaurant	2202 SR 530	Commercial	1,326,840
Microgreen Polymers Inc	7220 201st St	Commercial	1,325,680
Arlington School Dist	1220 E Fifth St	Schools	1,266,932
Southvillage Apartments	Jensen Farm Lane	Multi-Family	1,253,065

Largest 25 Water Users (Facilities) Total	54,548,588
Water System Total Consumption	426,612,643
Percent of Total Consumption	13%

Table 4-3

Historical Water Supply and System Demand

Year	Annual Supply to Distribution System (1,000 gallons)				Average Daily Demand (gpm)
	Haller Well Field	Airport Well Field	PUD	Total	
2005	335,593	17,612	153,183	508,989	968
2006	342,065	7,807	196,910	547,087	1,041
2007	338,863	10,404	173,369	522,651	994
2008	312,022	9,507	187,517	509,073	966
2009	334,292	12,369	181,396	528,057	1,005
2010	307,264	19,069	155,636	481,969	917
2011	324,928	12,038	128,928	465,893	886
2012	448,713	13,502	43,554	505,769	960
2013	477,628	9,587	30,917	518,131	986
2014	485,624	30,052	58,445	574,121	1,092

Table 4-4

Existing Per Capita Demand

Year	Total Annual Supply (1,000 gallons)	Average Daily Demand (gpd)	Water Service Area Population	Average Per Capita Demand (gpd/person)
2005	508,989	1,394,491	13,636	102
2006	547,087	1,498,870	14,083	106
2007	522,651	1,431,922	15,582	92
2008	509,073	1,390,909	16,018	87
2009	528,057	1,446,732	16,202	89
2010	481,969	1,320,463	16,417	80
2011	465,893	1,276,420	16,421	78
2012	505,769	1,381,882	16,461	84
2013	518,131	1,419,538	16,761	85
2014	574,121	1,572,934	16,245	97
Existing Per Capita Demand Used in This Analysis (gal/day/capita)				**90**

Table 4-5

2014 Demands by Pressure Zone

Pressure Zone	2014 Annual Supply (1,000 gallons)	Average Daily Demand (gpm)	Percent of Total Demand (%)
342	424,849	808	74.0%
520	145,827	277	25.4%
540	574	1.1	0.1%
710	2,871	5.5	0.5%
Total	574,121	1,092	100.0%

Chart 4-3

Historical Monthly Water Supply by Year (2005-2014)

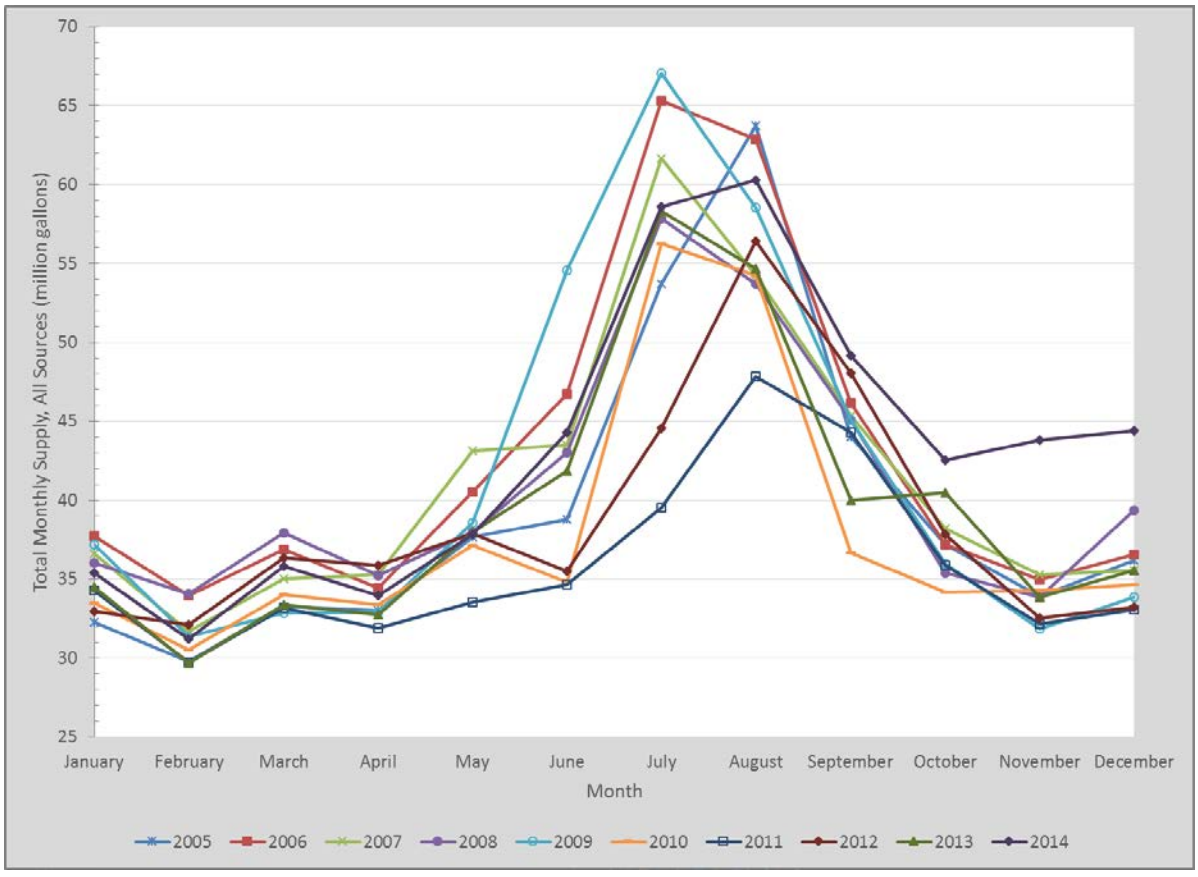
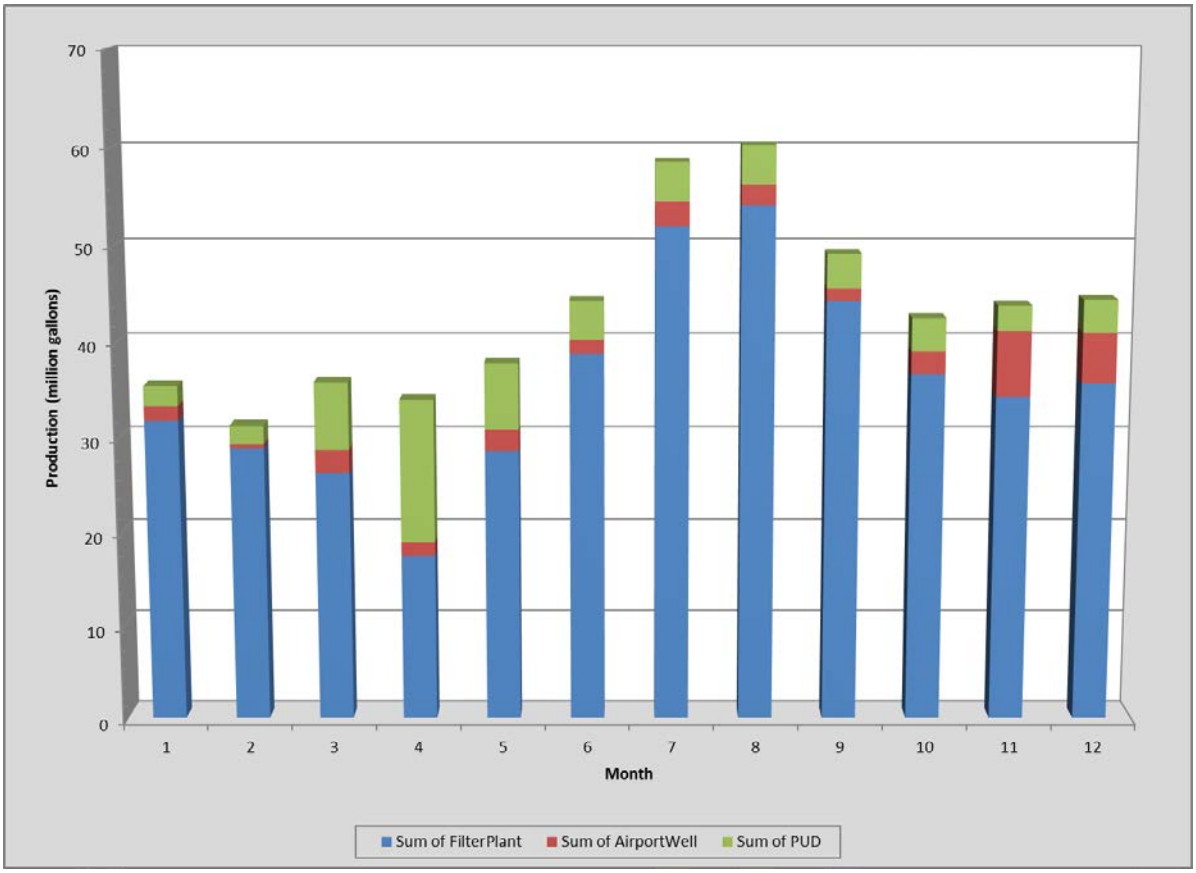


Chart 4-4

2014 Monthly Water Supply by Source



Distribution System Leakage

The difference between the amount of water supply and authorized water consumption is the amount of distribution system leakage (DSL). The City's authorized water consumption includes water service to customers' parcels, all of which are metered, and temporary service from hydrants via portable meters under hydrant use permits. This usage is termed revenue water. Authorized consumption also includes certain non-revenue uses, all of which is measured and tracked. The Water Department uses raw and treated water to maintain the filters critical to potable water production at the Haller Water Treatment Plant (WTP). Staff in most City departments estimate and report the water they are authorized to use in their day-to-day operations. These include: Public Works' uses such as maintenance flushing of water mains and sanitary and storm sewers, and street sweeping; and Fire Department uses such as training, hose testing, and community heat relief.

DSL includes any unauthorized and often unknown "losses" from a water system. Some losses (leakage) are real, such as main breaks and leaking facilities (on the city's side of the meter). These

losses are tracked but not necessarily quantified. Other losses are simply apparent. They include: firefighting; errors in production and consumption metering and data management; water theft from illicit connections; and water theft from hydrants. The Water Use Efficiency Rule, which became effective in 2007, established a DSL standard of 10 percent or less based on a rolling three-year average. Ranging from 6 to 9 percent, the City met this standard annually since 2005, as shown in **Table 4-6**. For reasons not yet understood, however, the City's DSL jumped to 13~~%~~ percent in 2014.

Historically, the City reached a recorded high DSL of 20 percent for calendar year 2003. After implementing a number of improvements, annual DSL was reduced to single digits for several years. Since 2009, DSL has been somewhat erratic, including three years at or above ~~about~~ 11 percent, as shown in **Table 4-6**. The initial success was credited to four factors:

1) the City's replacement of old and likely inaccurate customer meters on a 20-year life cycle basis;
2) database improvements to the City's accounting system;
3) the promotion of water use efficiency (WUE) within the system; and
4) accounting for as much non-revenue water as possible.

Reasons for the erratic trending are thought to be related to errors made in understanding the conversion to a new accounting system (BIAS) in approximately September 2010, and possible actual leaks in the distribution system.

A Water Loss Control Action Plan is required under WAC 246-290-820 when the 3-year rolling average of DSL exceeds 10 percent. As shown in **Table 4-6**, the City exceeded this criterion in 2014, and finds its recent trending unacceptably high. The City maintained the 10 percent criterion in its goals adopted with the prior WSP, but also established for itself a higher goal: "maintain 5 to 7 percent or lower DSL in the water system on an annual basis (see the Water Use Efficiency Program in **Appendix E**). The City intends to correct the erratic nature of our DSL and return it to levels within the 10 percent threshold. The Water Loss Control Action Plan drafted and included within the Water Use Efficiency Program (**Appendix E**) outlines the approach the City will take. Specific actions in the water loss control action plan are anticipated to include: an audit of account metering, billing, and reporting processes; continuing its customer meter replacement program; improving its documentation of authorized, non-revenue consumption; and conducting leak detection surveys of the system.

Table 4-6
Distribution System Leakage

Water Use Classification	Calendar Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Authorized Consumption--Revenue (1,000 gallons)										
Metered Customer Use	447,647	477,747	469,602	457,677	428,421	417,996	421,812	396,705	415,446	426,611
Authorized Consumption--Non-revenue (1,000 gallons)										
WTP Backwashing--Filter Maintenance	35,571	33,455	27,134	19,504	28,125	28,218	35,873	41,813	45,063	56,809
Distribution System Flushing	721	317	388	327	1,037	423	349	265	369	433
Sanitary Sewer Collection System	16	20	19	53	42	22	19	40	40	48
Stormwater System	0	0	0	18	0	16	8	17	17	25
Street Sweeping	0	0	10	49	44	31	30	16	16	14
Unmetered Facilities[2,3]	0	0	0	0	0	0	0	0	357	524
Fire Training & Hoses Tests[4]	0	0	0	0	139	76	76	76	103	168
Heat Relief (Fire Dept)	0	0	0	0	90	0	0	0	0	0
Total Authorized Non-revenue Consumption	36,309	33,792	27,551	19,951	29,477	28,786	36,355	42,227	45,964	58,045
Total Raw Water (1,000 gallons)										
Total Raw Water Production/Supply[1]	508,989	547,087	522,651	509,073	528,057	481,969	465,893	505,769	518,131	574,121
Distribution System Leakage										
Total DSL (1,000 gallons)	25,034	35,548	25,498	31,445	70,160	35,187	7,726	66,837	56,721	89,465
Total DSL (%)	4.9%	6.5%	4.9%	6.2%	13.3%	7.3%	1.7%	13.2%	10.9%	15.6%
Rolling 3-Year Average DSL (%)	4.5%	5%	5%	6%	8%	9%	7%	7%	9%	13%

[1] Total raw water is equal to finished water production plus water used to backwash and maintain WTP filters.

[2] Includes flushing of WTP clearwell after water quality concern for iron and manganese.

[3] Includes 500,000 gallons for partial draining of reservoirs during cleaning.

[4] 2013 and 2014 data include data from Arlington Heights Fire District 21 in addition to Arlington Fire Department.

Equivalent Residential Units

The demand of each customer class can be expressed in terms of ~~equivalent~~ Equivalent ~~residential~~ Residential ~~units~~ Units (ERUs) for demand forecasting and planning purposes. One ERU is equivalent to the amount of water used by a single family residence. The number of ERUs representing the demand of the other customer classes is determined from the total demand of the customer class and the unit demand per ERU from the single family residential demand data.

Table 4-7 presents the computed number of ERUs for each customer class from 2005 through 2014 for the City's retail water service area (WSA). The annual demands per ERU shown are based on consumption data that was computed for each customer class and the average amount of non-revenue water (authorized uses, and unauthorized DSL) from each year. Much like the average day demand, the system's average demand per ERU varies from year to year based on factors such as weather and DSL. However, such factors can affect single family residential customers differently than multi-family, commercial/industrial and the other customer classes.

Table 4-7

Equivalent Residential Units (ERUs)

Year	Average Number of Connections	Total ERUs	Average Annual Demand (gallons)	Demand per ERU (gal/day/ERU)
Single Family Residential (ERU Basis)				
2005	4,075	4,075	277,560,148	187
2006	4,264	4,264	307,668,904	198
2007	4,342	4,342	297,880,047	188
2008	4,396	4,396	290,064,746	181
2009	4,375	4,375	302,219,902	189
2010	4,394	4,394	289,263,025	180
2011	4,434	4,434	271,045,652	167
2012	4,514	4,514	305,082,472	185
2013	4,577	4,577	311,454,281	186
2014	4,589	4,589	341,934,025	204
2005-2014 Average				187
Multi-Family Residential				
2005	177	1,010	68,798,230	187
2006	187	905	65,288,815	198
2007	192	924	63,388,295	188
2008	196	1,011	66,705,574	181
2009	236	1,077	74,393,969	189
2010	245	1,002	65,972,111	180
2011	245	1,237	75,608,291	167
2012	245	1,214	82,046,526	185
2013	246	1,206	82,104,534	186
2014	246	1,224	91,219,015	204
Commercial/Industrial				
2005	383	1,927	131,231,258	187
2006	399	2,022	145,918,515	198
2007	426	2,043	140,172,803	188
2008	449	2,006	132,376,549	181
2009	496	1,798	124,233,037	189
2010	502	1,702	112,029,815	180
2011	507	1,541	94,185,132	167
2012	516	1,416	95,702,546	185
2013	529	1,397	95,083,529	186
2014	538	1,499	111,710,046	204

Table 4-7

Equivalent Residential Units (ERUs) – Continued

Year	Average Number of Connections	Total ERUs	Average Annual Demand (gallons)	Demand per ERU (gal/day/ERU)
School/City				
2005	105	401	27,301,988	187
2006	106	342	24,666,384	198
2007	106	295	20,238,693	188
2008	106	296	19,526,603	181
2009	71	390	26,938,587	189
2010	71	222	14,593,501	180
2011	71	406	24,809,975	167
2012	71	331	22,400,835	185
2013	71	351	23,883,495	186
2014	71	336	25,053,548	204
Hydrant Permits				
2005	96	60	4,097,699	187
2006	82	49	3,544,824	198
2007	95	14	971,625	188
2008	59	6	399,376	181
2009	11	4	271,508	189
2010	7	2	110,475	180
2011	7	4	244,299	167
2012	11	8	536,405	185
2013	10	82	5,605,369	186
2014	14	56	4,204,290	204
System-Wide Totals				
2005	4,836	7,473	508,989,322	187
2006	5,038	7,582	547,087,442	198
2007	5,161	7,618	522,651,462	188
2008	5,206	7,715	509,072,848	181
2009	5,189	7,643	528,057,003	189
2010	5,218	7,320	481,968,927	180
2011	5,264	7,621	465,893,350	167
2012	5,357	7,483	505,768,786	185
2013	5,432	7,613	518,131,209	186
2014	5,458	7,705	574,120,924	204

The average demand per ERU from 2005 through 2014 was 187 gpd. This is less than the typical range of between 250 and 300 gpd for single family demand in the Puget Sound area. This demand per ERU value will be used later in this chapter to forecast ERUs in future years based on estimated

future water demand. This demand per ERU value will also be used to determine the capacity (in terms of ERUs) of the existing system in **Chapter 7**.

Average Day Demand

Average day demand (ADD) is the total amount of water delivered to the system in a year divided by the number of days in the year. The ADD is determined from historical system water use patterns and can be used to project future demand within the system. ADD data is typically used to determine standby storage requirements for water systems. Standby storage is the volume of a reservoir used to provide water supply under emergency conditions when supply facilities are out of service. Water production records from the ~~City's water treatment plant~~ WTP and wholesale sources were reviewed to determine the system's ADD. The system's ADD from 2005 through 2014 ranged from 886 gpm to its all-time high of 1,092 gpm as shown in **Table 4-8**.

Maximum Day Demand

Maximum day demand (MDD) is the maximum amount of water used throughout the system during a 24-hour time period of a given year. MDD typically occurs on a hot summer day when lawn watering is occurring throughout much of the system. In accordance with WAC 246-290-230, the distribution system shall provide fire flow at a minimum pressure of 20 pounds per square inch (psi) during MDD conditions. Supply facilities (wells, pump stations, interties, etc.) are typically designed to supply water at a rate that is equal to or greater than the system's MDD.

Daily water production and reservoir level records were reviewed to determine the system's MDD. The City's MDD over the last 10 years occurred on July 11, 2007. Although many peak demand days are associated with periods of high temperatures, the high on July 11 was only 71°F, and adjacent days only got as high as 75°F. As shown in **Table 4-8**, MDD of the system that day was 2,063 gpm for a daily total of 2.97 MG.

The maximum day peaking factor (the ratio of MDD to ADD) was greatest on July 11, 2007, matching the 2005 factor of 2.08. ~~Peak~~ Maximum day demand factors have decreased over the last 10 years, ranging from a maximum of 2.08 to a minimum of 1.35 (**Table 4-8**). A review of production data indicates that while average days have basically remained steady at about 1.41 MGD, maximum days have declined by about 23 percent from 2.97 MGD to about 2.31 MGD.

Peak Hour Demand

Peak hour demand (PHD) is the maximum amount of water used throughout the system, excluding fire flow, during a one-hour time period of a given year. In accordance with WAC 246-290-230, new public water systems or additions to existing systems shall be designed to provide domestic water at a minimum pressure of 30 psi during PHD conditions. Equalizing storage requirements are typically based on PHD data.

The PHD, like the MDD, is typically determined from the combined flow of water into the system from all supply sources and reservoirs. Hourly water production records and chart recordings of

reservoir levels are available for all of the City's supply and storage facilities. Instantaneous production and storage data were reviewed for the ~~peak~~ maximum day (July 11, 2007). In addition, data for five other ~~peak or~~ high use days over the last 10 years were reviewed where total water supply was greatest, and/or where rates of decline in water reservoir levels appeared greatest (i.e., they were discharging to the system at high rates).

As shown in **Table 4-8**, the greatest annual MDD measured over the past decade occurred on July 11, 2007, and PHD on this day was 2,478 gpm at 7:00 pm. However, this was only the third highest PHD for this evaluation period. On August 8, 2005 at 9:30 am, a PHD of 2,866 gpm was observed during that year's MDD. The greatest PHD observed during the period evaluated did not occur on an annual MDD. The PHD over the past decade was 2,943 gpm, recorded on August 4, 2014 at 4:30 pm. During this event, all water *sources* produced 1,957 gpm (two-thirds of the PHD) direct to distribution, and *reservoirs* discharged a record-high 986 gpm.

Table 4-8 shows the peaking factors of the water system based on the average day, maximum day and peak hour demand data presented above. These peaking factors will be used later in this chapter in conjunction with projected average day demands to estimate the system's future maximum day and peak hour demands. The MDD/ADD ratio of 2.08 is within the typical range of 1.2 to 2.5 for most systems.

The estimated PHD/MDD ratio of 1.42 is within the typical range of 1.3 to 2.0 for most systems. In the previous WSP, PHD could not be computed based on actual system data because not all reservoirs were monitored. Instead, a PHD/MDD factor typical of similarly sized systems of 1.80 was applied to the system's estimated MDD, resulting in an estimated PHD of 3,630 gpm. The PHD/MDD factor based on actual data of 1.42 is less than the previously used assumption, and the actual PHD estimate is 687 gpm (19 percent) less.

Fire Flow Demand

Fire flow demand is the amount of water required during firefighting as defined by applicable codes. Fire flow requirements are established for individual buildings and expressed in terms of flow rate (gpm) and flow duration (hours). Fighting fires imposes the greatest demand on the water system because a high rate of water must be supplied over a short period of time, requiring each component of the system to be properly sized and configured to operate at its optimal condition. Adequate storage and supply is useless if the transmission or distribution system cannot deliver water at the required rate and pressure necessary to extinguish a fire.

The Arlington Fire Department provided a list of existing buildings with large fire flow requirements within the City. It is anticipated that fire flow requirements of future buildings will be lower than the older buildings because many larger buildings are now required to have sprinkler systems. The City has adopted the 2012 International Fire Code, with few exceptions, for determining fire flow requirements throughout the City.

Table 4-8

Maximum Day and Peak Hour Demands and Peaking Factors

Maximum Day Demand Data (in gpm)

Year	Average Day Demand (ADD)	Maximum Day Demand (MDD)	Date	Peak Day Factor
2005	967	2,013	8-Aug-05	2.08
2006	1,039	1,918	21-Jul-06	1.85
2007	992	2,063	11-Jul-07	2.08
2008	964	1,578	12-Jul-08	1.64
2009	1,005	1,976	30-Jul-09	1.97
2010	917	1,582	27-Jul-10	1.73
2011	886	1,197	4-Aug-11	1.35
2012	960	1,756	16-Aug-12	1.83
2013	986	1,624	26-Jul-13	1.65
2014	1,092	1,630	27-Aug-14	1.49

Peak Hour Demand Data for Selected Periods (in gpm)

Date	Hour	All Production Sources	Reservoirs to Distribution	Peak Hour Demand (PHD)
8-Aug-05	9:30	2,547	319	2,866
8-Aug-05	15:00	2,537	-1,296	1,241
11-Jul-07	8:00	1,515	873	2,388
11-Jul-07	8:30	1,814	71	1,885
11-Jul-07	12:40--15:30	1,366	729	2,095
11-Jul-07	19:00	2,096	382	2,478
11-Jul-07	20:00	1,739	710	2,449
20-Jul-09	19:00	1,435	764	2,199
20-Jul-09	20:00	2,202	496	2,698
3-Aug-14	17:00	910	933	1,843
4-Aug-14	14:00	1,957	0	1,957
4-Aug-14	16:30	1,957	986	2,943
27-Aug-14	12:30	1,957	500	2,457

Peaking Factors

Maximum Day Peaking Factor (MDD/ADD)	1.75
Peak Hour Demand/Maximum Day Demand 8/14/2014 (PHD/MDD)	1.81
Peak Hour Demand/Average Day Demand (PHD/ADD)	3.16

General planning level fire flow requirements were established for the different land use categories to provide a target level of service for planning and sizing future water facilities. The general planning level fire flow requirement for each land use category is shown in **Table 4-9**. The water system analyses presented in **Chapter 7** are based on an evaluation of the water system for providing sufficient fire flow in accordance with these general planning level fire flow

requirements and the fire flow requirements of existing buildings. The fire flow requirements shown in the table do not necessarily equate to actual existing or future fire flow requirements for all buildings, since this is typically based on building size, construction type and fire suppression systems provided. Improvements to increase the available fire flow to meet actual fire flow requirements greater than those shown in the table shall be the responsibility of the developer.

Table 4-9

General Planning-Level Fire Flow Requirements Used in this WSP Update

Land Use Category	Fire Flow Requirement (gpm)	Flow Duration (hours)
Existing 540 and 710 Zones[1]	900	2
Low Density Residential	1,000	2
Medium Density Residential	1,750	2
High Density Residential	2,500	2
Commercial/Business Park	3,000	3
Industrial	3,500	3
Schools	3,500	3

(1) For general planning level purposes, the future fire flow requirement in the 540 and 710 Zones is considered to be 1,000 gpm.

As shown in **Table 4-9**, the City's general planning level fire flow requirements range from a minimum of 900 gpm for a duration of two hours for the existing 540 and 710 Zones which consists of suburban residential and rural land uses, to a maximum of 3,500 gpm for a duration of three hours for industrial and school areas, which are primarily located in the area surrounding the Arlington Airport. The City's Fire Chief currently allows 900 gpm of fire flow for two hours in the residential areas of the 540 and 710 Zones. For general planning level purposes, the future fire flow requirement in these areas is considered to be 1,000 gpm. Actual fire flow requirements in these zones will continue to be evaluated on a case-by-case basis by the City's Fire Chief.

4.4 FUTURE WATER DEMANDS

4.4.1 Basis for Projecting Demands (Amended)

Future demands were calculated from the results of the existing per capita demand computations shown in **Table 4-4** and the projected population data from **Chapter 3**. Future water demands are projected to increase not only as a result of population growth, but also as a result of increasing per capita demand. Projections were computed with and without water savings expected from implementing the water use efficiency measures contained in the City's WUE Program in **Appendix E**.

Trending of Average Day Demand

The City's WUE Program (**Appendix E**) analyzed three variants on the measure of average annual demand on its water supply, gallons per day—per capita, per connection, and per ERU. All demonstrated decreases in consumption sharply in the 1990s, and then gradually but fairly steadily since 2000.

Demand-side goals for decreasing consumption which were established by the City in 2004, 2008, and 2011 were attained and/or on target for attainment. For example, 2014 and 2018 have target years since goal setting first occurred in the 2004 WSP. On a per connection basis, the 2004 goal of reducing system-wide consumption by 10 percent by 2018 was met in 2009. The 2011 WSP established goals of reducing consumption by two percent by 2014 and five percent by 2018. On a per capita basis, system-wide demand declined from 87 gpcd in 2008 to as low as 78 gpcd in 2012 (a reduction of 10.3 percent). This beat the goal of 85 gpcd before it spiked to 97 gpcd in 2014~~ itself~~. The goal of 82 gpcd in 2018 remains ~~not un~~reasonable. For planning purposes, the 2011 WSP estimated 90 gpcd for all future year projections, a level that appeared conservative at that time.

Water Use Efficiency and Other Factors Influencing Per Capita Demand

The City attributes the declining trend in average annual demand, in part, to successful implementation of its WUE Program. For the last decade, the City implemented more than the minimum amount of WUE measures required, including distribution of indoor and outdoor conservation kits, customer education, conservation rate structures and rebate programs. The City also assumes it has benefitted from the cultural attitudes of western Washington and the Pacific Northwest, as numerous other utilities in the Puget Sound have observed similar trends.

It would be incorrect to assert that all gains in efficiency over the last 20 years are the result of the WUE program, however. The economic recession which began in 2008 contributed to diminished water use by residents and businesses attempting to save money through conservation practices or reduced water-based services. The City also "lost" some of its largest water customers during this period. For example, the recession forced the closure of the Bayliner Boats facility and the Northwest Hardwoods' sawmill. Cascade Valley Hospital implemented efficiency improvements during its expansion and remodel. Arlington High School converted its grass football field to artificial turf and dramatically reduced the school district's irrigation demand. What remains unclear is the extent of the influence of the economy on declining demand. The extended decline over multiple decades and several changes in the economic climate speaks to increasingly efficient water use.

The City anticipates the reversal of some of the apparent gains in efficiency as economic recovery and growth occur in the Arlington marketplace. It is not unlikely that the 97 gpcd demand in 2014 is not a "fluctuation", but an indicator of economic recovery. In fact, the City of Arlington, along with the City of Marysville, is poised for ~~a burst of~~ an increase in industrial and commercial growth

with the preliminary approval and recognition by Puget Sound Regional Council (PSRC) of the Arlington-Marysville Manufacturing Industrial Center (MIC). The Central Arlington area is also anticipated to receive an influx of commercial and industrial growth during the next planning cycle. Both of these areas are identified as two of the six focus areas for growth in **Chapter 3**. Growth in these and other non-residential areas will serve to increase per capita demand. The City is optimistic that the employment outlook will return to or exceed pre-recession levels within 10 to 20 years.

Estimating Future Per Capita Demand

The City feels it could be presumptuous to assume, as it did in the previous 2011 WSP, sustained levels of reduced or "lower" average day demand, at least on a per capita or per connection basis. Staff are concerned there may even be an economic swing toward increased per capita demand. Growth projections for the City of Arlington water service area issued by PSRC and Snohomish County identify a 2035 population of 24,937, as referenced in **Chapter 3**, but also an employment estimate of more than 8,500 additional jobs (**Table 4-10**). Using Office of Financial Management (OFM) data for 2006, the ratio of population to jobs for 2035 (1.20) is about *three percent higher* than that observed in 2006 (1.16). The ratio had increased through the recession to at least 1.49 (in 2014) as the City saw numerous closures of commercial and industrial businesses. During the same period, per capita consumption continued its decrease begun in the 1990s to less than 90 gpcd. With the forecast increase in population *and* jobs for the City, the City selected to forecast average day demand conservatively, from approximately current levels to a level *three percent higher* than it was in 2006. Therefore, per capita demand is shown to increase linearly from 90 gpcd in 2015 to 110 gpcd in 2035 (**Table 4-11**). These future per capita demand values are projections made without savings from WUE measures implemented over the same period.

Table 4-10
Employment Assumptions Affecting Future Water Demand Projections
(Amended)

Year	Jobs (count)	Population (count)	Ratio (Pop./Jobs)	Per capita consumption (gal/day/capita)
2006	13,560	15,693	1.16	106
2014	12,284	18,250	1.49	*90
2035	20,829	24,937	1.20	*110

Source of population and jobs data: PRSC and Snohomish County

* Range of 78 to 97 gpdc over the seven previous years, average of 86 gpdc; Range of 90 gpdc to 110 gpdc used for planning future demand

4.4.2 Demand Forecasts and Conservation (Amended)

Table 4-11 presents the demand forecast for the City's water system. The actual demand data from 2013 and 2014 are also shown in the table for comparison purposes. The future average day demands were projected based on population estimates for the given years (**Table 3-2**) and the estimated demand per capita values. The future maximum day and peak hour demands were computed from the projected average day demands and the existing system peaking factors shown in **Table 4-8**. The future demand projections are also shown with and without estimated reductions in water use from achieving WUE goals described above and in **Appendix E**.

A 50-year (2064) demand forecast was not formally developed in this WSP update as it was in the previous WSP, when population growth after the 20-year planning horizon was assumed at up to two percent. For purposes of evaluating the capacity of the City's water rights over the long term, however, growth from year 20 to year 50 was assumed at approximately 1.3 percent and per capita consumption was held at 110 gallons per capita per day, as described above for 2034. With an estimated water service area population of 34,789 in 2064, the ADD and MDD would be 2,657 gpm and 4,651 gpm, respectively.

The 50-year demand projection allows for early planning of system supply, locating future supply sources to maximize efficiency and minimize infrastructure and pumping costs, supply assurance through structuring of wholesale contracts and water right permits and certificates, reducing environmental impacts, redundancy of supply sources, and for the purposes of the Integrated Water Resource Management Program, included in **Appendix I**.

Continued

Table 4-11
Future Water Demand Projections (Amended)

Description	2013 Acutal[1]	2014 Actual[1]	Projected 2015 (+1 yrs)	2016 (+2 yrs)	2017 (+3 yrs)	2018 (+4 yrs)	2019 (+5 yrs)	2020 (+6 yrs)	2021 (+7 yrs)	2022 (+8 yrs)	2023 (+9 yrs)	2024 (+10 yrs)	2034 (+20 yrs)	2035 (+21 yrs)
Population Data														
Water Service Area Population	16,761	16,245	16,564	16,850	17,137	17,423	17,709	17,996	18,282	18,569	18,855	19,142	22,006	22,293
Increase from Base Year 2014			319	605	891	1,178	1,464	1,751	2,037	2,324	2,610	2,897	5,761	6,048
Demand Basis Data (gal/day/capita)														
ADD without WUE	85	97	90	91	92	93	94	95	96	97	98	99	109	110
ADD with WUE			90	90	91	92	93	94	95	96	97	98	108	109
Average Day Demand (gpm)														
Demand without WUE	986	1,092	1,036	1,065	1,095	1,126	1,156	1,188	1,219	1,251	1,283	1,316	1,666	1,703
Demand with WUE			1,032	1,059	1,087	1,111	1,141	1,172	1,203	1,234	1,266	1,299	1,643	1,680
Maximum Day Demand (gpm)														
Demand without WUE	1,725	1,912	1,812	1,864	1,917	1,970	2,024	2,051	2,107	2,163	2,219	2,277	2,826	2,891
Demand with WUE			1,806	1,853	1,902	1,943	1,997	2,024	2,078	2,133	2,189	2,246	2,787	2,851
Peak Hour Demand (gpm)														
Demand without WUE	3,115	3,451	3,272	3,366	3,460	3,556	3,654	3,704	3,803	3,904	4,007	4,110	5,102	5,219
Demand with WUE			3,261	3,346	3,433	3,509	3,605	3,653	3,752	3,851	3,952	4,055	5,031	5,147

(1) 2013 and 2014 maximum day and peak hour demand values are based on actual average day demand amounts for the given year and historical peaking factors and do not necessarily represent actual peak demands for these years.

The analysis and evaluation of the existing water system with proposed improvements, as presented in **Chapters 7** and **9**, is based on the projected demand data without WUE savings. This ensures that the future system will be sized properly to meet all requirements, whether or not additional water use savings are achieved. However, the City will continue to pursue reductions in water use by implementing the WUE Program contained in **Appendix E** of this Comprehensive Water System Plan.

Table 4-12 presents the existing and projected ERUs of the system. The ERU forecasts are based on the projected water demands from **Table 4-10** and the average demand per ERU that was computed from the actual 2005 through 2014 data shown in **Table 4-7**. The historical and projected water demand and ERU data from **Tables 4-11** and **4-12** is also shown graphically in **Chart 4-5**.

Continued

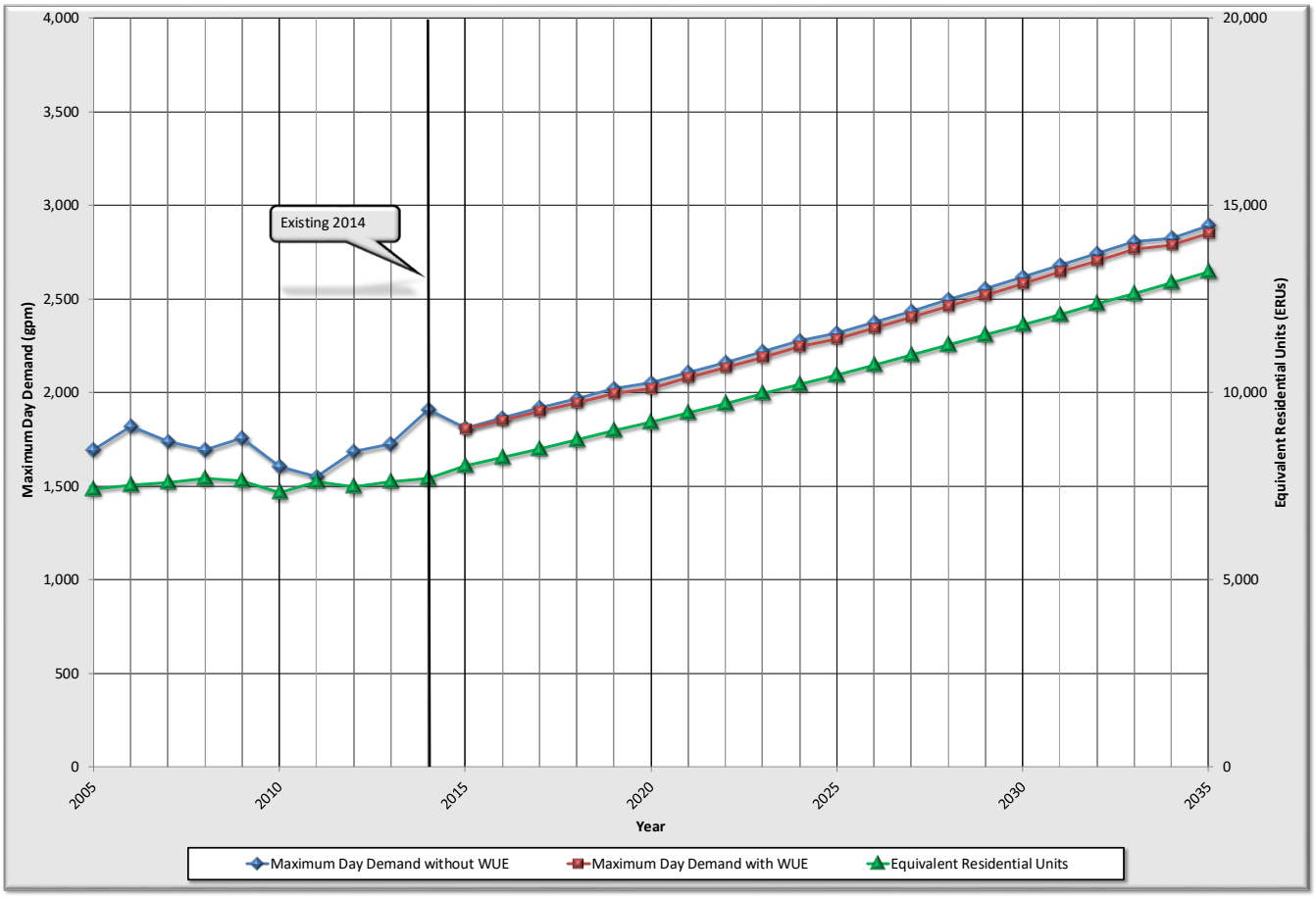
Table 4-12

Future ERU Projections (Amended)

Description	2013 Actual	2014 Actual	Projected 2015 (+1 yrs)	2016 (+2 yrs)	2017 (+3 yrs)	2018 (+4 yrs)	2019 (+5 yrs)	2020 (+6 yrs)	2021 (+7 yrs)	2022 (+8 yrs)	2023 (+9 yrs)	2024 (+10 yrs)	2034 (+20 yrs)	2035 (+21 yrs)
Demand Data (gpm)														
ADD without WUE	986	1,092	1,036	1,065	1,095	1,126	1,156	1,188	1,219	1,251	1,283	1,316	1,666	1,703
ERU Basis Data (gal/day/ERU)														
Demand per ERU without WUE	186	204	185	185	185	185	185	185	185	185	185	185	185	185
Demand per ERU with WUE			185	184	184	183	183	183	183	183	183	183	183	183
Equivalent Residential Units (ERUs)														
Total System ERUs	7,613	7,705	8,040	8,270	8,503	8,738	8,977	9,219	9,465	9,713	9,964	10,219	12,932	13,220

Chart 4-5

Future Water Demand and ERU Projections (Amended)



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5 Policies and Design Criteria

5.1 INTRODUCTION



The City of Arlington (City) operates and plans water service for City residents and businesses according to the design criteria, laws and policies that originate from the seven agencies shown in **Table 5-1**. The agencies are listed from those with the broadest to the narrowest authority.

These laws, design criteria and policies guide the City's operation and maintenance of the water system and its planning for growth and improvements. The seven agencies' overall objective is to ensure that the City provides high quality water service at a fair and reasonable cost to its customers. The seven agencies also set the standards the City must meet to ensure the water supply is adequate to meet existing and future water demands. The water system's ability to meet these demands is detailed in **Chapter 7** and the recommended improvements are identified in **Chapter 9**.

The highest three governmental entities establishing policies and laws – the U.S. Government, Washington State and Snohomish County Council – establish requirements in statutes, regulations or ordinances. The Arlington City Council adopts regulations and policies that cannot be less stringent or in conflict with those established by governments above them. The City's policies take the form of laws, standards, memoranda and operational procedures, many of which are summarized in this chapter.

Continued

Table 5-1

Regulatory Agencies

Agency	Design Criteria/Laws/Policies
U.S. Department of Health & Human Services	Federal Regulations
U.S. Environmental Protection Agency	Federal Regulations
Washington State Department of Health	State Regulations
Washington State Department of Ecology	State Regulations
Snohomish County Council	County Regulations
Arlington City Council	Administrative Policies
American Water Works Association	Design Criteria
North Snohomish County Water Utility Coordinating Committee	Policies and Design Criteria

The policies associated with these five categories are presented in the sections which follow:

- Supply
- Customer Service
- Facilities
- Finance and
- Organization.

5.2 SUPPLY POLICIES

5.2.1 Quality Protection

A. The City will pursue steps to meet or exceed all water quality laws and standards.

B. The City will take all reasonable measures to protect its system and customers.

5.2.2 Cross-connection Control

A. The City has a responsibility to protect the public water system from contamination due to cross connections. Cross connections that can be eliminated will be eliminated.

B. The City has a cross-connection control program for eliminating cross connections. A copy of the City's Cross-connection Control Program is contained in **Appendix G**.

C. The City has staff certified for backflow prevention and inspection.

D. The City will comply with the backflow prevention assembly installation and testing requirements as indicated in Washington Administrative Code (WAC) 246-290-490, and

as published in the Pacific Northwest Section, American Water Works Association (AWWA) manual *Cross-connection Control Manual Accepted Procedure and Practice*.

5.2.3 Quantity

A. The City will plan for at least a 50-year projected use of its supply sources so that future water resource limitations can be handled effectively.

B. The City will ensure the capacity of the system, including its supply facilities, storage and transmission mains, is sufficient to meet the peak day demands of the system.

5.2.4 Reliability and Sustainability

A. The City will ensure, to the maximum extent practicable, that service interruptions are minimized in terms of number and duration. This will require planning and preparation for various event scenarios, including source contamination, treatment failures, main and hydrant breaks, accidents, drought, climate change, fire and other emergencies, and earthquakes and other natural disasters.

B. Reliability and sustainability goals will be met using:

   i. multiple and diverse water sources.

   ii. distribution infrastructure such as looping of mains, flow control and pressure relief valves, pump stations, and other redundancy measures.

   iii. emergency response planning for all identified stressors that may lead to water service interruptions, including those listed above.

   iv. Integrated water resource management (IWRM) opportunities identified in the IWRM Program in **Appendix I.**

5.2.5 Fire Flow

A. The City will plan to provide the following minimum fire flows for future development.

   i. Low Density Residential: 1,000 gallons per minute (gpm) for a 2-hour duration.

   ii. Medium Density Residential: 1,750 gpm for a 2-hour duration.

   iii. High Density Residential: 2,500 gpm for a 2-hour duration.

   iv. Commercial/Business Park: 3,000 gpm for a 3-hour duration.

   v. Industrial/Schools: 3,500 gpm for a 3-hour duration.

Improvements to increase the available fire flow to meet actual fire flow requirements greater than those shown shall be the responsibility of the developer. In areas where development can meet fire flow requirements by installing water mains sized per this Comprehensive Water System Plan (WSP), but the City desires larger pipes for fire flow in other areas, the City will endeavor to pay the cost difference associated with the increased pipe size.

5.2.6 Water Use Efficiency

A. The City has and will continue to promote the efficient and responsible use of water and will conserve water.

B. The City's Water Use Efficiency Program will be updated at least as frequently as its Water System Plans (six to ten years), and will include an evaluation of goals and measures for implementation. The City's current adopted program is contained in **Appendix E**.

C. Progress toward water use efficiency goals will be reviewed and reported annually to staff, customers, and agencies.

5.2.7 Regional Participation

The City will continue to participate in regional supply management and planning activities to protect the environment, reduce cost of service, increase reliability, improve water quality and secure needed water quantities. The City currently participates in the following activities.

- North Snohomish County Water Utility Coordinating Committee (NSWUCC);
- City of Everett Water Utilities Committee (EWUC).
- EWUC Water Conservation Subcommittee.
- EWUC Mutual Aid Agreement.
- Water Supply Forum (Central Puget Sound. through EWUC).
- Washington Water Utility Council (WWUC. within the AWWA Pacific Northwest Section).
- Washington State Department of Health (DOH) regional training opportunities.

5.2.8 Integrated Water Resources Management Program

An Integrated Water Resources Management Program (IWRMP) is defined by the Technical Committee of the Global Water Partnership as "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems." The City's IWRMP establishes policies and criteria related to operating and managing its multiple water sources. Recommendations and evaluations regarding water use efficiency, water sources, water storage, customer rate structures and water reuse, among other items, are included in the IWRMP. A copy of the City's IWRMP is contained in **Appendix I**.

5.2.9 Environmental Responsibility

A. The water utility will implement procedures, and modifications to procedures, when it is demonstrated that such procedures, as part of an integrated watershed management plan involving other utilities and land uses in the Stillaguamish and Quilceda basins, would result in net environmental benefits at a reasonable cost to the utility.

B. The water utility will manage its operations, withdrawals, and discharges with consideration for parameters known to cause, or which potentially could cause, impairments to water quantity and quality in the Stillaguamish River. As of this plan, parameters of primary concern include: instream flows, water temperature, phosphorus and other nutrients, and copper and zinc.

C. The water utility will maintain lists of viable alternatives for adaptive management planning in the event that changes in effluent or receiving water quality require the consideration or implementation of such procedures.

5.3 CUSTOMER SERVICE POLICIES

5.3.1 Water Service and Connection

A. The City's future water service area (WSA) is consistent with that established by the 2010 CWSP, or as may be modified consistent with procedures established within the CWSP.

B. The City will strive to provide potable water service to the people within the City's retail WSA, provided all policies related to service can be met.

C. All proposed developments within the City's retail WSA shall connect directly to the City's water system, unless deemed unfeasible by the City at the time of the request.

D. Water system extensions required to provide water service to proposed developments shall be approved by the City's Department of Public Works and must conform to the City's adopted design criteria and construction standards and specifications, as shown in the City's Public Works Design and Construction Standards and Specifications, which are contained in **Appendix D**. All costs of the extension shall be borne by the developer or applicant.

E. Water utility extensions shall be given based on system capacity with the following priorities.

   i. Extensions shall first be given to applicants within the City limits.

   ii. Second priority shall be given to those applicants within the UGA.

   iii. Third priority shall be given to those applicants within the retail WSA.

   iv. Extensions may be given higher priority where existing water quality or quantity problems make extension necessary.

F. Water service can be extended within the retail WSA if the project is in compliance with the City's utility standards and policies, WSP, water rights, Snohomish County's adopted land use plan, and zoning and development regulations.

G. The City has the duty to serve all customers within the retail WSA if all of the following conditions can be met.

i. The City has sufficient capacity to serve water in a safe and reliable manner.

ii. The applicant is in compliance with all applicable local plans, development regulations, and utility standards and policies.

iii. Sufficient water rights and supply are available.

iv. The City can provide such service in a timely and reasonable manner.

H. Water service cannot be extended outside of the future WSA identified in the North Snohomish County Coordinated Water System Plan unless a special agreement with an adjacent purveyor exists and all of the following conditions are met.

i. The designated water purveyor cannot provide such service in a timely and reasonable manner.

ii. The designated water purveyor agrees to transfer the WSA.

iii. The change complies with the requirements and regulations of the Snohomish County Comprehensive Plan and the North Snohomish County Coordinated Water System Plan.

iv. The extension is approved in a WSP amendment.

v. All duty to serve conditions can be met by the City.

I. For water service applications within the City limits, the City will review the availability for water service during land use permitting, site civil review and building permit review. During the land use permitting process, the City will determine if water is available for the site in accordance with the adopted protocols in the CWSP. During the site civil review, the City will address the sizing and looping of the water main. The formal water service application begins at the time of building permit application when fire flow and service sizing is evaluated. The complete process takes several months to complete.

J. For water service applications outside of the City limits, the applicant must first obtain a water utility service agreement from the City. The City will review the agreement and determine the availability of water. Water availability requests can be processed in approximately two weeks.

K. Water system capacity, pressure and fire flow will be evaluated at the time of the water service application. The City will use the capacity analysis contained in Chapter 7 to evaluate sources of supply, treatment, storage, distribution system and water rights capacity available to the applicant.

L. The Certificate of Water Service Availability shall expire at the time that the associated permit expires (i.e. land use, site civil or building permit).

M. Time extensions in regards to the Certificate of Water Service Availability shall be granted in accordance with the associated permit requirements. When extensions are denied, the disputes are handled through the rules guiding the associated permit process. Disputes can be brought to the City Council for discussion and resolution.

N. Individual wells may be installed on existing lots of record within the City's retail WSA if the City determines it is unfeasible to provide direct connection to the City's water system at the time of the request. This option is strictly limited to individual cases where timely and reasonable service is not possible. State and County approvals for new wells must be obtained, and regulations governing well construction and operation must be followed. Owners of individual wells will be required to connect to the City's water system at the time City water becomes available.

5.3.2 Annexations

A. The City will follow state guidelines in the assumption of facilities in annexation areas.

B. Service to areas outside of the City limits without annexation will be evaluated on a case by case basis by the City Council.

5.3.3 Temporary Services

A. No temporary service is allowed, unless there are plans for timely permanent water service that meet City standards. All temporary services will be evaluated by the City Council.

5.3.4 Emergency Service

A. Compliance with standards may be temporarily deferred for emergency water service.

B. Policy criteria may be temporarily waived for emergency service.

5.3.5 Planning Boundaries

A. The City's retail WSA and existing and future WSAs will be designated in the current WSP and will be consistent with the North Snohomish County Coordinated Water System Plan.

B. The City will follow State of Washington guidelines in assuming portions of adjacent water systems as a result of annexation.

5.3.6 Transfer of Development Rights

A. In order for the transfer of development rights (TDR) to be certified, TDR applicants must comply with Snohomish County Code Chapters 30.35A and 30.35B, and the City's Land Use Code Chapter 20.37.

5.3.7 Satellite System Management

A. The City will consider providing management or ownership services to satellite water systems within or adjacent to the City's retail WSA.

5.4 FACILITY POLICIES

This section describes the planning criteria and policies used to establish an acceptable hydraulic operating level and a standard of quality for the water system. Additional criteria are contained in the City's Public Works Design and Construction Standards and Specifications, a copy of which is included in **Appendix D**.

5.4.1 Minimum Standards

A. All proposed developments within the City's existing and future retail WSA shall conform to the City's adopted design criteria, construction standards and specifications in addition to the requirements of governmental agencies.

5.4.2 Pressure

A. The City will endeavor to maintain a maximum pressure of 125 pounds per square inch (psi) in the water mains during normal demand conditions. Individual residences and businesses are responsible for reducing pressures to a satisfactory pressure or to residential building code standards.

B. The City will endeavor to maintain a minimum pressure of 40 psi at customer meters during normal demand conditions, excluding a fire or emergency.

C. The City will endeavor to maintain a minimum pressure of 30 psi at customer meters during peak and all other demand conditions, excluding a fire or emergency.

D. During fire conditions, the City will endeavor to maintain a minimum pressure of 20 psi at customer meters and throughout the remainder of the system.

E. During a failure of any part of the system, the maximum pressure will not exceed 150 psi.

5.4.3 Velocities

A. During normal demand conditions, the City will ensure the velocity of water in a water main is less than 5 feet per second (fps).

B. During emergency conditions such as a fire, and for design purposes, the City will endeavor to ensure the velocity of water in a water main does not exceed 10 fps.

5.4.4 Storage

A. Storage within the distribution system must be of sufficient capacity to supplement supply when system demands are greater than the supply capacity (equalizing storage), and still maintain sufficient storage for proper pump operation (operational storage) fire suppression (fire flow storage) and other emergency conditions (standby storage).

B. Gravity standby storage must be located above the elevation that yields a 20 psi service pressure to the highest service in the zone under peak hour demand conditions. The City will endeavor to maintain a minimum standby storage volume of 200 gallons per equivalent residential unit (ERU).

C. Gravity fire flow storage must be located above an elevation that yields a 20 psi service pressure to all services in the zone under maximum day demand conditions.

D. The City will provide sufficient standby storage for an emergency condition in which a major supply source is out of service. The volume of storage will be sufficient to maintain uninterrupted supply to the system during an emergency condition for a duration of two days.

E. The City will provide sufficient storage for a fire condition equal to the system's maximum fire protection water demand and the required duration.

F. The City will have high-water level and low-water level alarms for each storage facility, and alarms will report to the WTP Operations and Maintenance Office.

G. A water level indicator for each storage facility will be located at the WTP Operations and Maintenance Office.

H. Storage facilities will be located in areas where they will satisfy the following requirements.

   i. Minimize fluctuations in system pressure during normal demands.

   ii. Maximize the use of storage facilities during fires and peak demands.

   iii. Improve the reliability of supply to the City.

   iv. Maintain water quality by usage cycling. Consideration may also be given to internal tank mixing devices.

5.4.5 Transmission and Distribution

A. Unless deemed impractical by the City, transmission and distribution mains will be looped to increase reliability and fire flow capacity and to decrease head losses.

B. All mains will comply with the generally recognized design criteria from the AWWA and DOH guidelines that follow.

   i. All new construction will be in accordance with the City's Public Works Design and Construction Standards and Specifications, of which Chapter 2 is included in **Appendix D**, or as may be amended.

   ii. Distribution system designs will be engineered such that adequately sized service lines will be used. All residential service lines will be one-inch or larger. Service lines will be the same size as the meter or larger.

C. All water mains will be cement-mortar lined ductile iron pipe. The City may consider other piping materials for specialized applications on a case by case basis.

D. All new distribution main design will utilize a hydraulic analysis to assist in determining water main size.

E. All new mains providing fire flow will be sized to provide the required fire flow at a minimum residual pressure of 20 psi during peak day demand conditions, while maintaining a maximum pipeline velocity of less than 10 fps. New water mains in commercial, government and school areas shall be a minimum of 12 inches in diameter and looped.

F. Valve installations will satisfy the following criteria.

   i. Zone valves will be located at all pressure zone boundaries to allow future pressure zone realignment without the need for additional pipe construction.

   ii. Isolation valves will typically be installed in the lines to allow individual pipelines to be shut down for repair or installation services. Unless it is impractical to do so, the distance between in-line isolation valves shall not exceed 1,000 feet. A minimum of four valves shall be provided per cross and three valves per tee. The City may reduce the number of valves and increase distance between valves for new construction based on the system's configuration.

   iii. Air/vacuum release valves will be placed at all high points, or "crowns," in all pipelines and must have City approval prior to installation.

   iv. Blowoff assemblies shall be located at main dead ends where there is no fire hydrant or as required by the City to allow flushing of distribution main lines. Locations of blow-off assemblies shall be determined based on ease of access and the ability to dispose of flushed water. Blowoff assemblies shall be installed in utility rights-of-way except when an access and construction easement is provided for in writing for the City. Blowoff assemblies shall have valves the same size as the main with concrete thrust blocking.

   v. Individual pressure-reducing or check valves will be installed on all new or replacement customer service lines in the City. Pressure-reducing valves protect customers from high pressures in case a mainline pressure-reducing station fails. Check valves prevent hot water tanks from emptying into the City's distribution system when a nearby water main is empty or when the pressure in the main is less than the pressure in the tank, and prevent contamination of the system mains by possible cross connections in the customer's pipes or fixtures.

G. Fire hydrant installations will satisfy the following criteria.

   i. Fire hydrants serving detached single-family dwellings or duplex dwellings on individual lots will be located not more than 600 feet apart on center, such that all single-family lots are within 300 feet of a fire hydrant, as measured along the path of vehicular access.

   ii. Fire hydrants serving any use other than detached single-family dwellings or duplex dwellings on individual lots will be located not more than 300 feet apart on center

and will be located so that at least one hydrant is located within 150 feet of all structures, but not closer than 50 feet, unless approved by the Arlington Fire Department (Fire Department).

iii. A minimum of one fire hydrant shall be installed per intersection.

iv. The Fire Department will review all proposed fire hydrant installations to ensure the correct number and spacing of fire hydrants for each project per the Fire Department's standards.

5.4.6 Supply and Booster Pump Stations

A. All existing and future booster pump stations will be modified and constructed to comply with the following minimum standards.

i. All structures will be designed to minimize combustibility, where practical.

ii. All buildings will have adequate heating, cooling, ventilation, insulation, lighting and work spaces necessary for on-site operation and repair.

iii. Sites will be fenced to improve security, reduce vandalism and reduce the potential for City liability.

iv. Each station will be equipped with a flow meter and all necessary instrumentation to assist personnel in operating and troubleshooting the facility.

v. Emergency power capability will be provided to at least one supply or booster pump station per pressure zone.

B. Pumps will be operated automatically, with flexibility in pump start/stop settings.

C. Stations will be operated with the provision for at least two methods of control to minimize system vulnerability.

D. Manual override of stations will be provided locally at stations and at the WTP Operations and Maintenance Office using the City's supervisory control and data acquisition (SCADA) system.

E. Stations will be monitored with alarms for the following conditions.

i. Pump started automatically or manually.

ii. Power phase failure.

iii. Power outage/generator running.

iv. Communication failure.

v. Flood in structure.

vi. Low suction pressure.

vii. High and low discharge pressure.

viii. Intrusion.

ix. Smoke detector.

x. Heat detector.

F. Stations will have the following indicators.

i. Local flow indication and totalizing.

ii. Flow indication and totalizing at the WTP Operations and Maintenance Office.

iii. Recording of combined supply flow to the system.

iv. Discharge pressure gauges.

v. Motor amperage gauges.

vi. Alarm indicators for all items included under station monitoring.

vii. Appropriate hazardous material signage on exterior of buildings.

G. Booster pump stations will be placed wherever necessary to fulfill the following criteria.

i. Provide supply redundancy to a pressure zone.

ii. Improve the hydraulic characteristics of a pressure zone.

iii. Maximize storage availability and transmission capacity.

iv. Improve water quality (i.e. increase circulation) and quantity.

5.4.7 Pressure Reducing Stations

A. All pressure reducing valves will be placed in vaults that are large enough to provide ample workspace for field inspection and valve repair.

B. Vaults will be provided with adequate drainage to prevent water accumulation and equipped with sump pumps to prevent vault flooding or pumped of excess water annually.

C. Pressure relief valves may be provided on the low pressure side of the pressure reducing valves to prevent the system from over-pressurizing in case of a pressure reducing valve failure.

5.4.8 Water Treatment Plant

A. The City's water treatment plant (WTP) must be operated under the direct supervision of a certified operator (WAC 246-292).

B. All future water treatment facilities shall be designed in accordance with WAC 246-290-250.

C. All water treatment facilities shall treat water to levels that comply with all current DOH standards.

D. All water treatment facilities shall treat water to levels that comply with all current DOH standards, including the Washington State DOH Treatment Optimization Program (TOP).

5.4.9 Control

A. The City's monitoring system must be capable of efficiently operating the water system's components in accordance with this WSP and in response to reservoir levels, system pressures and abnormal system conditions.

5.4.10 Maintenance

A. Facility and equipment breakdown is given the highest maintenance priority. Emergency repairs are to be made even if overtime labor is involved.

B. Equipment will be scheduled for replacement when it becomes obsolete and as funding is available.

C. Worn parts will be repaired, replaced or rebuilt before they represent a high failure probability.

D. Spare parts will be stocked for all equipment items whose failure will impact the ability to meet other policy standards.

E. Equipment that is out of service will be returned to service as soon as possible.

F. A preventive maintenance schedule will be established for all facilities, equipment and processes.

G. Tools will be obtained and maintained to repair all items whose failure will impact the ability to meet other policy standards.

H. Dry, heated shop space will be available for maintenance personnel to maintain facilities.

I. All maintenance personnel will be trained and certified to efficiently perform their job descriptions.

J. Maintenance will be performed by the water maintenance staff or other approved sources and supervised by the Water Utility Supervisor.

K. Written records and reports showing the operation and maintenance history will be maintained on each facility and item of equipment.

5.4.11 Joint Use

A. All joint-use facilities (with other public water systems) must comply with the City policy and design standards.

B. Maintenance of all joint-use facilities will be consistent with a written operations and maintenance manual prepared jointly with the cooperating agency for each specific joint-use facility.

C. Joint-use facilities will be pursued only in those areas that improve reliability or reduce operating costs.

5.5 FINANCIAL POLICIES

5.5.1 General

A. The City will set rates that comply with state regulations.

B. Rates and additional charges established for the City should be as follows.

i. Cost-based rates that recover current, historical and future costs associated with the City's water system and services;

ii. Equitable charges to recover costs from customers, commensurate with the benefits they receive.

iii. Adequate and stable source of funds to cover the current and future monetary needs of the City.

iv. Do not subsidize the operation of other City departments.

C. Existing City customers pay the direct and indirect costs of operating and maintaining the facilities through water rates. In addition, the water rates will include debt service incurred to finance the City's capital assets serving existing customers, if required.

D. New customers seeking to connect to the water system will be required to pay connection fees and charges for an equitable share of the historical cost of the system and for the system's Capital Improvement Program (CIP). Connection charge revenues in conjunction with rate revenue, will be used to fund the growth CIP and existing system CIP when designed to provide for growth.

E. New and existing customers will be charged for extra services through separate ancillary charges based on the costs to provide the services. Ancillary charges can increase equitability, as well as operating efficiency, by discouraging unnecessary demand for services. The charges will be reviewed regularly and updated on an as-needed basis to reflect increases in operating or material costs. Revenue from ancillary charges will be used to finance annual operations and maintenance or existing system CIP requirements.

F. The City will maintain information systems that provide sufficient financial and statistical information to ensure conformance with rate setting policies and objectives.

G. User charges must be sufficient to provide cash for the expenses of operating and maintaining the system. To ensure the fiscal and physical integrity of the utility, an amount should also be set aside each year and retained for capital expenditures. The amount may

be transferred from the Operations and Maintenance Fund to the water Improvement Fund for general or specific purposes.

H. A Working Capital Reserve will be maintained to cover unanticipated emergencies and fluctuations in cash flow.

I. Water rates will strive to equitably charge customers with different service requirements based on the cost of providing the water service. Service requirements relate to the total volume of water used, peak rates of use and other factors.

J. Water rates will be based on an inclining block rate structure to encourage the efficient use of water.

K. Fees and charges are calculated based on the service provided. Rates will be the same for all customers of the same class within the retail WSA.

5.5.2 Connection Charges

A. Owners of properties that have not been assessed, charged or borne an equitable share of the cost of the water system will pay one or more of the following connection charges prior to connection to a water main.

B. Latecomers Fee: Latecomers fees are negotiated with developers and property owners and provide for the reimbursement of a pro rata portion of the original cost of water system extensions and facilities.

C. Connection Charge: The connection charge will be assessed against any property that has not participated in the development of the water system. Meter charges, or hookup fees, are additional in order to recover the cost of meter and service line installation.

D. Developer Extension Charges: These charges are for the administration, review and inspection of a developer extension project.

5.6 ORGANIZATIONAL POLICIES

5.6.1 Staffing

A. Personnel certifications will meet or exceed Washington State standards.

B. The Water Department actively supports and funds staff training.

5.6.2 Relationship with Other Departments

A. The Water Department is a subdivision of the City's Public Works Department. The Wastewater and Stormwater Departments are sister departments within Public Works.

B. The Finance Department is responsible for customer billing, payment collection, project cost accounting and fund activity reporting.

C. The Human Resources Department is responsible for employee records and salary schedules.

D. The Building Department, Fire Department and Engineering Department establish fire flow requirements.

E. The Building Department, Fire Department and Water Department work cooperatively in the development and maintenance of a hazardous materials inventory and database to facilitate emergency response and to assure public safety and source water protection.

F. The Police Department and/or the City Code Enforcement Officer are responsible for enforcing violations of City water ordinances.

G. The Fire Department uses water utility facilities for fire protection and training.

H. The Fire Department is responsible for emergency responses to hazardous events at water system facilities.

I. The Fire Department is responsible for hydrant fire flow testing under the supervision of the Water Department.

6 Water Source and Quality

6.1 INTRODUCTION

The two basic objectives of a water system are to provide a sufficient quantity of water to meet customer usage demands and to provide high quality water. **Chapter 7** discusses the City of Arlington's (City) ability to supply a sufficient quantity of water and identifies future source requirements. This chapter discusses the City's existing water sources, water rights, water quality regulations and water quality monitoring results.



6.2 EXISTING WATER SOURCES AND TREATMENT

6.2.1 Water Sources

The City's water supply is provided by four wells and a wholesale purchase agreement with the Snohomish County Public Utility District No. 1 (PUD), with the primary source of water coming from the City's Haller Wellfield. The Haller Wellfield is located immediately adjacent to the Stillaguamish River and comprised of three individual wells under the influence of surface water. The Airport Wellfield is comprised of one groundwater well that withdraws water from the Marysville Trough Aquifer. The City's wholesale agreement with the PUD allows for the purchase of up to 1,000 gallons per minute (gpm) of treated water. Additional information on each of the City's existing sources is presented in **Chapter 2** and contained in **Appendix B**.

6.2.2 Water Treatment

The City's Water Treatment Plant, originally constructed in 1924 and replaced in 2001, treats water from the Haller Wellfield. Water is pumped from the Haller Wellfield to the direct filtration system, which consists of three filter beds. All three regularly operated pumps in the Haller Wellfield can alternate or run simultaneously depending on the volume of water required at the water treatment plant. Primary coagulant and filter aid are added to the combined filter influent. The total capacity of the filtration system is currently 1,710 gpm. The plant operates with one or two filter beds in the winter and increases to three in the peak of summer. After processing, filtered water is chlorinated and is discharged into a 270,000 gallon clear well to receive a 4-hour chlorine

contact time. As the water exits the clear well, sodium hydroxide is added to adjust the pH level for corrosion control and there is sufficient chlorine in the water to provide a disinfecting residual in the distribution system. Two pumps are available for backwashing the filter beds.

Water pumped from the Airport Wellfield is chlorinated by flow pacing diluted sodium hypochlorite into the system during pump operation. Bulk 12.5 percent sodium hypochlorite is diluted and injected into the water pipeline through a metering pump feed system. Target doses are 0.5 milligrams per liter (mg/L).

The City does not add fluoride to its water sources which have naturally low fluoride levels. Water supplied by the PUD to the City is fluoridated at its source by the City of Everett. It remains fully fluoridated when it reaches the City's master meter. Fluoride levels decline and are variable once the water enters the City's distribution system depending on proximity to the PUD master meter and water system demands. Water supply from the PUD is not re-chlorinated or subjected to any additional treatment prior to entering the City's distribution system.

6.3 WATER SUPPLY, WATER RIGHTS, AND WATER PURCHASES

6.3.1 Overview

A water right is a legal authorization to use a specified amount of public water from specified points of diversion or withdrawal for specific beneficial purposes on specified places of use. The water right amount is expressed in terms of instantaneous withdrawal rate and annual withdrawal volume. Washington State law requires users of public water to apply for and receive approval from the Washington State Department of Ecology (Ecology) prior to actual water use. This approval is granted in the form of a water right permit or certificate.

The process for obtaining a state-issued water right involves first obtaining a water right permit, then a water right certificate. A water right permit provides permission to develop a water right by constructing, developing and testing the water source. A water right permit remains in effect until a water right certificate is issued (if all terms of the permit are met) or the permit has been canceled. A water right certificate is issued by Ecology following a review process and determination that the amount of water put to beneficial use is consistent with the amount and conditions indicated on the water right permit.

A water right permit is issued by Ecology only if the proposed use meets the following requirements:

- Water will be put to beneficial use;
- There will be no impairment to existing or senior rights;
- Water is available for appropriation; and
- Issuance of the requested water right will not be detrimental to public welfare.

The water right decision process also considers existing basin management plans, stream closures, instream flows, hydraulic continuity (surface water interconnected to groundwater), seawater intrusion, utilization of existing water sources, water conservation and availability of alternative water supplies, among other things. The water right decision process is becoming increasingly complex and time consuming due to the many competing interests for water, environmental issues and regulatory requirements.

Water right claims are another type of water right document intended to represent water rights established prior to adoption of the relevant water code. Beginning in 1974, water right claims were required to be filed with Ecology to document vested water rights established prior to 1917 for surface water, and prior to 1945 for groundwater.

Municipal Water Law

The 2003 Municipal Water Law (MWL) (Second Engrossed Second Substitute House Bill 1338; Chapter 5, Laws of 2003; 58th Legislature; 2003 1st Special Session; Municipal Water Supply -- Efficiency Requirements) clarified municipal water rights, providing the flexibility and certainty that municipalities need to plan for growth.

The MWL allows a municipal water supplier's place of use under its water rights to be changed to match the current service area. It allows changes to the water right place of use to occur via the approval of the service area by the Washington State Department of Health (DOH), as opposed to the previous method of the water right change application process with Ecology (RCW 90.03.386(2)).

Water right certificates issued before September 9, 2003, for municipal water supply purposes were often based on system capacity rather than full perfection of the water right by placing the water to beneficial use. These are known as "pumps and pipes" certificates, and the MWL confirms that they were water rights "in good standing" (RCW 90.03.330(3)).

The MWL also added the definitions for "municipal water supplier" and "municipal water supply purposes" in RCW 90.03.015(3) and (4). Under RCW 90.03.330(2), Ecology is prohibited from revoking or diminishing a water right certificate for municipal water supply purposes unless the certificate was issued with ministerial errors or was obtained through misrepresentation. The only exceptions are for issuance of certificates following approval of water right change or transfer applications and in the context of general water rights adjudications.

The MWL also imposed new conservation and use efficiency requirements on municipal water suppliers to ensure that the water resource is judiciously managed. The City of Arlington has embraced these efforts, including metering of all sources and services, engaging the public in goal setting, limiting the amount of unaccounted for water, and implementing conservation measures (see **Appendix E**, Water Use Efficiency). In addition, water use efficiency is a key component of

the Integrated Water Resources Management Program (IWRMP) included for the first time in this WSP (**Appendix I**).

A June 11, 2008, King County Superior Court decision held 3 of 12 sections of the MWL were unconstitutional and in violation of the doctrine of separation of powers. Ecology issued "Interim Guidance" on the MWL pending the outcome of this litigation, and then rescinded that document after the Washington State Supreme Court upheld the entire MWL as facially constitutional. This WSP was completed with full recognition and implementation of the MWL provisions upheld by the Supreme Court in October 2010.

Stillaguamish Instream Flow Rule

On August 26, 2005, Ecology adopted the Stillaguamish Instream Flow Rule (IFR) as a water management program to guide water management decisions in the Stillaguamish River basin (WRIA 5). It became effective September 26, 2005. Both of the City's production sources—the Haller well field and the Airport well field—are within the Stillaguamish basin and subject to the IFR. (It is important to note that although some documents exist which reference the Airport well field as being within the Quilceda Creek/Snohomish River basin [WRIA 7], the presence of a groundwater divide near the south end of the City—distinct from the surface divide near 188th Street—places all or nearly all of the well field in the Stillaguamish basin.)

Major provisions of the IFR include:

- declaring the appropriation of any previously unappropriated waters to instream values (streams received their own water right);
- prohibiting the appropriation of all surface and ground waters through new water rights for consumptive and/or out-of-stream uses (referred to as closing the basin);
- establishing minimum stream-flows for various river segments and tributary streams necessary to protect the resources that depend on flowing water (quantifying the water rights of the streams);
- establishing exceptions to these provisions through:
    - unquestioned reservations of limited quantities of water for:
        - permit-exempt wells for individual homes,
        - stockwatering, and
        - lakes; and
    - changes to existing water rights only to the extent that any impairment (reduction) of instream flows is fully mitigated.

The Stillaguamish IFR affects the City of Arlington because no reservation or other provision is made for the future urban population to be served by its water utility. Further, the closure of the

basin to new appropriations which would impact streams and rivers and the groundwaters connected to them constrains the water supply alternatives, even innovative ones, available to the City. Nearly any alternative for additional water will require mitigation of impacts to instream flows through the "retiring" of a like amount of water. In other words, an increase of 100 gallons of water for municipal supply within the basin would require that the beneficial use of 100 gallons for another purpose be retired.

6.3.2 Water Rights Portfolio

The City's water rights portfolio includes eight water rights for its Airport and Haller Wellfields and the Stillaguamish River established for conventional municipal supply, such as potable domestic uses, manufacturing, and fire flows. Three water right transfers that were pending in the previous WSP have been successfully completed, and these certificates are included as existing water rights in this WSP. The portfolio also includes three water rights it holds to meet other municipal supply purposes on city-owned properties, such as cemetery irrigation, irrigation of a constructed wetland and park, and turf farm irrigation within an industrial/business park in the airport flight zone. One other existing application for a new water right, filed prior to the passage of the Stillaguamish Instream Flow Rule (Chapter 173-505 WAC) in September 2005, remains pending. **Table 6-1** presents a comprehensive overview of all water rights, and refers to subsequent tables with details for existing potable, pending potable, and other water rights the City holds.

6.3.3 Existing Water Rights for Potable Supply

The City currently holds seven water right certificates and one water right claim for its sources of municipal water supply for potable uses including domestic, manufacturing, and fire. These documents are provided in **Appendix K**. Existing sources utilized by the City to provide water supply to its distribution system include the Airport and Haller Wellfields. As described previously, the MWL assures these water rights apply to the City's water service area (WSA) as it may expand or be modified from time to time. Even though the place of use on these water right documents may indicate "City of Arlington" or some other location, they are tied to the service area shown in the City's most recent approved water system plan. A summary of the water rights information is presented in **Table 6-2**. All were recognized by Ecology as active, 100-percent consumptive, out-of-stream uses when they quantified minimum instream flows in the Stillaguamish Instream Flow Rule in 2005.

Airport Wellfield

Two water rights have been issued to the City with the point of withdrawal being the Airport Wellfield. These water rights are Ground Water Certificate (GWC) 5170 and Ground Water Certificate G1-24900C. GWC 5170 was granted with a priority date of February 12, 1965, for a maximum instantaneous withdrawal rate of 200 gpm and an annual volume of 320 acre-feet. Though the City inherited three or four wells when it re-acquired the airport from the military, this water right applied to what was then known as Navy Well No. 3. In 1986, Ecology approved water

right G1-24900C, which increases the withdrawal rate and volume from the Airport Wellfield to a combined total of 580 gpm and 696 acre-feet per year with the caveat that the additional annual amount was non-additive to existing rights (**Table 6-2**). This increases annual withdrawal at the airport from 320 to up to 696 acre-feet as long as total annual withdrawal at Haller Wellfield is up to 376 acre-feet less than the sum of annual amounts on all Haller water rights. The City sees this flexibility as a valuable tool in the future of its IWRMP.

Haller Wellfield

The water right held by the City with the earliest priority date, October 10, 1924, is surface water certificate SWC 194 (also known as the PSPL right). The water right pre-dates regulation of groundwater in Washington State. It was applied to a well collecting seepage from the Stillaguamish River via riverbank filtration. For a period of time, the well was augmented by water directly from the river by a pipe, but the well operated as the Town's supply prior to that time, and the City continues to use the same well today. PSPL includes authorized withdrawals up to 5 cfs continuously, and as a surface water right, has provided the City with a large inchoate source of supply. Ecology validated SWC 194 in its Administrative Order 11WRNR—DE 7563 in 2011, both of which are included in **Appendix K**.

The history of the PSPL water right is complex and is briefly summarized here. In the early 1960s, following the construction of Haller Wells No. 1 and No. 2 immediately adjacent to the original Haller Well (aka No. 3), the City consulted the State regarding water rights. Groundwater certificate GWC 5169 was issued with a priority date of February 12, 1965, authorizing 1,700 gpm instantaneous withdrawal, and an annual volume of 1,344 acre-feet. However, having failed to recognize PSPL, the State made an administrative error in issuing GWC 5169. In 2011, the Department of Ecology corrected this error with Administrative Order 11WRNR—DE 7563. The Order maintained the City's holding of both water rights, but converted GWC 5169 to non-additive quantities as shown in **Table 6-2**. Effectively, GWC 5169 serves a protective function for the City when water rights in the Stillaguamish basin are adjudicated. A more detailed history of the PSPL water right is also provided in **Appendix K**.

The City has acquired four additional water rights for the Haller wellfield. All were originally primarily irrigation rights converted to municipal supply upon transfer to the City. Three of the four transfers were still pending in the previous WSP, but were approved for inclusion in the City's portfolio in 2012.

In 2009, a portion of the split Klein water right claim 300889CL(A) provided the City 135 gpm to be withdrawn instantaneously and 72.18 acre-feet of water to be withdrawn on an annual basis (**Table 6-2**). Priority date is March 1931. A maximum of 68.94 acre-feet of this annual water right is to be withdrawn between March 1st and September 30th. The remaining 3.24 acre-feet may be withdrawn year-round.

Table 6-1

City of Arlington Comprehensive Water Rights Portfolio[a]

For Additional Details, See		Surface or Ground Right	Water Right Type	Water Right Number	Current Use	Season of Use	Name, Originally Issued to	Priority Date	Status	Existing (or Target) Use at Wellfield	Existing Water Rights				Acreage (Irrigation Only)
											Instantaneous		Annual		
Table No.	Table Subject										Additive (gpm)	Non-Additive (gpm)	Additive (acre-feet)	Non-Additive (acre-feet)	
6-2	Existing	Ground	Certificate	GWC 5170	Municipal	Year-round	City of Arlington	2/12/1965	In-hand	Airport	200	--	320.00	--	--
6-2	Existing	Ground	Certificate	G1-24900C	Municipal	Year-round	City of Arlington	9/17/1986	In-hand	Airport	380	--	--	376.00	--
6-2	Existing	Surface	Certificate	SWC 194	Domestic	Year-round	Puget Sound Power & Light	10/10/1924	In-hand	Haller	2,244	--	3619.84	--	--
6-2	Existing	Ground	Claim	Claim 300889CL(A)	Municipal	Seasonal[b]	Don Klein	3/1/1931	In-hand	Haller	135	--	72.18	--	--
6-2	Existing	Surface	Certificate	SWC 5983	Municipal	Year-round	Sill (Graafstra)	8/30/1951	In-hand	Haller	112	--	49.09	--	--
6-2	Existing	Ground	Certificate	GWC 1488	Municipal	Interruptible[c]	Robertson (Neunzig)	9/4/1951	In-hand	Haller	90	--	40.00	--	--
6-2	Existing	Surface	Certificate	SWC 10024	Municipal	Interruptible[c]	Foerester (Graafstra)	3/29/1965	In-hand	Haller	269	--	122.72	--	--
6-2	Existing	Ground	Certificate	GWC 5169	Municipal	Year-round	City of Arlington	2/12/1965	In-hand	Haller	--	1,700	--	1344.00	--
6-3	Pending	Ground	Application	G1-26641C	Municipal	Year-round[d]	City of Arlington	7/7/1992	Cost Reimbursement - Phase 1 complete	(Airport)[e]	900	--	850.00	--	--
6-4	Other	Ground	Certificate	G1-23085GWRIS	Irrigation	Seasonal[b]	Green Valley Turf Farms	4/17/1978	In-hand	(Airport)[e]	150	--	80.00	--	140
6-4	Other	Ground	Certificate	GWC 02968	Irrigation	Seasonal[b]	Hammer	4/9/1952	In-hand	(Haller)[e]	156	--	30.00	--	26
6-4	Other	Ground	Certificate	GWC 02401	Irrigation	Seasonal[b]	Arlington Cemetery	4/20/1955	In-hand	(Haller)[e]	150	--	60.00	--	30

[a] This table provides a summary of all water rights actively managed by the City of Arlington. Not all provide potable water, but all are managed with the anticipation of providing potable water.

[b] Water right is available only during the irrigation season, which may be specifically defined in the water right. The Klein right has a small continuous withrawal component.

[c] Water right is available year-round except when flow-limited during low flows the winter season. The Foerester right has a small continuous withrawal component.

[d] Application is for year-round use. If awarded, use of the water right would require mitigation or would be flow-limited during the entire year.

[e] Where current use is irrigation, the water right is managed for eventual transfer to the intended point of withdrawal shown. Application G1-26641 is intended for use at the Airport wellfield.

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Table 6-2

Existing Water Rights for Potable Supply

DOH No.	Water Right Number	Priority Date	Surface or Ground Right	Existing Water Rights			
				Instantaneous		Annual	
				Additive (gpm)	Non-Additive (gpm)	Additive (acre-feet)	Non-Additive (acre-feet)
Airport Wellfield							
S04	GWC 5170	2/12/1965	Ground	200	---	320.00 [a]	---
S04	G1-24900C	9/17/1986	Ground	380	---	---	376.00 [a]
Total Airport Wellfield Potable Supply Water Rights				**580**	**0**	**320.00**	**376.00**
Haller Wellfield							
S05	SWC 194 (aka PSPL)	10/10/1924	Surface	2,244 [b]	---	3,619.84 [b]	---
S05	Claim 300889CL(A) (aka Klein)	3/1/1931	Ground	135	---	72.18 [c]	---
S05	SWC 5983	8/30/1951	Surface	112	---	49.09	---
S05	GWC 1488	9/4/1951	Ground	90 [d]	---	40.00 [d]	---
S05	GWC 5169 [e]	2/12/1965	Ground	---	1,700	---	1,344.00
S05	SWC 10024	3/29/1965	Surface	269 [f]	---	122.72 [f]	---
Total Haller Wellfield Potable Supply Water Rights				**2,850**	**1,700**	**3,903.83**	**1,344.00**
Total Potable Supply Water Rights				**3,430**	**1,700**	**4,223.83**	**1,720.00**
Subset of these rights that are interruptible October 1 to April 15				334 [d,f,g]	---	151.12 [d,f,g]	---
Subset of these rights that are interruptible October 1 to February 29				n/a	---	68.94 [c]	---
Subtotals for interruptible water rights				334 [g]	---	220.06 [g]	---
Subtotals for interruptible water rights (percent of column totals)				9.7%	---	5.2%	---

(a) The Airport Wellfield includes a primary water right of 320 acre-feet of water (under GWC 5170) and an additional 376 acre-feet of water (under G1-24900C), which *can* be withdrawn at this location but must be counted towards the City's total annual allotment of water.

(b) The water right certificate specifies an instantaneous rate of 5.0 cfs, and does not specify an annual quantity. Administrative order 11WRNR quantifies the certificate as 2,244 gpm and 3,619.84 ac-ft.

(c) The City did not apply for a change in season of use when transferring this water right. Based on the original array of beneficial uses, a maximum of 68.94 of 72.18 ac-ft of this water is to be withdrawn seasonally (March 1 through September 30). The remaining 3.24 acre-feet and the 135 gpm withdrawal rate may be applied year-round.

(d) All 40 acre-feet may be withdrawn continuously (at a maximum of 90 gpm) April 16 to September 30, or it may be considered interruptible during the intervening period when the mainstem Stillaguamish River drops below established minimum flows (2,000 to 2,200 cfs).

(e) Administrative order 11WRNR, dated November 30, 2011, identified that GWC 5169 was issued in error. The City operates its Haller well field under SWC 194 (aka PSPL). The City holds GWC 5169 in "reserve", and the water quantities are non-additive.

(f) 11.6 of 122.72 ac-ft is continuous all year, whereas 111.12 ac-ft is continuous 4/16 to 9/30, and interruptible from 10/1 to 4/15; 25 of 269 gpm is continuous all year, whereas 244 gpm is continuous 4/16 to 9/30, and interruptible from 10/1 to 4/15. See notes (d), (g).

(g) GWC 1488 and SWC 10024 sum to 40+111.12 = 151.12 ac-ft of interruptible water when the mainstem Stillaguamish River drops below established minimum flows (2,000 to 2,200 cfs) between October 1 and April 15. Adding 68.94 ac ft for 300889CL(A) results in 220.06 ac-ft of water rights that are interruptible--all of which fall outside the peak summer season. For instantaneous demands, GWC 1488 and SWC 10024 reduce total Qi by 90+244=334 gpm when the river is limited as described in this footnote.

Floyd Sill's surface water certificate SWC 5983 provides the City with 112 gpm and 49.09 ac-ft of water without restriction. The priority date is August 30, 1951 (**Table 6-2**). The City obtained this water right upon its purchase of Henry Graafstra's Country Charm Dairy in 2010. Similar to the City's use of the PSPL surface water right in the operation of the Haller wellfield, Graafstra had implemented a *de facto* change by converting the surface water diversion to withdrawal from a riverside well.

GWC 1488 authorizes the City to withdrawal an annual volume of 40 acre-feet at a maximum rate of 90 gpm; (**Table 6-2**). The priority date is September 4, 1951. Originally issued to P. Robertson, the City purchased and transferred the water right from Linda Neunzig dba Ninety Farms. Despite its earlier priority date, the water right is subject to interruption between October 1 and April 15 when flows in the mainstem Stillaguamish River at I-5 drop below 2,000 cfs to 2,200 cfs. The City's overall portfolio is immediately reduced by the stated quantities whenever the flow-based interruptions may occur.

Gordon Foerester's surface water certificate SWC 10024 was obtained from Henry Graafstra at the same time as the Sill water right. The maximum rate of withdrawal is 269 gpm; annual volume is limited to 122.72 acre-feet (**Table 6-2**). The priority date is March 29, 1965. Similar to GWC 1488, the water right is interruptible—but only partially so—between October 1 and April 15 when flows in the mainstem Stillaguamish River at I-5 drop below 2,000 cfs to 2,200 cfs. Under these conditions the City's overall portfolio is immediately reduced by 244 gpm and 111.12 ac-ft.

In all, up to 3,903.83 ac-ft of water may be withdrawn from the Haller Wellfield at an instantaneous rate of 2,850 gpm. Combined with water rights for potable use at the airport, the City has a total water rights portfolio providing 4,223.83 ac-ft of water at a maximum rate of 3,430 gpm. As shown in **Table 6-2**, these quantities may be reduced when the instream flow requirements described above are not met. The instantaneous rate is reduced by 334 gpm (nearly 10%) to 3,096 gpm. The annual quantity would be reduced by up to 220.06 ac-ft (more than 5%) to 4003.77 ac-ft if minimum instream flows between October 1 and April 15 were never met.

Additional water rights information for each source may be found on the certificates and permits, which are included in **Appendix K**.

6.3.4 Pending Water Rights for Potable Supply

In addition to the water rights secured above, the City continues to pursue other water rights opportunities where they may advantageous to the City. A summary of pending water rights information is presented in **Table 6-3**.

Table 6-3

Pending Water Rights for Potable Supply

DOH No.	Water Right Number	Priority Date	Surface or Ground Right	Existing Water Rights: Instantaneous Additive (gpm)	Existing Water Rights: Annual Additive (acre-feet)
Airport Wellfield					
S04	G1-26641	7/7/1992	Ground	900	850.00
Total Pending at Airport Wellfield				**900**	**850.00**
Total Pending Potable Supply Water Rights				**900**	**850.00**

Airport Wellfield

In 1992, the City applied for a water right to develop a new well source on the Airport Wellfield (Application G1-26641, with priority date July 7, 1992). The application requests 900 gpm and 850 acre-feet per year of water for conventional potable supplies (**Table 6-3**). Ecology issued a preliminary permit (G1-26641) to the City, who drilled an investigative well to evaluate the aquifer. Results were promising, though water quality testing indicated manganese treatment would be required. In 2007, the City initiated the cost reimbursement process for review of this application. Phase 1 was successfully completed. No other competing water right applications are senior to the City, and Ecology approved modification of the City's application to include production from up to three wells, rather than one well. However, Ecology has determined that a new groundwater withdrawal at this location would require mitigation for impairment to the 2005 Stillaguamish IFR. A satisfactory mitigation plan will address the impacts of the quantities, timing, and location of the water right. In addition, hydrogeologic evaluation indicated that an east-west groundwater divide in the proximity of 172nd Street and very close to the proposed well site had not been located with confidence, and that development of the well might impair tributaries in the south-trending Quilceda Creek basin, which were closed by Surface Water Source Limitation (SWSL) in about 1945. This complication resulted in a delay in initiating cost reimbursement phase 2.

However, the City has always intended that under this application it would appropriate Stillaguamish basin water. To do so with the least amount of effort, the proposed points of withdrawal would need to be moved further north onto the airport and away from the groundwater divide between the Stillaguamish and Quilceda/Snohomish basins. Amending the 1992 application to do so would require re-advertisement of the public notice, and a mitigation proposal to counter impairment under the Stillaguamish IFR. The 1992 priority date should not be affected. The amended application could be immediately evaluated under phase 2 of the cost reimbursement program. Whether the City moves forward with this water right in this or some other fashion will

likely be decided in the near future. See the discussion under Long-Term Water Supply Planning later in this chapter.

Haller Wellfield

No water right acquisitions for the Haller Wellfield, including new applications and transfers, are currently being pursued at this time. Three water rights identified as pending for transfer to the Haller Wellfield in the previous WSP have been approved. They are addressed earlier in this chapter with other existing water rights.

6.3.5 Existing Water Rights for Other Municipal Supply Purposes

The City currently holds three groundwater right certificates under which water is used to meet municipal water supply purposes other than conventional potable supplies. These water rights are appurtenant to city-owned properties and critical to the achievement of specific objectives the City has for these parcels. These three water rights are used for beneficial uses generally associated with the use of water within a municipality, which meet the definition of "municipal water supply purposes" under RCW 90.03.015(4). A summary of the water rights information is presented in **Table 6-4**.

Table 6-4

Existing Water Rights for Other Municipal Supply Purposes

DOH No.	Water Right Number	Priority Date	Surface or Ground Right	Use	Existing Water Rights: Instantaneous Additive (gpm)	Existing Water Rights: Annual Additive (acre-feet)	Acreage (acres)
Airport Wellfield							
S04	G1-23085GWRIS	4/17/1978	Ground	Irrigation	150	80.00	140
Total Existing Airport Wellfield Other Uses Water Rights					**150**	**80.00**	**140**
Haller Wellfield							
S05	GWC 02968	4/9/1952	Surface	Irrigation	156	30.00	26
S05	GWC 02401	4/20/1955	Surface	Irrigation	150	60.00	30
Total Existing Haller Wellfield Other Uses Water Rights					**306**	**90.00**	**56**
Total Existing Other Uses Water Rights					**456**	**170.00**	**196**

The City's intent in this water right self-assessment is to formally conform these water rights as rights for municipal water supply purposes pursuant to RCW 90.03.560. In addition, long-term demand identified in this WSP indicates opportunities to change the beneficial use of these water rights from irrigation to potable supply. The City's Water Reclamation Facility produces Class A Reclaimed Water, and its NPDES permit authorizes re-use of the reclaimed water (currently limited to irrigation of a constructed treatment wetland). The IWRMP identifies the opportunity to change/transfer the irrigation rights discussed here for potable supply in exchange for the distribution (now or at a future time) of reclaimed water to these locations for irrigation.

This same intent was expressed in the previous WSP, but conforming documents for these water rights were ultimately not issued—perhaps due to confusion over ownership. RCW 90.03.560 indicates that water right documents may be amended "to ensure that water rights that are for municipal water supply purposes, as defined in RCW 90.03.015, are correctly identified as being for municipal water supply purposes." It does not specify that the rights needed to be originally issued to a municipality, simply that they are held by the municipality. RCW 90.03.015 defines "municipal water supply purposes", in part, as a City's beneficial use of water for "governmental proprietary purposes". It then clearly provides examples of beneficial uses considered as meeting municipal water supply purposes, including "irrigation of parks and open spaces".

Municipal corporations serve a proprietary function when they enter into business ventures or perform discretionary acts in the best interests of its citizens. This is what is occurring when the City of Arlington provides burial services in its cemetery, stormwater treatment and open space functions in its Old Town Wetland, or commercial turf farming on otherwise unusable lands in its airport runway protection zones. All of these proprietary functions occur on properties held in fee simple ownership by the City, and involve water use authorized under water rights attached to those properties.

Cemetery Well

The Arlington Cemetery holds GWC 2401 for irrigation of 30 acres of lawn. The maximum rate of withdrawal from a dug well is 150 gpm; annual volume is limited to 60 acre-feet (**Table 6-4**). The priority date is April 20, 1955.

The groundwater right was initially issued to the Arlington Cemetery. Title transferred to the City of Arlington when the City purchased the cemetery. The City Council and the Cemetery Advisory Board place high value on the aesthetics of the cemetery, which is situated on gravelly, sandy loam soils. Accordingly, the City has historically irrigated all of its developed and utilized areas from Memorial Day to fall each year.

The cemetery was formerly irrigated by hand lines and a big gun maneuvered between various connections on a piecemeal irrigation system. Begun in 2010, the City completed upgrade of its entire irrigation system to include new distribution mains, laterals and numerous *in situ* sprinkler heads. The City also installed in 2013 nearly 5,000 feet of trunk line ("purple pipe") for the conveyance of reclaimed water to the cemetery and other locations with potential for reclaimed water use. This is about 50% of the total length necessary to re-use reclaimed water at the cemetery.

Hammer Well

The City of Arlington also holds GWC 2968, originally issued to Curtis Hammer for irrigation of 26 acres of pasture from a dug well. The maximum rate of withdrawal is 156 gpm; annual volume is limited to 30 acre-feet (**Table 6-4**). The priority date is April 9, 1952.

The City purchased the Hammer property in 2000 for purposes of constructing a wetland for the treatment of otherwise untreated stormwater from 280 acres of Old Town Arlington. Initially, the City leased the parcel for continued agricultural production of silage and hay. Construction of the unlined wetland was begun in 2010 and completed in August 2011. The wetland also includes walking trails, educational signage, educational facilities, and other open space as an extension of Haller Park from the east. The well is used to irrigate and maintain the sinuous "hills" and swales of the wetland during summer months when stormwater runoff is limited. The water reclamation facility is located due east of the wetland, across SR9. With a reclaimed water permit in hand, flood irrigation of the wetland using reclaimed water may begin replacing use of the well in 2015. Application for transfer of the Hammer water right to the Haller Wellfield is anticipated to occur shortly thereafter.

Airport Turf Farm Well

The City of Arlington holds G1-23085 originally issued to Green Valley Turf Farms for irrigation of 140 acres of turf (as a sod farm) at the Arlington municipal airport. The maximum rate of withdrawal is 150 gpm; annual volume is limited to 80 acre-feet (**Table 6-4**). The priority date is April 17, 1978.

In addition to flight facilities and operations, the City of Arlington Municipal Airport includes numerous parcels leased as part of an industrial center and business park. This water right was first issued to Green Valley Turf Farms for irrigation of a turf farm on property owned by the City immediately north of 172nd Street. After a number of years of operation immediately adjacent to runways with low vertical clearance requirements, the Federal Aviation Administration (FAA) ordered the City to discontinue turf farm locations on that site for safety reasons. Airport staff and lessees initiated *de facto* changes by moving the points of withdrawal and place of use to 53 acres immediately south of 172nd Street, approximately 50 to 1,500 feet south of the original location. Soils on the site are a complex of Lynnwood loamy sand and Custer fine sandy loam, and irrigation use has remained consistent despite this change. A review of the water right during this self-assessment clarified the *de facto* changes and identified the need to submit a change application to conform the authorized and actual point of withdrawal and place of use for this water right. When reclaimed water becomes available to the turf farm, or if turf farm operations are discontinued, the City anticipates transferring this water right to the Airport Wellfield.

6.3.6 Wholesale Water Purchases

The City entered into a Wholesale Water Agreement with PUD No. 1 of Snohomish County on June 15, 1998. The agreement has been amended on occasion to provide each of five annual increments of 200 gpm up to 1000 gpm at a master meter at the boundary between service areas along Burn Rd. It established the bases for initial water rates and general facilities charges (GFCs), and for increases to these costs. The City clarified its intent to continue use of its existing sources, and agreed to not use PUD water to solely meet peaks. The PUD agreed to maintain the quality, quantity, pressure, reliability of its water supply. The term of the Agreement is "through 2018 and

thereafter unless terminated by mutual agreement or upon 5-year written notice by either party". Conversations with the PUD, have confirmed the intent of both parties to maintain the agreement indefinitely.

Late in the decade of the 2000s, the City reached its maximum reliance on the PUD source. Average day demands ranged between 350 and 400 gpm, and in 2009 the City placed a maximum day demand of 656 gpm on the PUD. The City's 2011 Water Supply Study demonstrated the economic benefit to the City of relying more heavily on its own production sources. Since then, the City has drawn between 50 and 110 gpm from the PUD.

The PUD delivers filtered and disinfected surface water from the City of Everett's Spada Reservoir on the Sultan River to Arlington. This is an inter-basin transfer of water and is considered a "foreign flow" to the Stillaguamish Basin. Foreign flows can provide creative opportunities in the context of the City's IWRMP, including as mitigation for impairments that may be created by the issuing of new water rights.

6.3.7 Water Supply Evaluation

An evaluation of the City's existing water rights and wholesale purchase agreement was performed to determine the sufficiency of the water rights to meet both existing and future water demands. **Table 6-5** compares the total instantaneous water right amounts of the sources with the maximum day demand of the system. It also compares the total annual water right amounts of the sources with the average day demand of the system. As shown in **Table 6-5**, the City has sufficient water rights (both instantaneous and annual) to meet the current demands of existing customers.

Table 6-5

Existing Water Supply Evaluation

Description	Instantaneous Rights/ Maximum Day Demand (gpm)	Annual Rights/ Average Day Demand (acre-feet)	Annual Rights/ Average Day Demand (gpm)
Available Water Supply			
Total Water Rights	3,430	4,223.83	2,618
PUD Wholesale Supply Source	1,000	1,612.90	1,000
Totals	4,430	5,836.73	3,618
Required Supply			
Existing (2014) Water Demand	1,912	1,761.41	1,092
Surplus or Deficient Water Supply			
Surplus (or Deficient) Supply	2,518	4,075.33	2,526

Table 6-6 summarizes the results of the future water rights evaluation, which compares the water rights of the existing sources with the future 6-, 10-, 20-, and 50-year demand projections of the system. The analysis considered future demand projections first without (**Table 6-6a**) and then with additional water use reductions from planned water use efficiency efforts (**Table 6-6b**). The City has sufficient instantaneous and annual water rights to meet the projected average day and maximum day demands for nearly 50 years. Deficits are projected in year 50 (2064) for maximum day demand, even with conservation. However, the deficits are based on assumed, sustained population growth rates. And if they are indeed realistic, the unmet demands are at a scale such that they can be corrected using plumbing improvements, efficiency practices and additional storage facilities.

Table 6-6a

Future Water Supply Evaluation Without Conservation

Description	Instantaneous Rights/ Maximum Day Demand (gpm)	Annual Rights/ Average Day Demand (acre-ft)	Annual Rights/ Average Day Demand (gpm)
Year 2020 (6-year) Without Conservation			
Total Water Rights	3,430	4,223.83	2,618
PUD Wholesale Supply Source	1,000	1,612.90	1,000
Projected (2014) Water Demand	2,097	1,932.39	1,198
Surplus (or Deficient) Supply	**2,333**	**3,904.35**	**2,420**
Year 2024 (10-year) Without Conservation			
Total Water Rights	3,430	4,223.83	2,618
PUD Wholesale Supply Source	1,000	1,612.90	1,000
Projected (2024) Water Demand	2,338	2,154.98	1,336
Surplus (or Deficient) Supply	**2,092**	**3,681.75**	**2,282**
Year 2034 (20-year) Without Conservation			
Total Water Rights	3,430	4,223.83	2,618
PUD Wholesale Supply Source	1,000	1,612.90	1,000
Projected (2034) Water Demand	2,996	2,761.47	1,712
Surplus (or Deficient) Supply	**1,434**	**3,075.26**	**1,906**
Year 2064 (50-year) Without Conservation			
Total Water Rights	3,430	4,223.83	2,618.00
PUD Wholesale Supply Source	1,000	1,612.90	1,000.00
Projected (2064) Water Demand	4,651	4,285.77	2,657.00
Surplus (or Deficient) Supply	**(221)**	**1,550.97**	**961.00**

Table 6-6b

Future Water Supply Evaluation With Conservation

Description	Instantaneous Rights/ Maximum Day Demand (gpm)	Annual Rights/ Average Day Demand (acre-ft)	Annual Rights/ Average Day Demand (gpm)
Year 2020 (6-year) With Conservation			
Total Water Rights	3,430	4,223.83	2,618.00
PUD Wholesale Supply Source	1,000	1,612.90	1,000.00
Projected (2020) Water Demand	2,069	1,906.58	1,182.00
Surplus (or Deficient) Supply	**2,361**	**3,930.15**	**2,436.00**
Year 2024 (10-year) With Conservation			
Total Water Rights	3,430	4,223.83	2,618.00
PUD Wholesale Supply Source	1,000	1,612.90	1,000.00
Projected (2024) Water Demand	2,307	2,125.95	1,318.00
Surplus (or Deficient) Supply	**2,123**	**3,710.79**	**2,300.00**
Year 2034 (20-year) With Conservation			
Total Water Rights	3,430	4,223.83	2,618.00
PUD Wholesale Supply Source	1,000	1,612.90	1,000.00
Projected (2034) Water Demand	2,956	2,724.37	1,689.00
Surplus (or Deficient) Supply	**1,474**	**3,112.36**	**1,929.00**
Year 2064 (50-year) With Conservation			
Total Water Rights	3,430	4,223.83	2,618.00
PUD Wholesale Supply Source	1,000	1,612.90	1,000.00
Projected (2064) Water Demand	4,588	4,229.31	2,622.00
Surplus (or Deficient) Supply	**(158)**	**1,607.42**	**996.00**

6.4 LONG-TERM WATER SUPPLY PLANNING

6.4.1 Beyond the Projections (Amended)

Despite the favorable outlook derived from projections of system-wide water supply, numerous other factors facing the City are influencing supply-side decision making. These are summarized below.

- Water rights
    - Washington State statutes are clear that determinations of the extent and validity of existing water rights are tentative, as final decisions can only be made by Superior Courts through general adjudication of water rights.
    - The interruptibility of the City's water rights was not considered in the evaluations in Table 6-5 and Table 6-6. As shown in Table 6-2, up to 334 gpm (10 percent) of the City's facial instantaneous rate and up to 220.06 ac-ft (5 percent) of the City's facial annual allocation may be reduced when the instream flow requirements described above are not met.
    - The unit costs of finished water from each source has not been considered in the supply analysis. In addition, other water rights in the City's portfolio have economic and environmental values that need to be carefully managed. See Sections 6.3.4 and 6.3.5.
- Water quality
    - Source water quality is a critical concern for potable supplies. The high and moderate susceptibility of the Haller and Airport Wellfields, respectively, make protection of paramount concern. Potential for contamination at the Airport Wellfield was marked by the possible detection of 1,4-dioxane during UCMR3 monitoring.
    - The Airport Wellfield occupies a former military base and is surrounded by the City's industrial area.
- Declining infrastructure and aquifer condition
    - Efforts in 2012 to rehabilitate the Haller Wellfield and regain some lost productivity from wells that are greater than 50 and greater than 100 years old were unsuccessful.
    - Successive structural failures in the casing of the only production well in the Airport Wellfield have resulted in repeated raising of the pump from a depth of 185 feet bgs to about 110 feet bgs.

- Regulatory requirements
    - Revisions to the Skagit Instream Flow Rule occurred somewhat concurrent with the development of the Stillaguamish Instream Flow Rule, resulting in numerous similarities between the two rules. At least one subbasin in the Skagit Basin which borders the Stillaguamish basin divide has been found to be without water and a moratorium has been placed on development of its lands. This has caused some confusion and concern over the status of these and other instream flow rules where reservations were created while the basins were closed to new appropriations.
    - Case law is growing more complex as court decisions involving water resources increase. Numerous water-related bills are introduced by the legislature each year, and some are enacted into law. The Stillaguamish has been referenced in more than one bill, in part because its instream flow rule was not promulgated through the watershed planning process adopted as RCW 90.82 in 1998.
- Energy requirements
    - The distribution of water from the City's sources to its reservoirs and between its pressure zones requires water to be pumped at significant cost. Only the smaller 540 and 710 zones facilitate the gravity flow of water purchased from the PUD. Alternative sources and source locations could help reduce the utility's energy dependence.
- Changes in WSA
    - The growth of the City~~ particularly expansion west of I-5~~ presents new needs and new opportunities for situating sources and designing distribution networks to best serve these areas.

6.4.2 Identification of Alternative Sources

Concurrent with the publication of this WSP (2015), the City is beginning a dedicated effort to identify additional and/or alternative water sources that would address as many of the concerns identified above as possible. A diversity of sources will assure the reliable and sustainable production of potable water in the City's WSA and in the Stillaguamish basin.

6.4.3 Water Rights

In 2006, the City retained West Water Research to conduct an evaluation of water rights available to the City for purposes of municipal supply and mitigation. The assessment process screened 2,490 water rights in the Stillaguamish and Quilceda basins. A total of 131 water rights met aerial photo and field review criteria established by the City. The final evaluation report then identified 16 high priority and 59 medium priority water rights for potential transfer to either the Haller or Airport Wellfield (or for mitigation). The City has investigated several of these 75 potentially transferable water rights consistent with capital funding availability. All four of the water rights transfers discussed earlier were identified through this process. Effective with this WSP, the City

is reducing its water right acquisition efforts to an opportunistic approach. Rather than broadly identify water rights acquisition as a separate line item in the capital improvements schedule for the Water Department, water rights are included with the development of specific alternative water sources in **Chapter 9**.

6.4.4 Integrated Water Resources Management

To best meet the 50-year future demand projections, the water rights identified in this WSP must be available for municipal water supply purposes. Programmatic efforts to improve water use efficiency and adaptively manage the City's water resources also need to be successful. Finally, alternative sources may need to be developed, including production wells and the optional purchase of wholesale water supplies from the PUD in excess of its current 1,000 gpm contract.

The City will strive to continue to use its existing water sources efficiently by continuing the current water conservation measures and implementing proposed measures outlined in the City's Water Use Efficiency Program, which is included in **Appendix E**.

The City's Integrated Water Resources Management Program (IWRMP) was prepared as part of the prior WSP in **Appendix I**. The IWRMP initiates a program to integrate the management of the City's multiple water uses within the framework of the natural climate, water resources and other water uses of the Stillaguamish and Quilceda basins. The IWRMP develops policies and actions to flexibly manage the City's water resources to improve long-term water availability, reliability and environmental quality in a cost-effective manner.

The City's water system currently has interties with the PUD. The PUD purchases water from the City of Everett's (Everett) raw water supply, which originates in the Spada Lake Reservoir created by the Culmback Dam on the Sultan River, approximately 30 miles east of Everett. As a regional water provider, Everett provides water to over 550,000 people in Snohomish County. It should be noted, however, that Everett may not meet its long-term water demand projections without the development of new water rights, including a pending 1954 application.

6.5 DRINKING WATER REGULATIONS

6.5.1 Overview

The quality of drinking water in the United States is regulated by the Environmental Protection Agency (EPA). Under provisions of the Safe Drinking Water Act (SDWA), the EPA is allowed to delegate primary enforcement responsibility for water quality control to each state. In the State of Washington, the DOH is the agency responsible for implementing and enforcing the drinking water regulations. For the State of Washington to maintain primacy (delegated authority to implement requirements) under the SDWA, the state must adopt drinking water regulations that are at least as stringent as the federal regulations. In meeting these requirements, the State, in cooperation with the EPA, has published drinking water regulations that are contained in Chapter 246-290 WAC.

6.5.2 Existing Regulations

The SDWA was enacted in 1974 as a result of public concern about water quality. The SDWA sets standards for the quality of drinking water and requires water treatment if these standards are not met. The SDWA also sets water testing schedules and methods that water systems must follow. In 1986, the SDWA was amended as a result of additional public concern and frequent contamination of groundwater from industrial solvents and pesticides. The 1986 Amendments require water systems to monitor and treat for a continuously increasing number of water contaminants identified in the new federal regulations. The EPA regulated approximately 20 contaminants between 1974 and 1986. The 1986 Amendments identified 83 contaminants that the EPA was required to regulate by 1989. Implementation of the new regulations has been marginally successful due to the complexity of the regulations and the associated high costs. To rectify the slow implementation of the new regulations, the SDWA was amended again and re-authorized in August of 1996.

In response to the 1986 SDWA Amendments, the EPA established six rules known as the Phase I Rule, the Phase II and IIb Rules, the Phase V Rule, the Surface Water Treatment Rule (SWTR), the Total Coliform Rule, and the Lead and Copper Rule. The EPA regulates most chemical contaminants through the Phase I, II, IIb and V Rules. Additional drinking water regulations have been published since these six rules were first established, and the EPA is continually proposing new rules for promulgation. The City's currently active sources are affected by many of these rules.

The EPA set two limits for each contaminant regulated under the rules. The first limit is a health goal referred to as the Maximum Contaminant Level Goal (MCLG), at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. The MCLG is zero for many contaminants, especially known cancer-causing agents (carcinogens), because it is assumed that any amount of exposure may pose some risk of cancer.

The second limit is a legal limit referred to as the Maximum Contaminant Level (MCL). MCLs are the enforceable, maximum permissible levels of contaminants in water which is delivered to any user of a public water system. Each MCL is set as close to (equal to or higher than) its MCLG as feasible. EPA determines an MCL as the level that may be achieved using the best available technology, treatment techniques, and other means which EPA finds are cost effective. A summary of each rule follows.

To fully understand the discussion that follows, a brief definition of several key terms is provided below.

- Organic Chemicals – Animal or plant produced substances containing carbon and other elements such as hydrogen and oxygen.

- Synthetic Organic Chemicals (SOCs) – Manmade organic substances, including herbicides, pesticides, and various industrial chemicals and solvents.
- Volatile Organic Chemicals (VOCs) – Chemicals, as liquid, that evaporate easily into the air.
- Inorganic Chemicals (IOCs) – Chemicals of mineral origin that are naturally occurring elements. These include metals such as lead and cadmium.

Phase I Rule

The Phase I Rule, which was the EPA's first response to the 1986 Amendments, was published in the Federal Register on July 8, 1987 and became effective on January 9, 1989. This rule provided limits for eight VOCs that may be present in drinking water. VOCs are used by industries in the manufacture of rubber, pesticides, deodorants, solvents, plastics and other chemicals. VOCs are found in everyday items such as gasoline, paints, thinners, lighter fluid, mothballs and glue, and are typically encountered at dry cleaners, automotive service stations and elsewhere in industrial processes. The City currently complies with all contaminant monitoring requirements under this rule.

Phase II and IIb Rules

The Phase II and IIb Rules were published in the Federal Register on January 30, 1991 and July 1, 1991, and became effective on July 30, 1992 and January 1, 1993, respectively. These rules updated and created limits for 38 contaminants (organics and inorganics), of which 27 were newly regulated. Some of the contaminants are frequently applied agricultural chemicals (nitrate), while others are more obscure industrial chemicals. The City currently complies with all contaminant monitoring requirements under this rule.

Phase V Rule

The Phase V Rule was published in the Federal Register on July 17, 1992, and became effective on January 17, 1994. This rule set standards for 23 additional contaminants, of which 18 are organic chemicals (mostly pesticides and herbicides) and 5 are IOCs (such as cyanide). The City currently complies with all contaminant monitoring requirements under this rule.

Surface Water Treatment Rule

The Surface Water Treatment Rule (SWTR) was published in the Federal Register on June 29, 1989, and became effective on December 31, 1990. Surface water sources such as rivers, lakes, and reservoirs (which are open to the atmosphere and subject to surface runoff), and groundwater sources that are under the direct influence of surface water (referred to as GWI sources), are governed by this rule. The SWTR seeks to prevent waterborne diseases caused by the microbes *Legionella* and *Giardia lamblia*, which are present in most surface waters. The rule requires disinfection of all surface water and GWI sources. All surface water and GWI sources must also be filtered, unless a filtration waiver is granted. A filtration waiver may be granted to systems

with pristine sources that continuously meet stringent source water quality and protection requirements. The Haller Park Wellfield is classified as a GWI source and is subject to the SWTR. The City currently complies with all requirements under this rule.

Interim Enhanced Surface Water Treatment Rule

The EPA proposed the Interim Enhanced Surface Water Treatment Rule (IESWTR) on July 29, 1994. The final rule was published in the Federal Register on December 16, 1998, and became effective on February 16, 1999, concurrent with the Stage 1 Disinfectants/Disinfection By-products Rule. The rule primarily applies to public water systems that serve 10,000 or more people and use surface water or GWI sources. The rule also requires primacy agencies (i.e., DOH) to conduct sanitary surveys of all surface water and GWI systems, regardless of size. The rule was the first to directly regulate the protozoan *Cryptosporidium* and has set the MCLG for *Cryptosporidium* at zero. Water systems affected by this rule needed to comply with it by December 16, 2001. The City currently complies with all requirements under this rule.

Long Term 1 Enhanced Surface Water Treatment Rule

This is the follow-up rule to the IESWTR that became effective in December of 1998. The final Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) was published on January 14, 2002, and became effective February 13, 2002. The rule addresses water systems using surface water or groundwater under the direct influence of surface water serving fewer than 10,000 people. The rule extends protections against *Cryptosporidium* for smaller water systems. The City meets the requirements of the SWTR and the IESWTR and therefore complies with all requirements under this rule.

Total Coliform Rule

The Total Coliform Rule was published in the Federal Register on June 29, 1989, and became effective on December 31, 1990. The rule set both health goals (MCLGs) and legal limits (MCLs) for total coliform levels in drinking water, and the type and frequency of testing that is required for water systems. The rule requires more monitoring than prior requirements, especially for small systems. In addition, every public water system is required to develop a coliform monitoring plan, subject to approval by DOH.

Coliform is a group of bacteria, some of which live in the digestive tract of humans and many animals, and are excreted in large numbers with feces. Coliform can be found in sewage, soils, surface waters and vegetation. The presence of any coliform in drinking water indicates a health risk and potential waterborne disease outbreak, which may include gastroenteric infections, dysentery, hepatitis, typhoid fever, cholera and other infectious diseases.

The rule established the MCLG for total coliform at zero. To comply with the legal limit, systems must not find coliform in more than 5 percent of the samples taken each month. For smaller systems like the City's that take fewer than 20 samples per month, 1 sample that contains coliform would exceed the legal limit and trigger the follow-up sampling requirements. A copy of the City's Water Quality Monitoring Plan is contained in **Appendix H**. The City currently complies with all contaminant monitoring requirements under this rule. See also discussion of the Revised Total Coliform Monitoring Rule later in this chapter.

Lead and Copper Rule

The Lead and Copper Rule was published in the Federal Register on June 7, 1991, and became effective on December 7, 1992. On January 12, 2000, the EPA published minor revisions to the rule in the Federal Register, which primarily improved the implementation of the rule. On June 29, 2004, additional minor revisions and clarifications on several requirements of the Lead and Copper Rule were published by the EPA. The rule identifies action levels for both lead and copper. An action level is different than a MCL in that a MCL is a legal limit for a contaminant, and an action level is a trigger for additional prevention or removal steps. The action level for lead is greater than 0.015 mg/L. The action level for copper is greater than 1.3 mg/L. If the 90th percentile concentration of either lead or copper from the group of samples exceeds these action levels, a corrosion control study must be undertaken to evaluate strategies and make recommendations for reducing the lead or copper concentration below the action levels. The rule requires systems that exceed the lead level to educate the affected public about reducing its lead intake. Systems that continue to exceed the lead action level after implementing corrosion control and source water treatment may be required to replace piping in the system that contains the source of lead. Corrosion control is typically accomplished by increasing the water's pH to make it less corrosive, which reduces its ability to break down water pipes and absorb lead or copper.

Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery, porcelain, pewter, brass and water. Lead can pose a significant risk to health if too much of it enters the body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Lead can slow normal mental and physical development of growing bodies.

Copper is a common, natural and useful metal found in our environment. It is also a trace element needed in most human diets. The primary impact of elevated copper levels in water systems is stained plumbing fixtures. At certain levels (well above the action levels), copper may cause nausea, vomiting and diarrhea. It can also lead to serious health problems in people with Wilson's disease. Long-term exposure to elevated levels of copper in drinking water could also increase the risk of liver and kidney damage. The City currently complies with all contaminant monitoring and treatment requirements under this rule.

Radionuclides Rule

The EPA established interim drinking water regulations for radionuclides in 1976 under the SDWA. Radionuclides are elements that undergo a process of natural decay and emit radiation in the form of alpha or beta particles and gamma photons. The radiation can cause various kinds of cancers, depending on the type of radionuclide exposure from drinking water. The regulations address both manmade and naturally occurring radionuclides in drinking water. MCLs were established for alpha, beta and photon emitters, and radium 226/228.

The 1986 amendments to the SDWA finalized the regulations for radionuclides by eliminating the term "interim." The amendments also directed the EPA to promulgate health-based MCLGs, as well as MCLs. The EPA failed to meet the statutory schedules for promulgating the radionuclide regulations, which resulted in a lawsuit. In 1991, the EPA proposed revisions to the regulations, but a final regulation based on the proposal was never promulgated. The 1996 amendments to the SDWA directed the EPA to revise a portion of the earlier proposed revisions, adopt a schedule, and review and revise the regulations every six years, as appropriate, to maintain or improve public health protection. Subsequent to the 1996 Amendments, a 1996 court order required the EPA to either finalize the 1991 proposal for radionuclides or ratify the existing standards by November 2000.

The final rule was published in the Federal Register on December 7, 2000, and became effective on December 8, 2003. The rule established an MCLG of zero for the four regulated contaminates and MCLs of 5 pCi/L for combined radium-226 and radium-228; 15 pCi/L for gross alpha (excluding radon and uranium); 4 mrem/year for beta particle and photon radioactivity; and 30 µg/L for uranium. The City currently complies with all contaminant monitoring requirements under this rule.

Wellhead Protection Program

Section 1428 of the 1986 SDWA Amendments mandates that each state develop a wellhead protection program. The Washington 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. In Washington State, DOH is the lead agency for the development and administration of the State's wellhead protection program.

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. All federally defined Group A public water systems that use groundwater as their source are required to develop and implement a wellhead protection program. All required elements of the City's wellhead protection program must be documented and included in its Comprehensive WSP. A copy of the City's Wellhead and Watershed Protection Program is contained in **Appendix F**.

Consumer Confidence Report

The final rule for the Consumer Confidence Report (CCR) was published in the Federal Register on August 19, 1998, and became effective on September 18, 1998. Minor revisions were posted in the Federal Register on May 4, 2000. The CCR is the centerpiece of the right to know provisions of the 1986 Amendments to the SDWA. All community water systems, like the City, were required to issue the first report to customers by October 19, 1999. The annual report must be updated and re-issued to all customers by July 1st of each year thereafter.

The CCR is a report on the quality of water that was delivered to the system during the previous calendar year. The reports must contain certain specific elements, but may also contain other information that the purveyor deems appropriate for public education. Some, but not all, of the information that is required in the reports includes the source and type of the drinking water, type of treatment, contaminants that have been detected in the water, potential health effects of the contaminants, identification of the likely source of contamination, violations of monitoring and reporting, and variances or exemptions to the drinking water regulations. A copy of the City's latest CCR is contained in **Appendix J**.

Stage 1 Disinfectants/Disinfection By-products Rule

Disinfection by-products (DBPs) are formed when free chlorine reacts with organic substances, most of which occur naturally. These organic substances (called precursors) are a complex and variable mixture of compounds. The DBPs themselves may pose health risks. Trihalomethanes is a category of DBPs that had been regulated prior to this rule. However, systems with groundwater sources that serve a population of less than 10,000 were not previously required to monitor for trihalomethanes.

The EPA proposed the Stage 1 Disinfectants/Disinfection By-products Rule (D/DBPR) on July 29, 1994. The final rule was published in the Federal Register on December 16, 1998, and became effective on February 16, 1999. The rule applied to the City and most other water systems, including systems serving fewer than 10,000 people that added a chemical disinfectant to their drinking water during any part of the treatment process. The rule reduced the MCL for total trihalomethanes, which are a composite measure of four individual trihalomethanes, from the previous interim level of 0.10 mg/L to 0.08 mg/L. The rule established MCLs and required monitoring of three additional categories of DBPs: 1) 0.06 mg/L for five haloacetic acids; 2) 0.01 mg/L for bromate; and 3) 1.0 mg/L for chlorite. The rule also established maximum residual disinfectant levels (MRDLs) for chlorine (4.0 mg/L), chloramines (4.0 mg/L) and chlorine dioxide (0.8 mg/L). The rule requires systems using surface water or groundwater directly influenced by surface water to implement enhanced coagulation or softening to remove DBP precursors, unless alternative criteria are met.

Compliance with this rule must have been satisfied by December 16, 2001 for large surface water systems (those serving over 10,000 people) and by December 16, 2003 for smaller surface water systems and all groundwater systems. The City complied with all contaminant monitoring

requirements under this rule. With the authorization of the subsequent Stage 2 D/DBP rule and the completion of a long term monitoring plan it required, the Stage 1 Rule no longer has an effect on the City's operations and drinking water quality.

Unregulated Contaminant Monitoring Rule

The EPA established the Unregulated Contaminant Monitoring Rule (UCMR) to generate data on contaminants that are being considered for inclusion in new drinking water standards. The information collected by select public water systems will ensure that future regulations established by the EPA are based on sound science. The rule was first published in the Federal Register on September 17, 1999, and was subsequently amended on March 2, 2000 and January 11, 2001. The UCMR became effective on January 1, 2001.

Three separate lists of unregulated contaminants are maintained under the UCMR: List 1, List 2 and List 3. Contaminants are organized on the tiered lists based on the availability of standard testing procedures and the known occurrence of each contaminant, with List 1 containing contaminants that have established standard testing procedures and some, but insufficient, information on their occurrence in drinking water. Monitoring for contaminants on the three lists is limited to a maximum of 30 contaminants within a 5-year monitoring cycle, and the EPA is required to publish new contaminant monitoring lists every 5 years. As new lists are published, contaminants will be moved up in the lists if adequate information is found to support additional monitoring. All public water systems serving more than 10,000 people and a randomly selected group of smaller water systems are required to monitor for contaminants.

The City of Arlington was not large enough nor selected to participate in the first two cycles of the UCMR, though it has monitored some unregulated contaminants for a number of years. It participated for the first time in the third cycle of the Rule (UCMR3), which was authorized April 16, 2012. Between June 2013 and March 2014, quarterly or biannual water samples were collected from each source and a point of maximum residence time in the distribution system. Samples were analyzed for 21 contaminants ranging from naturally-occurring metals to pesticides, flame retardants, and pharmaceuticals. The City currently complies with all contaminant monitoring requirements under this rule.

Arsenic

The EPA established interim drinking water regulations for arsenic in 1976 under the SDWA. Arsenic is highly toxic, affects the skin and nervous system, and may cause cancer. The 1986 SDWA amendments require the EPA to conduct research to assess health risks associated with exposure to low levels of arsenic. The EPA issued a proposed regulation on June 22, 2000, and allowed a 90 day public review period. The final rule, which was published in the Federal Register on January 22, 2001, was to become effective on March 23, 2001, except for certain amendments to several sections of the rule. However, because of the national debate regarding the science and costs related to the rule, the EPA announced on May 22, 2001 that it was delaying the effective date for the rule to allow time to reassess the rule and afford the public a full opportunity to provide

further input. On October 31, 2001, the EPA reaffirmed the final rule as published on January 22, 2001. The Arsenic Rule subsequently became effective on February 22, 2002.

The rule sets the MCLG of arsenic at zero and reduces the MCL from the previous standard of 0.05 mg/L to 0.01 mg/L. Arsenic's monitoring requirements will be consistent with the existing requirements for other inorganic contaminants. The regulation required the City to begin monitoring by January 23, 2006. The City currently complies with all contaminant monitoring requirements under this rule.

Filter Backwash Recycling Rule

The 1986 SDWA Amendments required the EPA to promulgate a regulation governing the recycling of filter backwash water within public water systems' treatment processes. Public water systems using surface water or groundwater under the direct influence of surface water that utilize filtration processes and recycling must comply with the rule. The rule aims to reduce risks associated with recycling contaminants removed during filtration. The EPA issued a proposed regulation on June 22, 2000, and allowed a 90 day public review period. The final rule was published in the Federal Register on June 8, 2001, and became effective on August 7, 2001.

The rule requires filter backwash water be returned to a location that allows complete treatment. In addition, filtration systems must provide detailed information regarding the treatment and recycling process to the State. The regulation requires water systems to have complied with the rule starting December 8, 2003 if filter backwash water was recycled.

From its inception in 2001 to November 18, 2014, the City's water treatment plant backwash was discharged to its wastewater treatment plant for recycling. Effective November 18, 2014, filtration backwash is discharged to one of two locations. The initial fractions (15 percent to 50 percent) of the various backwash cycles are laden with sediments, and these continue to be discharged to the wastewater facility for treatment. The remaining 50 to 85 percent of the backwash is dechlorinated, if needed, and discharged to a constructed treatment wetland to support wetland vegetation and recharge groundwater adjacent to the Stillaguamish River. The City currently complies with all requirements under this rule.

Stage 2 Disinfectants/Disinfection By-products Rule

This rule is the second part of the Disinfectants/Disinfection By-products Rule, of which the Stage 1 D/DBPR became effective in February 1999. The Stage 2 Disinfectants/Disinfection By-products Rule (Stage 2 D/DBPR) was published on January 4, 2006 in the Federal Register and became effective March 6, 2006. The EPA implemented this rule simultaneously with the Long Term 2 Enhanced Surface Water Treatment Rule.

Similar to the Stage 1 D/DBPR, this rule applies to most water systems that add a disinfectant to the drinking water other than ultraviolet light or those systems which deliver such water. The Stage 2 D/DBPR changes the calculation procedure requirement of the MCLs for two groups of

DBPs (TTHM and HAA5) by requiring each sampling location to determine compliance with MCLs based on their individual annual average DBP levels (termed the Locational Running Annual Average), rather than utilizing a system-wide annual average. The rule also proposes new MCLGs for chloroform (0.07 mg/L), trichloroacetic acid (0.02 mg/L) and monochloroacetic acid (0.03 mg/L).

Additionally, the rule requires systems to document peak DBP levels and prepare an Initial Distribution System Evaluation (IDSE) report to identify Stage 2 D/DBPR compliance monitoring sites. IDSEs require each water system to prepare a separate IDSE plan and report, with the exception of those systems who obtain a 40/30 Certification or a Very Small System (VSS) Waiver. In order to qualify for the 40/30 Certification, all samples collected during Stage 1 monitoring must have TTHM and HAA5 levels less than or equal to 0.040 mg/L and 0.030 mg/L, respectively. The first stage of the IDSE schedule required systems serving 100,000 or more people to submit IDSE plans by October 1, 2006. Systems serving 50,000 to 99,999 people had to submit IDSE plans by April 1, 2007, while systems serving 10,000 to 49,999 people had to submit plans by October 1, 2007. Systems serving fewer than 10,000 people had to submit an IDSE plan by April 1, 2008 if they did not qualify for 40/30 Certification or a VSS Waiver.

The City currently complies with all contaminant monitoring requirements under this rule and has completed its IDSE plan. When relying primarily on its local production sources (Haller and airport well fields), the City is eligible for the 40/30 Certification. Water purchased from the PUD can blend with the well sources and cause these levels to be exceeded. The City is currently documenting total organic carbon (TOC) concentrations in its distribution system for 12 consecutive months to demonstrate low levels of organics. With qualifying results for TTHM, HAA5, and TOC, the City anticipates it will be issued a 40/30 Certification in 2016.

Long Term 2 Enhanced Surface Water Treatment Rule

Following the publishing of the IESWTR, the EPA introduced the LT1ESWTR to supplement the preceding regulations. Following the LT1ESWTR, additional regulations were mandated in the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The final rule was published in the Federal Register on January 5, 2006, and became effective on March 6, 2006. The final rule was implemented simultaneously with the Stage 2 D/DBPR described in the previous section. This rule applies to all systems that use surface water or GWI sources.

This rule establishes treatment technique requirements for filtered systems based on their risk level for contamination calculated from the system's average *Cryptosporidium* concentration. Requirements include up to 2.5-log *Cryptosporidium* treatment in addition to existing requirements under the IESWTR and LT1ESWTR. Filtered systems that demonstrate low levels of risk will not be required to provide additional treatment. Unfiltered systems under this rule must achieve at least a 2-log inactivation of *Cryptosporidium* if the mean levels in the source water remain below 0.01 oocysts/L. If an unfiltered system elects not to monitor, or the mean level of *Cryptosporidium* exceeds 0.01 oocysts/L, the LT2ESWTR requires the system to provide a

minimum 3-log inactivation of *Cryptosporidium*. All unfiltered systems are also required to utilize a minimum of two disinfectants in their treatment process.

The LT2ESWTR also addresses systems with unfinished water storage facilities. Under this rule, systems must either cover their storage facilities or achieve inactivation and/or removal of 4-log virus, 3-log *Giardia lamblia* and 2-log *Cryptosporidium* on a state-approved schedule. Lastly, the rule extends the requirement of the disinfection profiles mandated under the LT1ESWTR to the proposed Stage 2 D/DBPR. The City's Water Treatment Plant is currently in compliance with all requirements under this rule. Water samples will be analyzed for LT2ESWTR parameters again in 2016.

Groundwater Rule

The EPA promulgated the Groundwater Rule (GWR) to reduce the risk of exposure to fecal contamination that may be present in public water systems that use groundwater sources. The GWR also specifies when corrective action (which may include disinfection) is required to protect consumers who receive water from groundwater systems from bacteria and viruses. The GWR applies to public water systems that use groundwater and to any system that mixes surface and ground waters if the groundwater is added directly to the distribution system and provided to consumers without treatment equivalent to surface water treatment. The final rule was published in the Federal Register on November 8, 2006, and became effective on January 8, 2007.

The rule targets risks through an approach that relies on the four following major components.

1. Periodic sanitary surveys of groundwater systems that require the evaluation of eight critical elements and the identification of significant deficiencies (such as a well located near a leaking septic system). States must complete the initial survey for most community water systems by December 31, 2012, and for community water systems with outstanding performance and all non-community water systems by December 31, 2014. DOH conducted its most recent sanitary surveys of the City's water system in 2011 (all facilities outside of the WTP, including the airport well) and 2012 (WTP) under the state's existing sanitary survey program.

2. Source water monitoring to test for the presence of E. coli, enterococci or coliphage in the sample. There are two monitoring provisions.

    - Triggered monitoring for systems that do not already provide treatment that achieves at least 99.99 percent (4-log) inactivation or removal of viruses and that have a total coliform positive routine sample in the distribution system under the Total Coliform Rule.

    - Assessment monitoring is a complement to triggered monitoring. A state has the option to require systems to conduct source water assessment monitoring at any time to help identify high risk systems.

3. Corrective actions are required for any system with a significant deficiency or source water fecal contamination. The system must implement one or more of the following corrective action options: 1) correct all significant deficiencies; 2) eliminate the source of contamination; 3) provide an alternate source of water; or 4) provide treatment that reliably achieves 99.99 percent inactivation or removal of viruses.

4. Compliance monitoring to ensure that treatment technology installed to treat drinking water reliably achieves at least 99.99 percent inactivation or removal of viruses.

The compliance date for requirements of this rule other than the sanitary survey was December 1, 2009. The City is currently providing system-wide chlorination and therefore is not significantly impacted by the Groundwater Rule.

6.5.3 Future Regulations

Drinking water regulations are continuously changing in an effort to provide higher quality and safer drinking water. Modifications to the existing rules described above and implementation of new rules are planned for the near future. A summary of upcoming drinking water regulations that will most likely affect the City is presented below.

Revised Total Coliform Rule

The 1989 Total Coliform Rule was developed to increase public health protection from pathogenic microbial contaminants. It requires all public water systems to monitor for the presence of total coliform bacteria in the distribution system.

Coliform bacteria is not pathogenic but is an indicator of pathogens that is relatively easy to detect.

In 2003 EPA announced the results of its first Six-Year Review of existing drinking water regulations, which at that time included 69 National Primary Drinking Water Regulations, including the TCR.

Based on that review, EPA decided to revise the TCR and used a negotiated rulemaking process to develop the appropriate revisions. In July 2007, EPA established the TCR Distribution System Advisory Committee to provide advice and make recommendations on revisions to the TCR. In September 2008, the DSAC recommended a number of changes to the TCR, which are reflected in an Agreement in Principle.

Based on that agreement, EPA proposed the Revised TCR in 2010.

On Feb. 13, 2013, the final Revised TCR was published in the Federal Register. Significant improvements were made during the revision process, including new requirements that ensure assessment and corrective action when monitoring results indicate a potential risk of contamination exists.

The RTCR applies to all public water systems. Systems will have until April 2016 to comply with the rule requirements.

The revised rule eliminates the total coliform MCL and public notice based solely on total coliform occurrence. The revisions reflect the work of the EPA's TCR/ Distribution System Advisory Committee, AWWA, consumer and environmental advocates, and other stakeholders.

The final RTCR is very similar to the proposed RTCR. In finalizing the RTCR, EPA:

- Eliminates the total coliform MCL,
- Requires assessments to identify sanitary defects when there are total coliform or E. coli exceedances.
- Requires systems to fix sanitary defects identified through assessments.

This rule-making does not change the analytical methods used to comply with the TCR. Neither does it establish new requirements for finished water storage facility inspection and maintenance, cross connection control, water loss prevention, pressure management, distribution system management plans, or other distribution system operations.

Unregulated Contaminant Monitoring Rule

Analyses from UCMR3 monitoring described earlier are not scheduled for completion until 2016, but EPA has already started work in developing the next five-year monitoring cycle under UCMR4. In accordance with the original Unregulated Contaminant Monitoring Regulation (UCMR), the EPA is proposing an updated contaminant monitoring list in addition to other minor revisions to the UCMR. The proposed revisions include a list of 30 monitoring parameters and several new testing methods to conduct the monitoring. The City will be tasked with preparatory activities in 2017. Beginning in about January 2018, the City will sample its surface water and GWI sources four times, and its groundwater source(s) twice over the course of one year.

Lead and Copper Rule Long-Term Revisions

Beginning in 2004, EPA conducted a wide-ranging review of implementation of the Lead and Copper Rule (LCR) to determine if there is a national problem related to elevated lead levels. EPA's comprehensive review consisted of several elements, including a series of workshops designed to solicit issues, comments, and suggestions from stakeholders on particular issues; a review of monitoring data to evaluate the effectiveness of the LCR; and a review of the LCR implementation by States and water utilities. As a result of this multi-part review, EPA identified seven targeted rule changes and EPA promulgated a set of short-term regulatory revisions and clarifications on October 10, 2007, to strengthen implementation of the existing Lead and Copper Rule. After implementing the short-term revisions, EPA identified and initiated in December 2009 several regulatory changes to be considered as part of the more comprehensive changes to the rule. These considerations are longer-term in nature as they require additional data collection, research,

analysis, and stakeholder involvement to support decisions. Changes will be made to make the rule more cost effective and more protective of public health. The current target for release of the draft rule for public review and comment in the Federal Register is December 2016 (http://yosemite.epa.gov/opei/RuleGate.nsf/byRIN/2040-AF15).

Perchlorate Rule

Perchlorate is both a naturally occurring and man-made chemical that is used to produce rocket fuel, fireworks, flares and explosives. Perchlorate can also be present in bleach and in some fertilizers. Perchlorate may have adverse health effects because scientific research indicates that this contaminant can disrupt the thyroid's ability to produce hormones needed for normal growth and development.

EPA has been on all contaminant candidate lists (CCLs) required by the 1996 SDWA amendments since 1998. Following public comment periods in 2007, 2008, and 2009, EPA issued its determination to regulate perchlorate as primary drinking water contaminant. This determination initiated the process for establishing a primary drinking water standard. Initially, EPA anticipated release of the draft rule in 2013. The current target for release of the draft rule for public review and comment in the Federal Register is March 2017 (http://yosemite.epa.gov/opei/RuleGate.nsf/byRIN/2040-AF28).

Carcinogenic Volatile Organic Compound Rule

After reaching out to stakeholders via multiple meetings and its web site, EPA initiated on March 24, 2011 the development of one national primary drinking water regulation covering up to 16 carcinogenic volatile organic compounds (VOCs). EPA also plans to seek input from the Science Advisory Board, the National Drinking Water Advisory Council, the Department of Health and Human Services, and State and tribal drinking water programs prior to issuing a proposed rule.

EPA will develop a proposed regulation to address carcinogenic VOC contaminants as a group, rather than individually, in order to provide public health protections more quickly and also to allow utilities to more effectively and efficiently plan for improvements. PCE and TCE, which EPA determined to be candidates for regulatory revision under a planned review of existing drinking water regulaitions, will be included in the VOC drinking water standard. Besides PCE and TCE, the group may include up to six additional regulated VOCs; and up to eight unregulated VOCs from the EPA's Contaminant Candidate List 3. The current target for release of the draft rule for public review and comment in the Federal Register is February 2018 (http://yosemite.epa.gov/opei/rulegate.nsf/byRIN/2040-AF29).

Radon

Regulation of radon in drinking water has been a contested issue since it was first proposed by EPA in July 1991. The 1996 SDWA Amendments required EPA to withdraw their original proposal due to agency comments, and new regulation was proposed in November 1999. The rule proposes a dual MCL standard, including a less stringent MCL for systems or states which

implement an EPA-approved program to reduce radon risks in household indoor air and tap water. The development of a final rule has been tabled, apparently on and off, since that time. Primary concerns within the drinking water community include highly variable background levels, implementation of the dual standard, implementation of mitigation programs involving air quality, program costs, and tort risks. Radon volatilizes readily and is a much greater risk from an indoor air quality perspective. According to one source cited by EPA, even after 89 percent of the radon in affected drinking water volatilizes, it composes only about 1 to 2 percent of the radon in indoor air. It is not currently known when or what a radon regulation may require as adopted by the EPA or what will be the rule's implementation schedule. Because the final radon rule requirements are uncertain, the impact of this rule on the City is unknown at this time.

6.6 SOURCE WATER QUALITY

This section presents the current water quality standards for groundwater sources and the results of the City's recent source water quality monitoring efforts. A discussion of the water quality requirements and monitoring results for the City's distribution system is presented in the section that follows.

6.6.1 Drinking Water Standards

Drinking water quality is regulated at the Federal level by the EPA and at the State level by DOH. Drinking water standards have been established to maintain high quality drinking water by limiting the levels of specific contaminants (i.e., regulated contaminants) that can adversely affect public health and are known or likely to occur in public water systems. Non-regulated contaminants do not have established water quality standards and are generally monitored at the discretion of the water purveyor and in the interest of customers.

The regulated contaminants are grouped into two categories of standards: primary and secondary. Primary standards are drinking water standards for contaminants that could affect health. Water purveyors are required by law to monitor and comply with these standards and notify the public if water quality does not meet any one of the standards. Secondary standards are drinking water standards for contaminants that have aesthetic effects, such as unpleasant taste, odor or color (staining). The national secondary standards are unenforceable federal guidelines or goals where federal law does not require water systems to comply with them. However, states may adopt their own enforceable regulations governing these contaminants. The State of Washington has adopted regulations that require compliance with some of the secondary standards. Water purveyors are not required to notify the public if water quality does not meet secondary standards.

6.6.2 Source Monitoring Requirements and Waivers

The City is required to perform water quality monitoring at each of its active sources for inorganic chemical (IOC) and physical substances, organic chemicals and radionuclides. The monitoring requirements that the City must comply with are specified in WAC 246-290-300. A description of

the source water quality monitoring requirements and procedures for each group of substances is contained in the City's Water Quality Monitoring Plan that is included in **Appendix H**.

In 1994, DOH developed the Susceptibility Assessment Survey Form for water purveyors to complete to determine a drinking water source's potential for contamination. The results of the susceptibility assessment may provide monitoring waivers that allow reduced source water quality monitoring. Based on the results of the susceptibility assessment survey for each source, DOH assigned a moderate susceptibility rating to the Airport Wellfield and a high susceptibility rating for the Haller Wellfield.

Despite the confirmed susceptibility, the sources have been granted monitoring waivers that allow the City to reduce monitoring of certain analytes or suites (panels) of parameters. Source waivers include:

- Complete inorganic panel (IOCs)—once at each source in the 9-year period 2011 through 2019;
- Synthetic organic chemicals (SOCs), herbicides—once at each source in the 9-year period 2014 through 2022;
- Synthetic organic chemicals (SOCs), pesticides and fumigants—monitoring exempted at each source in the 3-year period 2014 through 2016.
- Volatile organic chemicals (VOCs)—once at the airport well field in the 6-year period 2014 through 2019.

Although the City has obtained these waivers, it has historically completed the water quality testing for information purposes, particularly IOCs.

6.6.3 Source Monitoring Results

The quality of the City's sources has been good and meets or exceeds all drinking water standards. In 14 years of monitoring IOCs and physical characteristics at both sources, the only exceedance of a water quality standard has been when manganese mildly exceeded its secondary (non-health, aesthetic based) standard at the Airport Wellfield one time in 2001. Since that time, manganese has been either undetected or detected at levels within standards at either source.

Nitrates, barium, chromium, and radionuclides have all been detected regularly or occasionally in at least one source, but have always easily met primary and secondary standards.

VOCs have also monitored and all standards were met. As required by DOH, the City sampled for the chemical ethylene dibromide (EDB), which was once commonly used as a pesticide and gasoline additive, and the chemical dibromo-chloropropane (DBCP) in 1998 and 2001. The results of the EDB and DBCP monitoring indicated that the City is meeting the regulatory requirements.

Five parameters were detected in at least one sample at each source under UCMR3 in 2013 and 2014. Chlorate, chromium-6, and strontium were consistently detected in all required samples. Total chromium and vanadium were each detected in one sample from each source. The laboratory also detected 1,4-dioxane at a very low level in the first sample taken at the airport well. Subsequent efforts by the lab to validate the detection using the same sample and additional follow-up samples did not detect the parameter. Under EPA protocols, 1,4-dioxane was recorded as a non-detection at the well.

In the Fall of 2009, increased fish activity within the Stillaguamish River generated increased organic compounds. This impacted the water supply from the Haller Wellfield which led to taste issues and numerous customer complaints. While the finished water from the treatment facility met all safe drinking water regulations, the treatment process does not have a granular activated carbon filter or similar process to improve tastes and odors.

6.7 DISTRIBUTION SYSTEM WATER QUALITY

6.7.1 Monitoring Requirements and Results

The City is required to perform water quality monitoring within the distribution system for coliform bacteria, disinfectant (chlorine) residual concentration, DBP, lead and copper, and asbestos in accordance with Chapter 246-290 WAC. A description of the distribution system water quality monitoring requirements and procedures are contained in the City's Water Quality Monitoring Plan that is included in **Appendix H**.

The City has been in compliance with all monitoring requirements for the past several years. A summary of the results of distribution system water quality monitoring within the City's system is presented below.

Coliform Monitoring

The City is required to collect a minimum of 15 coliform samples per month from different locations throughout the system, based on a population served of 16,245 in 2014. The results of coliform tests since the prior WSP, and years prior, were all satisfactory.

Disinfectant Residual Concentration Monitoring

Disinfection requirements applicable to City's Airport Wellfield are contained in WAC 246-290-451, which states that a disinfectant residual concentration shall be detectable in all active parts of the distribution system. Disinfection requirements applicable to the City's Haller Wellfield are contained in WAC 246-290-662 for filtered systems, which states that a minimum 0.2 mg/L disinfectant residual concentration shall be maintained at the point the water enters the system and that the disinfectant residual concentration in the distribution system is detectable in at least 95 percent of the samples taken each calendar month. In an effort to comply with these requirements, the City has established a chlorination target to maintain a residual disinfectant concentration of at least 0.2 mg/L in the distribution system. The water samples collected by the City for coliform

analysis are also tested for residual disinfectant concentration. The results of residual disinfectant concentration tests in 2014 indicate a range of 0.10 mg/L to 1.75 mg/L, with the average being 0.79 mg/L. All of the 3,017 distribution samples taken during 2014 had detectable levels of chlorine residual. Therefore, the system was in compliance with the regulations.

Lead and Copper Monitoring

The Lead and Copper Rule identifies the action level for lead as being greater than 0.015 mg/L and the action level for copper as being greater than 1.3 mg/L. The results of the tests from the most recent (2012) monitoring period, which included 31 sample sites, indicate a range of less than 0.001 mg/L to 0.006 mg/L for lead and a range of 0.022 mg/L to 0.521 mg/L for copper. The 90th percentile concentration for lead was 0.003 mg/L, and the 90th percentile concentration for copper was 0.430 mg/L. Results for both parameters are below their action levels specified above. Therefore the City complies with this regulation.

Asbestos

Asbestos monitoring is required if the sources are vulnerable to asbestos contamination or if the distribution system contains more than 10 percent of asbestos cement pipe. Although none of the City's sources are susceptible to asbestos contamination, asbestos cement (AC) pipe comprises approximately 10.4 percent of the City's distribution system (**Table 2-6**). Therefore, the City must monitor for asbestos in the distribution system on a nine-year cycle. Monitoring must be accomplished during the first three-year compliance period of each nine-year compliance cycle. The water sample must be taken at a tap that is served by an asbestos cement pipe under conditions where asbestos contamination is most likely to occur. The current MCL for asbestos is 7 million fibers per liter and greater than 10 microns in length. The City's most recent sample in 2013 did not detect asbestos contamination.

Disinfectants/Disinfection By-products Monitoring

TTHM and HAA5 are disinfection by-products that are formed when free chlorine reacts with organic substances (i.e., precursors), most of which occur naturally. Formation of TTHM and HAA5 is dependent on such factors as amount and type of chlorine used, water temperature, concentration of precursors, pH and chlorine contact time. TTHM and HAA5 have been found to cause cancer in laboratory animals and are suspected to be human carcinogens.

The City has been required to monitor for trihalomethanes because the Haller Wellfield source is under the influence of surface water and requires disinfection. Monitoring from 2008 to 2014 resulted in the running annual average of TTHM being approximately 0.023 mg/L. This is below the TTHM MCL of 0.08 mg/L, and the City is in compliance. In the same 2008 to 2014 timeframe, the running annual average of HAA5 was approximately 0.017 mg/L. This is below the HAA5 MCL of 0.06 mg/L, and the City is in compliance.

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7 Water System Analysis

7.1 INTRODUCTION

This chapter presents the analysis of the City of Arlington's (City) existing water system. Individual water system components were analyzed to determine their ability to meet policies and design criteria under both existing and future water demand conditions. The policies and design criteria are presented in **Chapter 5**, and the water demands are presented in **Chapter 4**. A description of the water system facilities and current operation is presented in **Chapter 2**. The last section of this chapter presents the existing and projected system capacity analyses that were performed to determine the maximum number of equivalent residential units (ERUs) that can be served by the City's existing water system.



7.2 PRESSURE ZONES (AMENDED)

The ideal static pressure of water supplied to customers is between 40 and 80 pounds per square inch (psi). Pressures within a water distribution system are commonly as high as 120 psi, requiring pressure regulators on individual service lines to reduce the pressure to 80 psi or less. It is difficult for the City's water system (and most others) to maintain distribution pressures between 40 and 80 psi, primarily due to the topography of the water service area (WSA). Therefore, water utilities divide their distribution system into pressure zones in order to manage customers' water pressures within acceptable ranges. The City's distribution system currently consists of four pressure zones, as shown in **Figure 2-1**.

Table 7-1 lists each of the City's four pressure zones, the highest and lowest elevation served in each zone, and the minimum and maximum distribution system pressures within each zone, based on maximum static water conditions (full reservoirs and zero demands). The City is currently providing water at pressures of at least 40 psi to all services throughout the water system, except for a limited area within the 520 Zone. The lower pressure in the 520 Zone occurs in the higher elevations, and these pressures are above the Washington State Department of Health (DOH) minimum requirement of 30 psi. Recent pressure zone improvements along 89th Avenue NE eliminated pressures that were below 30 psi in the 520 Zone. The pressure in all of the zones after completion of future pressure zone improvements are shown in the lower portion of **Table 7-1**.

Table 7-1

Minimum and Maximum Distribution System Static Pressures

	Highest Elevation Served		Lowest Elevation Served	
Pressure Zone	Elevation (feet)	Static Pressure (psi)	Elevation (feet)	Static Pressure (psi)
Existing System - Before Proposed Zone Modifications				
342 Zone	245	42	40	131
520 Zone	438	39	206	136
540 Zone	423	51	257	123
710 Zone	580	56	300	178
Future System - After Proposed Zone Modifications				
342 Zone	245	42	40	131
520 Zone	438	36	206	136
560 Zone	469	39	300	113
615 Zone	500	50	410	89
710 Zone	580	56	448	113

All of the City's pressure zones have areas of pressure higher than 80 psi, as shown in **Table 7-1**. Excess pressure can increase the risk of pipe failure. The highest pressures in the 342 Zone occur in the Island Crossing area along SR 530 east of I-5. The highest pressures in the 520 Zone occur within the cul-de-sacs along the pressure zone boundary with the 342 Zone. The highest pressures in the 540 Zone occur just upstream of the Lower Burn Road pressure reducing valve (PRV), whereas the highest pressures in the 710 Zone, occur along 105th Avenue NE, north of 195th Street NE. A future pressure zone reconfiguration creating the 560 Zone will reduce the maximum pressure in the 710 Zone, as shown in **Table 7-1**.

The City requires individual services that have pressures greater than 80 psi to install customer-owned pressure regulators to reduce the pressures to acceptable levels, per the plumbing code. In **Table 7-1**, the listed static pressures are calculated in the water mains after calibration at hydrants. Actual service pressures reaching customers will be lower where the City requires pressure regulators. The City has accepted these higher pressures in the system due to the pressure

regulator requirement, good condition of the water mains, and the material of the water main being primarily Pressure Class 52 ~~150~~ ductile iron. Therefore, no pressure zone improvements are planned to resolve the existing high pressures in the 342, 520, and 540/615 Zones.

7.3 SOURCE CAPACITY EVALUATION

This section evaluates the combined capability of the City's existing sources (two existing groundwater wellfields and one wholesale supply source) to determine if there is sufficient capacity to meet the overall demands of the system based on existing and future water demands. The section that follows will also address the evaluation of the individual facilities to determine if they have sufficient capacity to meet the existing and future demands of the individual zone, or zones that they supply.

7.3.1 Analysis Criteria

Supply facilities must be capable of adequately and reliably supplying high-quality water to the system in quantities and ~~at~~ pressures that meet the requirements of Washington Administrative Code (WAC) 246-290-230. The evaluation of the combined capacity of the sources in this section is based on the criteria that they provide supply to the system at a rate that is equal to or greater than the maximum day demand (MDD) of the system.

7.3.2 Source Capacity Analysis Results

The combined capability of the City's active sources to meet both existing and future demand requirements, based on existing pumping capacities of the individual supply facilities, is presented in **Table 7-2**. The demands used in the evaluation for 2020, 2024, and 2035 are future demand projections without reductions from the water use efficiency efforts shown in **Table 4-10** of **Chapter 4**. If additional reductions in water use are achieved through water use efficiency efforts, the total source capacity required in the future will be less than that shown in **Table 7-2**.

Since the 540 and 710 Zones are currently supplied directly by the Snohomish County PUD No. 1 (PUD) and do not rely on City storage, the City's system must be capable of supplying the maximum rate of fire flow and the peak hour demands (PHD) for those zones in addition to the MDD of the 342 and 520 Zones. Once the booster pump station (BPS) improvements are completed to make storage from the 342 and 520 Zones available to the upper zones for fire flow purposes, the City's required source capacity will be equivalent to the MDD of the 342 and 520 Zones and the PHD of the upper zones, as shown in 2035. The existing fire flow requirement in the upper zones is 900 gallons per minute (gpm), but the analyses in **Table 7-2** assumes that the fire marshal will require a residential fire flow requirement of 1,000 gpm in the future. **Table 7-2** also assumes that commercial development at the SR9 roundabout will not occur until 2025. If commercial development occurs in the 615 Zone prior to 2035, the 710 Zone BPS will be needed to provide adequate fire flow to the commercial development (i.e., fire flow requirement greater than 1,000 gpm).

Table 7-2
Source Capacity Evaluation (Amended)

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Source Capacity (gpm)				
Maximum Day Demand (342 and 520 Zones)	1,900	2,015	2,213	2,806
Peak Hour Demand (540/615 and 710 Zones)	21	65	114	153
540/615 and 710 Zones Max Fire Flow Requirement[2]	900	1,000	1,000	---
Totals	2,821	3,081	3,328	2,959
Available Source Capacity (gpm)				
Haller Wellfield	1,700	1,700	1,700	1,700
Airport Wellfield	220	220	0	0
PUD Wholesale Source	1,000	1,000	1,000	1,000
New Supply Well No. 1	0	360	580	580
New Supply Well No. 2	0	0	679	679
Totals	2,920	3,280	3,959	3,959
Surplus or Deficient Source Capacity (gpm)				
Surplus or Deficient Amount	99	199	632	1,000

(1) 2014 maximum day and peak hour demand values are based on actual average day demand amounts and historical peaking factors and do not necessarily represent the actual peak demands.
(2) Assumes fire flow in the upper zones will be provided from storage in the 342 and 520 Zones via a proposed 710 Zone Booster Pump Station instead of directly from the PUD intertie by 2035. If the fire flow requirement at the SR9 roundabout in the 615 Zone is greater than 1,000 gpm with commercial development, the 710 Zone Booster Pump Station will be necessary at the time of that development.

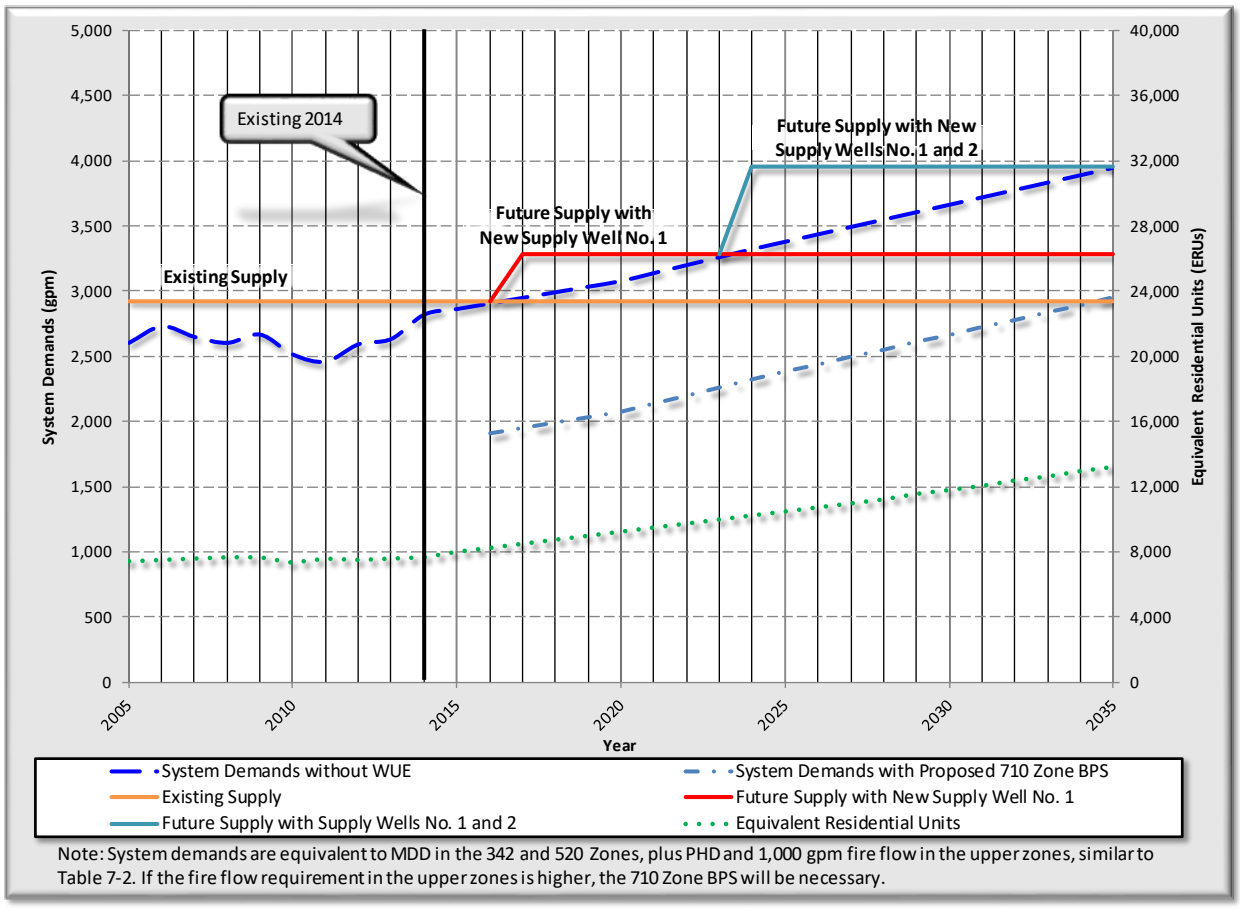
The results of the analyses indicate that the City's existing sources have sufficient capacity to meet existing demands, but additional supply will be necessary prior to 2020. As introduced in **Section 6.4**, the City is evaluating improvements to relocate the Airport Wellfield to a location outside of the airport industrial area. New Supply Well No. 1 will utilize the water right available to the Airport Wellfield and supply availability at this source will increase between 2020 and 2024 when the Airport Wellfield will be abandoned. The City also plans to introduce an additional supply source, New Supply Well No. 2, to increase the available source capacity available to the system to meet the current available water right amount. These and other source capacity improvements, to meet the required source capacity of the system, are described further in **Chapter 9**.

As shown in **Chart 7-1**, the existing configuration is sufficient to meet existing system demands, but may not be sufficient prior to 2016. The system demands include the MDD of the 342 and 520 Zones, the PHD of the 540 and 710 Zones, and the 1,000 gpm fire flow requirement of the 540 and 710 Zones. The projected system demands with the 710 Zone BPS shows the reduction in system demand when this station is constructed. This improvement makes storage from the 342 and 520 Zones available to the upper zones, allowing fire flow in the upper zones to be supplied

by the proposed 710 Zone BPS instead of directly from the intertie with the PUD. Without the 710 Zone BPS improvement, Supply Well No. 1 is necessary in 2016 and Supply Well No. 2 is necessary by 2023, as shown in **Chart 7-1**. The City intends to closely monitor system demands as development occurs. Since actual 2014 demands are less than the projected demands that the supply analysis is based on, the City may have sufficient capacity to meet future demands prior to the Supply Well Nos. 1 and 2 improvements.

Chart 7-1

Future Water Supply and Demand Projections (Amended)



Note: System demands are equivalent to MDD in the 342 and 520 Zones, plus PHD and 1,000 gpm fire flow in the upper zones, similar to Table 7-2. If the fire flow requirement in the upper zones is higher, the 710 Zone BPS will be necessary.

7.4 WATER SUPPLY FACILITIES EVALUATION

This section evaluates the existing supply facilities to determine if they have sufficient capacity to provide water supply at a rate that meets the existing and future demands of the one or more zones they supply. This section also identifies facility deficiencies that are not related to the capacity of the supply facilities. Improvements to resolve these deficiencies are described further in **Chapter 9**.

7.4.1 Analysis Criteria

The DOH evaluation to determine if supply facilities have adequate capacity is based on one of two criteria, as follows:

1) if the facility provides to a pressure zone that has water storage, then the amount of supply required is equal to the MDD of the zone; or
2) if the pressure zone that the facility provides supply to does not have water storage, then the amount of supply required is equal to the PHD of the zone.

The higher supply requirement of the latter criteria is due to the lack of equalizing storage that is typically utilized to provide short-term supply during times of peak system demands.

7.4.2 Supply Analysis Results (Amended)

710 Zone Facilities

The 710 Zone is currently a closed zone (served by a single source) and is supplied with water directly from the PUD through an intertie located east of the City on Burn Road. **Table 7-3** summarizes the existing water supply evaluation for the 710 Zone. The existing required supply is based on the PHD and the existing maximum fire flow requirement of the 710 Zone. The results of the analyses indicate that the existing configuration is sufficient to meet existing demands of the 710 Zone.

A future BPS is planned to transfer water from the 520 Zone to provide redundant supply to the 710 Zone. The 710 Zone analyses in **Table 7-3** are computed with the 710 Zone BPS constructed in 2035 (i.e., top half of the table), and with the 710 Zone BPS constructed in 2020 (i.e., bottom half of the table). The results of the analyses indicate that the existing configuration is sufficient to meet the existing needs of the 710 Zone, but not the 6- and 20-year demands without the proposed developer-funded 710 Zone BPS.

The analyses assume that the current fire flow requirement of 900 gpm in the 710 Zone will increase to 1,000 gpm as growth occurs, in accordance with standard single-family residential fire requirements. However, if the fire marshal determines that proposed future residential structures in the 710 Zone require less than the planning level fire flow requirement of 1,000 gpm assumed in the 2020 and 2024 analyses, the existing configuration of the zone without the BPS may be sufficient to support the development depending on its domestic demand requirements. In addition, portions of the 710 Zone will be converted to a lower pressure zone in the future, which will reduce the ~~PHD~~ demands of the zone, as indicated by the 2035 demand in **Table 7-3**. The City will closely monitor future development of the zone, and track existing demands and actual fire flow requirements to ensure sufficient capacity is available prior to the approval of new water services in this zone.

Table 7-3

710 Zone Supply Evaluation

Without Proposed 710 Zone BPS (CIP DF15) in 2020

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
710 Zone Peak Hour Demand	17	49	84	2
710 Zone Max Fire Flow Requirement	900	1,000	1,000	1,000
Totals	917	1,049	1,084	1,002
Available Supply (gpm)				
PUD Wholesale Supply Source	1,000	1,000	1,000	1,000
Future 710 Zone Booster Pump Station	---	---	---	3,200
Totals	1,000	1,000	1,000	4,200
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	83	-49	-84	3,198

With Proposed 710 Zone BPS (CIP DF15) in 2020

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
710 Zone Peak Hour Demand	17	49	84	2
710 Zone Max Fire Flow Requirement	900	1,000	1,000	1,000
Totals	917	1,049	1,084	1,002
Available Supply (gpm)				
PUD Wholesale Supply Source	1,000	1,000	1,000	1,000
Future 710 Zone Booster Pump Station	---	3,200	3,200	3,200
Totals	1,000	4,200	4,200	4,200
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	83	3,151	3,116	3,198

(1) 2014 maximum day and peak hour demand values are based on actual average day demand amounts and historical peaking factors and do not necessarily represent the actual peak demands.

540 and 615 Zone Facilities

The 540 Zone is currently a closed zone (i.e., does not have water storage) and is supplied with water directly from the PUD through the Upper Burn Road PRV. **Table 7-4** summarizes the existing water supply evaluation based on supply requirements for the 540 Zone. The existing required supply is based on the PHD and the existing maximum fire flow requirement in the 540 Zone. The results of the analyses indicate that the existing configuration is sufficient to meet existing demands of the 540 Zone, but the existing configuration may not be sufficient by 2020.

Table 7-4

540 and 615 Zones Supply Evaluation

Without Proposed 710 Zone BPS (CIP DF15) in 2020

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
540/615 Zone Peak Hour Demand	3	17	34	160
540/615 Zone Max Fire Flow Requirement	900	3,000	3,000	3,000
Totals	903	3,017	3,034	3,160
Available Supply (gpm)				
Transfer from 710 Zone via PRV Station(s)	983	951	916	4,198
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	79	-2,067	-2,117	1,037

With Proposed 710 Zone BPS (CIP DF15) in 2020

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
540/615 Zone Peak Hour Demand	3	17	34	160
540/615 Zone Max Fire Flow Requirement	900	3,000	3,000	3,000
Totals	903	3,017	3,034	3,160
Available Supply (gpm)				
Transfer from 710 Zone via PRV Station(s)	983	4,151	4,116	4,198
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	79	1,133	1,083	1,037

(1) 2014 maximum day and peak hour demand values are based on actual average day demand amounts and historical peaking factors and do not necessarily represent the actual peak demands.

Table 7-4 summarizes the future water supply with and without the proposed developer-funded 710 Zone BPS. The fire flow requirement for the 615 Zone increases to 3,000 gpm in 2020 due to the commercial land use located near the SR9 roundabout. If the commercial development occurs, the 710 Zone BPS will be necessary at the time of that development. If the commercial development is delayed and the fire marshal determines that proposed future residential structures require the existing 900 gpm fire flow requirement, the existing configuration of the zone may be sufficient to support the development depending on its domestic demand requirements at least through 2020. The City will track existing demands and actual fire flow requirements to ensure sufficient capacity is available prior to approval of new water services in this zone. The City intends to closely monitor demands in these zones as development occurs, similar to the 710 Zone.

The City intends to reconfigure the upper zones prior to 2035, which will include conversion of the 540 Zone to a 615 Zone. Once the proposed 710 Zone BPS is constructed, additional supply from the 520 Zone will be available to the 615 Zone through the Upper Burn Road PRV, and a potential additional PRV at the 710 Zone BPS. Since fire flow demand is assumed to be limited to one pressure zone at any given time, the transfer amount available from the 710 Zone is the difference of the 710 Zone total available supply and the PHD of the 710 Zone.

342 Zone Facilities

The Haller Wellfield and Airport Wellfield provide water supply directly to the 342 Zone. These facilities can also indirectly serve the 520 Zone through the 520 Zone BPS. **Table 7-5** summarizes the current and future supply requirements of the 342 Zone, based on the zone's existing and projected water demands. **Table 7-5** also summarizes the current amount of water supply directly available to the 342 Zone, based on the capacity of the wellfields. ~~Although w~~Water from the PUD can be transferred to the 342 Zone from the 540 Zone through the Lower Burn Road PRV, and water can be transferred to the 342 Zone from the 520 Zone through five PRVs located along the western boundary of the 520 Zone~~, the transfer amounts are excluded from this direct supply analyses~~. The results of the analyses indicate that the existing configuration is sufficient to meet the existing demands of the 342 Zone. Future supply will be needed, as indicated by the new supply wells in 2020 and 2024.

Table 7-5

342 Zone Supply Evaluation (Amended)

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
342 Zone Maximum Day Demand	1,415	1,415	1,415	2,224
Transfer to 520 Zone via 520 BPS[2]	456	501	528	0
Totals	1,870	1,916	1,942	2,224
Available Supply (gpm)				
Haller Park Wellfield	1,700	1,700	1,700	1,700
Airport Wellfield	220	220	0	0
New Supply Well No. 1	0	360	580	580
New Supply Well No. 2	0	0	679	679
Totals	1,920	2,280	2,959	2,959
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	50	364	1,017	735

(1) 2014 maximum day and peak hour demand values are based on actual average day demand amounts and historical peaking factors and do not necessarily represent the actual peak demands.

(2) Supply transferred to 520 Zone via 520 BPS intentionally calculated to result in a net zero supply or deficiency in the 520 Zone's existing and future planning periods.

520 Zone Facilities

The 520 Zone is supplied water through the 186th Street flow-control valve (from the 710 Zone), and through the BPS (from the 520 Zone). The flow-control valve located on 186th Street NE near Arlington High School provides water purchased from the PUD to the 520 Zone through the 710 Zone. The current flow rate is 30 ~~80~~ gpm and the City intends to convert this to an emergency supply PRV when adjacent pressure zone improvements are completed. The 342 Zone storage facilities indirectly serve the 520 Zone through the 520 Zone BPS. **Table 7-6** summarizes the current and future supply requirements of the 520 Zone, based on existing and projected water demands for the system. **Table 7-6** also summarizes the amount of water supply available to the 520 Zone. The transfer amount available from the 342 Zone is equal to the supply shown as being transferred to the 520 Zone via the 520 Zone BPS in **Table 7-5**, plus the surplus supply amount from the 342 Zone, as shown in **Table 7-5**. The transfer amount available from the 615 Zone through the 186th Street flow control valve (FCV) is equal to the surplus supply amount from the 615 and 710 Zones. The results of the analyses indicate that the existing configuration is sufficient to meet the existing 6-, 10-, and 20-year demands of the 520 Zone.

Table 7-6

520 Zone Supply Evaluation (Amended)

Description	Actual[1] 2014	Future Projections 2020 (+6 years)	2024 (+10 years)	2035 (+21 years)
Required Supply (gpm)				
520 Zone Maximum Day Demand	486	501	528	595
Available Supply (gpm)				
Transfer from 342 Zone via 520 Zone Booster Pump Station	505	790	790	735
Transfer from 186th Street FCV	30	0	0	1,037
Totals	535	790	790	1,772
Surplus or Deficient Supply (gpm)				
Surplus or Deficient Amount	50	289	262	1,177

(1) 2014 maximum day and peak hour demand values are based on actual average day demand amounts and historical peaking factors and do not necessarily represent the actual peak demands.

7.4.3 Facility Deficiencies (Amended)

The WTP and PUD master meter facilities were both constructed in the early 2000s and are in excellent condition. The clearwell pumps at the WTP are operating at a reduced hydraulic grade line and show signs of excessive wear. Replacement of the clearwell pumps will be necessary to improve the hydraulic performance of the facility. In addition, the City's old ~~water treatment plant~~ WTP is no longer used and needs to be fully demolished.

The Haller Wellfield includes wells that are more than 50- and 100-years old and which have experienced declining specific capacities. A rehabilitation effort in 2012 was ineffective. In addition, the third well, drilled in 2002, has iron and manganese issues making it unusable without additional treatment for these parameters. The older wells have also had an increased number of manganese detections in recent years.

The Airport Wellfield has had declining capacity, water quality issues associated with manganese, and is sited in the City's industrial core. The City intends to replace this well at another location. The City is also planning to construct an additional source of supply to allow full utilization of the City's existing water rights. Proposed improvements to resolve these deficiencies are identified in **Chapter 9**.

7.5 STORAGE FACILITIES

This section evaluates the City's existing reservoirs to determine if they have sufficient capacity to meet the system's existing and future storage requirements.

7.5.1 Analysis Criteria (Amended)

Water storage is typically made up of the following components: operational storage; equalizing storage; standby storage; fire flow storage; and dead storage. Each storage component serves a different purpose and will vary from system to system. A definition of each storage component and the criteria used to evaluate the capacity of the City's reservoirs is provided below and in WAC 246-290-010.

Operational Storage – Volume of a reservoir used to supply the water system under normal conditions when the source or sources of supply are not delivering water to the system (i.e., sources are in the off mode). Operational storage is the average amount of draw-down in the tank during normal operating conditions, which represents a volume of storage that will most likely be unavailable for equalizing, fire flow, or standby storage. The operational storage in the City's reservoirs is the amount of storage between the fill or pump-start set-point level and the overflow or full elevation of the reservoir.

Equalizing Storage – Volume of a reservoir used to supply the water system under peak demand conditions when the system demand exceeds the total rate of supply of the sources. DOH requires that equalizing storage be stored above an elevation that will provide a minimum pressure of 30 psi at all service connections throughout the system during PHD conditions. Because the City's supply sources primarily operate on a "call-on-demand" basis to fill the storage tanks, the equalizing storage requirements are determined using the standard DOH formula that considers the difference between the system PHD and the combined capacity of the supply sources.

ES = (PHD – Q_S)(150 minutes), but in no case less than zero.

Where:

ES = Equalizing Storage, in gallons.

PHD = Peak Hour Demand, in gpm.

Q_S = Sum of all installed and active sources, except emergency supply, in gpm.

For the equalizing storage analyses, the well sources serving the 342 Zone and the BPS and flow control valve serving the 520 Zone were utilized for the supply capacity for their respective zones.

Standby Storage – Volume of the reservoir used to supply the water system under emergency conditions when supply facilities are out-of-service due to equipment failures, power outages, loss of supply, transmission main breaks, and any other situation that disrupts the supply source. DOH

requires that standby storage be stored above an elevation that will provide a minimum pressure of 20 psi at all service connections throughout the system. The criteria for determining the standby storage requirements for the City's system, which has multiple supply sources, is based on the standard DOH formula that requires that the amount is sufficient to supply the system for a 48-hour period when the primary supply facility is out-of-service and the system is experiencing demands that are close to average day demands (ADD).

$$\mathbf{SB = (2\ days)[(ADD)(N) - t_m\ (Q_S - Q_L)]}$$

Where:

SB = Standby Storage, in gallons.

ADD = Average Day Demand per ERU, in gallons per day (gpd) per ERU.

N = Number of ERUs.

Q_S = Sum of all installed and continuously available sources, except emergency supply, in gpm.

Q_L = The capacity of the largest source available to the system, in gpm.

t_m = Time the remaining sources are pumped on the day when the largest source is not available, in minutes. Unless otherwise restricted, this value is 1,440 minutes.

The standby storage analyses ~~was~~ were completed for each reservoir operating area. For the 342 Zone, the largest capacity source that was assumed to be out-of-service was the Haller Wellfield, but it was assumed that the PUD wholesale supply source would be available to the 342 Zone in the event that the Haller Wellfield is out-of-service and that the PUD supply source would not be needed for fire flow in the upper zones during this circumstance. For the 520 Zone analysis, the 520 Zone BPS was assumed to be out-of-service in the existing analyses and the PUD wholesale supply source was assumed to be out-of-service in the future analyses. DOH recommends that the minimum standby storage volume be no less than 200 gallons per ERU. In the future storage analyses, this calculation determined the standby storage volume required for the City's reservoir operating areas.

Fire Flow Storage – Volume of the reservoir used to supply water to the system at the maximum rate and duration required to extinguish a fire at the building with the highest fire flow requirements. The magnitude of the fire flow storage is the product of the fire flow rate and duration of the system's maximum fire flow requirement established by the local fire authority. DOH requires that fire flow storage be stored above an elevation that will provide a minimum pressure of 20 psi at all points throughout the distribution system under MDD conditions. The fire

flow storage requirements shown in the analyses that follow are based on the maximum fire flow requirement in the system of 4,750 gpm for four hours.

Dead Storage – Volume of the reservoir that cannot be used because it is stored at an elevation that does not provide system pressures that meet the minimum pressure requirements established by DOH without pumping. This unusable storage occupies the lower portion of most ground-level reservoirs. Water that is stored below an elevation that cannot provide a minimum pressure of 20 psi is considered dead storage for the analyses that follow.

7.5.2 Storage Analyses Results (Amended)

The storage analyses are based on an evaluation of the existing storage facilities providing water to two operating areas: the 342 Zone, which is within the operating area of the Gleneagle Reservoir; and the 520 Zone, which is within the operating area of the 520 Zone Reservoir.

Existing Storage Analysis

As shown in **Table 7-7**, the maximum combined storage capacity of the City's reservoirs is approximately 4~~.00~~ million gallons (MG). The calculations assume that the fire flow storage in the 520 Zone is available to the 342 Zone through PRVs. The results of the existing storage evaluation, as shown in **Table 7-7**, indicate that the system ~~does have~~ has sufficient storage. Although the 520 Zone is calculated to have a slight deficiency in **Table 7-7**, this deficiency can be resolved through the use of the 520 Zone BPS to transfer the surplus of 342 Zone water to the 520 Zone during an emergency.

Table 7-7

Existing Storage Evaluation (Amended)

Description	Supply Area		Totals
	342 Zone	520 Zone	
Available/Usable Storage (MG)			
Maximum Storage Capacity	2.00	2.00	4.00
Dead (Non-usable Storage)	0.00	0.00	0.00
Total Available Storage	2.00	2.00	4.00
Required Storage (MG)			
Operational Storage	0.44	0.26	0.70
Equalizing Storage	0.10	0.05	0.15
Standby Storage	1.14	0.64	1.78
Fire Flow Storage	0.00	1.14	1.14
Totals	1.68	2.09	3.77
Surplus or Deficient Storage (MG)			
Surplus or Deficient Amount	0.32	-0.09	0.23

Note: Fire flow for the 342 Zone is provided by the 520 Zone through various PRVs.

Future Storage Analysis

The system's future storage requirements were computed for the 6-, 10-, and 20-year planning periods based on year 2020, 2024, and 2035 demand projections. The analyses were performed to determine the adequacy of the City's storage facilities to meet future storage requirements for each storage supply area. The future analyses are based on New Supply Well Nos. 1 and 2 being online, as indicated in **Table 7-2**. The equalizing storage requirement is less in 2020 and 2024 than in 2014, due to the increased available source capacity scheduled to become available by 2020 and 2024. The calculations assume that the PUD wholesale supply source is available to the 342 Zone when the Haller Wellfield is offline. The calculations also assume that the fire flow storage in the 520 Zone is available to the 342 Zone through PRVs, and that 615 and 710 Zones storage will be provided in the existing and proposed 520 Zone reservoirs. Water will be conveyed to these zones via the proposed 710 Zone BPS. As shown in **Table 7-8**, the City will have approximately ~~0.06~~ 0.10 MG of surplus storage in 2024 with the supply improvements, and a ~~0.75~~ 0.64 MG storage deficiency in 2035. Additional storage is required to meet the needs of the system through the 20-year planning period. If the new well and 710 BPS improvements are postponed, the future storage projections will need to be updated accordingly. Storage requirements will increase if these other improvements are not completed. Site acquisition and the design and construction of a new reservoir is identified in **Chapter 9** to provide the system's projected additional storage needs.

Table 7-8

Future Storage Projections (Amended)

Description	2020 Supply Area			2024 Supply Area			2035 Supply Area		
	342 Zone	520/615/710 Zones	Totals	342 Zone	520/615/710 Zones	Totals	342 Zone	520/615/710 Zones	Totals
Available/Usable Storage (MG)									
Maximum Storage Capacity	2.00	2.00	4.00	2.00	2.00	4.00	2.00	2.00	4.00
Dead (Non-usable Storage)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Available Storage	2.00	2.00	4.00	2.00	2.00	4.00	2.00	2.00	4.00
Required Storage (MG)									
Operational Storage	0.44	0.26	0.70	0.44	0.26	0.70	0.44	0.26	0.70
Equalizing Storage	0.07	0.00	0.07	0.01	0.00	0.01	0.16	0.00	0.16
Standby Storage	1.36	0.48	1.84	1.52	0.53	2.04	2.03	0.61	2.64
Fire Flow Storage	0.00	1.14	1.14	0.00	1.14	1.14	0.00	1.14	1.14
Totals	1.88	1.88	3.75	1.98	1.92	3.90	2.64	2.01	4.64
Surplus or Deficient Storage (MG)									
Surplus or Deficient Amount	0.12	0.12	0.25	0.02	0.08	0.10	-0.64	-0.01	-0.64

NOTE: Components may not sum due to rounding.

7.5.3 Facility Deficiencies (Amended)

The City's newest reservoir, the 520 Zone Reservoir, was constructed in 1993 for the 520 Zone. The reservoir does not have any noticeable deficiencies and was designed to withstand a seismic event based on the structural design codes of that time. Although the steel tank's paint coating is

currently in good condition, a qualified coating inspector has been retained to inspect the integrity of the coating on a five-year time schedule, or more frequently if visible signs of coating deterioration appear. In addition, the exterior needs to be pressure washed for general cleaning purposes. The cleaning and inspection of the 520 Zone Reservoir last occurred in 2014. The site does need a chain link fence to improve facility security.

The City's Gleneagle Reservoir provides water storage to the 342 Zone. The Gleneagle Reservoir is a post-tensioned concrete tank with a wooden roof that requires replacement. The existing roof is decaying, has persistent moss problems, and poorly designed vents. Although the tank's paint coating is currently in good condition, a qualified coating inspector has been retained to inspect the integrity of the coating on a five-year time schedule, or more frequently if visible signs of coating deterioration appear. In addition, the exterior needs to be pressure washed for general cleaning purposes. The cleaning and inspection of the Gleneagle Reservoir last occurred in 2014. Following replacement of the existing roof and with continued regular maintenance and inspections, the City does not anticipate the need to replace the Gleneagle Reservoir within the 20-year planning period.

~~The Burn Road Reservoir was taken offline and drained in 2014 because of age and vandalism issues. The reservoir still needs to be properly demolished.~~

Proposed improvements to resolve these deficiencies are identified in **Chapter 9**.

7.6 DISTRIBUTION AND TRANSMISSION SYSTEM

This section evaluates the City's existing distribution and transmission system (i.e., water mains) to determine if they are adequately sized and looped to provide the necessary flow rates and pressures to meet the system's existing and future requirements. This section also identifies deficiencies that are not related to the capacity of the water mains.

7.6.1 Analysis Criteria

Distribution and transmission mains must be capable of adequately and reliably conveying water throughout the system at acceptable flow rates and pressures. The criteria used to evaluate the City's distribution and transmission system is the state-mandated requirements for Group A water systems contained in WAC 246-290-230, Distribution Systems. The pressure analysis criteria states that the distribution system "…shall be designed with the capacity to deliver the design PHD quantity of water at 30 psi under PHD flow conditions measured at all existing and proposed service water meters." It also states that if fire flow is to be provided, "… the distribution system shall also provide MDD plus the required fire flow at a pressure of at least 20 psi at all points throughout the distribution system."

Hydraulic analyses of the existing system were performed under existing PHD conditions to evaluate its current pressure capabilities and identify existing system deficiencies. The existing system was also analyzed under existing MDD conditions to evaluate the current fire flow

capabilities and identify additional existing system deficiencies. Additional hydraulic analyses were then performed with the same hydraulic model under future MDD conditions and with the proposed improvements to demonstrate that the identified improvements will eliminate the deficiencies and meet the requirements far into the future. The following is a description of the hydraulic model, the operational conditions and facility settings used in the analyses.

7.6.2 Hydraulic Model (Amended)

Description

A computer-based hydraulic model of the existing water system was updated using Version 8i of the WaterGEMS® program, developed by Bentley Systems, Inc. All water mains in the City's water system, including dead-end mains, were included in the model and based on AutoCAD® water system maps, as-built records provided by the City, or GIS records provided by the City. The junction node elevation data was extracted from a topographic file that was generated by the Puget Sound LiDAR Consortium. A hydraulic model node diagram providing a graphical representation of the model of the water system is contained in **Appendix C**.

Demand Data

The hydraulic model of the existing system contains 2014 ADD data. The peaking factors calculated in **Chapter 4** were used to analyze the system under MDD and PHD conditions. Demand distribution was established during the previous water system plan (WSP) when consumption data from 2008 metered billing records were distributed, based on the recorded usage for each parcel to the closest representative junction node of the model.

The hydraulic model of the proposed system contains six-year demand levels that are projected for the year 2020, 10-year demand levels that are projected for year 2024, and 20-year demand levels that are projected for the year 2035. The future distribution is based on the City's estimated future demand levels in each pressure zone.

Facilities

The hydraulic model of the existing system contains all active existing system facilities. For the proposed system analyses in the years 2020, 2024, and 2035, the hydraulic model contains all active existing system facilities and proposed system improvements identified in **Chapter 9** for the six-year, 10-year, and 20-year planning periods, respectively.

The facility settings for the pressure analyses corresponded to a PHD event in the water system. All sources of supply that are currently available to the system, or will be available in the future for the 2020, 2024, and 2035 analyses, during a peak period were operating at their normal summertime pumping rates. The reservoir levels were modeled to reflect full utilization of operational and equalizing storage. The operational conditions for the pressure analyses are summarized in **Table 7-9**.

Table 7-9

Hydraulic Analyses Operational Conditions

Description	PHD Pressure Analysis				Fire Flow Analysis			
	2014	2020	2024	2035	2014	2020	2024	2035
Demand	2014 PHD	2020 PHD	2024 PHD	2035 PHD	2014 MDD	2020 MDD	2024 MDD	2035 MDD
Gleneagle Reservoir HGL (ft)	331.9	332.3	333.2	330.1	331.9	332.3	333.2	330.1
520 Zone Reservoir HGL (ft)	516.8	517.3	517.3	517.3	504.8	505.3	505.3	505.3
520 Zone Booster Pump Station	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Proposed 710 Zone Booster Pump Station	---	---	---	ON	---	---	---	ON
Airport Wellfield	ON	ON	OFF	OFF	ON	ON	OFF	OFF
Haller Park Wellfield	ON	ON	ON	ON	ON	ON	ON	ON
New Supply Well No. 1	---	ON	ON	ON	---	ON	ON	ON
New Supply Well No. 2	---	---	ON	ON	---	---	ON	ON
Snohomish County PUD No. 1 Master Meter	ON	ON	ON	ON	ON	ON	ON	ON

Separate fire flow analyses were performed on the system to size distribution system improvements and calculate fire flow availability. The hydraulic model for the fire flow analyses contain settings that correspond to MDD events. All sources of supply that are currently available to the system during a peak period were operating at their normal pumping rates, and the reservoir levels were modeled to reflect full utilization of operational, equalizing, and fire flow storage, based on the maximum planning-level fire flow requirement. **Table 7-9** summarizes the operational conditions for the fire flow analyses for 2014, 2020, 2024, and 2035. ~~the existing, year 2020, year 2024, and year 2035 systems~~.

Calibration

Hydraulic model calibration is the process of adjusting hydraulic model data so the model closely reflects actual system pressures and flows under similar demand and operating conditions. Initial Hazen Williams roughness coefficients were entered into the model, based on computed estimates of the coefficients from available pipe age and material data. For example, assuming that the internal surface of water pipes become rougher as they get older, older water mains were assigned lower roughness coefficients than new water mains. In 2010, additional calibration of the model was achieved using field fire flow and pressure data, which was collected throughout the system for this purpose. Hydraulic model calibration was achieved by adjusting the roughness coefficients of the water mains and elevations of the junction nodes in the model until the model results reflected an acceptable level of accuracy. The average accuracy of the calibrated model was better than 98 percent of the actual field data collected, with a range of 100 to 94 percent accuracy at individual analysis locations. For the purposes of this WSP, some model pressures were field-checked to verify elevations, but field flow tests were not performed.

7.6.3 Hydraulic Analyses Results (Amended)

Several hydraulic analyses were performed to determine the capability of the system to meet the pressure and flow requirements identified in **Chapter 5** and contained in WAC 246-290-230. The first analysis was performed to determine the pressures throughout the system under 2014 ~~existing (i.e., 2014)~~ PHD conditions. The results of this analysis were used to identify locations of low and high pressures. To satisfy the minimum pressure requirements, the pressure at all water service locations must be at least 30 psi during PHD conditions. In addition, the system should not have widespread areas with high pressures, generally considered to be more than 120 psi. A summary of the pressure deficiencies identified from the results of this analysis is contained in **Table 7-10**.

There are several areas within the City's distribution system that have pressures in excess of 100 psi. Most areas of the 710 Zone currently experience high pressures as does the lower elevations of the 520 Zone near the boundary with the 342 Zone. The high pressures in the 342 Zone occur near Haller Park, the areas near the Stillaguamish River and March Creek, Island Crossing and several other lower elevation areas of the pressure zone.

The second set of analyses was performed to determine the capability of the existing water system to provide fire flow throughout the system under MDD conditions. A separate fire flow analysis was performed for each node in the model to determine the available fire flow at a minimum residual pressure of 20 psi in the main adjacent to the hydrant and a maximum allowable water main velocity of 10 feet per second. More than 800 fire flow analyses were performed to comprehensively evaluate the water system. For each node analyzed, the resulting fire flow was compared to its general planning-level fire flow requirement, which was assigned according to its land use classification. As is typical of most water systems, the City's distribution system was constructed to meet fire flow requirements that were in place at the time of construction. Land use classification changes and/or increase in fire flow requirements over time may create deficiencies. A summary of the results of the analyses for representative system nodes is presented in **Table 7-11**.

Table 4-9 in **Chapter 4** lists the general planning-level fire flow requirements for each land use classification. Since the fire flow requirement varies for buildings within each land use classification, the land use based fire flow requirements are only used as a general target for the primary purpose of the system-wide analyses that were performed for this WSP. Additional improvements may be needed in areas where actual fire flow requirements exceed the planning-level targets, and shall be the responsibility of the developer. The results of the fire flow analyses were used to identify undersized water mains and proposed water main improvements.

Once all deficiencies were identified, proposed water main improvements were included in the model, and pressure and fire flow analyses were performed throughout the system to demonstrate that the improvements will eliminate the deficiencies and meet the flow and pressure requirements. These analyses were modeled under projected year 2035 MDD conditions to ensure that the improvements are sized sufficiently to meet the needs of the future. A summary of the results of

these analyses is shown in **Table 7-11** for the same areas that were summarized from the existing water system analyses. The results of the analyses indicate that all fire flow deficiencies are resolved with the proposed improvements. Many of the fire flow deficiencies will be resolved prior to 2035, but since the selection of specific projects to resolve existing fire flow deficiencies will be accomplished annually during the City's budget development process, all fire flow deficiencies were assumed to be resolved in 2035 for the purposes of this WSP. A description of these improvements and a figure that shows their locations are presented in **Chapter 9**.

Table 7-10

Pressure Analysis Summary (Amended)

Land Use	Approximate Location	Existing Pressure Zone	Proposed Pressure Zone	Existing Node Number	Pressure (psi)			
					Existing System	Future w/Improvements		
						2020	2024	2035
Low Pressure Areas								
Public/Semi-Public	Arlington High School	520 Zone	520 Zone	J-1089	37	31	32	32
Low/Mod Dens Res	Noble Dr & Cedarbough Loop	520 Zone	520 Zone	J-178	37	37	38	37
High Pressure Areas								
Mod Dens Res	211th Pl NE & Ronning Rd	342 Zone	342 Zone	J-511	103	102	104	103
Low/Mod Dens Res	Smokey Point Concrete	342 Zone	342 Zone	J-692	117	117	118	117
OTBD3	Near Haller Park Wellfield	342 Zone	342 Zone	J-1	111	110	112	110
Mod Dens Res	Kraetz Rd & 59th Ave NE	342 Zone	342 Zone	J-581	107	106	108	107
Moderate Density Residential	Crossroads Fellowship Church	342 Zone	342 Zone	J-924	107	106	109	108
Low/Mod Dens Res	196th Pl NE & 45th Dr NE	342 Zone	342 Zone	J-391	105	104	106	106
Low/Mod Dens Res	North of Stillaguamish River on Arlington-Darrington Rd	342 Zone	342 Zone	J-518	114	113	115	114
Highway Comm	Island Crossing at Intersection of Interstate 5 and SR 530	342 Zone	342 Zone	J-117a	125	124	126	125
Low/Mod Dens Res	Crown Ridge Boulevard & SR 9	520 Zone	520 Zone	J-351	105	100	101	101
Low/Mod Dens Res	North end of Heron Ct	520 Zone	520 Zone	J-530	134	128	129	129
Low/Mod Dens Res	Near 71st Avenue NE along 172nd St NE	520 Zone	520 Zone	J-649	127	121	122	122
Low/Mod Dens Res	Old Burn Rd & Burn Hill Rd	540 Zone	520 Zone	J-625	134	134	134	107
Rural Residential	Zaretzke Rd & ~183rd St NE	710 Zone	560 Zone	J-814	104	40	40	40
Rural Residential	In 105th Ave NE, north of 195th St N	710 Zone	560 Zone	J-984	178	113	113	113
Rural Residential	186th St NE & ~95th Ave NE	710 Zone	615 Zone	J-823	108	67	67	67
Rural Residential	95th Ave NE & Burn Rd	710 Zone	615 Zone	J-786	119	78	78	78
Low/Mod Dens Res	In 182nd St NE, west of 89th Ave NE	710 Zone	615 Zone	J-366	121	80	80	80

Table 7-11

Fire Flow Analysis Summary (Amended)

Description	Approximate Location	Existing Pressure Zone	Node Number	Available Fire Flow (gpm)				Target Fire Flow (gpm)
				Existing System	Future w/Improvements			
					2020	2024	2035	
High Dens Res	E Gilman Ave & Talcott Ave	342 Zone	J-517	4,485	4,411	4,287	5,000	2,500
Low Density Res.	Shady Grove Pl & Cedarbough Lp	342 Zone	J-184	914	911	903	1,721	1,000
Moderate Density Res.	E Robinhood Dr & ~E 2nd St	342 Zone	J-520	869	863	853	3,822	1,750
Stillaguamish Senior Center	18308 Smokey Point Blvd	342 Zone	J-736	2,775	2,756	2,742	3,196	2,500
Island Crossing	Interstate 5 & SR 530	342 Zone	J-117a	2,340	2,335	2,321	3,005	3,000
Business Park	184th Pl NE & ~36th Dr NE	342 Zone	J-731	2,598	2,590	2,585	5,000	3,000
Puget Sound Kidney Center	18828 Smokey Point Blvd	342 Zone	J-682	2,726	2,728	2,728	5,000	3,000
Moderate Density Res.	183rd Pl NE & 31st Ave NE	342 Zone	J-738	2,867	2,835	2,820	3,068	1,750
Crossroads Fellowship Church	2425 200th St NE	342 Zone	J-924	1,727	1,727	1,727	3,823	1,750
Cascade Valley Hospital	Stillaguamish Ave & Medical Dr	342 Zone	J-460	1,724	1,724	1,723	5,000	3,500
Moderate Density Res.	Ronning Rd & 210th St NE	342 Zone	J-602	1,599	1,598	1,598	3,086	1,750
Smokey Point Concrete	23315 Dike Rd	342 Zone	J-692	1,314	1,358	1,352	4,185	3,000
Moderate Density Res.	Kraetz Rd & 59th Ave NE	342 Zone	J-581	1,699	1,696	1,692	3,318	1,750
Mod Dens Res	Hillcrest Dr & Florence St	342 Zone	J-1075	886	883	882	3,207	1,750
Regency Care Center	620 S Hazel St	342 Zone	J-108	1,957	2,055	2,051	4,540	1,750
Arlington Municipal Airport	188th St NE & 58th Ave NE	342 Zone	J-910	2,664	2,668	2,668	5,000	3,500
Aviation Flightline	188th St NE & ~49th Ave NE	342 Zone	J-663	3,822	3,787	3,741	5,000	3,500
Haller Middle School	French Ave & E 1st St	342 Zone	J-634	2,032	2,032	2,032	5,000	3,500
Post Middle School	1220 E Fifth St	342 Zone	J-47	2,395	2,394	2,394	5,000	3,500
General Industrial	20800 67th Ave NE	342 Zone	J-1070	2,949	2,979	2,977	5,000	3,500
High Density Res.	Medical Center Dr	342 Zone	J-701	3,719	3,683	3,680	5,000	2,500
Old Town Res. District	E Division St & High St	342 Zone	J-12	1,474	1,474	1,473	5,000	2,500
High Density Res.	201st St NE & 80th Ave NE	342 Zone	J-568	2,173	2,173	2,173	4,863	2,500
Haggen Food & Pharmacy	20115 74th Ave NE	342 Zone	J-572	3,057	3,057	3,056	5,000	3,000
General Commercial	59th Ave NE south of SR 531	342 Zone	J-664	2,781	2,779	2,779	5,000	3,500
General Commercial	7607 204th St NE	342 Zone	J-798	2,836	2,836	2,835	5,000	3,000
Crossroads Car Wash	51st Ave NE & SR 531	342 Zone	J-553	3,526	3,471	3,428	5,000	3,000
Arlington Dry Kilns	19406 68th Dr NE	342 Zone	J-248	4,361	4,334	4,330	5,000	3,500
Presidents Elem. School	401 N French Ave	342 Zone	J-35	2,256	2,255	2,255	5,000	3,500
General Industrial	19009 62nd Ave NE	342 Zone	J-145	3,488	3,500	3,500	5,000	3,500
Arlington Hardware	215 N Olympic Ave	342 Zone	J-30	4,547	4,468	4,334	5,000	3,000
Smokey Point Distributing	17305 59th Ave NE	342 Zone	J-473	2,507	2,506	2,505	5,000	3,500
Arlington High School	18821 Crown Ridge Blvd	520 Zone	J-1089	1,532	1,511	1,478	2,708	1,500
Pioneer Elem. School	8213 Eaglefield Dr	520 Zone	J-431	1,831	1,803	1,759	3,812	3,500
Gleneagle Golf Clubhouse	7619 East Country Club Dr	520 Zone	J-194	2,342	2,304	2,241	4,106	3,250
Low Density Res./Rural-5[1]	Burn Rd & Old Burn Rd	540 Zone	J-353	940	940	920	3,777	1,000
Low Density Res./Rural-5[1]	196th St & Old Burn Rd	540 Zone	J-860	940	940	920	5,000	1,000
Low Density Res./Rural-5[1]	Burn Rd & McElroy Rd	710 Zone	J-354	940	918	888	5,000	1,000
Low Density Res./Rural-5[1]	Zaretzke Rd & ~183rd St NE	710 Zone	J-814	443	900	890	1,693	1,000
Low Density Res./Rural-5[1]	10310 195th St NE	710 Zone	J-598	940	915	887	1,406	1,000

(1) The existing target fire flow in the 540 and 710 Zones is 900 gpm.

7.6.4 Other Deficiencies

This section presents a summary of deficiencies not related to the capacity of the mains. These deficiencies will be eliminated upon completion of the proposed improvements that are presented in **Chapter 9**.

Several areas throughout the system have sufficient fire flow; however, high water velocities are experienced in the system because the water mains are undersized to carry the fire flows at acceptable water velocities. Operating the system with high water velocities can potentially damage the system due to the high surge pressures that commonly occur with high water velocities. Water main improvements identified in **Chapter 9** have been sized to prevent water velocities from exceeding 10 feet per second.

Some areas of the system have water mains that are more than 50 years old, which is beyond the average life expectancy of water mains. Most of the older water mains are located in the City's downtown area in the 342 Zone.

Approximately 10.4 percent of the City's water main is asbestos cement (AC). Most of the AC pipe is located in downtown Arlington and near the Arlington Airport. Several important water mains are also AC pipe, including the water main adjacent to Cascade Valley Hospital, Haller Middle School, and President's Elementary School.

The City is planning to replace these mains in the future, as shown in the schedule of planned improvements in **Chapter 9**. All new water main installations are required to use cement-mortar lined ductile iron water main in accordance with the City's Public Works Design and Construction Standards and Specifications, Chapter 2 of which is included in **Appendix D**.

7.7 PRESSURE REDUCING STATIONS

This section evaluates the City's existing pressure reducing stations to identify deficiencies related to their current condition and operation capability.

7.7.1 Evaluation and Deficiencies

The City has a total of seven operational pressure reducing stations, all of which are less than (approximately) 20 years old. Five of the pressure reducing stations transfer water from the 520 Zone to the 342 Zone during a fire flow event or other drop in pressure within the lower zone. All five pressure reducing stations are functioning properly. Some of the stations have drainage issues, which can interfere with access to the valves and piping.

The two remaining PRV stations are located along Burn Road and reduce the pressure from the PUD wholesale supply source. These PRVs are operating properly. Proposed improvements for additional pressure reducing stations are addressed in **Chapter 9**.

7.8 TELEMETRY AND SUPERVISORY CONTROL SYSTEM

This section evaluates the City's existing telemetry and supervisory control system to identify deficiencies related to its condition and current operational capability.

7.8.1 Evaluation and Deficiencies (Amended)

The City's telemetry system was installed in 2001, and remote telemetry units are installed at all of the major water system facilities except ~~the Burn Road Reservoir (now offline) and~~ the PUD master meter. The existing remote telemetry units are linked to the master telemetry unit with bridged-circuit telephone lines.

7.9 SYSTEM CAPACITY

This section evaluates the capacity of the City's existing and future water system components (supply, storage, transmission, and water rights) to determine the maximum number of ERUs it can serve. Once established, system capacity becomes useful in determining how much capacity is available in the water system to support new customers that apply for water service through the building permit process. The system capacity information, together with the projected growth of the system expressed in ERUs (as shown in **Chart 4-5** of **Chapter 4)** also provides the City with a schedule of when additional system capacity is needed.

7.9.1 Analysis Criteria

The capacity of the City's system was determined from the limiting capacity of the water rights, supply, storage, and transmission facilities. The supply capacity analysis was based on two operating areas; the 342 and 520 Zones, and the 540/615 and 710 Zones. The supply capacity analysis was based on the combined MDD of the 342 and 520 Zones and the combined PHD and the maximum fire flow requirement of the 540/615 and 710 Zones. Since the WTP capacity is equal to the capacity of the Haller Wellfield, a separate analysis was not completed for the capacity of the WTP. The transmission capacity analysis was based on the total capacity of the transmission system for the supply sources and the system's MDD per ERU.

The storage capacity analysis was based on the storage capacity for equalizing and standby storage, and the computed storage requirement per ERU. Operational, dead, and fire flow storage capacity were excluded from the storage analyses because these components are not directly determined by water demand or ERUs. For the analyses, a reserve amount equivalent to the existing operational, dead, and fire flow storage requirements was deducted from the total available storage capacity to determine the storage capacity available for equalizing and standby storage. This storage capacity available for equalizing and standby storage was divided by the existing number of ERUs presented in **Chapter 4** to determine the storage requirement per ERU. The annual water rights capacity evaluation was based on the existing annual water rights, as summarized in **Chapter 6**, and the system's ADD per ERU. The instantaneous water rights capacity evaluation was based on the existing instantaneous water rights, as summarized in **Chapter 6**, and the system's MDD per

ERU. The ERU-based demand data was derived from the ADD of the system and demand peaking factors from **Chapter 4**.

7.9.2 Existing Capacity Analysis Results

A summary of the results of the existing system capacity analysis is shown in **Table 7-12**. The results indicate that the limiting capacity of the system is supply, which can support up to a maximum of approximately 8,282 ERUs. The existing water system has a surplus of approximately 577 ERUs. All other water system components also have sufficient capacity to support existing water system customers.

Table 7-12

Existing System Capacity Analysis

Demands Per ERU Basis	
Average Day Demand Per ERU (gal/day)	204
Maximum Day Demand Per ERU (gal/day)	357
Peak Hour Demand Per ERU (gal/day)	645
Supply	
Limiting Supply Rate - Source Capacities (gal/day)	3,022,982
Maximum Supply Capacity (ERUs)	8,282
Storage Capacity	
Maximum Equalizing & Standby Storage Capacity (gal)	2,158,234
Existing ES & SB Storage Requirements (gal)	1,926,233
Equalizing & Standby Storage Requirement Per ERU (gal)	250
Maximum Storage Capacity (ERUs)	8,633
Transmission Capacity	
Limiting Transmission Capacity (gal/day)	6,204,200
Maximum Day Demand Per ERU (gal/day)	357
Maximum Transmission Capacity (ERUs)	17,367
Annual Water Rights and Wholesale Supply Capacity	
Annual Water Right & Wholesale Supply Capacity (gal/day)	5,209,920
Average Day Demand Per ERU (gal/day)	204
Maximum Annual Water Right Capacity (ERUs)	25,521
Instantaneous Water Rights and Wholesale Supply Capacity	
Instantaneous Water Right & Wholesale Supply Capacity (gal/day)	6,379,200
Maximum Day Demand Per ERU (gal/day)	357
Maximum Instantaneous Capacity (ERUs)	17,857
Maximum System Capacity	
Based on Limiting Facility - Supply Capacity	8,282
Unused Available System Capacity	
Maximum System Capacity (ERUs)	8,282
Existing (2014) ERUs	7,705
Surplus Capacity (ERUs)	577

7.9.3 Future Capacity Analysis Results (Amended)

A summary of the results of the six-year projected system capacity analysis is shown in **Table 7-13**. The six-year projected system capacity analysis includes improvements that are planned to be completed within the six-year planning period, as described in **Chapter 9**. These improvements include the construction of New Supply Well No. 1. The results of the 2014 system capacity analyses indicate that the proposed improvements will increase the system capacity to approximately 10,115 ERUs based on the limiting component of the City's supply system. The future water system will have a surplus of approximately ~~813~~ 895 ERUs with the construction of these improvements.

Table 7-13

2020 Future System Capacity Analysis with New Supply Well No. 1 (Amended)

Demands Per ERU Basis	
Average Day Demand Per ERU (gal/day)	185
Maximum Day Demand Per ERU (gal/day)	325
Peak Hour Demand Per ERU (gal/day)	586
Supply	
Limiting Supply Rate - Source Capacities (gal/day)	3,283,200
Maximum Supply Capacity (ERUs)	10,115
Storage Capacity	
Maximum Equalizing & Standby Storage Capacity (gal)	2,158,234
Existing ES & SB Storage Requirements (gal)	19,113
Equalizing & Standby Storage Requirement Per ERU (gal)	207
Maximum Storage Capacity (ERUs)	10,404
Transmission Capacity	
Limiting Transmission Capacity (gal/day)	6,204,200
Maximum Day Demand Per ERU (gal/day)	325
Maximum Transmission Capacity (ERUs)	19,113
Annual Water Rights and Wholesale Supply Capacity	
Annual Water Right & Wholesale Supply Capacity (gal/day)	5,209,920
Average Day Demand Per ERU (gal/day)	185
Maximum Annual Water Right Capacity (ERUs)	28,088
Instantaneous Water Rights and Wholesale Supply Capacity	
Instantaneous Water Right & Wholesale Supply Capacity (gal/day)	6,379,200
Maximum Day Demand Per ERU (gal/day)	325
Maximum Instantaneous Capacity (ERUs)	19,652
Maximum System Capacity	
Based on Limiting Facility - Supply Capacity	10,115
Unused Available System Capacity	
Maximum System Capacity (ERUs)	10,115
Projected (2020) ERUs	9,219
Surplus Capacity (ERUs)	895

NOTE: Components may not sum due to rounding.

A summary of the results of the 10-year projected system capacity analysis is shown in **Table 7-14**. The 10-year projected system capacity analysis includes improvements that are planned to be completed within the 10-year planning period, as described in **Chapter 9**. These improvements include the construction of New Supply Well No. 1 and No. 2. The results of the 2024 system capacity analyses indicate that the proposed improvements will increase the system capacity to approximately ~~10,659~~ 10,718 ERUs based on the limiting component of the City's storage system. The future water system will have a surplus of approximately ~~286~~ 500 ERUs with the construction of these improvements.

Table 7-14

2024 Future System Capacity Analysis with New Supply Well Nos. 1 and 2 (Amended)

Demands Per ERU Basis	
Average Day Demand Per ERU (gal/day)	185
Maximum Day Demand Per ERU (gal/day)	325
Peak Hour Demand Per ERU (gal/day)	586
Supply	
Limiting Supply Rate - Source Capacities (gal/day)	4,261,176
Maximum Supply Capacity (ERUs)	13,127
Storage Capacity	
Maximum Equalizing & Standby Storage Capacity (gal)	2,158,234
Existing ES & SB Storage Requirements (gal)	19,113
Equalizing & Standby Storage Requirement Per ERU (gal)	201
Maximum Storage Capacity (ERUs)	10,718
Transmission Capacity	
Limiting Transmission Capacity (gal/day)	6,204,200
Maximum Day Demand Per ERU (gal/day)	325
Maximum Transmission Capacity (ERUs)	19,113
Annual Water Rights and Wholesale Supply Capacity	
Annual Water Right & Wholesale Supply Capacity (gal/day)	5,209,920
Average Day Demand Per ERU (gal/day)	185
Maximum Annual Water Right Capacity (ERUs)	28,088
Instantaneous Water Rights and Wholesale Supply Capacity	
Instantaneous Water Right & Wholesale Supply Capacity (gal/day)	6,379,200
Maximum Day Demand Per ERU (gal/day)	325
Maximum Instantaneous Capacity (ERUs)	19,652
Maximum System Capacity	
Based on Limiting Facility - Storage Capacity	10,718
Unused Available System Capacity	
Maximum System Capacity (ERUs)	10,718
Projected (2024) ERUs	10,219
Surplus Capacity (ERUs)	500

NOTE: Components may not sum due to rounding.

8 Operations and Maintenance

8.1 INTRODUCTION

The City of Arlington's (City) water operations and maintenance program consists of the following elements.



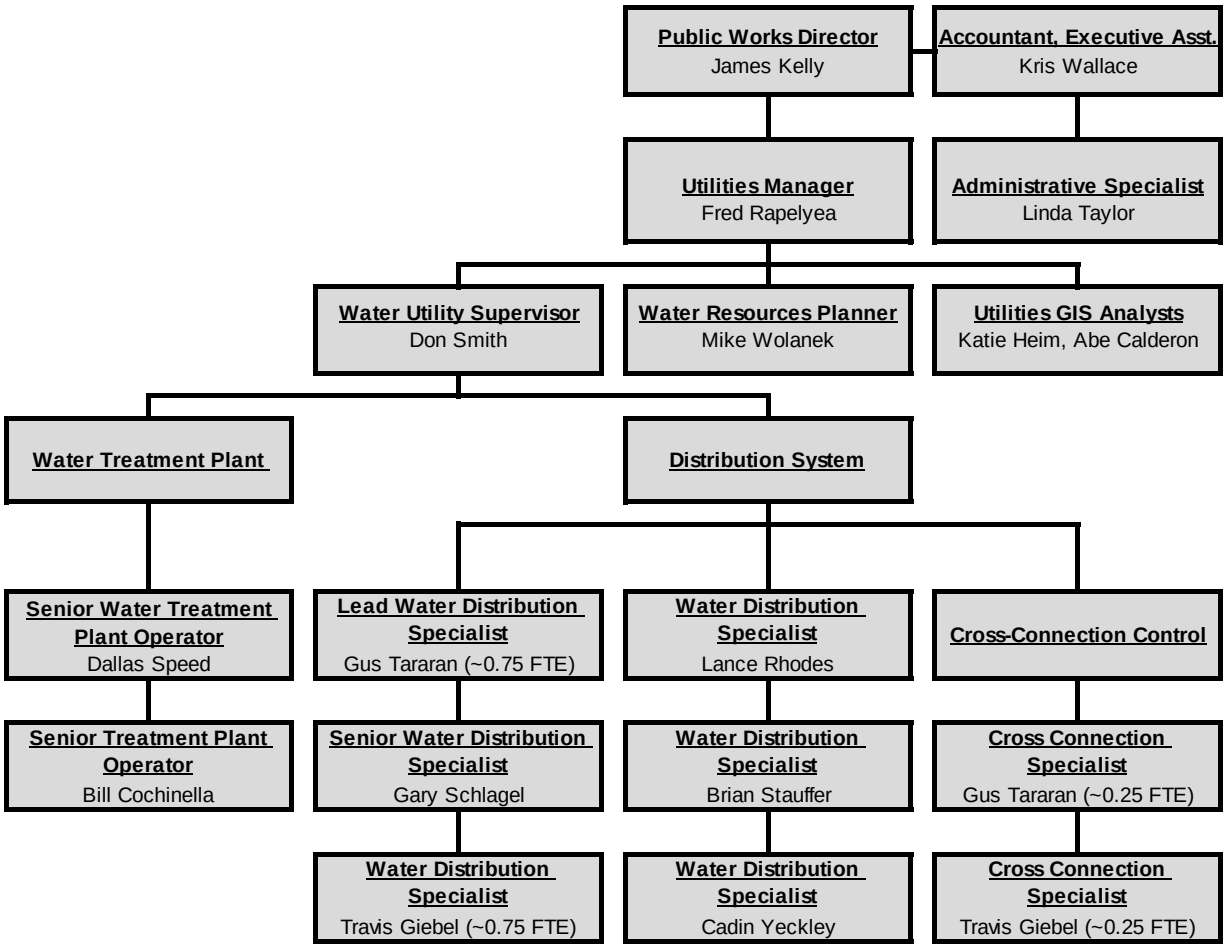
- Normal operation of the water supply, treatment and distribution systems.
- Emergency operation of the water system, when one or more of the components is not available for normal use due to natural or man-made events.
- A preventive maintenance program to ensure that the water system is receiving maintenance in accordance with generally accepted standards.
- A cross-connection control program, as required by law, to ensure that there is no compromise of the water system's integrity due to contamination introduced from a customer's operation.

8.2 NORMAL OPERATIONS

8.2.1 Organizational Structure (Amended)

The City's Water Department is part of the Utilities Division of the Public Works Department. The Utilities Manager reports to the Public Works Director, Mr. James Kelly. The Utilities Manager position was recently filled by Wastewater Supervisor Fred Rapelyea. ~~is currently vacant. The Water Utility Supervisor, Utilities and Administrative Specialists, Water Resources Planner and Utilities GIS Specialists normally report to the Utilities Manager, but report to the Public Works Director during vacancies of the Utilities Manager position.~~ Operators and specialists of the water treatment plant and distribution system report to the Water Utility Supervisor, Mr. Don Smith. The department's organizational chart is shown in **Figure 8-1**. The essential functions of the various positions and groups are discussed later in this chapter.

Chart 8-1 (Amended)
Public Works Functional Organization Chart



The current water utility staff consists of WTP operators and distribution specialists who function under the Water Utility Supervisor, as shown in **Figure 8-1**. Each of these personnel perform routine operations and maintenance activities, including inspecting, testing, installing and repairing system facilities; routine operation and preventive maintenance; water quality sampling; regulatory compliance monitoring; recordkeeping; administrative tasks; general clerical work; and corrective or breakdown maintenance required in response to emergencies.

Washington State law (Chapter 246-292 WAC) requires that the City's water system be operated under the direct supervision of a certified operator, or a Water Utility Supervisor of appropriate class required by Health for the type of WTP managed. The water treatment process is required to be supervised by a certified Water Treatment Plant Operator appropriate for the complexity of the

treatment process. In addition, specialty certification is required for backflow device testing and cross-connection control program activities and management. **Table 8-1** shows the current certifications of the City's water operations and maintenance staff. It is City policy to maintain a well-qualified, technically trained staff. The City annually allocates funds for personnel training, certification and membership in professional organizations such as the American Water Works Association (AWWA). The City believes that the time and money invested in training, certification and professional organizations are repaid many times in improved safety, skills and confidence.

Table 8-1 (Amended)

Personnel Certifications

Name	Position	Certification
Bill Cochinella	Water Treatment Plant Operator	WTPO-2, CCS
Travis Giebel	Water Distribution Specialist	WTPO-IT, BAT
Lance Rhodes	Water Distribution Specialist	WDM-1
Gary Schlagel	Senior Water Distribution Specialist	WTPO-IT, WDS, CCS
Don Smith	Water Utility Supervisor	WDM-2, WDS, WTPO-3, CCS
Dallas Speed	Senior Water Treatment Plant Operator	WTPO-2, CCS
Brian Stauffer	Water Distribution Specialist	New employee
Gus Tararan	Cross-Connection Specialist	BAT, WDS, WTPO-IT, CCS
Cadin Yeckley	Water Distribution Specialist	New employee

Certification Definitions

BAT - Backflow Assembly Tester
CCS - Cross-Connection Control Specialist
IT - In Training
WDM - Water Distribution Manager
WDS - Water Distribution Specialist
WTPO - Water Treatment Plant Operator

8.2.2 Personnel Responsibilities (Amended)

The key responsibilities of the water operations and maintenance management and staff are summarized below.

Public Works Director – Provides overall direction and guidance to the Public Works Department; approves priorities and activities; planning of capital projects; approval of fund expenditures; and functions as Utilities Manager during position vacancy.

Utilities Manager – ~~Vacant.~~ Supervises, organizes, directs and performs activities related to the operation and maintenance of the Utilities Division of the Public Works Department.

Water Utility Supervisor – Organizes, directs and performs activities related to the operation and maintenance of the City's water system, including treatment and distribution.

Water Resources Planner – Develops and administers water conservation, wellhead protection and watershed control programs; leads long-term water supply efforts, including water right acquisition and water use efficiency implementation; primary regulatory lead within utilities (water, sewer and storm); meet integrated water resource management objectives through coordination between water, wastewater, and stormwater utilities, and through partnerships established across the basin; and assists with water quality programs and customer outreach.

Utilities GIS Analysts – Develop and administer a GIS database for the utility infrastructure, particularly distribution network; and develop and administer an asset management program for the utility, including integrating a work order process for maintenance and operations of the distribution network with the GIS database.

Public Works Accountant – Day to day financial management of all utilities; develops and tracks budgets; asset management; compiles staff timesheets; coordinates public works' affairs with the Finance Department; prepares reports for Department Heads, Executive Directors, and City Council; coordinates with state auditors as may be required.

Utilities Specialist – Vacant. Coordinates development and building permit review comments and ensures timely submittal of comments; calculates water and sewer fees for new connections; coordinates the business license review process for the utilities division; tracks employee reviews, training and certifications; and organizes and oversees as-built records and the filing system.

Administrative Specialist – Performs the administrative support and general secretarial duties for the utilities division; receives, resolves and/or directs responses to customer inquiries and complaints; calculates water and sewer fees for new connections; and assists with Cross-connection Control Program and database management; and administers bulk water and hydrant permit programs.

Water Treatment Plant Operator – Performs a variety of skilled tasks to efficiently operate and maintain the City's water treatment plant, including technical work to perform all routine and non-routine water treatment plant operations, maintenance and laboratory work.

Lead Water Distribution Specialist – Performs non-routine trouble shooting, maintenance, inspection, installation and repair work for the water distribution system; and directs all necessary routine water distribution system tasks.

Water Distribution Specialist – Performs all necessary routine activities in the installation, construction, maintenance, repair and testing of the water distribution system, including water meters and metering system. Responds to customer inquiries regarding water quality and water usage.

~~**Water Service Specialist** – Performs work in the installation, maintenance and repair of the City's water meters, and performs minor service repairs, reads meters and responds to customer inquiries regarding water usage.~~

Cross Connection Specialist – Administers the Cross-connection Control Program, including development reviews, backflow assembly inspection and testing, building permit inspections, well decommissioning, database maintenance and regulatory reporting; and assists water distribution specialists as needed.

8.2.3 Available Equipment

The water department has several types of equipment available for both routine and emergency operation and maintenance of the water system. The equipment is stored at the City's water treatment plant and at the City's maintenance yard. If additional equipment is required for specific projects, the City will rent or contract with a local contractor for the services needed. A stock of supplies in sufficient quantities for normal system operation and maintenance and short-term emergencies is stored at the water treatment plant. A list of major equipment and chemicals used in the normal operation of the water system is shown in **Table 8-2**. In addition, equipment from other City departments, such as wastewater, stormwater, street and parks, is available if needed.

The vactor truck has been acquired by the Stormwater Department since the previous WSP update, and is shared by all City utilities. It has become an integral part of Water Department operations, and emergency repair of main breaks in particular.

8.2.4 Service, Equipment and Supply Vendors

The list in **Table 8-3** identifies the typical vendors for service, materials, supplies and chemicals. The City maintains adequate supplies and materials for normal operation. The suppliers are local and maintain adequate materials for unusual needs.

8.2.5 Routine Operations

Routine operations involve the analysis, formulation and implementation of procedures to ensure that the facilities are functioning efficiently and meeting pressure and water quality requirements and other system demands. The utility's maintenance procedures are effective, with repairs being made promptly so customers receive high quality water service.

8.2.6 Continuity of Service

As a municipality, the City of Arlington has the structure, stability, authority and responsibility to ensure that water service will be continuous. For example, changes in the City Council or staff would not have a pronounced effect on the City's customers or quality of service.

Table 8-2

Water Department Equipment and Chemical Inventory

Quantity	Description	Size/Special Features
	Mobile Equipment Inventory	
1	Backhoe	
2	Dump Truck	12 ton, 6 ton
2	Emergency Generator	5 kW
1	Emergency Generator	1 kW
2	Pickup Truck	3/4 Ton
6	Pickup Truck	1/2 Ton
3	Portable Pumps	3 inch, 2.5 inch
2	Utility Trailer	Enclosed
1	Utility Trailer	Open
1	Vactor Truck	Shared by all utilities depts.
Varies	Miscellaneous Equipment	
	Chemical Inventory	
Varies	Calcium Thiosulfate	
Varies	Filter Aide	
Varies	Primary Coagulant	
Varies	Sodium Hydroxide	25 percent
Varies	Sodium Hypochlorite	0.8 and 12.5 percent

8.2.7 Routine Water Quality Sampling

Washington State Department of Health (DOH) has adopted federal regulations that specify minimum monitoring requirements for water systems. The sampling requirements depend on the population served, source type and treatment provided. The specific requirements are contained in WAC 246-290-300. The City currently performs all routine coliform sampling throughout the distribution system, taking a total of 15 samples each month. A further discussion of the water quality monitoring program is contained in **Chapter 6** and **Appendix H** of this Comprehensive Water System Plan (WSP).

8.2.8 Cross-Connection Control (CCC)

The City first drafted a Cross-Connection Control Program in 1999 to comply with state regulations (WAC 246-290-490) pertaining to contamination of potable water due to cross connections. The current Cross-Connection Control Program, revised in 2006 and 2010 and included without revision in this WSP in **Appendix G**, is a combination program between the City's Water Department and Building Department that permits the Water Department Cross-Connection Control Officer to regulate all cross-connection control devices. The staff members with Cross-Connection Control Specialist certifications are shown in **Table 8-1**.

Table 8-3 (Amended)

Service, Equipment and Supply Vendors List

Name	Address	Phone	Products
Engineering and Technical Services			
City Engineer	154 Cox Avenue, Arlington, WA 98223	360-403-3512	Engineering Support
RH2 Engineering, Inc.	12100 NE 195th Street, Suite 100 Bothell, WA 98011	425-951-5400 800-720-8052	Engineering Support
Brown and Caldwell	701 Pike St # 1200, Seattle, WA 98101	206-749-2257 206- 624-0100	Engineering Support
Pacific Groundwater Group	2377 Eastlake Avenue E Seattle, WA 98101	206-329-0141	Groundwater Engineering Support
Process Solutions	19155 62nd Avenue NE Arlington, WA 98223	360-403-7037	Control Systems (SCADA)
Adjacent Purveyors			
City of Marysville	80 Columbia Avenue Marysville, WA 98270	360-651-5100	Equipment, Materials, Labor
Snohomish County PUD	3301 Old Hartford Rd Lake Stevens, WA 98258	425-397-3000	Equipment, Materials, Labor and Emergency Water Supply
Laboratory and Analytical Services			
Edge Analytical	11525 Knudson Road Burlington, WA 98233	360-757-1400	Water Quality Testing
Materials and Supplies			
HB Jaeger	1830 16th Street, Snohomish, WA 98290	360-568-5958 425-486-5958	Pipes, Valves, Fittings
HD Fowler	6016 29th Drive NE Marysville, WA 98271	360-651-2400	Pipes, Valves, Fittings
Unit Process Co.	6600 Merrill Creek Parkway Everett, WA 98203	425-349-4242 800-833-8726	Bray Valves and Actuators
Summit Research Labs	45 River Road, Suite 300 Flemmington, NJ 08822	(360) 371-0246	Chemical (Primary Coagulant)
Clearbrook, Inc.	328 Nicolet Blvd Manasha, WA 54954	920-722-2243	Chemical (Filter Aid)
Univar	8201 S 212th Kent, WA 98032	253-872-5091	Chemical (Sodium Hydroxide & Sodium Hypochlorite)
Measurement Technologies, Inc.	P.O. Box 2195 Redmond, Washington 98073	877-889-8482 425-836-8683	Chemical (Calcium thiosulfate)
GC Systems, Inc.	2310 Inter Avenue Puyallup, WA 98372	800-525-9425	Control Valves
Equipment and Service			
PumpTech, Inc.	13251 Northup Way Bellevue, WA 98005	425-644-8501	Pumps and Service
Whitney Equipment, Inc.	21222 30th Drive SE Bothell, WA 98021	425-486-9499	Pumps and Service
Technical Controls	830 SW 34th Street, Suite E Renton, WA 98057	425-282-6030	Pumps and Service (LMI Metering Pumps)
Ferguson Waterworks	2042 112th St S Tacoma, WA 98444	253-538-8275	Water Meters (at services)
Severn Trent Services	1077 Dell Avenue Campbell, CA 95008	360-710-5368 800-524-6542	Equipment and Service (Chlorine Generator)
TMG Services	898 Valentine Avenue SE Pacific, WA 98047	253-891-0247 800-562-2310	Equipment and Service (Chlorine Analyzer)
Generator Services Northwest	3229 152nd St SW, Lynnwood, WA 98087	425-745-2096	Service and Repair (Generator)
Control Contractors, Inc.	5300 Denver Avenue S Seattle, WA 98108	206-328-1730	Service and Repair (HVAC)

8.2.9 Backwash Waste Discharge to Wetland

Effective November 2014, the City modified its operations with regard to the effluent generated during maintenance of the filter trains within the WTP. Prior to this date, all backwash used to maintain the clarifier and filters of the three treatment trains discharged directly to the Water Reclamation Facility (WRF). Depending on the changing characteristics of the effluent through the various backwash cycles, it is now discharged either to the WRF, or to a constructed treatment wetland west of the WTP. The wetland also receives stormwater runoff from Old Town Arlington, and reclaimed water from the WRF. At the time of this WSP update, the portion of daily backwash waste discharged from the WTP to the wetland has ranged from 45% to 80%, and averages 70%. This benefits the wetland, by maintaining its hydrology, as well as the WRF, by not diluting the mixed liquor in the membrane bioreactors. Discharging to the wetland requires the City to operate under an NPDES permit for discharges of waste to waters of the State. Although the wetland itself is not considered a water of the State, it does overflow to the Stillaguamish River. A copy of the NPDES permit is included in **Appendix R**.

8.2.10 Recordkeeping and Reporting

DOH has enacted regulations for recordkeeping and reporting procedures for operations and water quality testing that may be found in WAC 246-290-480.

Recordkeeping

Records shall be kept for chlorine residual and other information as specified by DOH. DOH requires retention of critical records dealing with facilities and water quality issues as summarized below.

- Bacteriological analysis results: five years.
- Chemical analysis results: for as long as the system is in operation.
- Daily source meter readings: ten years.
- Water treatment plant records: ten years.
- Other records of operation and analyses as may be required by DOH: three years.
- Documentation of actions to correct violations of primary drinking water standards: three years after last corrective action.
- Records of sanitary surveys: ten years.
- Project reports, construction documents and drawings, construction completion (inspection) reports and approvals: life of the facility. A project completion report form is included in **Appendix D**.
- Backwash volume and quality data and reports for NPDES discharge permit: 5 years
- Where applicable, daily records of chlorine residual, fluoride level, water treatment plant performance and turbidity: three years.

The City's recordkeeping procedure is as follows.

1. Data is recorded daily at all sites, and monthly logs are kept in a folder at the utilities office or water treatment plant.
2. Monthly reports for the water treatment plant are automated for calculations.
3. Service information is entered into an Access database.

Reporting

The City must report the following to DOH:

- Within 48 hours: A failure to comply with the primary standards or treatment technique requirements specified in Chapter 246-290 WAC;
- Within 48 hours: A failure to comply with the monitoring requirements specified in Chapter 246-290 WAC;
- Within 48 hours: A violation of a primary maximum contaminant level (MCL);
- Within one business day: A backflow incident, per WAC 246-290-490 (8)f; and
- As soon as possible, but no later than 24 hours after the violation is known: National Primary Drinking Water Regulation (NPDWR) violations and situations with significant potential to have serious adverse effect on human health as a result of short-term exposure, which require Tier 1 public notices per 40 CFR 141.202.

The City must submit all applicable reports to DOH as required by Chapter 246-290 WAC. Monthly reports are due by the tenth day of the following month, unless otherwise specified. Daily and annual source meter readings must be made available to DOH on request. Records regarding the status of monitoring waivers must be submitted during each monitoring cycle. Waiver information is updated annually by DOH, and the utility is provided with a testing schedule.

A water facilities inventory and report form (WFI) must be submitted to DOH within 30 days of any change in name, category, ownership or responsibility for management of the water system.

The City must notify DOH of the presence of:

- Coliform in a sample within ten days of notification by the testing laboratory; and
- Fecal coliform or E. coli in a sample by the end of the business day in which the City is notified by the testing laboratory.

When a coliform MCL violation is determined, the City must:

- Notify DOH within 24 hours of determining acute coliform MCL violations;

- Notify DOH before the end of the next business day when a non-acute coliform MCL is determined; and
- Notify water customers in accordance with WAC 246-290-71001 through 71007 and the Environmental Protection Agency's (EPA) Public Notification Rule.

If volatile organic compound monitoring is required, a copy of the results of the monitoring and any public notice must be sent to DOH within 30 days of receipt of the test results.

The City must report the following to Ecology:

- By the 15th of each month: Discharge Monitoring Report (DMR) containing discharge volumes water quality monitoring results for parameters required by the NPDES permit. A failure to comply with the primary standards or treatment technique requirements specified in Chapter 246-290 WAC;
- Immediately, as necessary: notifications of non-compliance, planned bypass, changes in operations and maintenance, and spills or other discharges.

Other Reports

Several other reports are required for state agencies, including the Department of Revenue, Department of Labor and Industries, Department of Social and Health Services, Department of Ecology and the Employment Security Department. All reports are to be completed according to their instructions.

8.2.11 Operations and Maintenance Records (Amended)

Facilities Operations and Maintenance Manuals

Operations and maintenance manuals are available for staff member's reference. These manuals are kept on file at the water treatment plant and utilities office. The City intends to maintain its policies of requiring complete operation and maintenance manuals for all new equipment and facilities.

Mapping and As-Built Drawing Records

Maintenance of as-built drawings is essential to maintenance crews, city planners, developers and anyone else needing to know how the water system is laid out. The City's water distribution system is fully mapped in digital format using the ESRI ArcServer geodatabase management system. The as-built drawing records are stored in an organized file at the utilities office and are maintained by the utilities department. The City is in the process of filing all existing and new drawings in portable document format (pdf files, using Adobe Acrobat), and making them available to staff through a searchable electronic engineering library.

Operations and Maintenance Records

Records are stored at the Water Department or on the City's computer network for nearly every asset or process, including but not limited to:

- Backflow and cross-connections
- Bacteriological tests
- Backwash quality and discharge
- Billing and consumption records
- Chlorination levels
- Confined spaces
- Customer complaints
- Hydrant repairs
- Hydrant meter forms
- Hydrant databases
- Inorganic chemical tests
- Lead and copper tests
- Precipitation
- Pump motor tests
- Synthetic organic compound tests
- Vandalism forms
- Volatile organic compound tests
- Water balance
- Water used for construction
- Water maintenance
- Water main notes
- Water worksheets
- Water main flushing
- Water samples from new developments
- Well sounding and static water levels

8.2.12 Safety Procedures and Equipment

Safety is the concern and responsibility of all water operations and maintenance staff. To maintain the highest level of safety, the City has taken steps toward educating its staff and providing resources to ensure a safe working environment. The City continuously improves the safety program as the requirements and affected operations change. The American Water Works Association publishes a manual entitled *Safety Practices for Water Utilities* (M3) that describes safety programs and provides guidelines for safe work practices and techniques for a variety of water utility work situations.

The following procedures should be followed for operations and maintenance tasks that involve the most common potential workplace hazards in the City's water system. Many of these procedures are written in greater detail and on file at Water Department offices.

Use of Chlorine, Chlorine Products, Primary Coagulant, Filter Aide and Calcium Thiosulfate

Standard Procedure – Handle with care, provide adequate ventilation, and wear safety glasses and rubber gloves.

Sodium Hydroxide

Standard Procedure – Handle with care, provide adequate ventilation, wear safety goggles, apron and rubber gloves. Keep the container tightly closed and store in a dry, corrosion-proof area. Protect from unintentional contact with water. Never return contaminated material to its original container. Immediately contact the chemical supplier/manufacturer for handling instructions if drums of caustic appear to be swollen.

Working in Confined Spaces

Standard Procedure – Follow state requirements for confined space entry.

Working around Heavy Equipment

Standard Procedure – Obtain proper training and follow all safety procedures. Use noise protection equipment.

Working in Traffic Areas

Standard Procedure – Wear proper clothing and provide adequate signage and flagging for work area. Certified flaggers are to be used when traffic management requires flagging around a work site.

Working on or around Water Reservoirs

Standard Procedure – Follow proper safety harness procedures for working on tall structures. Entry into a reservoir is a confined space work area, and those regulations and procedures apply.

Working in or around Pump Stations

Standard Procedure – Obtain proper training and follow all safety procedures for working on pumps and electrical equipment. Use noise protection equipment.

Working on Asbestos Cement (AC) Water Main

Standard Procedure – Obtain proper training and follow all safety procedures for working with asbestos materials.

The water utility personnel are required to take training courses on the following topics.

- Asbestos Cement Pipe Handling
- Confined Space Entry
- Hazardous Waste
- Fall Protection
- Hearing Protection
- Competent Persons
- Laboratory Safety
- Electrical Hazards
- Heavy Equipment Operation
- CPR and First Aid
- Blood-borne Pathogens
- Traffic Flagging
- Lockout-Tag out

The City's facilities are equipped with confined space entry equipment, oxygen-gas meters and lockout-tag out equipment where appropriate. Each City vehicle is equipped with first aid and blood-borne handling kits, fire extinguishers and road safety equipment. The City also owns flagging signs and equipment for the safe handling of traffic.

The Public Works Department follows all appropriate OSHA and WISHA regulations in its day to day operations and complies with the following State requirements.

- WAC 296-809-500 to 800: Entry into confined spaces.
- WAC 296-155-650 to 66411 Part N: Shoring of open ditches.
- WAC 296-155-429: Lockout-tag out for work on energized or de-energized equipment or circuits.
- Chapter 296-155 WAC Part C1: Fall restraint for access to the top of the City's water reservoirs.
- Manual on Uniform Traffic Control Devices: Traffic control for work in the public right-of-way.

8.3 EMERGENCY OPERATIONS

8.3.1 Capabilities (Amended)

The City is equipped to accommodate short-term system failures and abnormalities. The general water system emergency response capabilities are as follows.

Multiple Supply Capability

The City could lose the operation of one of its groundwater wells without adversely impacting its ability to meet the normal demands of its customers. The City currently has three operational wells that could be used to provide customers with water in an emergency. In the event that a water treatment plant train is out of service, there are two other trains to continue treatment of the Haller Wellfield water. The City also has an intertie with the Snohomish County PUD No. 1 (PUD) that could be used to augment supply to the system in the event that a well is out of service.

The diversity of the City's water sources worked extremely well during the very large landslide which impacted the North Fork Stillaguamish River at Oso in March 2014. The City temporarily shut-down the Haller well field and WTP until the river conditions and risk to riverbank facilities could be assessed (a period of hours). The City continued to operate the Haller well field and WTP at reduced levels while increasing supplies at the airport and PUD sources (a period lasting days to months). This allowed staff to monitor influent water turbidity levels, effects on treatment processes, and assess the water quality impacts on the raw water in the Stillaguamish River.

An emergency intertie established in 1978 between the City's distribution system and the City of Marysville (Marysville) Ranney Well Transmission Main and the City's water system has since

been abandoned. However, the new Marysville water treatment plant, which is located within Arlington City limits, could provide supply directly to the City's 342 Zone with a booster pump station and the City could also directly supply Marysville's 240 Zone with a pressure reducing station.

Multiple Reservoirs

Water storage is provided by two active reservoirs. A third reservoir near Burn Road was taken off-line in 2014 and demolished in 2016 for safety concerns related to the age of the reservoir and the stability of the slope. The loss of the Burn Road reservoir removes the redundancy it provided to the 342 Zone and the Gleneagle reservoir when it is out of service for cleaning, painting or repairs. Several pressure reducing stations allow discharge of water from the 520 Zone to the 342 Zone, however. The 520 Zone Booster Pump Station provides the capability to distribute water to the 520 Zone from the 342 Zone when the 520 Zone Reservoir or PUD intertie is out of service.

Distribution System

The City has attempted to loop water mains wherever possible to improve water circulation (i.e. water quality) and minimize impacts to the system in the event that a portion of the distribution system must be taken out of service for maintenance or repairs.

Emergency Equipment

The City is equipped with the necessary tools to deal with common emergencies. If a more serious emergency should develop, the City will hire a local contractor to make repairs to alleviate the emergency condition. A vactor truck was acquired by the Stormwater Department since the previous WSP update, and is shared by all City utilities. It has become an integral in the emergency repair of main breaks.

Emergency Communications

The Water Department has a published emergency number (360-386-5926) for the public to directly contact water department personnel. The police and other City departments can also reach any member of the water department via employee cell phones or home contact numbers. Emergency contact information, including cell phone and home phone numbers, is provided to each City department.

The Water Department is also outfitted for emergency radio communications (as are the Wastewater and Stormwater Departments). Each vehicle that may respond in an emergency is equipped with two-way radios. The Public Works Administration and the Water Reclamation Facility offices are also equipped with base units for radio communications with field crews. The Administration office has also been identified as an Emergency Operations Center (EOC) for use as needed during certain emergencies.

On-call Personnel

The designated on-call person is equipped with a service vehicle and required to respond to a call within 30 minutes, but can often respond to a call within 15 minutes. A list of emergency telephone numbers is provided to each on-call employee. New employees are not placed on-call until they are familiar with the water system and maintenance procedures and are properly certified by the State of Washington.

Contacts

The City maintains a list of adjacent utility contacts for routine and emergency use, shown in **Table 8-4**.

Table 8-4

Utility and Agency Contacts

Agency	Contact	Phone*	Address
Utility Contacts			
City of Marysville	Public Works	360-363-8161 (W) 360-363-8100 (PW)	80 Columbia Avenue Marysville, WA 98270
City of Everett	Water Dept.	425-257-8800 (W) 425-257-8821 (E)	3200 Cedar Street Everett, WA 98201
City of Stanwood	Water Division	360-629-9781 (W, E)	10220 270th Street NW Stanwood, WA 98292
Snohomish County PUD	Water Operations Center	425-397-3000 (W) 877-783-1000 (E)	3301 Old Hartford Rd. Lake Stevens, WA 98258
Tatoosh Water Company	Administration	360-629-6800 (W)	1624 300th Street NW Stanwood, WA 98292
Agency Contacts			
Washington State Department of Health	Richard Rodriguez Erika Lindsey Emergency	253-395-6771 (W) 253- 395-6766 (W) 877-481-4901 (E)	20425 72nd Ave. South, Building 2, Suite 310 Kent, WA 98032-2358
Washington State Department of Ecology	Tonya Lane Spill Emergency	425-649-7050 (W) 800-424-8802 (E)	3190 160th Avenue SE Bellevue, WA 98008-5452

*Phone Key: (W) = Water business; (PW) = Public Works; (E) = Emergency

Material Readiness

Some critical repair parts, tools and equipment are kept on-hand and in fully operational condition. As repair parts are used, they are re-ordered. Inventories are kept current and are adequate for most common emergencies that can reasonably be anticipated. The City has ready access to an inventory of repair parts, including parts required for repair of each type and size of pipe within the service area. Additionally, the City has been provided with after-hours emergency contact

phone numbers for key material suppliers, which gives the City 24-hour access to parts not kept in inventory.

Mutual Aid Agreement

In addition to the above considerations, the City is a signatory to a 2006 Water and Sewer Mutual Aid Agreement with multiple Snohomish County water purveyors. The agreement provides the opportunity for sharing of equipment, personnel, materials and other resources during emergencies. The agreement is invoked at the request of the City Mayor to neighboring water purveyors. During emergencies the Public Works Director is the primary contact and the Water Utility Supervisor is the secondary contact. A contact list for all participating purveyors was last updated in 2013. A copy of the 2006 Agreement and the 2013 Contact List is contained in **Appendix P**.

The City is not currently a member of WA-WARN, a similar but separate network of water and wastewater systems which facilitates the provision of rapid mutual aid and assistance from member utilities in an emergency.

8.3.2 Emergency Response Plan and Vulnerability Assessment

An *Emergency Response Plan* and a vulnerability assessment was prepared in February 2003 to comply with the requirements of the Bioterrorism Act of 2002. The documents contain a vulnerability assessment of the City's water system facilities, a contingency operation plan for responding to emergency events, a list of water personnel responsible for making decisions in emergency situations and other elements. The Vulnerability Assessment and Emergency Response Plan also contain detailed action plans and other confidential information that is exempt from public disclosure under the provisions of *RCW 42.56.210*. They are available for review by authorized personnel on a need to know basis. The City recognizes this plan needs to be updated with new contact information and additional details for selected response procedures. A team of City utility staff is anticipated to convene in 2016 to begin the update process.

8.3.3 Public Notification (Amended)

Kristen Banfield is the City's Communications Manager/City Clerk ~~Human Resources & Communications Director~~, and is responsible for speaking on behalf of the City in the event that a public notice is required.

The federal Safe Drinking Water Act (SDWA), WAC 246-290-71001 through 71007 and the EPA Public Notification Rule require purveyors to notify their customers if any of the following conditions occur.

- National Primary Drinking Water Regulations (NPDWR) violations.
- Failure to comply with a primary MCL described under WAC 246-290-310.
- Failure to comply with a surface water treatment technique.

- Failure to comply with monitoring requirements under Chapter 246-290 WAC.
- Operation under a variance or exemption.
- Failure to comply with the requirements of any schedule that has been set under a variance or exemption.
- Failure to comply with testing procedures as prescribed by drinking water regulations.
- Occurrence of a water-borne disease outbreak or other water-borne emergency.
- Exceedance of the secondary maximum contaminant level (SMCL) for fluoride.
- Availability of unregulated contaminant monitoring data.
- Issuance of a departmental order.
- Failure to comply with a departmental order.
- Issuance of a category red operating permit by DOH.

Public notice requirements for each type of violation or situation are organized into three tiers per 40 CFR 141.201 through 208 and are based on the seriousness of the violation and the potential for adverse health effects. Tier 1 public notices are required for NPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure. Public notices in this tier must be provided as soon as possible (no later than 24 hours after the violation is known). DOH must also be notified within this timeframe, and it may require repeat or additional notices.

Tier 2 public notices are required for all other NPDWR violations and situations not covered in Tier 1 with the potential to have serious adverse effects on human health. Public notices under Tier 2 requirements, with the exception of turbidity violations, must be provided as soon as possible, but no later than 30 days after the violation is known. Turbidity violations must be reported to DOH as soon as possible, but no later than 24 hours after the violation is known, to determine whether a Tier 1 public notice will be necessary. Repeat notices must be issued for as long as the violation persists.

All other NPDWR violations and situations not included in Tier 1 and Tier 2 are grouped within Tier 3. Tier 3 public notices must be provided within one year of the City learning of the violation or beginning operations under a variance or exemption. The notice must be repeated annually for as long as the violation, variance, exemption or other situation persists.

8.4 PREVENTIVE MAINTENANCE

Maintenance schedules that meet or exceed manufacturer's recommendations have been established for all critical components in the water system. The following schedules are used as a minimum for preventive maintenance, and manufacturer's recommendations should be followed where conflict exists.

Storage Facilities

Daily	Visual and audio inspections. Check security and inspect facilities for proper operation.
Annually	Check interior condition, vents, hatches, etc. on tanks.
Every 5 years	Underwater video inspections.
As Needed	Clean and/or repaint interior and exterior as needed on tanks (estimated 10 to 20 year frequency).

Distribution System

Annually or As Needed	Leak survey.
Semi-Annually	Flushing.

Wells

Daily	Log and record volume delivered and current supply rate; visual and audio inspection; check oil level (Airport Well only); check packing; check security; check for excessive heat and vibration of pump motors.
Annually	Check all valves and screens; check control valve settings; re-grease; change oil (Airport Well only).
As Needed	Maintain electrical and mechanical equipment; paint structures and piping; calibrate equipment; replace O-rings and diaphragms in equipment.

Water Treatment Plant

Daily	Log and record run hours, motor starts, chemicals used, chemicals added, chlorine solution generated, fuse indicators, backwash volumes, volume delivered and current supply rate; visually inspect pumps; check pump packing; check pump oil levels; check all equipment for proper function and operation; check security.
Monthly	Exercise the emergency eyewash and emergency shower. Confirm charge on fire extinguishers and rotate per vendor service plan.
Quarterly	Measure treatment train media.
Annually	Check all valves and screens; check control valve settings; re-grease pumps; change pump oil.
As Needed	Maintain electrical and mechanical equipment; paint structures and piping; equipment calibration; indoor and outdoor facility maintenance and repairs.

Booster Pump Stations

Daily	Visual and audio inspection; check security; check pump motors for excessive heat and vibration.
Weekly	Observe and record motor current draw (three phases); log and record volume delivered and pump motor hours; check motor oil level; measure and record discharge pressure; check motor noise, temperature and vibration.
Annually	Take inventory of parts, pumps and motors.
As Needed	Calibrate flow meter; maintain electrical and mechanical equipment; paint structures and piping; routine maintenance of equipment.

Engine Generator Sets (WTP, Booster Pump Station)

Bi-Weekly	Operate to achieve normal operating temperatures; observe output. (Staff)
Semi-Annually	Routine maintenance in accordance with manufacturer's recommendations. (Contract)
As Needed	Replace fluids and filters in accordance with manufacturer's recommendations (or more frequently depending on amount of use). Perform tune-up; replace parts as necessary. (Contract)

Pressure Reducing Stations

Annually	Flush and check all valves and screens; check pressure settings.
As Needed	Rebuild and paint every five years or as necessary.

Interties

Annually	Review intertie procedures, if any, with adjacent utilities.

Isolation Valves

5 to 10 Year Intervals	Operate fully open and closed; uncover where buried; clean out valve boxes and repair as necessary. Repair and/or install valve marker posts as necessary.

Hydrants

Year 1 (of 2-year cycle)	Check for leakage and visual damage. Operate and flush; lubricate as necessary; measure pressure. Check nozzle and cap threads, and clean and lubricate per manufacturer's recommendations. Replace lost and damaged gaskets. Inspect drain system to ensure proper drainage and protection from freezing weather. Check and operate the auxiliary valve in accordance with the valve maintenance schedule. Leave in open position.
Year 2 (of 2-year cycle)	Check for leakage and visual damage. Clean exterior and paint as necessary. Landscape as needed for accessibility (repeat more often if necessary).

Meters

Annually	WTP raw and finished water meters are serviced and calibrated annually by a third-party vendor. Service and calibration records are maintained at the WTP.
2 to 5 Year Intervals	The source meter at the Airport Wellfield is serviced and calibrated as needed. The meter at the 520 Booster Pump Station is service and calibrated as needed. Service includes: time and measure volume of meter-delivered flow; dismantle, clean and inspect all parts; replace worn or defective parts; retest meter for accuracy. The PUD source meter is maintained by the PUD.
2 to 30 Year Intervals	Customer meters shall be replaced when reading problems are encountered.

Air and Vacuum Release Valve Assemblies

Annually	Flush and inspect, repair as needed.

Blowoff Assemblies

Annually	Flush and inspect, repair as needed.

Telemetry and Control System

Daily	Backup program and data.
Monthly	Visually inspect cabinets and panels for damage, dust and debris.
Semi-Annually	Inspect the inside of cabinets and panels for damage, dust and debris. Vacuum clean all modules. Test alarm indicator units. Clean and flush all pressure sensitive devices. Visually inspect all meters to coordinate remote stations.
Annually	Check master and remote telemetry units for proper operation; repair as necessary.

Tools and Equipment

Rolling Stock	
Weekly	Check all fluid levels and brakes. Fluid levels and brakes are checked each time the equipment is used if less than weekly.
As Needed	Replace fluids and filters in accordance with manufacturer's recommendations (or more frequently depending on type of use); preventive maintenance per manufacturer's recommendation.
Tools	
As Needed	Clean after each use; lubricate and maintain as necessary; inspect for damage and wear before each use; preventive maintenance performed per manufacturer's recommendation.

8.5 STAFFING

The preventive maintenance procedures, as well as the normal and emergency operations of the utility, are described in the previous sections. The hours of labor and supervisory activity required to effectively execute the ongoing maintenance and operations schedules form the basis for determining adequate staffing levels.

8.5.1 Current Staff

The current staff includes management and supervisory personnel, operators, maintenance workers and office personnel engaged in operating and maintaining the water system. There are currently eight field crew and two supervisory personnel in the operations and maintenance organization that support the City's water system. The Public Works Director, ~~(serving as~~ Utilities Manager~~)~~,

the Water Resources Planner, and the Utilities Specialist each support the City's water, wastewater, and stormwater utilities; thus, only a portion of their time is available for the water utility. Therefore, the water utility is supported by approximately ten full-time staff equivalents.

8.5.2 Current Staff Required

The amount of time annually available for each staff member for operations and preventative maintenance of the water system is shown in **Table 8-5**.

Table 8-5

Time Available Per Year Per Person

Beginning Hours Available	2,080
Less average vacation of 3 weeks per year	-120
Less average sick leave of 2 weeks per year	-80
Less holidays of 10 days per year	-80
Less average training of 40 hours per year	-40
Less average small tasks other than above of 1 hour per day	-220
Net Available Hours Per Year Per Person	1,540

The estimated hours of work required to achieve optimum operation and maintenance of the water system is shown in **Table 8-6**. The table identifies the staffing time for maintenance tasks, operational tasks, capital improvements and construction of water system facilities. The upper section of the tables identifies the staffing time requirements for recommended preventive maintenance tasks, and the lower section identifies the staffing time requirements for recommended operations tasks. The estimates of the time required for each component are based on a composite of similarly sized utilities in the region that are considered to have a responsible preventive and corrective water system maintenance program.

The regional productivity rates are modified as appropriate to reflect the characteristics of the utility being analyzed. System complexity and geographic characteristics can have a significant impact on productivity. The City's characteristics were considered when adjusting the regional values in this analysis.

To achieve the level of operations and maintenance shown in **Table 8-6**, approximately 10.2 full-time personnel are required for the water system alone. The City's current available water system staff is sufficient to meet these requirements. At the current staffing level, the City is capable of adequately operating the water system, complying with the minimum DOH and Ecology requirements and accomplishing the preventive maintenance tasks at the desired frequency listed previously in this chapter. The City will add staff in the future, as necessary and as allowed by budget, to meet the increasing requirements of system operation and maintenance, due to customer growth and increased regulatory requirements.

Table 8-6

Current Staff Required

Description	Total Units In System	Frequency (Times/Year)	Time/Unit (Hours)	Time/Year (Hours)
Preventive Maintenance				
Hydrants	800	0.25	0.5	100
Isolation Valves, Hydrant Valves	2,000	0.1	0.25	50
Air and Vacuum Release Valves	10	1	0.5	5
Blowoff Assemblies	50	1	0.25	13
Meters	5,147	0.1	2	1,029
Leak Survey of Water Mains	89 miles	1	0.5	45
Flushing Water Mains	89 miles	1	5	445
Booster Pump Station	1	1	40	40
Pressure Reducing Stations	8	1	6	48
Interties	3	1	6	18
Wells	4	1	50	200
Water Treatment Plant	1	1	4,620	4,620
Reservoirs	3	1	30	90
Telemetry and Control System	1	1	40	40
Operations				
Monitor System	10	260	0.3	780
False Alarm Response	1	12	2	24
Meter Reading	5,147	6	0.1	3,088
Groundskeeping	6	12	6	432
Inventory	1	1	40	40
Meter Repair/Replace	257	1	4	1,030
Main Breaks	1	4	8	32
System Failures	1	4	8	32
Hydrant Repairs	5	1	8	40
Service Connections	150	1	8	1,200
Main Connections	2	1	24	48
Water Quality Sampling	20	12	0.5	120
Administration	1	260	8	2,080
Total Staff Required				
Total Hours Required				15,689
Total Full Time Staff Required	**(based on 1,540 hours per year per person)**			**10.2**

9 Water System Improvements

9.1 INTRODUCTION



This chapter presents proposed improvements to the City of Arlington (City) water system that are necessary to resolve existing system insufficiencies and accommodate the projected growth of water customers. The water system improvements were identified from an evaluation of the results of the water system analyses presented in **Chapter 7**. The water system improvements have been sized to meet both the existing and future demand conditions of the system.

A Capital Improvement Program (CIP) number has been assigned to each proposed improvement. Numbers were assigned to the improvements starting at the north end of the system, and in general, incrementally increase to the south, as shown in **Figure 9-1**, a plan view of the improvements. The improvements are also illustrated in the hydraulic profile of the future water system that is shown in **Figure 9-2**. The improvements are organized and presented in this chapter according to the following categories (next page): The remainder of this chapter presents a brief description of each group of improvements, the criteria for prioritizing, the basis for the cost estimates, and the implementation schedule.

- Water System Improvements Since Last Water System Plan
- Water Main (WM) Improvements
- Pressure Zone (PZ) Improvements
- Pressure Reducing Station Improvements
- Facility (F) Improvements
- Miscellaneous (M) Improvements
- Developer-funded (DF) Improvements

9.2 WATER SYSTEM IMPROVEMENTS SINCE ~~LAST~~ THE 2011 WATER SYSTEM PLAN (AMENDED)

The water system has undergone several changes since the City's 2011 ~~when the City last updated~~ its Comprehensive Water System Plan (WSP) was published. The City has implemented numerous recommended projects from the 2011 and 2015 CIP. One notable improvement is the conversion of the water main in 89th Avenue NE from the 520 Zone to the 710 Zone. This conversion increases pressures on 89th Avenue NE and eliminates dead storage in the 520 Zone. The City has also implemented numerous high priority asbestos cement (AC) water main replacement and water main extension projects. **Table 9-1** lists the water system improvements that have been completed since the last WSP. Projects completed between the 2015 WSP and the 2017 amendment have also been added to **Table 9-1**. The CIP numbers shown in parenthesis correspond to the 2011 WSP.

Table 9-1
Improvements Completed Since ~~Last~~ the 2011 Water System Plan (Amended)

Project Description	Year	Diameter (inches)
Highway 9 Crossing 16" Water Main (WM4)	2012	16
Conversion of 342 Zone in 520 Zone in Cedarbough Loop (PZ3)	2012	8
Haller Wellfield Assessment (F5)	2012	n/a
Water Rights Acquisition Prgram (M1)	2012	n/a
Security System Improvements (M4)	2012	n/a
AC Water Main Replacement (Airport)	2012	8
AC Water Main Replacement (Lenore, Gifford, Washington) (24, 26, 31)	2012	12
AC Water Main Replacement (Broadway at SR 530) (1)	2012	12
Utility Administrative Building (F2)	2013	n/a
Airport Boulevard Water Main Extension (DF8)	2013	12
173rd Street Water Main	2013	12
WTP Discharge to Wetland	2014	n/a
AC Water Main Replacement (Gilman and Alcazar) (4 and 11)	2014	12
89th Avenue NE Pressure Zone Conversion (PZ1)	2015	n/a
AC Water Main Replacement (Jensen St) (47)	2015	12
AC Water Main Replacement (Marion, Florence) (44b)	2015	8
AC Water Main Replacement (5th St) (12)	2016	8 and 12
AC Water Main Replacement (Gifford, Washington, Stillaguamish) (16, 17, 18)	2016	12
AC Water Main Replacement (Highland Dr) (42)	2016	8 and 12
Demolish Burn Rd Reservoir (F3)	2016	n/a
Source of Supply Study (F2)	2017 (in progress)	n/a

The completed improvements are also crossed out on the 2011 WSP CIP, which is provided in **Table 9-2**. Projects that are ongoing are highlighted accordingly, and projects that have been removed from the CIP prepared for this WSP are also noted. Projects that were not completed or removed are included in the CIP prepared for this WSP and provided at the end of the chapter.

A brief explanation of the removed projects is as follows:

- WM3 – North Airport 12-inch Water Main: The City determined that this main was not necessary for redundancy, water quality, or fire flow.
- M5 – Groundwater Recharge Feasibility Assessment: The City decided not to pursue this as an opportunity.
- DF7 – North Island Crossing Commercial 12-inch Water Main Loop: This project has been reassigned as CIP WM6 in this chapter.
- DF9 – 12-inch Water Main in 172nd Street NE from Airport Boulevard to 60th Avenue NE: The water main was moved to the proposed WM5 Manufacturing Industrial Center (MIC) water main improvements.
- DF10 – 12-inch Water Main in 172nd Street NE from 63rd Avenue NE to 67th Avenue NE: The water main was moved to the proposed WM5 MIC water main improvements.
- DF13 – 107th Avenue NE to Burn Road 8-inch Water Main Loop: In order to resolve existing high pressures, this water main loop was removed and a new 560 pressure zone is proposed.

9.3 WATER MAIN IMPROVEMENTS (AMENDED)

The following water main improvements were identified based on the results of the distribution and transmission system analyses discussed in **Chapter 7**. Most of the water main improvements are up-sizing of existing distribution water mains and replacement of AC mains. These water main improvements are grouped in the Annual Water Main Replacement Program project (CIP WM1). The individual water main improvement projects within this group are numbered 1 through 113, as shown on **Figure 9-1**. The other water main improvements are mostly larger-diameter water mains that function more like transmission than distribution mains, and are identified as individual projects (CIP WM2 through WM6 ~~WM5~~).

9.3.1 Future Water Main Extensions and Replacements

All new water main extensions and replacements shall be installed in accordance with the City's Design and Construction Standards and Specifications, which are contained in **Appendix D**. All new water mains shall be cement-mortar lined ductile iron pipe and sized by a hydraulic analysis to ensure that all pressure, flow, and velocity requirements, as stated in **Chapter 5**, are met. In general, new water mains that will carry fire flow in residential areas shall be a minimum of 8 inches in diameter, and looped for multi-family residential developments and single family transmission purposes. New water mains in commercial, business park, industrial, school, and airport areas shall be a minimum of 12 inches in diameter and looped.

Table 9-2

Modified Improvement Schedule from the Previous (2011) Water System Plan (Amended)

CIP No.	Description	Estimated Cost (2010 $$)	20-Year Schedule of Improvements Planned Year of Project and Estimated Cost in 2010 $$							
			2011	2012	2013	2014	2015	2016	2017-2022	2023-2030
Water Main Improvements										
WM1	Annual Water Main Replacement Program	$25,459,000	$400K	$400K	$300K	$200K	$400K	$400K	$2,400K	$20,959K
WM2	12" Water Main in 204th Street NE for North Island Crossing	$1,580,000							$1,580K	
~~WM3~~	~~North Airport 12" Water Main~~	~~$515,000~~							~~$515K~~	
~~WM4~~	~~Highway 9 Crossing 16" Water Main~~	~~$400,000~~	~~$400K~~							
Pressure Zone Improvements										
~~PZ1~~	~~89th Avenue NE 12" Water Main~~	~~$1,070,000~~		~~$535K~~	~~$535K~~					
PZ2	Conversion of 540 Zone to 520 and 615 Zones	$280,000							$280K	
~~PZ3~~	~~Conversion of 342 Zone to 520 Zone in Cedarbough Loop~~	~~$90,000~~						~~$90K~~		
Facility Improvements										
F1	Demolish Old WTP	$170,000			$170K					
~~F2~~	~~Utility Administration Building~~	~~$700,000~~	~~$450K~~	~~$250K~~						
~~F3~~	~~Demolish Burn Road Reservoir~~	~~$75,000~~						$75K		
F4	Airport Wellfield Well Rehabilitation and Treatment	$945,000		$45K	$250K	$650K				
~~F5~~	~~Haller Wellfield Assessment and Well Replacement~~	~~$165,000~~	~~$165K~~							
F6	Future 2.0 MG Reservoir	$4,050,000							$4,050K	
F7	Gleneagle Reservoir Roof Replacement	$350,000			$350K					
F8	520 Reservoir Improvements	$25,000		$25K						
Miscellaneous Improvements										
~~M1~~	~~Water Rights Acquisition Program~~	~~$400,000~~	~~$100K~~	~~$100K~~	~~$100K~~	~~$100K~~				
M2	Drive-by Read Meter Conversion	$540,000	$30K	$30K	$40K	$40K	$50K	$50K	$300K	
M3	Source Water Protection Program	$30,000			$30K					
~~M4~~	~~Security System Improvements~~	~~$15,000~~			~~$10K~~	~~$5K~~				
~~M5~~	~~Groundwater Recharge Feasibility Assessment~~	~~$35,000~~							~~$35K~~	
~~M6~~	~~Comprehensive Water System Plan Update~~	$360,000						~~$120K~~		$240K
Total Estimated Project Costs of City Funded Improvements		**$37,254,000**	**$1,545K**	**$1,385K**	**$1,785K**	**$995K**	**$450K**	**$735K**	**$9,160K**	**$21,199K**
Developer Funded Improvements										
DF1	12" Water Main Loop from 59th Ave NE to 66th Ave NE	$480,000	Timing of Project Based on Timing of Future Developments							
DF2	8" Water Main Replacement in 211th Pl NE	$210,000	Timing of Project Based on Timing of Future Developments							
DF3	Jensen Farm High Density Residential 8" and 12" Water Main Loop	$70,000	Timing of Project Based on Timing of Future Developments							
DF4	59th Ave and Cemetery Road Industrial Improvements	$750,000	Timing of Project Based on Timing of Future Developments							
DF5	12" Water Main in 196th St NE from Burn Road to Crown Ridge Blvd	$350,000	Timing of Project Based on Timing of Future Developments							
DF6	Northwest Airport 12" Water Main Loop	$640,000	Timing of Project Based on Timing of Future Developments							
DF7	North Island Crossing Commercial 12" Water Main Loop	$760,000	Timing of Project Based on Timing of Future Developments							
~~DF8~~	~~Island Crossing 12" Water Main Connection in 180th St NE~~	~~$600,000~~	Timing of Project Based on Timing of Future Developments							
DF9	12" Water Main in 172nd St NE from Airport Blvd to 60th Ave NE	$590,000	Timing of Project Based on Timing of Future Developments							
DF10	12" Water Main in 172nd St NE from 63rd Ave NE to 67th Ave NE	$320,000	Timing of Project Based on Timing of Future Developments							
DF11	12" Water Main in 172nd St NE from 67th Ave NE to 71st Ave NE	$300,000	Timing of Project Based on Timing of Future Developments							
DF12	12" Water Main in Troon Ct from Troon Ct Cul-de-Sac to 174th St NE	$190,000	Timing of Project Based on Timing of Future Developments							
DF13	107th Ave NE to Burn Road 8-inch Water Main Loop	$530,000	Timing of Project Based on Timing of Future Developments							
DF14	615 Zone Water Main East of 89th Ave NE	$1,470,000	Timing of Project Based on Timing of Future Developments							
DF15	710 Zone Booster Pump Station and Water Main	$2,400,000	Timing of Project Based on Timing of Future Developments							
Total Estimated Project Costs of Developer Funded Improvements		**$9,660,000**								

~~Project~~ = Project completed since 2015 WSP
~~Project~~ = Project removed since 2015 WSP
Project = Ongoing project

9.3.2 CIP WM1: Annual Water Main Replacement Program

Deficiency: Most of the water main improvements shown in **Figure 9-1** are required to resolve existing system fire flow deficiencies caused primarily by older undersized water mains installed prior to the local government adoption of fire flow requirements. The improvements also include the City's AC water main replacement program.

Improvement: Replace existing water main with new ductile iron water main in accordance with the City's Public Works Design and Construction Standards and Specifications, which are contained in **Appendix D**. The individual water main improvements grouped under this project are numbered 1, 2, 3, etc., as shown in **Figure 9-1.** The selection of specific projects will be accomplished annually during the City's budget development process and will be guided by the prioritization presented later in this chapter. This provides the City with the flexibility to coordinate these projects with other projects that may occur within the same area. An allowance of $500,000 per year has been established for the annual replacement of the water mains.

9.3.3 CIP WM2: 12-inch Water Main in 204th Street NE for North Island Crossing

Deficiency: The City began directly serving the Island Crossing Water System on February 8, 2005. Although there is existing 10-inch water main in Smokey Point Boulevard, CIP WM2 is necessary to improve fire flow and reliability in the Island Crossing area.

Improvement: Install new 12-inch ductile iron water main in 204th Street NE, 43rd Avenue NE, and Cemetery Road from 47th Avenue NE to Smokey Point Boulevard. A creek crossing will be necessary. Approximately 75 percent of this project will be developer-funded.

9.3.4 CIP WM3: 198th Place NE/Cemetery Road Water Main

Deficiency: The City's supply and storage facilities are located in the eastern portion of the service area. The water main in 198th Place NE and Cemetery Road is one of the primary water mains connecting the service areas on the east and west sides of the Arlington airport. This vital water main is comprised of 12-inch AC, 10-inch ductile iron (DI), 8-inch DI, and is 45 to 55 years old.

Improvement: Install new 12-inch ductile iron water main in 198th Place NE/Cemetery Road/204th Street NE from 49th Avenue NE to 67th Avenue NE.

In 2014, with the filing of a petition with Snohomish County Planning and Development Services, the City proposed expansion of its Urban Growth Area (UGA) into its Rural Urban Transition Area (RUTA) west of I-5. This area does not currently have municipal water service. Water main extensions and looping are necessary if this area is to be served.

Since the 2015 WSP was published, the City decided to not grow west of I-5 at this time, and subsequently withdrew its petition from the Snohomish County docket. There is no longer a need for capital improvements for water distribution. Since this area is in the City's Water Service Area, this 2017 WSP Amendment keeps CIP WM4 solely for tracking purposes. No resources are allocated to this project.

~~**Deficiency:** The City is proposing Urban Growth Area (UGA) expansion into its Rural Urban Transition Area (RUTA) west of I-5. This area does not currently have municipal water service. Water main extensions and looping are necessary to service this area.~~

~~This WSP plans for projected water service needs throughout the City's WSA, including both currently serviced and currently unserviced areas. Because this would be the City's first extension of its distribution system west of I-5, the actual improvements and timing of those improvements are predicated on events that are neither known nor certain. Water service will not be provided to this area unless or until there is approval by the County Council (through the 2016 or later docket) and a sound development proposal. This is noted in the 25%/75% capital cost split between the City and a future developer in Table 9-6. See additional discussion in Section 3.2.2.~~

~~**Improvement:** Install new 12-inch ductile iron water in 188th Street NE from 29th Avenue NE to 23rd Avenue NE, 23rd Ave NE from 188th Street NE to 200th Street NE, and 200th Street NE from 23rd Avenue NE to Smokey Point Boulevard. Two I-5 freeway borings will be necessary to provide a looped system. Approximately 75 percent of this project will be developer-funded.~~

9.3.5 CIP WM5: South of 172nd Area MIC Water Main

Deficiency: The Manufacturing Industrial Center (MIC) area south of 172nd Street NE is planned for industrial development. Water main extensions and looping are necessary to service this area.

Improvement: Install new 12-inch ductile iron water main in 43rd Avenue NE from approximately 174th Place NE to approximately 168th Street NE, approximately 47th Avenue NE from SR 531 to approximately 168th Street NE, 51st Avenue NE from SR 531 to approximately 168th Street NE, approximately 168th Street NE from 43rd Avenue NE to approximately 65th Avenue NE, approximately 65th Avenue NE from SR 531 to approximately 168th Street NE, and SR 531 from approximately 64th Avenue NE to approximately 65th Avenue NE. Approximately 75 percent of this project will be developer-funded.

9.3.6 CIP WM6: Island Crossing Utility Local Improvement District

Deficiency: Recent developer proposals in the Island Crossing area have generated the potential for commercial enterprises with high demand for potable water on a schedule much quicker than anticipated in the 2015 WSP. Existing infrastructure within Island Crossing was installed in approximately 1973, and is situated in a more remote area of the distribution system. Some mains are undersized, and there is no looping or redundancy. Fire flow demands in Island Crossing will exceed supply much quicker than anticipated in the 2015 WSP.

Improvement: Install approximately 5,100 linear feet of 12-inch ductile iron water main along the western boundary of the Island Crossing area, as shown in **Figure 9-1**. It is recommended that this project be planned and coordinated with CIP WM2, which also provides additional looping and redundancy to improve fire flow availability and the level-of-service provided to the Island Crossing area.

9.4 PRESSURE ZONE IMPROVEMENTS

The following pressure zone improvements are proposed in the portions of the City's water service area (WSA) that do not meet the City's pressure standards, and will improve various high- and low-pressure problem areas throughout the water system. A brief description of the existing deficiency and proposed improvement for each project are provided in the next paragraph.

9.4.1 CIP PZ1: Conversion of 710 Zone to 560 Zone (107th Avenue NE)

Deficiency: As shown in **Table 7-10** of **Chapter 7**, existing customers in the lower elevations of the 710 Zone on 107th Avenue NE and 195th Street NE have high pressure well above 100 pounds per square inch (psi).

Improvement: Convert a portion of the 710 Zone on 107th Avenue NE and 195th Street NE to a 560 Zone by installing a pressure reducing station on 107th Avenue NE at approximately 184th Street NE. The proposed pressure reducing station should have an 8-inch valve and a 3-inch valve.

9.4.2 CIP PZ2: Conversion of 710 Zone to 615 Zone

Deficiency: Portions of the 710 Zone on Burn Road, 186th Street NE, and 89th Avenue NE have high pressure.

Improvement: Convert the 710 Zone to a 615 Zone by installing a pressure reducing station on Burn Road east of McElroy Road. The proposed pressure reducing stations should each have an 8-inch valve and a 3-inch valve.

9.4.3 CIP PZ3: Conversion of 540 Zone to 615 and 520 Zone.

Deficiency: The 540 Zone located along Burn Road has moderately low pressures.

Improvement: Convert a portion of the 540 Zone to the 520 Zone by installing a pressure reducing station on Burn Road at 196th Street NE. Convert a portion of the 540 Zone to the 615 Zone by abandoning the existing Upper Burn Road pressure reducing valve (PRV). The proposed pressure reducing stations should each have an 8-inch valve and a 3-inch valve.

9.5 FACILITY IMPROVEMENTS

The following water system facility improvements were identified from the results of the water system analyses that are discussed in **Chapter 7**. The improvements are primarily necessary to resolve existing system deficiencies, but have also been sized to accommodate projected growth.

9.5.1 CIP F1: Demolish Old Water Treatment Plant

Deficiency: Constructed in 1924, the old water treatment plant was replaced with a new water treatment plant in 2001. The old WTP is no longer in use, but was painted with an attractive mural by at-risk youth in 2014.

Improvement: Demolish the old water treatment plant later in this planning horizon. Demolition could require stabilization of the slope on the north side of the new WTP.

9.5.2 CIP F2: Source of Supply Study

Deficiency: The results of the source capacity evaluation in **Chapter 7** indicate that the City's existing sources do not have sufficient capacity to meet projected demands. In addition, the well casing in the City's existing Airport Well collapsed in 2009, reducing the well depth from 185 feet to approximately 120 feet, and the well's supply rate from 580 gallons per minute (gpm) to 220 gpm. The Airport Well is also an aging facility with other deficiencies, including drainage problems, electrical hazards, limited clearances, and corrosion. According to the water rights analysis in **Chapter 6**, the City has excess water rights available to utilize to meet future demand projections.

Improvement: Prepare a source of supply study that evaluates options for utilizing the excess water rights within the WSA to replace the existing Airport Well. As of the 2017 WSP Amendment, this CIP project is in progress.

9.5.3 CIP F3: Demolish Burn Road Reservoir

Deficiency: The City's Burn Road Reservoir is nearly 50 years old and is surrounded by steep slopes. The facility also experiences continuous vandalism. In 2014, the Burn Road Reservoir was taken off line and drained.

Improvement: Rather than protect the steep hillside, increase security measures, and improve the Burn Road Reservoir, the City will demolish it.

This reservoir was demolished in 2016, following the completion of the City's 2015 WSP. Due to elevated petroleum hydrocarbons under the reservoir (from diesel applied as a corrosion prevention measure during construction in the early 1960s), the site was treated with compost to enhance the natural degradation of the soil contaminants. It will be monitored by the City as an operations and maintenance task periodically in the future. This 2017 WSP Amendment keeps CIP F3 solely for tracking purposes. No future capital expenditures are anticipated.

9.5.4 CIP F4: New Supply Well No. 1 (Replace Airport Well)

Deficiency: The results of the source capacity evaluation in **Chapter 7** indicate that the City's existing sources do not have sufficient capacity to meet projected demands. The well casing in the City's existing Airport Well collapsed in 2009, reducing the well depth from 185 feet to approximately 120 feet, and the well's supply rate from 580 gpm to 220 gpm. The equipment in

the Airport Well building is located below grade, which causes drainage problems and electrical hazards. The aging building also has limited clearances and exposed insulation. The interior piping has signs of corrosion and requires replacement. ~~If additional water rights are obtained for this well, a larger pump, along with iron and manganese treatment, will be required at this facility. Replacement of the Airport Well at the existing location or at another site outside of the airport area will be determined by CIP F2 – Source of Supply Study.~~ Since publication of the 2015 WSP the City Water Utility, at the behest of the Federal Aviation Administration, has determined that a new water source should be obtained off of Airport property and that the current Airport Well be closed after the new source is fully operational. The location of a new well will be identified as part of CIP F2 – Source of Supply.

Improvement: ~~Construct a new facility that includes a new well, structure, piping, well pump, on-site chlorine generation system, and an iron and manganese treatment process. The reuse of the Airport Well's existing electrical equipment will be examined during the design phase. The piping and treatment facility will be designed to accommodate future supply sources as determined in CIP F2 – Source of Supply Study. The cost estimates assume that the well will produce approximately 580 gpm and be drilled to a depth of approximately 200 feet. After the well is drilled, a treatment pilot study will be performed to determine the exact design parameters of the filter and chlorination systems.~~ No improvements are planned for the Airport Well other than necessary operations and maintenance work to keep the well operational until CIP F5 – New Supply Well is complete and on-line.

9.5.5 CIP F5: New Supply Well No. 2

Deficiency: The results of the source capacity evaluation in **Chapter 7** indicate that the City's existing sources and New Supply Well No. 1 do not have sufficient capacity to meet projected demands.

Improvement: Construct an additional well facility at the site of the New Supply Well No. 1, if determined to be an acceptable location for water right transfer, per CIP F2 – Source of Supply Study. The facility will include drilling a well with a depth of approximately 200 feet and a capacity of ~~approximately~~ 679 gpm. Supply Well No. 2 water will be treated by the treatment facility constructed for CIP F4.

9.5.6 CIP F6: Future 1.0 Million Gallon (MG) Reservoir

Deficiency: The City's future water system will have insufficient storage.

Improvement: Locate and install a new 520 Zone Reservoir to provide additional gravity storage for future customers. The new reservoir will have an overflow elevation of approximately 520 feet to enable gravity supply to the 520 Zone. The reservoir will be sized to provide at least 1.0 MG of usable storage to provide adequate storage for future customers. The optimal location of the proposed 520 Zone Reservoir is within the areas shown in **Figure 9-1**.

9.5.7 CIP F7: Gleneagle Reservoir Roof Replacement

Deficiency: The City's Gleneagle Reservoir has a wooden roof that requires replacement. The existing roof experiences decay and persistent moss problems. The structure also has poorly designed vents.

Improvement: Evaluate the existing concrete structure and determine the requirements for a new roof. Remove and replace the roof, along with any necessary structural members associated with the roof replacement.

9.5.8 CIP F8: 520 Reservoir Improvements

Deficiency: The City's 520 Reservoir site does not have a perimeter chain link fence to prevent intruders from entering the site.

Improvement: Install a chain link fence on the 520 Reservoir site to improve security and deter vandalism.

9.5.9 CIP F9: Replacement Clearwell Pumps

Deficiency: At least two of the City's three clearwell pumps that supply the 342 Zone with treated water from the Haller Wellfield are showing signs of excess wear and reduced capacity from their design conditions. The pumps are critical to the City's ability to provide water supply to its customers.

Improvement: Install three replacement clearwell pumps at the Water Treatment Plant. Two pumps were replaced in 2016 and 2017, leaving the one remaining pump to be replaced in 2018.

9.6 MISCELLANEOUS IMPROVEMENTS

The following miscellaneous improvements are planning efforts and program elements that are required to comply with various water regulations or are improvements that do not fit into one of the previous categories.

9.6.1 CIP M1: Drive-by Read Meter Conversion

Deficiency: The City currently uses a significant amount of staff time to read customer water meters.

Improvement: The City will continue to upgrade manual customer meters to drive-by meter read systems. Existing touch meter systems will also be updated with drive-by transponders. As of this 2017 WSP Amendment, progress with drive-by meter conversions is well ahead of schedule. Anticipated meter conversions are scheduled to be significantly complete by 2018.

9.6.2 CIP M2: Source Water Protection Program

Deficiency: The City's Haller and Airport Wellfields are susceptible to contamination. The City has begun, but needs to complete a Wellhead Protection and Watershed Control Program.

Improvement: The City will improve the mapping of its wellhead protection areas and implement wellhead protection requirements in its municipal code. Objectives include protection of high-quality water to promote public health, minimizing customer costs, protection of instream water resources, and to advocate for the City's interests within the Upper Stillaguamish Basin.

9.6.3 CIP M3: WSP Update

Deficiency/Requirement: The Washington Administrative Code (WAC) 246-290-100 requires that the City's WSP be updated every 6 years and submitted to Washington State Department of Health (DOH) for approval. Proposed changes to the WAC may extend the update requirement to 10 years.

Improvement: The City will update and submit its WSP every 6 years to comply with state requirements, or 10 years if the state standard is modified. The WSP amendment being completed in 2017 is anticipated to receive approval through 2024.

9.7 DEVELOPER-FUNDED IMPROVEMENTS

The following water system improvement costs shall be borne by the developers, rather than the existing water customers, unless over-sizing of the improvements provides benefit to the existing customers. Improvements have been identified for the undeveloped areas of the City's existing and expected service area to illustrate the major facilities that will be required to properly serve that area. Additional developer-funded projects include localized on-site water main improvements that are not associated with overall water distribution, but would be necessary if the property served by the water main is redeveloped or expanded. The locations of the facilities are shown schematically in **Figure 9-1**.

9.7.1 CIP DF1: 12-inch Water Main Loop from 59th Avenue NE to 66th Avenue NE

Deficiency: Commercial development that occurs near SR 530 and 59th Avenue NE in the 342 Zone will require 12-inch water main to provide adequate levels of fire flow service to the area.

Improvement: Install 12-inch water main in SR 530 and 211th Place NE from Kraetz Road to Ronning Road.

9.7.2 CIP DF2: 12-inch Water Main Replacement in 211th Place NE

Deficiency: Commercial development that occurs near SR 530 and 59th Avenue NE in the 342 Zone will require a 12-inch water main connection to the existing system. The existing water main in 211th Place NE is 6-inch diameter pipe.

Improvement: Replace the 6-inch water main in 211th Place NE with 12-inch water main from Ronning Road to 67th Avenue NE.

9.7.3 CIP DF3: Jensen Farm High Density Residential 12-inch Water Main

Deficiency: Future high density apartments that develop in the vicinity of the 8-inch dead-end water main will have sufficient fire flow capacity, but with high velocities.

Improvement: Replace the existing 8-inch dead-end water main in Anna Lane, Lois Lane, and Jensen Park with 12-inch water main.

9.7.4 CIP DF4: 59th Avenue and Cemetery Road Industrial Improvements

Deficiency: The existing available fire flow at the fire hydrants at the end of the 8-inch dead-end water mains is less than the general fire flow requirement, and velocities are higher than acceptable.

Improvement: Upon further development of the adjacent properties, install 12-inch water main on-site.

9.7.5 CIP DF5: 12-inch Water Main in 196th Street NE from Burn Road to Crown Ridge Boulevard

Deficiency: Development that occurs east of Burn Road will require an extension of the 520 Zone to allow for continuous flow from the 520 Reservoir to the proposed developments.

Improvement: Install 12-inch water main within 196th Street NE from Burn Road to the 520 Zone.

9.7.6 CIP DF6: Northwest Airport 12-inch Water Main Loop

Deficiency: Development that occurs in the light industrial area located northwest of the airport will be required to install a 12-inch water main loop to improve reliability and fire flow in the area.

Improvement: Install 12-inch water main within the light industrial zone from approximately 188th Street NE to approximately 196th Place NE and 51st Drive NE.

9.7.7 CIP DF7: North Island Crossing Commercial 12-inch Water Main Loop

Since the 2015 WSP was published, the City decided to reassign this project as CIP WM6, as presented previously in this chapter. This 2017 WSP Amendment keeps CIP DF7 solely for tracking purposes. No resources are allocated to this project.

~~**Deficiency:** Development that occurs in the commercial areas of North Island Crossing will require looping for reliability and adequate fire flow capabilities.~~

~~**Improvement:** Install 12-inch water main within the commercial properties that will connect the Smokey Point Boulevard water main to the SR 530 water main.~~

9.7.8 CIP DF8: Kraetz Road Water Main

Deficiency: Development that occurs in the commercial areas at the end of the Kraetz Road water main will be required to replace the existing water main with 12-inch water main.

Improvement: Install 12-inch water main within Kraetz Road and Dike Road from SR 530 to Smokey Point Concrete as development occurs.

9.7.9 CIP DF9: 12-inch Water Main in 172nd Street NE from 67th Avenue NE to 71st Avenue NE

Deficiency: Development that occurs along 172nd Street NE between 67th Avenue NE and 71st Avenue NE will be required to extend the 12-inch water main from the existing water system for distribution of storage and supply to new development.

Improvement: Install 12-inch water main in 172nd Street NE between 67th Avenue NE and 71st Avenue NE as development occurs.

9.7.10 CIP DF10: 12-inch Water Main in Troon Court from Troon Court Cul-de-sac to 174th Street NE

Deficiency: Development that occurs south of Troon Court will be required to replace the existing 8-inch water main in Troon Court with 12-inch water main, and extend the 12-inch water main from the Troon Court cul-de-sac to the south for distribution of storage and supply to new development.

Improvement: Replace the existing 8-inch water main in Troon Court with 12-inch water main, and install the 12-inch water main south of the Troon Court cul-de-sac to approximately 174th Street NE as development occurs.

9.7.11 CIP DF11: 615 Zone Water Main East of 89th Avenue NE

Deficiency: Development that occurs east of 89th Avenue NE between 172nd Street NE and 186th Street NE will be required to extend and loop 8- and 12-inch water mains from the proposed 8-inch water main in 89th Avenue (CIP PZ1).

Improvement: Install 8- and 12-inch water mains east of 89th Avenue NE from 172nd Street NE to 186th Street NE to create a loop. Multiple creek crossings will be necessary.

9.7.12 CIP DF12: 710 Zone Booster Pump Station and Water Main

Deficiency: Development that occurs in the 615 and 710 Zones along Burn Road will not be adequately served by the existing PUD wholesale supply.

Improvement: Install a new pump station that will function as the back-up and fire flow supply facility for the 615 and 710 Zones. The pump station will supply the zones in conjunction with the PUD wholesale supply source. Additionally, install 12-inch water main from the Burn Road transmission main to the proposed 710 Zone booster pump station to convey supply throughout the area. The layout of the water main will be determined in the future by the location of roadways for the new development.

The pump station will have a maximum capacity to satisfy the largest fire flow requirement and peak water demand of the zone, estimated at approximately 3,200 gpm. The recommended pump arrangement is two smaller pumps for providing domestic service and one larger pump to provide fire flow and peak demand supply. The actual pump capacities and final configuration will be determined during the preliminary design phase of the project when more information is available about the area to be served. The preliminary design should consider the installation of a PRV at the pump station to provide fire flow to the 615 Zone near the pump station site and/or having the ability to use the same fire flow pump for both the 615 and 710 Zones, as needed.

9.8 ESTIMATING COSTS OF IMPROVEMENTS

Project costs for the proposed improvements were estimated by the City and RH2 Engineering, Inc., (RH2) based on costs of similar, recently-constructed projects in the City and around the Puget Sound area. The total cost estimates, which are presented in 2015 dollars, include the estimated construction cost of the improvement and indirect costs estimated at 35 percent for engineering preliminary design, final design, construction management services, permitting, legal, and administrative services. The construction cost estimates include a 10-percent contingency and sales tax of 8.8 percent.

Construction cost estimates for water main projects were determined from the water main unit costs (i.e., cost per foot length) shown in **Table 9-2** and the proposed diameter and approximate length of each improvement. These costs include all phases of installation (planning, design, permitting, and construction).

Table 9-3

Water Main Unit Costs

Water Main Diameter (inches)	Construction Cost Per Foot Length (2015 $/LF)
8	$170
12	$187
16	$206

The unit costs for each water main size are based on estimates of all construction-related improvements, such as materials and labor for the water main installation, water services, fire hydrants, fittings, valves, connections to the existing system, trench restoration, asphalt surface restoration per City standards, other work necessary for a complete installation, contingency, and sales tax. Additional costs were added to some water main improvements to cover anticipated, increased costs related to the project location and degree of difficulty. Indirect costs are estimated at 35 percent of the water main construction cost utilizing the construction cost per foot and the additional project related costs, and are included in the total cost for each water main project.

9.9 PRIORITIZING IMPROVEMENTS

The water system improvements were evaluated against established criteria to schedule projects that will correct the most deficiencies and meet the greatest need for improvement prior to projects correcting fewer deficiencies. A description of the criteria and method for prioritizing each category of improvements are provided below.

9.9.1 Water Main Improvements

Table 9-3 lists criteria that were established for prioritizing the water main improvements. The criteria are based on the underlying deficiencies of the existing water main that will be replaced by the proposed water main improvements. The criteria are arranged in four different categories with a weight factor assigned to each category. The criterion given the most weight is the Existing Water Main Fire Flow Capability.

Table 9-4

Water Main Improvements Priority Ranking Criteria

Points	Category	Weight Factor	Weighted Points
	Existing Water Main Fire Flow Capability		
3	Available Fire Flow is 69% or Less of Required Fire Flow	4	12
2	Available Fire Flow is 70-89% of Required Fire Flow	4	8
1	Available Fire Flow is 90-100% or More of Required Fire Flow	4	4
	Existing Water Main Year of Installation		
3	Before 1960	3	9
2	1960 - 1980	3	6
1	After 1980	3	3
	Existing Water Main Material		
3	Asbestos Cement	3	9
2	Galvanized Iron, Steel, or Cast Iron	3	6
1	Ductile Iron or PVC	3	3
	Existing Water Main Benefit Area		
3	Large Benefit Area (i.e. transmission main)	2	6
2	Medium Benefit Area	2	4
1	Small Benefit Area (i.e. localized area)	2	2

The Existing Water Main Fire Flow Capability category ranks the water main improvements based on the ability of the existing water mains to provide the required fire flow, as determined from the results of the hydraulic analyses in **Chapter 7**. The Existing Water Main Year of Installation category ranks the water main improvements based on the age of the existing water mains. The Existing Water Main Material category ranks the water main improvements based on the material of the existing water main. The Existing Water Main Benefit Area category ranks the water main improvements based on the size of the area that will benefit from the replacement.

The water main priority ranking criteria were applied to the annual water main replacement projects, which are grouped under CIP WM1. CIP 1 through 113, as shown in **Figure 9-1**, are presented in **Table 9-4** with their priority ranking.

9.9.2 Other Improvements

The additional pressure zone, pressure reducing station, and facility improvements were prioritized based on existing deficiencies, safety concerns, maintenance requirements, and capacity

requirements. The miscellaneous improvements were prioritized based on regulatory requirements and assessment of the water system needs. The priority order of these improvements is reflected in the schedule of improvements, which is presented in the next section.

9.10 SCHEDULE OF IMPROVEMENTS

The results of prioritizing the improvements were used to assist in establishing an implementation schedule that can be used by the City for preparing its six-year CIP and yearly water department budget. The implementation schedule for the proposed improvements is shown in **Table 9-5**. ~~An allowance of $500,000 per year has been established for the annual replacement of the water mains.~~

The City will identify and schedule the replacement of water mains to be funded by the annual water main replacement program during the annual budget process. This provides the City with the flexibility to coordinate these projects with road or other projects within the same area. The developer-funded improvement projects and their associated cost estimates are shown near the bottom of the table. However, the implementation dates for these improvements are not shown, due to the uncertainty of the timing of the future developments that will be responsible for these improvements.

9.10.1 Future Project Cost Adjustments

~~All cost estimates shown in the tables are presented in year 2015 dollars.~~ These cost estimates will need to be adjusted to account for the effects of inflation and changing construction market conditions to determine future costs at the actual time of project implementation. Future costs can be estimated using the Engineering News Record (ENR) Construction Cost Index for the Seattle area, or by applying an estimated rate of inflation that reflects the current and anticipated future market conditions.

Continued

Table 9-5

Prioritized Annual Water Main Replacement Projects (Amended)

No.	Size		Location			Estimated Cost	Priority[1]
	Length	Diam	In	From	To		
1	261	12	Broadway St	Falcon St	Dead End	$66,000	H
	671	12	Haller Ave	West Ave	Dead End	$183,000	
	124	12	Railroad St	WTP	Haller Park	$32,000	
2	1,245	12	Burke Ave	Broadway St	Manhattan Ave	$315,000	H
	897	12	Manhattan St	Gilman Ave	Fifth St	$227,000	
3	925	12	Gilman St	Railroad Ave	Newberry St	$234,000	H
4	890	12	Talcott St, Division St	Gilman Ave	Alcazar Ave	$225,000	M
5	1,919	12	Division St, SR9	West Ave	Burke Ave	$485,000	H
	390	12	Burke Ave	SR 9	West Ave	$99,000	
6	141	12	Olympic Ave	Division St (South)	Division St (North)	$36,000	M
7	1,150	8	Dunham Ave, Division St	Fifth St	Manhattan Ave	$264,000	H
	524	8	French Ave	Fifth St	Division St	$121,000	
8	744	12	Park Hill Dr	Alcazar Ave	Park Hill Dead End	$188,000	H
9	856	12	Fifth St	Clara St	Clara St Dead End	$217,000	M
	390	12	Driveway	Fifth St	Parking Lot	$99,000	
10	1,099	8	Clara St	Fifth St	Clara St Dead End	$253,000	H
11	589	12	Broadway St	SR 530	Division St	$149,000	H
	1,056	12	Division St, Rockery Rd	Dunham Ave	Manhattan Ave	$267,000	
~~12~~	~~464~~	~~12~~	~~Fifth St~~	~~West Ave~~	~~Olympic Ave~~	~~$131,000~~	~~H~~
	~~1,779~~	~~8~~	~~Fifth St~~	~~Olympic Ave~~	~~Just West of~~	~~$409,000~~	
	~~511~~	~~12~~	~~Fifth St~~	~~Just West of Washington Ave~~	~~Just West of Alcazar Ave~~	~~$130,000~~	
	344	12	Parking Lot	West Ave	Parking Lot	$87,000	
13	422	8	Fourth St	SR 9	West Ave	$97,000	H
14	308	8	Fourth St	Macleod Ave	Dunham Ave	$71,000	H
	67	12	Fourth St	Olympic Ave	Just West of Olympic	$17,000	
15	570	12	Fourth St	Gifford Ave	Stillaguamish Ave	$144,000	M
~~16~~	~~444~~	~~12~~	~~Gifford Ave~~	~~Fifth St~~	~~School~~	~~$113,000~~	~~H~~
	~~457~~	~~12~~	~~Washington Ave~~	~~Fifth St~~	~~School~~	~~$116,000~~	
	~~423~~	~~12~~	~~Washington Ave~~	~~Third Street~~	~~School~~	~~$107,000~~	
	~~446~~	~~12~~	~~Stillaguamish Ave~~	~~Fifth St~~	~~Fourth St~~	~~$113,000~~	
~~17~~	~~263~~	~~12~~	~~Washington Ave~~	~~Fifth St~~	~~Dead End~~	~~$67,000~~	~~M~~
~~18~~	~~626~~	~~12~~	~~School Property~~	~~School~~	~~School~~	~~$159,000~~	~~L~~
19	204	12	Clara St	Fifth St	Fourth St	$52,000	M
20	3,717	12	Third St	SR 9	E Robinhood Dr Dead	$952,000	H
21	438	12	West Ave	Third St	Second St	$111,000	L
	533	12	Second St	West Ave	Macleod Ave	$149,000	
22	894	12	Macleod Ave	Third St	First St	$226,000	M
23	322	12	Second St	French Ave	Lenore Ave	$82,000	L
24	59	12	Parking Lot	Macleod Ave	Parking Lot	$15,000	M
25	295	8	Second St	Washington Ave	Stillaguamish Ave	$68,000	M
26	263	12	Parking Lot	71st Ave NE	Parking Lot	$67,000	M
	852	12	Parking Lot	71st Ave NE	Aerospace	$216,000	
27	1,247	12	First St	French Ave	Stillaguamish Ave	$315,000	L
28	206	12	218th Pl NE	87th Ave NE	Dead End	$53,000	L

(1) Priority: H = High, M = Medium, L = Low

~~PROJECT –~~ Project completed since 2015 WSP
~~PROJECT –~~ Project removed since 2015 WSP

Table 9-5

Prioritized Annual Water Main Replacement Projects (Amended, Continued)

No.	Size		Location			Estimated Cost	Priority [1]
	Length	Diam	In	From	To		
29	190	12	217th Pl NE	87th Ave NE	Dead End	$48,000	L
30	490	8	Maple St	Stillaguamish Ave	West Side of Hamlin Dr	$113,000	H
	41	12	Maple St	West Side of Hamlin Dr	East Side of Hamlin Dr	$11,000	
	712	8	Maple St	East Side of Hamlin Dr	87th Ave NE	$164,000	
31	2,595	12	School Property	School	School	$656,000	H
	103	12	Lenore Ave	First St	School	$27,000	
32	179	8	Driveway off Old Burn Rd	Driveway	Driveway	$42,000	M
33	510	12	Maple St	West Ave	Olympic Ave	$399,000	H
34	557	12	Union St	Cobb Ave	Macleod Ave	$141,000	H
	314	8	Union St	Macleod Ave	Dunham Ave	$73,000	
35	840	8	Cobb Ave	Union St	Highland Dr	$193,000	H
36	86	12	Jackson St	Olympic Ave	~Macleod Ave	$22,000	M
37	209	12	Maple St	Dunham Ave	Alley West of Dunham Ave	$53,000	H
	1,598	8	Maple St, Macleod Ave	Alley West of Dunham Ave	Highland Dr	$367,000	
	236	12	Macleod Ave	Highland Dr	Dead End	$60,000	
38	3,465	12	French Ave	Fifth St	Highland Dr	$875,000	H
39	1,304	12	Hospital Property	Stillaguamish Ave	Highland Dr	$330,000	H
40	856	8	Stillaguamish Ave	Third St	First St	$197,000	H
	2,413	12	Stillaguamish Ave	First St	Apartment Driveway	$610,000	
41	918	12	Medical Center Dr	Stillaguamish Ave	212th St SE	$232,000	L
	325	12	Apartment Property	North Apartment Driveway	South End of Hamlin Dr	$83,000	
	329	12	Hamlin Dr	South End of Hamlin Dr	Maple St	$84,000	
~~42~~	~~266~~	~~12~~	~~Highland Dr~~	~~Hazel St~~	~~Cobb Ave~~	~~$68,000~~	~~H~~
	~~1,107~~	~~8~~	~~Highland Dr~~	~~Cobb Ave~~	~~French Ave~~	~~$255,000~~	
	~~1,169~~	~~12~~	~~Highland Dr~~	~~French Ave~~	~~Stillaguamish Ave~~	~~$296,000~~	
	~~390~~	~~12~~	~~SR 9~~	~~Highland Dr~~	~~Between Florence St and Marion St~~	~~$99,000~~	
43	361	8	Easement	Joanne Ln	67th Ave NE	$353,000	M
44	264	12	Hazel St	Highland Dr	Florence St	$67,000	H
	~~338~~	~~8~~	~~Florence St~~	~~Hazel St~~	~~Hillcrest Dr~~	~~$78,000~~	
	240	12	Hillcrest Dr	Florence St	Dead End	$61,000	
	~~174~~	~~8~~	~~Florence St~~	~~Hillcrest Dr~~	~~Corner of Florence St and Kona Dr~~	~~$40,000~~	
	449	8	Kona Dr	ner of Florence St and Kor	Marion St	$104,000	
	~~1,202~~	~~8~~	~~Marion St~~	~~Kona Dr~~	~~Hazel St~~	~~$276,000~~	
45	978	12	Wesley St, Parking Lot	Stillaguamish Ave	Parking Lot	$247,000	L
46	248	12	79th Ave NE	Portage St	Cul-de-Sac	$63,000	M
	208	12	Portage St	210th Pl NE	Dead End	$53,000	
	244	12	Retirement Home	Parking Lot	Parking Lot	$62,000	
~~47~~	~~1,058~~	~~12~~	~~Jensen St~~	~~Hazel St~~	~~Jensen St Dead End~~	~~$268,000~~	~~H~~
48	3,681	12	Oso Lumber	67th Ave NE	Hazel St	$1,200,000	M
49	1,326	12	Hazel St	Jensen St	204th St NE (S)	$430,000	H
	75	12	Dead End	North of 204th St NE	Just West of Hazel St	$19,000	
50	906	12	Safeway Property	Olympic Pl	Olympic Pl	$229,000	M
	173	12	Autozone Property	Olympic Pl	Dead End	$44,000	
51	394	12	Keith Ln	207th St NE	81st Dr NE	$100,000	L
	266	12	81st Dr NE	Keith Ln	North Dead End	$68,000	
	419	12	81st Dr NE	Keith Ln	South Dead End	$106,000	

(1) Priority: H = High, M = Medium, L = Low

~~PROJECT =~~ Project completed since 2015 WSP
~~PROJECT =~~ Project removed since 2015 WSP

Table 9-5

Prioritized Annual Water Main Replacement Projects (Amended, Continued)

No.	Size		Location			Estimated Cost	Priority [1]
	Length	Diam	In	From	To		
~~52~~	~~660~~	~~12~~	~~Stillaguamish Ave~~	~~Lower Burn Rd PRV~~	~~207th St NE~~	~~$167,000~~	~~M~~
	991	12	School Property	Stillaguamish Ave	207th St NE	$251,000	
53	434	12	210th St NE	66th Ave NE	Cul-de-Sac	$110,000	L
54	603	8	Circle Bluff Dr	Circle Bluff Dr	Circle Bluff Dr	$139,000	L
55	346	8	Lantern Ln	204th St NE	Cul-de-Sac	$80,000	M
56	774	8	64th Dr NE	204th St NE	206th Pl NE	$273,000	M
	339	8	Easement	206th Pl NE	64th Dr NE Dead End	$78,000	
	332	8	64th Dr NE	Dead End	208th St NE	$77,000	
	441	8	208th St NE	64th Dr NE	West of Ronning Rd	$102,000	
	849	8	208th St NE, Ronning Rd	West of Ronning Rd	210th St NE	$195,000	
	605	8	Ronning Rd	210th St NE	211th Pl NE	$139,000	
57	262	12	Easement	67th Ave NE	69th Ave NE	$67,000	M
	332	12	69th Ave NE	Dead End	North of 204th St NE	$84,000	
58	1,949	12	204th St NE	71st Ave NE	77th Ave NE	$493,000	H
	641	12	Parking Lot	77th Ave NE	Parking Lot	$162,000	
	81	12	207th St NE	207th St NE	80th Ave NE	$21,000	
59	1,883	12	Haggen Property	74th Ave NE	Haggen Property	$476,000	M
60	1,647	12	Portage Green Mobile Home Park	Portage Green Mobile Home Park	Portage Green Mobile Home Park	$416,000	M
61	340	8	62nd Dr NE	Cemetery Rd	202nd Pl NE	$79,000	M
	226	8	202nd Pl NE	62nd Dr NE	Dead End	$52,000	
	325	8	201st Pl NE	62nd Dr NE	Dead End	$75,000	
62	513	12	Vicinity of 520 Reservoir	Vicinity of 520 Reservoir	Vicinity of 520 Reservoir	$130,000	M
63	1,920	12	Mobile Home Park	199th St NE	67th Ave NE	$485,000	M
64	1,281	12	197th St NE	63rd Ave NE	67th Ave NE	$324,000	M
65	1,369	8	Cedarbough Loop	Woodlands Way	West of Country Club Dr	$315,000	M
	152	8	Oakwood Pl	Cedarbough Loop	Dead End	$35,000	
	174	8	Shady Grove Pl	Cedarbough Loop	Dead End	$40,000	
	220	8	Sprucewood Pl	Woodlands Way	Dead End	$51,000	
66	140	8	54th Dr NE	Cemetery Rd	Dead End	$33,000	H
67	992	12	51st Dr NE	198th Pl NE	Dead End	$251,000	H
	784	12	Airport Property	Dead End	Airport Property	$198,000	
68	622	8	196th Pl NE, 50th Ave NE	49th Ave NE	Dead End	$143,000	L
69	2,599	12	Airport Property	47th Ave NE	Airport Property	$657,000	M
70	1,180	12	62nd Ave NE	195th St NE	192nd St NE	$298,000	H
	1,742	12	Parking Lot/Easement	192nd St NE	188th St NE	$440,000	
	329	12	Easement	192nd St NE	Dead End	$84,000	
71	2,168	12	Hampton Lumber, UPS	67th Ave NE	Dead End	$818,000	H
72	294	12	Easement	63rd Ave NE	Dead End	$75,000	M
73	646	12	Easement	192nd St NE	Dead End	$164,000	M
74	2,094	12	Airport Property	59th Ave NE	Hangars	$529,000	H
	544	12	W.E. Evans Park	59th Ave NE	188th Pl NE	$138,000	
75	2,061	12	Airport Property	59th Ave NE	59th Dr NE	$521,000	L
76	1,307	12	Easement	191st Pl NE, 67th Ave NE	Easement	$330,000	M
77	1,052	12	66th Ave NE	188th St NE	South of 67th/66th Intersection	$266,000	M

(1) Priority: H = High, M = Medium, L = Low

~~PROJECT =~~ Project completed since 2015 WSP
PROJECT = Project removed since 2015 WSP

Table 9-5

Prioritized Annual Water Main Replacement Projects (Amended, Continued)

No.	Size		Location			Estimated Cost	Priority [1]
	Length	Diam	In	From	To		
78	466	12	188th St NE	67th Ave NE	East of 67th Ave NE	$118,000	M
	288	8	188th St NE	East of 67th Ave NE	Iris Ct	$67,000	
79	388	12	188th St NE	67th Ave NE	Lumber Yard	$98,000	H
	1,194	12	Lumber Yard	188th St NE	Dead End	$302,000	
	1,178	8	Lumber Yard	188th St NE	67th Ave NE	$271,000	
80	544	12	Mobile Home Park	188th St NE	Dead End	$138,000	M
81	1,252	12	59th Ave NE	188th St NE	South of 188th St NE	$317,000	M
82	1,924	12	Airport Property	Flightline	Flightline	$486,000	M
83	1,868	12	School Property	Eaglefield Dr	Eaglefield Dr	$472,000	M
84	90	12	175th St NE	85th Ave NE	Dead End	$23,000	M
	69	12	84th Ave NE	85th Ave NE	Dead End	$18,000	
	95	12	Shooting Range Parking Lot	SR 531	Parking Lot	$24,000	
85	393	12	Junkyard	Easement	Easement	$100,000	M
86	2,391	12	Easement	59th Ave NE	Easement	$604,000	M
87	3,410	12	Easement	59th Ave NE	Easement	$1,131,000	M
88	632	12	Airport Property	Hangars	Hangars	$160,000	M
89	1,107	12	Easement	172nd St NE	Easement	$280,000	M
90	1,498	12	Easement	59th Ave NE	59th Ave NE	$379,000	M
91	875	12	Airport Property	59th Dr NE	59th Dr NE	$221,000	M
	1,048	12	59th Dr NE	59th Dr NE	59th Dr NE	$265,000	
	1,129	12	Airport Property	59th Dr NE	Hangars	$286,000	
92	4,059	12	59th Ave NE	Business Park	Business Park	$1,295,000	M
	123	12	Airport Property	59th Ave NE	Hangars	$32,000	
93	2,754	12	Business Park	Business Park	Business Park	$696,000	H
94	109	12	Airport Property	Flightline	Flightline	$28,000	M
95	1,081	12	Bowman Manufacturing	51st Ave NE	Flightline	$273,000	L
96	890	12	Buzz Inn Property	51st Ave NE	Parking Lot	$225,000	M
97	1,277	12	Airport Property	51st Ave NE	Hangars	$323,000	M
98	411	12	187th Pl NE	35th Ave NE	Dead End	$104,000	L
99	647	12	Bjorn Rd	35th Ave NE	Smokey Point Blvd	$164,000	L
	42	12	Smokey Point Blvd	Bjorn Rd	Just North of Bjorn Rd	$11,000	
100	1,030	12	Parking Lot	Smokey Point Blvd	Bjorn Rd	$261,000	M
	435	12	Parking Lot	Bjorn Rd	Parking Lot	$110,000	
101	658	12	186th Pl NE	35th Ave NE	Easement	$167,000	M
	535	12	Easement	186th Pl NE	End of Driveway	$136,000	
	646	12	Driveway	35th Ave NE	End of Driveway	$164,000	
102	512	8	Easement	Smokey Point Blvd	Just East of 32nd Ave NE	$118,000	L
	206	12	185th Pl NE	Smokey Point Blvd	Dead End	$53,000	
103	581	12	183rd Pl NE	Smokey Point Blvd	Dead End	$147,000	L
104	466	12	Driveway	Smokey Point Blvd	36th Dr NE	$118,000	M
	240	12	36th Dr NE	Driveway	36th Dr NE End of Pavement	$61,000	
	460	12	181st Pl NE	Smokey Point Blvd	36th Dr NE	$117,000	
	756	12	Easement, 180th Pl NE	36th Dr NE End of Pavement	Smokey Point Blvd	$191,000	

(1) Priority: H = High, M = Medium, L = Low

~~PROJECT =~~ Project completed since 2015 WSP
PROJECT = Project removed since 2015 WSP

Table 9-5

Prioritized Annual Water Main Replacement Projects (Amended, Continued)

No.	Size		Location			Estimated Cost	Priority [1]
	Length	Diam	In	From	To		
105	283	12	185th Pl NE	31st Ave NE	Dead End	$72,000	L
106	239	12	184th Pl NE	31st Ave NE	Dead End	$61,000	L
107	156	12	Driveway	182nd St NE	Dead End	$40,000	L
108	178	12	Driveway	182nd St NE	Dead End	$45,000	M
	179	12	Driveway	Easement	Easement	$46,000	
109	229	12	31st Ave NE	181st St NE	180th St NE	$58,000	L
110	213	12	Parking Lot	Smokey Point Blvd	Parking Lot	$54,000	M
111	509	12	43rd Ave NE	SR 531	Walmart Parking Lot	$129,000	M
	1,479	12	Walmart Parking Lot	43rd Ave NE	SR 531	$374,000	
	82	12	SR 531	Just North of SR 531	Just South of SR 531	$21,000	
112	134	12	I-5	Smokey Point Blvd	Portage Creek	$34,000	M
113	359	12	193rd St NE	Smokey Point Blvd	Dead End	$91,000	M

(1) Priority: H = High, M = Medium, L = Low

~~PROJECT =~~ Project completed since 2015 WSP
~~PROJECT =~~ Project removed since 2015 WSP

Table 9-6

Proposed Improvements Implementation Schedule (Amended)

CIP No.	Description	Estimated Cost (10 Year) (2015 $$)	Estimated Cost (20 Year) (2015 $$)	10 Year Funding Cost ($) COA	10 Year Funding Cost ($) DF	10 Year Funding Source (%) COA	10 Year Funding Source (%) DF	20-Year Schedule of Improvements Planned Year of Project and Estimated COA Cost in 2015 $$ 2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2035
Water Main Improvements																			
WM1	Annual Water Main Replacement Program	$10,635,000	$19,095,000	$10,635,000	$0	100%	0%	$535K	$1,600K	$500K	$1,000K	$1,000K	$1,000K	$1,000K	$1,000K	$1,000K	$1,000K	$1,000K	$8,460K
WM2	12" North Island Crossing Water Main	$2,056,750	$2,057,000	$514,000	$1,542,750	25%	75%				$257K	$257K							
WM3	198th Place NE/Cemetery Road Water Main	$1,641,000	$1,641,000	$1,641,000	$0	100%	0%						$821K	$821K					
~~WM4~~	~~West I-5 Expansion Area Water Main~~	~~$2,577,000~~	~~$2,577,000~~	~~$644,250~~	~~$1,932,750~~	~~25%~~	~~75%~~										~~$322K~~	~~$322K~~	
WM5	South of 172nd MIC Area Water Main	$3,443,000	$3,443,000	$860,750	$2,582,250	25%	75%						$430K	$430K					
WM6	North Island Crossing Commercial 12" Water Main Loop	$1,270,000	$1,270,000	$317,500	$952,500	25%	75%					$159K	$159K						
Pressure Zone Improvements																			
PZ1	Conversion of 710 Zone to 560 Zone (107th Ave NE)	$90,000	$90,000	$90,000	$0	100%	0%					$90K							
PZ2	Conversion of 710 Zone to 615 Zone	$90,000	$90,000	$90,000	$0	100%	0%						$90K						
PZ3	Conversion of 540 Zone to 615 and 520 Zone	$90,000	$90,000	$90,000	$0	100%	0%											$90K	
Facility Improvements																			
F1	Demolish Old WTP	$0	$170,000	$0	$0	100%	0%												$170K
~~F2~~	~~Source of Supply Study~~	~~$25,000~~	~~$25,000~~	~~$25,000~~	~~$0~~	~~100%~~	~~0%~~		~~$25K~~										
~~F3~~	~~Demolish Burn Road Reservoir~~	~~$75,000~~	~~$75,000~~	~~$75,000~~	~~$0~~	~~100%~~	~~0%~~		~~$75K~~										
F4	New Supply Well No. 1 (Replace Airport Well)	$2,600,000	$2,600,000	$2,600,000	$0	100%	0%		$65K	$115K	$420K	$2,000K							
F5	New Supply Well No. 2	$1,000,000	$1,000,000	$1,000,000	$0	100%	0%						$125K	$875K					
F6	Future 1.0 MG Reservoir	$0	$2,970,000	$0	$0	100%	0%												$2,970K
F7	Gleneagle Reservoir Roof Replacement	$350,000	$350,000	$350,000	$0	100%	0%						$350K						
F8	520 Reservoir Improvements - Fence	$25,000	$25,000	$25,000	$0	100%	0%				$25K								
F9	Replacement Clearwell Pumps	$165,000	$165,000	$165,000	$0	100%	0%		$50K	$115K									
Miscellaneous Improvements																			
M1	Drive-by Read Meter Conversion	$800,000	$800,000	$800,000	$0	100%	0%		$267K	$267K	$267K								
M2	Source Water Protection Program	$30,000	$30,000	$30,000	$0	100%	0%				$30K								
M3	Comprehensive Water System Plan Update	$100,000	$270,000	$100,000	$0	100%	0%										$100K		$170K
Total Estimated Project Costs of City Funded Improvements		**$24,385,750**	**$36,156,000**	**$19,308,250**	**$5,077,500**	**-**	**-**	**$535K**	**$1,982K**	**$997K**	**$1,999K**	**$3,506K**	**$2,975K**	**$3,126K**	**$1,000K**	**$1,000K**	**$1,100K**	**$1,090K**	**$11,770K**
Developer Funded Improvements																			
WM2-DF	12" North Island Crossing Water Main	$1,542,750	$1,542,750	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
~~WM4-DF~~	~~West I-5 Expansion Area Water Main~~	~~$1,932,750~~	~~$1,932,750~~	~~100% Developer Funded~~				~~Timing of Project Based on Timing of Future Developments~~											
WM5-DF	South of 172nd MIC Area Water Main	$2,582,250	$2,582,250	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF1	12" Water Main Loop from 59th Ave NE to 66th Ave NE	$660,000	$660,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF2	12" Water Main Replacement in 211th Pl NE	$320,000	$320,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF3	Jensen Farm High Density Residential 12" Water Main	$360,000	$360,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF4	59th Ave and Cemetery Road Industrial Improvements	$700,000	$700,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF5	12" Water Main in 196th St NE from Burn Road to Crown Ridge Blvd	$460,000	$460,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF6	Northwest Airport 12" Water Main Loop	$680,000	$680,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
~~DF7~~	~~North Island Crossing Commercial 12" Water Main Loop~~	~~$1,270,000~~	~~$1,270,000~~	~~100% Developer Funded~~				~~Timing of Project Based on Timing of Future Developments~~											
DF8	Kraetz Rd Water Main	$1,720,000	$1,720,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF9	12" Water Main in 172nd St NE from 67th Ave NE to 71st Ave NE	$490,000	$490,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF10	12" Water Main in Troon Ct from Troon Ct Cul-de-Sac to 174th St NE	$250,000	$250,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF11	615 Zone Water Main	$2,220,000	$2,220,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
DF12	710 and 615 Zone Booster Pump Station and Water Main	$3,520,000	$3,520,000	100% Developer Funded				Timing of Project Based on Timing of Future Developments											
Total Estimated Project Costs of Developer Funded Improvements		**$15,505,000**																	

~~CIP NO.~~ Project completed since previous WSP
~~CIP NO~~ Project removed since previous WSP

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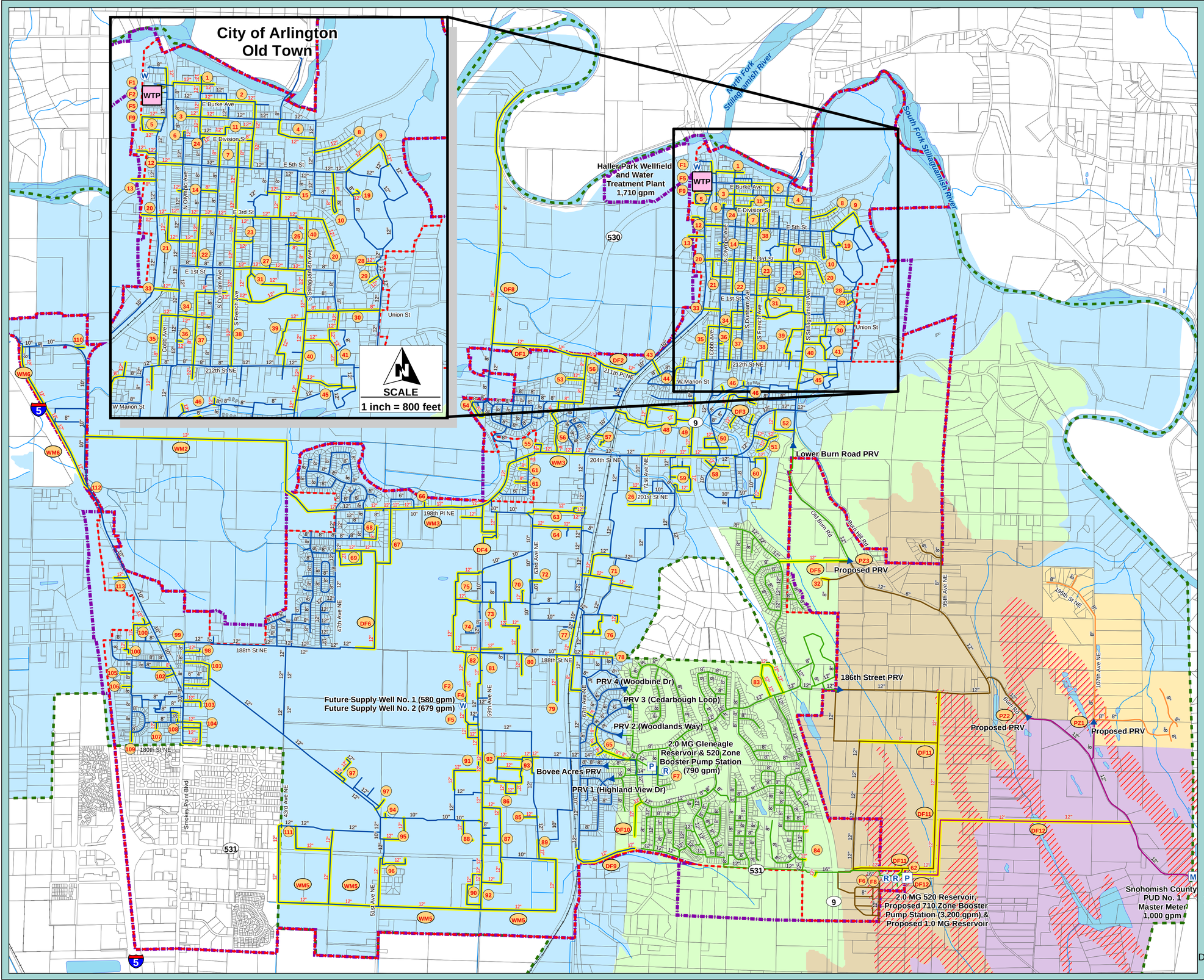
CITY OF ARLINGTON
COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 9-1
FUTURE WATER SYSTEM (AMENDED)



Legend

- City Limits
- UGA Boundary
- Future Water Service Area
- CIP Improvement Number
- Proposed Water Main Improvement
- Optimal Future 520 Zone Reservoir Location

Water Infrastructure

- Pump Station
- PRV
- Flow Control Valve
- Well
- Reservoir
- Meter

Water Main

- 342 Zone
- 520 Zone
- 560 Zone
- 615 Zone
- 710 Zone
- No Services

Pressure Zones

- 342 Zone
- 520 Zone
- 560 Zone
- 615 Zone
- 710 Zone

1 INCH = 1,200 FEET

0 1,200 2,400

DRAWING IS NOT TO SCALE IF BAR IS NOT 2" LONG

RH2 ENGINEERS PLANNERS SCIENTISTS

PLOT DATE: JUN 1, 2017

\\RH2\DFS\RICHLAND\DATA\ARL\417-057\GIS\MAPS\ARL-WSP-FIG-9-1.MXD
BY: LREITER

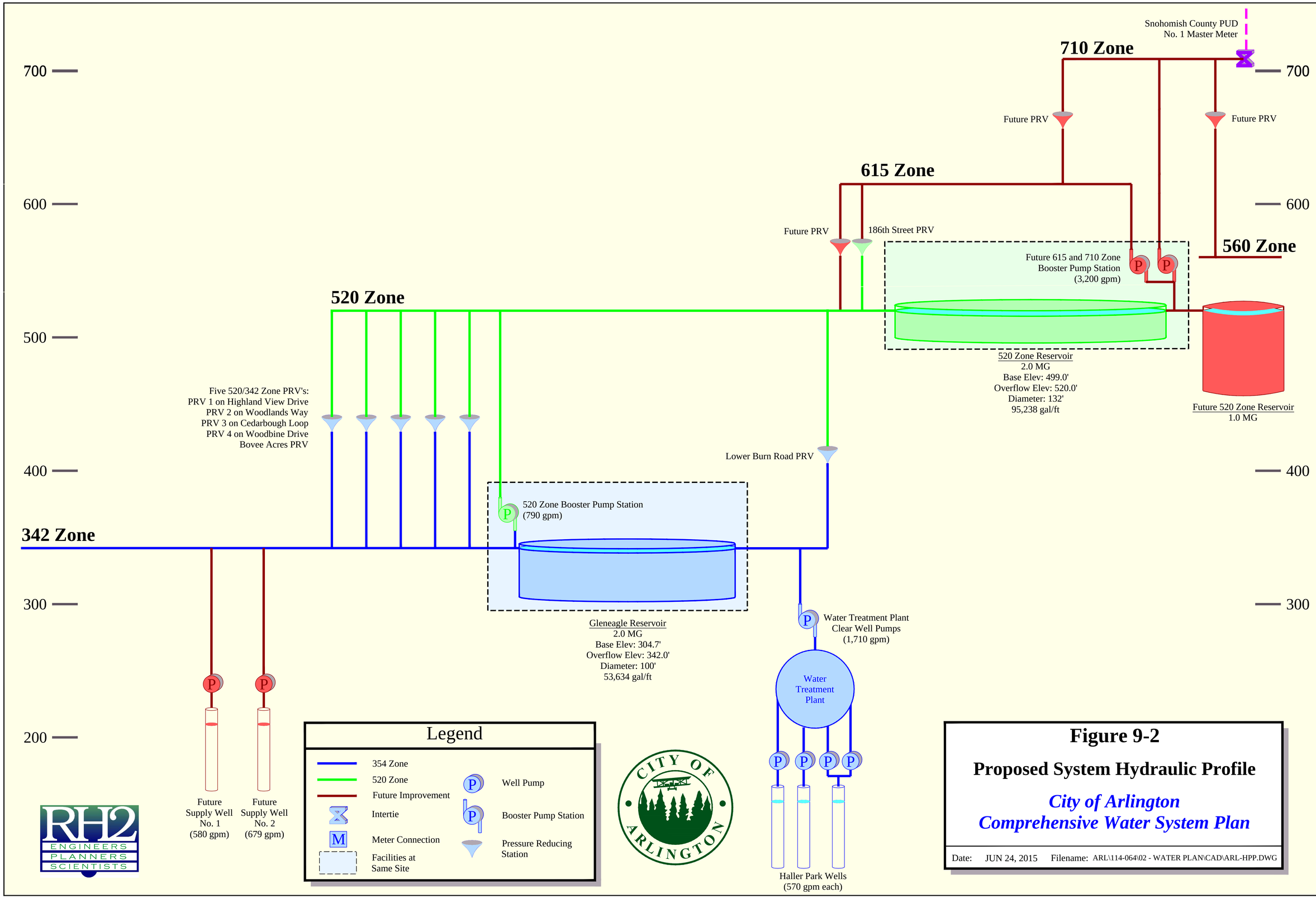


Figure 9-2

Proposed System Hydraulic Profile

City of Arlington
Comprehensive Water System Plan

Date: JUN 24, 2015 Filename: ARL\114-064\02 - WATER PLAN\CAD\ARL-HPP.DWG

10 Financial Plan

10.1 INTRODUCTION



The objective of the financial plan is to identify the total cost of providing utility service and to provide a financial program that allows the utility to remain financially viable during execution of the identified Capital Improvement Program (CIP). This analysis considers the historical financial condition of the utility, the sufficiency of utility revenues to meet current and future financial and policy obligations, and the financial impact of executing the CIP. Furthermore, the plan provides a review of the utility's rate structure with respect to rate adequacy and customer affordability, as well as the promotion of water conservation.

10.2 PAST FINANCIAL PERFORMANCE

This section includes a summary of historical financial performance for the utility (2010-2014), including a summary of Fund Resources and Uses and the schedule of outstanding debt.

10.2.1 Summary of Fund Resources and Uses

Water Utility Fund 401

Fund 401 serves as the Water Utility operating account where operating revenues are deposited and operating expenses are paid. The primary source of revenue comes from water service charges. Operating expenses include labor and materials for operations and maintenance of treatment and distribution facilities, debt payments, transfers to capital funds, and more. During the historical time period, average annual revenues have remained relatively flat, with an overall change of only -0.4%, or a decrease of about $17,000. Total expenditures (operating, debt service costs, and minor capital) have decreased 8% over the same period, or about $241,000. **Table 10-1** presents the detail of annual revenues, expenditures, and ending cash over the time period 2010 to 2014.

Table 10-1

Summary of Historical Fund Resources and Uses Arising From Cash Transactions Water Utility Fund 401

Water Utility Fund 401	2010	2011	2012	2013	2014
Beginning Net Cash and Investments					
Unspecified	$ -	$ -	$ -	$ -	**$ -**
Reserved	$ -	$ -	$ -	$ -	$ -
Unreserved [A]	$ 1,049,598	$ 1,336,570	$ 1,450,456	$ 1,666,867	$ 2,031,955
Total Beginning Cash Balance	**$ 1,049,598**	**$ 1,336,570**	**$ 1,450,456**	**$ 1,666,867**	**$ 2,031,955**
Revenues and Other Sources:					
Taxes [B]	$ 52,755	$ -	$ -	$ -	$ -
Intergovernmental Revenues	$ -	$ -	$ 3,587	$ -	$ 1,698
Charges For Services	$ 3,826,527	$ 3,733,553	$ 3,822,330	$ 3,864,066	$ 3,905,772
Fines & Forfeitures	$ 117,779	$ 96,130	$ 87,140	$ 76,125	$ 73,300
Miscellaneous Revenues	$ 38,639	$ 62,460	$ 34,148	$ 26,049	$ 35,709
Non Revenues	$ 3,656	$ 850	$ -	$ 545	$ 1,749
Insurance Recoveries	$ -	$ -	$ -	$ -	$ 4,278
Total Revenues and Other Sources	**$ 4,039,355**	**$ 3,892,994**	**$ 3,947,205**	**$ 3,966,784**	**$ 4,022,506**
Total Resources	**$ 5,088,953**	**$ 5,229,564**	**$ 5,397,661**	**$ 5,633,652**	**$ 6,054,461**
Operating Expenditures:					
Water Utility	$ 2,814,191	$ 2,882,918	$ 2,629,140	$ 2,653,684	**$ 2,677,426**
Non Expenditures	$ 673	$ -	$ 750	$ -	$ 924
Total Operating Expenditures	**$ 2,814,864**	**$ 2,882,918**	**$ 2,629,890**	**$ 2,653,684**	**$ 2,678,350**
Debt Services	$ 170,020	$ 170,020	$ 371,728	$ 141,205	$ 90,803
Interest & Other Debt Svc Costs	$ 21,055	$ 18,241	$ 9,726	$ 4,136	$ 2,724
Capital Expenditures	$ 7,005	$ 6,229	$ 17,750	$ 971	$ -
Total Expenditures	**$ 198,080**	**$ 194,490**	**$ 399,204**	**$ 146,312**	**$ 93,527**
Other Financing Uses	$ 739,439	$ 701,700	$ 701,700	$ 801,700	$ 751,700
Total Uses	**$ 3,752,383**	**$ 3,779,108**	**$ 3,730,794**	**$ 3,601,697**	**$ 3,523,577**
Excess (Deficit) of Resources Over Uses	$ 1,336,570	$ 1,450,456	$ 1,666,867	$ 2,031,955	$ 2,530,884
Non-Revenues					
Non-Expenditures					
Ending Net Cash and Investments					
Unspecified					
Reserved					
Unreserved	$ 1,336,570	$ 1,450,456	$ 1,666,867	$ 2,031,955	$ 2,530,884
Total	**$ 1,336,570**	**$ 1,450,456**	**$ 1,666,867**	**$ 2,031,955**	**$ 2,530,884**

[A] The beginning fund balance in 2010 was backcalculated by assuming that the ending balance for 2010 is the beginning balance for 2011.

[B] In 2011, taxes began to be included in "Charges for Services"

Water Utility Fund 405

Fund 405 serves as the Water Utility capital account where capital revenues are deposited and capital expenditures are paid. Examples of capital revenues include connection charges, grant and debt proceeds, and capital transfers from the operating fund. Capital expenditures are investments in the utility through acquisition or upgrade of fixed, physical, non-consumable assets, such as

buildings and equipment. Average annual revenues increased 34% over the time period, representing about $305,000. Total expenditures over that same period have more than doubled, representing an increase of about $759,000. **Table 10-2** presents the detail of annual revenues, expenditures, and ending cash over the time period 2010 to 2014.

Table 10-2

Summary of Historical Fund Resources and Uses Arising From Cash Transactions Water Improvement Fund 405

Water Improvement Fund (405)	2010	2011	2012	2013	2014
Beginning Net Cash and Investments	4,894,963	5,446,249	5,304,683	4,813,544	4,641,426
Revenues:					
Miscellaneous Revenues	58,935	67,057	50,990	35,602	41,107
Capital Contributions	91,110	251,550	449,350	148,350	66,650
Non Revenues	2,250	50,272	50,000	53,230	349,612
Interfund Transfers	750,000	700,000	700,000	800,000	750,000
Total Revenues and Other Sources	**902,295**	**1,068,879**	**1,250,340**	**1,037,182**	**1,207,369**
Total Resources	**5,797,258**	**6,515,128**	**6,555,023**	**5,850,726**	**5,848,795**
Operating Expenditures:					
Water Utility	253,465	95,361	356,446	42,728	39,501
Non Expenditures	2,138	258	-	450,000	-
Total Operating Expenditures	**255,603**	**95,620**	**356,446**	**492,728**	**39,501**
Capital Expenditures	95,406	1,084,825	1,311,558	101,347	1,070,545
Total Expenditures	**351,009**	**1,180,444**	**1,668,004**	**594,075**	**1,110,047**
Other Financing Uses	-	30,000	73,476	615,225	-
Total Uses	**351,009**	**1,210,444**	**1,741,480**	**1,209,300**	**1,110,047**
Excess (Deficit) of Resources Over Uses	5,446,249	5,304,683	4,813,544	4,641,426	4,738,748
Nonrevenues					
Nonexpenditures					
Ending Net Cash and Investments	**5,446,249**	**5,304,683**	**4,813,544**	**4,641,426**	**4,738,748**

10.2.2 Outstanding Debt Principal

Table 10-3 presents outstanding utility debt as of the end of 2014. As shown in the table, debt will be fully paid in 2016.

Table 10-3

Summary of Outstanding Debt

Debt Description	Principal Outstanding	Maturity Year
PWTF Loan: Water Treatment Plant Replacement	$ 181,607	2016
Total	**$ 181,607**	

10.3 AVAILABLE CAPITAL RESOURCES

Feasible long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the CIP identified in this WSP. In addition to the City's internal resources such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources such as grants, low-interest loans, and bond financing. The following is a summary of potential internal and external resources that might be available for funding the CIP.

10.3.1 Internal Utility Resources

Internal utility resources appropriate for funding capital needs include accumulated cash in capital funds, transfers from operating revenues, and capital revenue such as connection charges or local facilities charges. These resources are discussed below.

Utility Funds and Cash Reserves

Ongoing user charges (rates) paid by utility customers are operating revenues that are the primary funding source for all utility activities. While capital revenue cannot be used for operating or maintenance expenses, operating revenues can be used for capital investment. Rate revenue can pay for capital projects in two ways: either paying for debt service or directly paying for capital projects. Funding capital costs directly through rates avoids the interest expense associated with issuing new debt. Rate funded capital investment should be designed as a regular transfer from operating revenue each year; otherwise, trying to pay for capital projects with current-year operating revenue can lead to rate volatility. If regular transfers of operating revenue are made into the capital fund, then if capital spending is relatively low in any given year, cash reserves can be accumulated that will offset future capital project costs. The utility has been very successful at funding capital projects with reserves and not having to issue new debt.

Capital Connection Charges

A connection charge, as provided for by RCW 35.92.025, refers to a one-time charge imposed on new customers as a condition of connection to the utility system. Connection charges are separate from meter installation fees or similar charges for the labor and materials used to make a physical connection. Instead connection charges are intended to recover a proportionate share of existing infrastructure and planned future capital investment that will serve new customers.

Equity is served by providing a vehicle for new customers to share the cost of infrastructure investment. Further, connection charge revenue provides a source of cash flow used to support utility capital needs. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects; it cannot be used for operating or maintenance costs.

In the absence of a connection charge, growth-related capital costs would be borne in large part by existing customers. In addition, the net investment in the utility already collected from existing

customers would be diluted by the addition of new customers, effectively subsidizing new customers with prior customers' payments.

The City currently charges all new utility customers a connection charge based on meter size, starting at $4,300 for a 5/8" or 3/4" meter. A study is currently underway to review and update connection charges.

Local Facilities Charges

While a connection charge is the manner in which new customers pay their share of plant investment costs, local facilities charges is a funding mechanism that is used to pay the costs of local facilities that connect each property to the system's infrastructure. Local facilities funding is often overlooked in rate forecasting because it is funded up-front by either connecting customers, developers, or through an assessment to properties, but never from rates. Although these funding mechanisms do not provide a capital resource toward funding CIP costs, a discussion of these charges is included in this chapter because of their impact on new customers.

A number of mechanisms can be considered toward funding local facilities. One of the following scenarios typically occurs: (a) the utility charges a connection fee based on the cost of the local facilities (under the same authority as the connection charge); (b) a developer funds extension of the system to its development and turns those facilities over to the utility (contributed capital); or (c) a local assessment is set up called a Utility Local Improvement District (ULID/LID) or a Local Utility District (LUD) which collects tax revenue from benefited properties.

A local facilities charge (LFC) is a variation of the connection charge authorized through RCW 35.92.025. It is a city-imposed charge to recover the cost related to service extension to local properties. Often called a front-footage charge and imposed on the basis of footage of the main "fronting" a particular property, it is usually implemented as a reimbursement mechanism to a city for the cost of a local facility that directly serves a property. It is a form of connection charge and thus can accumulate up to 10 years of interest. It typically applies in instances where the city installs the facilities prior to the properties being developed.

A developer extension is a requirement that a developer install onsite and sometimes offsite improvements as a condition of extending service. These are in addition to the connection charge required and must be built to city standards. Part of the agreement between the city and the developer might include a late-comer agreement, resulting in a late-comer charge to other properties later served by the developer-funded extension.

A Latecomer charge is a variation of developer extensions whereby new customers connecting to a developer-installed improvement make a payment to the city based on their share of the developer's cost (RCW 35.91.920). The city passes this charge on to the developer who installed the facilities. Latecomer obligations are recorded on the title of affected properties. No interest is

allowed, and the reimbursement agreement is in effect for a period of 20 years, unless a longer duration is approved by the city.

A LID/ULID is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of specific facilities (RCW 35.43.042). Most often used for local facilities, some ULIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which a ULID can be rejected.

10.3.2 Government Programs & Resources

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining miscellaneous grant programs are lightly funded and heavily subscribed. Nonetheless, even the benefit of low-interest loans makes the effort of applying worthwhile. Grants and low-cost loans for Washington State utilities are available from various Washington State Departments. Several grant and loan programs that the City might be eligible for are described in greater detail below. Some of these programs may not pertain to all utility functions.

Department of Commerce

A September 2014 document from the Department of Commerce summarizes various loan and grant programs available for utility projects. The document titled "Summary of Some Grant and Loan Programs for Drinking Water and Wastewater Projects" can be found at http://www.commerce.wa.gov/Documents/9-2-14_multi-program_funding_program_summary.pdf

A few of those programs are described below:

Community Development Block Grant (CDBG) General Purpose Grant

These grants are made available through a competitive application process to assist small cities, towns and counties in Washington State in carrying out significant community and economic development projects that principally benefit low and moderate income persons.

- Eligible applicants are Washington State cities and towns with a population less than 50,000 and counties with a population less than 200,000 that are not participating in a CDBG Entitlement Urban County Consortium.
- Eligible projects include public facilities such as water, wastewater, and streets.
- Further details are available at:
    - http://www.commerce.wa.gov/Programs/Infrastructure/CDBG-Program-Overview/Pages/default.aspx
    - http://www.commerce.wa.gov/Documents/2015_CommerceResourceBook.pdf

Community Economic Revitalization Board (CERB)

CERB, a division of the Washington State Department of Commerce, primarily offers low cost loans; grants are made available only to the extent that a loan is not reasonably possible. The CERB targets public facility funding for economically disadvantaged communities, specifically for job creation and retention. Priority criteria include the unemployment rates, number of jobs created and/or retained, wage rates, projected private investment, and estimated state and local revenues generated by the project. According to their website, "CERB funds a variety of projects that create jobs including (but not limited to) domestic and industrial water, storm and sewer water projects, telecommunications and port facilities." Eligible applicants include cities, towns, port districts, special purpose districts, federally recognized Indian tribes and municipal corporations.

Funding details for the 2013 – 2015 Program are as follows per the Washington Commerce website: "$9 million was appropriated to CERB for the 2013-2015 Biennium. By state law, CERB must award 75% of this funding to projects in rural counties. The Board has also allocated $2,182,500 to be available for construction and planning grants on a first-come, first-served basis."

Program	Funding Limitations
Committed Private Sector Partner Construction	• $2 million per project loan award limit • Up to $300,000 or 50% of total award, **whichever is less**, may be grant funds. • 20% cash match required (minimum, percent of total project cost)
Prospective Development Construction	Available to rural communities only. • $2 million per project loan award limit • Up to $300,000 or 50% of total award, **whichever is less**, may be grant funds. • 50% cash match required (minimum, percent of total project cost)
Planning/Economic Feasibility Studies	• $50,000 grant per project award limit • 25% cash match required (minimum, percent of total project cost)

Further details are available at:

- http://www.commerce.wa.gov/commissions/CommunityEconomicRevitalizationBoard/
- http://www.commerce.wa.gov/Documents/2013-15_Policies.pdf
- http://www.commerce.wa.gov/commissions/CommunityEconomicRevitalizationBoard/Pages/CERB-Traditional-Programs.aspx

Public Works Board (PWB) Financial Assistance

The Board's goal is community access to financial and technical resources that help sustain local infrastructure. Cities, towns, counties, and special purpose districts are eligible to receive financial assistance for qualifying projects. When funding is available, the following tools exist:

- Construction Loan Program: http://www.pwb.wa.gov/financial-assistance/Construction/Pages/default.aspx
    - Funding Cycle: Per the Board website, the Governor's proposed 2015-17 budget offers $69.7M for 19 projects.

- Program Description: Low-interest loans for local governments to finance public infrastructure construction and rehabilitation. Eligible projects must improve public health and safety, respond to environmental issues, promote economic development, or upgrade system performance.
- Terms: For non-distressed communities, a term of five years or less has an interest rate of 1.28% and a term from six to twenty years has an interest rate of 2.55%.

- Pre-Construction Loan Program: http://www.pwb.wa.gov/financial-assistance/Pre-Construction/Pages/default.aspx
  - Funding Cycle: No funding has been allocated to the Pre-construction loan program for the 2013-15 biennium but the program still exists and could be funded in a future biennium.
  - Program Description: Local governments may apply for low interest loans to finance pre-construction activities to prepare a project for construction.
  - Terms: Terms are limited to a five year repayment period (the loan term may be converted to 20-years once the project has secured construction funding) with a 1% interest rate.
- Emergency Loan Program: http://www.pwb.wa.gov/financial-assistance/Emergency-Loan/Pages/default.aspx
  - Funding Cycle: No funding has been allocated to the Emergency loan program for the 2013-15 biennium, but the program still exists and could be funded in a future biennium.
  - Program Description: The Emergency Loan Program provides funding to address public works emergencies, thereby helping provide immediate restoration of critical public works services and facilities.
  - Terms: Funds are limited to $500,000 per jurisdiction per biennium, and come with a 20-year term (or the life of the project), and a 3% interest rate. No local match is required.
- Energy and Water Efficiency Loan Program: http://www.pwb.wa.gov/financial-assistance/Energy-Water/Pages/default.aspx
  - Funding Cycle: No funding has been allocated to the Energy and Water Efficiency (EWE) loan program for the 2013-15 biennium but the program still exists and could be funded in a future biennium.
  - Program Description: The EWE program is designed to encourage energy, water, and efficiency upgrades to existing infrastructure by providing low-cost loans.
  - Terms: The maximum loan amount is $1,000,000. The interest rate is dependent upon the term of the loan. Loans less than 5 years receive a 0.50% rate. Loans

between 5 and 10 years receive a 1% interest rate. Loans between 11 and 20 years receive a 1.50% interest rate.

- Drinking Water State Revolving Fund Loan Program: http://www.pwb.wa.gov/financial-assistance/Drinking-Water/Pages/default.aspx
    - Funding Cycle: The DWSRF program has shifted their application cycle to fall, starting September 1, 2014.
    - Program Description: The DWSRF loan program is a federal and state partnership program to provide low-interest loans to finance projects that increase public health protection. A 2012 Washington State law requires all public water systems that receive loans or grants for infrastructure to complete an Investment Grade Efficiency Audit (IGEA). This is an effort to apply energy efficiency to water systems, similar to DOH's Green Projects that was started in 2009, and may be financed as part of the DWSRF loan.
    - Terms: For construction loans, interest rates range from 1% to 1.5% with repayment periods of 20 years or life of the project being financed, whichever is less.
- Further general resources are available at:
    - http://www.pwb.wa.gov/financial-assistance/Pages/default.aspx
    - http://www.pwb.wa.gov/Documents/FINAL-MASTER-GUIDELINES.pdf
    - http://www.commerce.wa.gov/Documents/9-2-14_multi-program_funding_program_summary.pdf

10.3.3 Public Debt Financing

Public debt financing options include General Obligation Bonds and Revenue Bonds.

General Obligation Bonds

General Obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

RCW 39.36.020 states:

> *"(ii) Counties, cities, and towns are limited to an indebtedness amount not exceeding one and one-half percent of the value of the taxable property in such counties, cities, or towns without the assent of three-fifths of the voters therein voting at an election held for that purpose.*

(b) In cases requiring such assent counties, cities, towns, and public hospital districts are limited to a total indebtedness of two and one-half percent of the value of the taxable property therein."

While bonding capacity can limit availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs; and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an ad valorem property tax levy.

Revenue Bonds

Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The city agrees to satisfy these requirements by resolution as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except the practical limit of each utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic.

10.3.4 Capital Resource Funding Summary

An ideal capital financing strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are very limited and competitive in nature and do not provide a reliable source of funding for planning purposes. It is recommended that the City pursue these funding avenues but assume bond financing to meet needs for which the City's available cash resources are insufficient. G.O. Bonds may be useful for special circumstances, but since bonding capacity limits are most often reserved for non-utility purposes, revenue bonds are a more secure financing mechanism for utility needs. The capital financing strategy developed to fund the CIP identified in this WSP generally follows the funding priority below:

- Available grant funds and/or developer contributions
- Accumulated capital cash reserves from prior years
- Interest earned on capital fund balances and other miscellaneous capital resources
- Annual revenue from connection charges
- Annual transfers of rate-funded capital or excess cash (above target balances) from the operating account
- Revenue bond financing

10.4 FINANCIAL PLAN FRAMEWORK

10.4.1 Overview

The Water Utility is a self-supporting enterprise fund responsible for funding all of its costs. It is not dependent upon general tax revenues or other General Fund resources. The primary source of funding for the utility is service charges. The City controls the level of service charges by ordinance and can adjust them as needed to meet financial objectives.

The financial plan can give assurance of financial feasibility only if it considers the total cost of service – capital and operating. To meet this objective, the following analytical steps were taken:

Capital Funding Plan

The capital funding plan identifies total costs for the 20-year capital planning period, which is 2015 through 2035. The plan then shows how those costs can be paid for by some combination of existing reserves, current rate revenue, connection charges, debt financing and any special resources that may be readily available (e.g. grants, developer contributions, etc.). The capital funding plan impacts the financial forecast in two ways: debt financing results in annual debt service and potential debt service coverage requirements, and any rate revenue used for capital funding increases the rate revenue requirement.

Financial Forecast

The financial forecast, or revenue sufficiency analysis, forecasts the amount of annual rate revenue needed to be generated throughout the short-term planning horizon. It is our understanding that the Department of Health will be changing from the current 6-year cycle to a 10-year cycle for updating Comprehensive Water System Plans, so the short-term planning period is defined as the 10-year period (2015-2025).

The analysis incorporates operating revenues, O&M expenses, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to utility operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, revenue needs are impacted by debt covenants (typically revenue bonds) and specific fiscal policies and financial goals of the utility. For this analysis, two revenue sufficiency tests have been developed to reflect the financial goals and constraints of the City: cash needs must be met, and debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test – The cash flow test identifies all known cash requirements for the utility in each year of the planning period. Typically these include O&M expenses, debt service payments, rate-funded system reinvestment funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the utility are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfalls are established.

Coverage Test – The coverage test is based on a commitment made by the City when issuing revenue bonds and some other forms of long-term debt. For purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the City would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.0 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25 percent of annual revenue bond debt service payments. The excess cash flow derived from the added coverage (if any) can be used for either rate-funded capital expenditures or to build reserves. Targeting a higher coverage factor can help the City achieve a better credit rating and provide lower interest rates for future debt issues. The Water Utility does not have outstanding revenue bond debt and no new debt is forecasted over the 20-year planning horizon.

In determining the annual revenue requirement, both the cash and coverage sufficiency tests must be met and the test with the greatest deficiency drives the level of needed rate increase in any given year.

Independent Growth Assumptions – The customer growth assumptions in the financial forecast are independent of the long-term population growth assumptions contained in other chapters of this Comprehensive Plan. The reason is that the meaning of the word "conservative" for the purpose of facilities planning is the opposite of "conservative" for the purpose of financial forecasting. In planning capital facilities, a conservative customer and demand forecast will tend to fall on the high side of the reasonable range, because underestimating demand could lead to a capacity shortfall, a more serious problem than would result from overestimated demand. For financial planning, the opposite is true: a conservative growth forecast will tend to fall on the low side of the reasonable range, because assuming too many customers could lead to a revenue shortfall and rate spike, a more serious problem than would result from assuming too few customers.

Financial Forecast Customer Growth Assumptions – To be consistent with average growth over the last five years, customer growth is forecasted at 45 connections, or ERUs, per year over the 20-year planning horizon (averaging 0.63 percent per year).

10.4.2 Fiscal Policies

The City maintains a fund structure and implements financial policies that target management of a financially viable and fiscally responsible water utility. A brief summary of the key financial policies employed by the City, as well as those recommended and incorporated in the financial program are discussed below.

Reserve Policies

Utility reserves serve multiple functions: they can be used to address variability and timing of expenditures and receipts; occasional disruptions in activities, costs or revenues; utility debt obligations; and many other functions. The collective use of individual reserves helps to limit the City's exposure to revenue shortfalls, meet long-term capital obligations, and reduce the potential for bond coverage defaults.

Operating Reserve – An operating reserve is designed to provide a liquidity cushion; it protects a utility from the risk of short-term variation in the timing of revenue collection or payment of expenses. Like other types of reserves, operating reserves also serve another purpose: they help smooth rate increases over time. Target funding levels for an operating reserve are generally expressed as a certain number of days of operating and maintenance (O&M) expenses, with the minimum requirement varying with the expected revenue volatility. Industry practice for utility operating reserves ranges from 30 days (8%) to 120 days (33%) of O&M expenses, with the lower end more appropriate for utilities with stable revenue streams and the higher end of the range more appropriate for utilities with significant seasonal or consumption-based fluctuations.

The City's current policy is to maintain a minimum balance in the operating account equal to 3 months of operating reserves (90 days). Industry practice is to maintain a reserve range of 60 to 90 days of O&M expenses for water utilities. There are no changes recommended to this policy for the short term.

Rate Stabilization Reserve (Account) – A rate stabilization reserve is often required to be established per revenue bond covenants, although the amount of designated funding is not usually stipulated. The purpose of this type of reserve is to avoid unexpected rate increases, while ensuring that debt service payments can be made and coverage requirements will be met if revenue collections fall below normal levels. Per typical bond covenants, reserve amounts used in any given year are allowed to meet coverage requirements. There can be specific rules for the accounting of deposits and withdrawals into a rate stabilization reserve, so care must be taken when administering this reserve. The City may consider funding this reserve in the future if needed. It is recommended that the City confer with a bond advisor prior to funding this reserve.

Capital Contingency Reserve – A capital contingency reserve is the minimum fund balance in a capital fund, set aside for capital needs that are large, urgent, and unexpected. These needs could result from a sudden asset failure, or they could come from capital project cost overruns. There is more than one way to determine an appropriate level for this reserve. For instance, a utility could choose a certain percentage of the total cost of its assets, or it could base the minimum reserve on the cost of replacing a particular highly critical asset, or it could set the capital contingency as a percentage of average capital spending per year. The final target level should balance industry practice with the risk level of the City. The most common method is to set a minimum capital fund balance equal to 1% to 2% of the original cost of plant in service.

The City's current policy is to maintain a minimum balance in the Improvement Fund equal to $1 million (about 1.5% of current fixed assets). There are no changes recommended to this policy.

Restricted Bond Reserve – When issuing revenue bonds, bond underwriters require that the utility establish a restricted cash reserve, typically equal to one year's debt service payment (principal and interest) for each bond issue. The reserve can be used to fund the last year's debt service payment for each issue. The Water Utility does not have outstanding revenue bonds; therefore this reserve is not funded.

System Reinvestment Funding – System reinvestment funding promotes system integrity through reinvestment in the system. Target system reinvestment funding levels are commonly linked to annual depreciation expense as a measure of the decline in asset value associated with routine use of the system. Particularly for utilities that do not already have an explicit system reinvestment policy in place, implementing a funding level based on depreciation expense could significantly impact rates. A common alternative benchmark is annual depreciation expense net of debt principal payments on outstanding debt. This approach recognizes that customers are still paying for certain assets through the debt component of their rate, and intends to avoid simultaneously charging customers for an asset and its future replacement. The specific benchmark used to set system reinvestment funding targets is a matter of policy that must balance various objectives including managing rate impacts, keeping long-term costs down, and promoting "generational equity" (i.e. not excessively burdening current customers with paying for facilities that will serve a larger group of customers in the future).

The City does not have a policy in place for system reinvestment funding. It is recommended to establish a policy to annually fund from rates an amount equal to annual depreciation expense net of annual debt principal payments. To smooth rate impacts over the planning period, the financial plan incorporates a phase-in strategy beginning in 2016 that achieves the target by the end of the 10-year period.

Debt Management – It is prudent to consider policies related to debt management as part of broader utility financial policy structure. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage and total debt coverage targets.

The Water Utility does not have any outstanding revenue bonds, nor is any new debt forecasted to be needed to fund the 20-year CIP.

10.5 FINANCIAL PLAN RESULTS

10.5.1 Capital Improvement Program (Amended)

The CIP developed for this WSP identifies $37.0 million in project costs ($40.7 million inflated) over the 10-year planning horizon (including study year 2015). This includes $17.7 million of developer funded projects and $19.3 million of utility funded projects. The 20-year period totals

$45.5 million ($51.4 million inflated). Costs are stated in 2015 dollars and are escalated to the year of planned spending at an annual rate of 3.0% per year.

Table 10-4 summarizes the expected capital expenditures. Approximately 81% (2015 dollars) of the capital costs are included in the 10-year planning period.

Table 10-4

10-Year and 20-Year CIP (Amended)

Year	Total Annual Cost (2015 $)	Developer Funded (2015 $)	Utility Funded (2015 $)	Total Annual Cost (Inflated) [a]
Study Year 2015	$ 535,000	$ 0	$ 535,000	$ 535,000
2016	$ 1,982,000	$ 0	1,982,000	$ 1,982,000
2017	$ 997,000	$ 0	$ 997,000	$ 997,000
2018	$ 15,420,000	$ 13,421,000	$ 1,999,000	$ 16,359,078
2019	$ 4,754,000	$ 1,248,000	$ 3,506,000	$ 5,194,824
2020	$ 4,742,000	$ 1,767,000	$ 2,975,000	$ 5,337,163
2021	$ 4,417,000	$ 1,291,000	$ 3,126,000	$ 5,120,514
2022	$ 1,000,000	$ 0	$ 1,000,000	$ 1,194,052
2023	$ 1,000,000	$ 0	$ 1,000,000	$ 1,229,874
2024	$ 1,100,000	$ 0	$ 1,100,000	$ 1,393,447
2025	$ 1,090,000	$ 0	$ 1,090,000	$ 1,422,203
10- Year Capital Total	**$ 37,037,000**	**$ 17,727,000**	**$ 19,310,000**	**$ 40,765,155**
2026-2035	$ 8,460,000	$ 0	$ 8,460,000	$ 10,716,875
20- Year CIP Total	**$ 45,497,000**	**$ 17,727,000**	**$ 27,770,000**	**$ 51,482,029**

[a] Inflated to year of implementation

10.5.2 Capital Funding Plan (Amended)

A capital funding plan is developed to identify the total resources available to pay for the CIP and determine if new debt financing is required.

The Water Utility began 2015 with $2.3 million in the Operating Fund and $4.7 million in the Improvement Fund. Funds in excess of the Operating Fund maximum target of 90 days of O&M expenses are planned to be transferred to the Improvement Fund. Rate funded system reinvestment funds are projected to range between $109,313 and $1.7 million in the 10-year forecast.

The cash resources described above are forecasted to fully fund the 20-year CIP without the need for additional debt. Escalated developer funded projects total $19.1 million. **Table 10-5** presents the corresponding 20-year capital financing strategy.

Table 10-5

20-Year Capital Funding Strategy (Amended)

Year	Capital Expenditures 2015 $	Capital Expenditures Escalated	Debt Financing	Developer Funding	Cash Funding	Total Financial Resources
2015	$ 535,000	$ 535,000	$ -	$ 0	$ 535,000	$ 535,000
2016	$ 1,982,000	$ 2,041,460	-	$ 0	$ 2,041,460	$ 2,041,460
2017	$ 997,000	$ 1,026,910	-	$ 0	$ 1,026,910	$ 1,026,910
2018	$ 15,420,000	$ 16,359,078	-	$ 14,238,339	$ 2,120,739	$ 16,359,078
2019	$ 4,754,000	$ 5,194,824	-	$ 1,363,723	$ 3,831,101	$ 5,194,824
2020	$ 4,742,000	$ 5,337,163	-	$ 1,988,774	$ 3,348,389	$ 5,337,163
2021	$ 4,417,000	$ 5,120,514	-	$ 1,496,623	$ 3,623,891	$ 5,120,514
2022	$ 1,000,000	$ 1,194,052	-	$ 0	$ 1,194,052	$ 1,194,052
2023	$ 1,000,000	$ 1,229,874	-	$ 0	$ 1,229,874	$ 1,229,874
2024	$ 1,100,000	$ 1,393,447	-	$ 0	$ 1,393,447	$ 1,393,447
2025	$ 1,090,000	$ 1,422,203	-	$ 0	$ 1,422,203	$ 1,422,203
10-Year	**$ 37,037,000**	**$ 40,854,525**	**$ -**	**$ 19,087,459**	**$ 21,767,065**	**$ 40,854,525**
2026-2035	$ 8,460,000	$ 10,716,875	-	$ 0	$ 10,716,875	$ 10,716,875
Total	**$ 45,497,000**	**$ 51,571,399**	**$ -**	**$ 19,087,459**	**$ 32,483,940**	**$ 51,571,399**

10.5.3 Financial Forecast

The financial forecast is developed from the 2015 budget documents along with other key factors and assumptions to develop a complete portrayal of the utility's annual financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast:

Revenue Assumptions

- As previously discussed, rate revenues are assumed to grow at about 0.63% per year.
- Miscellaneous revenues are forecasted to increase at the customer growth rate, for the most part. Miscellaneous revenues include late penalties, NSF fees, and charges for special services.
- Connection charge revenue is budgeted at $86,000 for 2015. Based on the growth forecast, connection charge revenue is assumed at about $138,000 per year over the study period.
- Interest earnings initially assume a rate of 0.15% applied to beginning of year cash balances based on existing Local Government Investment Pool rates. The interest rate phases up to 1.0% within five years.

Expenditure Assumptions

- O&M expense projections are based on the 2015 budget and are forecasted to increase with general and labor cost inflation of 2.0% and benefit cost inflation of 7.0%.
- Utility and state taxes are calculated based on forecasted revenues and prevailing tax rates.
- The utility currently has one outstanding Public Works Trust Fund due to mature in 2016. Loan payments are about $92,000 per year in 2015 and 2016.
- The capital financial strategy developed for this WSP does not forecast the need to issue new debt.
- Any Operating Fund balance above the minimum requirement is assumed to be transferred to the Improvement Fund each year. The 2015 Operating Fund balance is expected to end the year at 90 days of O&M expenses, with the remainder transferred to the Improvement Fund.

Although the financial plan is completed for a 20-year planning period, the rate strategy focuses on the shorter term horizon, 2015 through 2025. It is recommended that the City revisit the proposed rates annually to ensure that the rate projections developed remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

Table 10-6 summarizes the annual revenue requirement for 2015 through 2025 based on the forecast of revenues, expenditures, fund balances, fiscal policies, and capital funding.

Table 10-6

10-Year Financial Forecast

	Study Year	10 Year Forecast									
Revenue Requirement	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Revenues											
Rate Revenues Under Existing Rates	$ 3,819,403	$ 3,845,225	$ 3,871,049	$ 3,896,873	$ 3,922,697	$ 3,948,522	$ 3,974,346	$ 4,000,170	$ 4,025,994	$ 4,051,818	$ 4,077,643
Non-Rate Revenues	100,496	115,280	130,001	131,283	138,431	138,923	135,989	125,415	130,481	135,885	139,159
Total Revenues	**$ 3,919,898**	**$ 3,960,505**	**$ 4,001,050**	**$ 4,028,157**	**$ 4,061,128**	**$ 4,087,444**	**$ 4,110,334**	**$ 4,125,585**	**$ 4,156,475**	**$ 4,187,704**	**$ 4,216,802**
Expenses											
Cash Operating Expenses	$ 2,763,264	$ 2,825,995	$ 2,889,954	$ 2,956,026	$ 3,024,315	$ 3,044,930	$ 3,116,990	$ 3,191,600	$ 3,268,891	$ 3,349,005	$ 3,432,091
Existing Debt Service	92,619	91,711	-	-	-	-	-	-	-	-	-
New Debt Service	-	-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment	-	109,313	293,003	456,182	620,529	789,227	969,755	1,169,671	1,353,763	1,542,679	1,740,630
Total Expenses	**$ 2,855,883**	**$ 3,027,019**	**$ 3,182,958**	**$ 3,412,209**	**$ 3,644,843**	**$ 3,834,158**	**$ 4,086,746**	**$ 4,361,271**	**$ 4,622,655**	**$ 4,891,684**	**$ 5,172,721**
Net Surplus (Deficiency)	**$ 1,056,965**	**$ 911,206**	**$ 783,318**	**$ 581,865**	**$ 377,085**	**$ 214,205**	**$ (12,086)**	**$ (260,147)**	**$ (495,081)**	**$ (737,653)**	**$ (992,248)**
Additions to Meet Coverage	-	-	-	-	-	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 1,056,965**	**$ 911,206**	**$ 783,318**	**$ 581,865**	**$ 377,085**	**$ 214,205**	**$ (12,086)**	**$ (260,147)**	**$ (495,081)**	**$ (737,653)**	**$ (992,248)**
Annual Rate Adjustment	0.00%	0.00%	0.00%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Cumulative Annual Rate Adjustment	0.00%	0.00%	0.00%	3.25%	6.61%	10.07%	13.65%	17.34%	21.15%	25.09%	29.16%
Rate Revenues After Rate Increase	$ 3,819,403	$ 3,845,225	$ 3,870,877	$ 4,023,166	$ 4,181,265	$ 4,345,391	$ 4,515,769	$ 4,692,632	$ 4,876,221	$ 5,066,787	$ 5,264,589
Additional Taxes from Rate Increase	$ -	$ -	$ -	$ 12,700	$ 25,984	$ 39,871	$ 54,386	$ 69,551	$ 85,390	$ 101,929	$ 119,194
Net Cash Flow After Rate Increase	**1,056,965**	**911,206**	**783,318**	**695,801**	**610,186**	**571,893**	**475,813**	**363,798**	**270,962**	**176,764**	**77,054**
Coverage After Rate Increases	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

Annual rate adjustments of 3.25% are projected for years 2018 through 2025 to cover projected O&M expenses, meet policy objectives for funding system reinvestment, and achieve other stated financial policy objectives. This rate strategy also provides sufficient funding to cash finance the 20-year CIP without the need for additional debt.

Table 10-7 shows a summary of the projected ending balances for the Operating Fund and Improvement Fund through 2025.

The combined minimum target balance is based on 90 days of O&M expenses plus $1 million for the Improvement Fund. The Water Utility does not have a restricted bond reserve. Funds remain above the targets throughout the forecast.

Table 10-7

Ending Cash Balance Summary

	Study Year	10 Year Forecast									
Ending Fund Balances	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Water Utility Fund	$ 681,353	$ 694,913	$ 712,584	$ 728,871	$ 745,705	$ 748,733	$ 768,548	$ 786,941	$ 805,995	$ 823,488	$ 846,227
Water Improvement Fund	6,369,907	5,772,266	4,223,449	3,874,976	3,847,650	3,491,479	2,354,627	2,783,066	3,244,769	3,494,980	3,776,488
Water Bond Reserve	-	-	-	-	-	-	-	-	-	-	-
Total	**$7,051,260**	**$ 6,467,179**	**$ 4,936,033**	**$ 4,603,847**	**$ 4,593,355**	**$ 4,240,212**	**$ 3,123,175**	**$ 3,570,007**	**$ 4,050,763**	**$ 4,318,468**	**$ 4,622,715**
Combined Minimum Target Balance	*1,454,235*	*1,463,276*	*1,475,056*	*1,485,914*	*1,497,137*	*1,499,155*	*1,512,365*	*1,524,627*	*1,537,330*	*1,548,992*	*1,564,151*

10.6 CURRENT AND PROJECTED RATES

10.6.1 Current Rates

The current water rate structure is comprised of a monthly fixed charge increasing by meter size, which includes up to 300 cubic feet of usage and an increasing block volume charge per hundred cubic feet (ccf) of use above the allowance. The same schedule of rates applies to all customer classes. **Table 10-8** shows the existing rate schedule.

The increasing block volume charge addresses water conservation incentives, consistent with the state's guidelines for a rate structure that encourages water demand efficiency (WQC 246-290-100).

Table 10-8

Existing Schedule of Rates

2015 Water Rates	
Monthly Base Rate	
Meter size (Inches)	**Current**
5/8"	$ 32.15
1"	$ 44.96
1 1/2"	$ 57.78
2"	$ 93.07
3"	$ 353.50
4"	$ 450.05
Metered Water Rate (per ccf)	
first 3 ccf	included
next 7 ccf	$ 2.94
over 10 ccf	$ 3.10

10.6.2 Projected Rates

Table 10-9 presents the proposed 10-year schedule of water rates, incorporating the proposed 3.25 percent annual rate increases, beginning in 2018. For purposes of the Financial Plan, the rate increases are applied uniformly to the existing rate structure. A study is underway to evaluate cost of service and rates by customer class.

Table 10-9

10-Year Proposed Rates

Across the Board Projected Rate Increases

Meter size (Inches)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
5/8"	$ 32.15	$ 32.15	$ 32.15	$ 33.19	$ 34.27	$ 35.39	$ 36.54	$ 37.73	$ 38.95	$ 40.22	$ 41.52
1"	$ 44.96	$ 44.96	$ 44.96	$ 46.42	$ 47.93	$ 49.49	$ 51.10	$ 52.76	$ 54.47	$ 56.24	$ 58.07
1 1/2"	$ 57.78	$ 57.78	$ 57.78	$ 59.66	$ 61.60	$ 63.60	$ 65.67	$ 67.80	$ 70.00	$ 72.28	$ 74.63
2"	$ 93.07	$ 93.07	$ 93.07	$ 96.09	$ 99.22	$ 102.44	$ 105.77	$ 109.21	$112.76	$116.42	$120.21
3"	$353.50	$ 353.50	$ 353.50	$ 364.99	$ 376.85	$ 389.10	$ 401.74	$ 414.80	$428.28	$442.20	$456.57
4"	$450.05	$ 450.05	$ 450.05	$ 464.68	$ 479.78	$ 495.37	$ 511.47	$ 528.09	$545.26	$562.98	$581.27
Volume Charge (per ccf)											
first 3 ccf	included	included	included	included	included	included	included	included	included	included	included
next 7 ccf	$ 2.94	$ 2.94	$ 2.94	$ 3.04	$ 3.13	$ 3.24	$ 3.34	$ 3.45	$ 3.56	$ 3.68	$ 3.80
over 10 ccf	$ 3.10	$ 3.10	$ 3.10	$ 3.20	$ 3.30	$ 3.41	$ 3.52	$ 3.64	$ 3.76	$ 3.88	$ 4.00

Table 10-10 shows residential monthly bill comparisons for the proposed annual increases.

Table 10-10

10-Year Monthly Bills

Residential	Current	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Monthly Bill	$40.97	$40.97	$ 40.97	$ 42.30	$ 43.68	$ 45.10	$ 46.56	$ 48.07	$ 49.64	$ 51.25	$ 52.92
% Increase		0.00%	0.00%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
$ Difference		$0.00	$ -	$ 1.33	$ 1.37	$ 1.42	$ 1.47	$ 1.51	$ 1.56	$ 1.61	$ 1.67

Sample bill at 5/8" meter using 6 ccf monthly

10.7 AFFORDABILITY

The Washington State Department of Health and the State Public Works Board have historically used an affordability index to prioritize low-cost loan awards. The typical threshold looks at whether a system's rates exceed 1.5% to 2.0% of the median household income for the demographic area. As a result, if monthly bills are less than 1.5% of the median household income for the demographic area, they are generally considered affordable.

According to a 2015 Alliance for Housing Affordability report, the median household income for the City of Arlington was $61,817. This figure is escalated for future years based on the assumed 2.0 percent labor cost inflation rate. **Table 10-11** presents the estimated residential water bill with the projected increases for the forecast period. The affordability mark (Monthly Bill *12 ÷ Median Income) averages 0.80% throughout the study period, indicating that rates are expected to remain affordable through 2025.

Table 10-11

Affordability Test

Year	Inflation	Median HH income	2.00% Monthly Threshold	Projected Monthly Bill	% of Median HH Income
2015		$ 61,817	$ 103.03	$ 40.97	0.80%
2016	2.00%	$ 63,053	$ 105.09	$ 40.97	0.78%
2017	2.00%	$ 64,314	$ 107.19	$ 40.97	0.76%
2018	2.00%	$ 65,601	$ 109.33	$ 42.30	0.77%
2019	2.00%	$ 66,913	$ 111.52	$ 43.68	0.78%
2020	2.00%	$ 68,251	$ 113.75	$ 45.10	0.79%
2021	2.00%	$ 69,616	$ 116.03	$ 46.56	0.80%
2022	2.00%	$ 71,008	$ 118.35	$ 48.07	0.81%
2023	2.00%	$ 72,428	$ 120.71	$ 49.64	0.82%
2024	2.00%	$ 73,877	$ 123.13	$ 51.25	0.83%
2025	2.00%	$ 75,355	$ 125.59	$ 52.92	0.84%

10.8 CONCLUSION

The analysis indicates that rate increases are necessary to fund ongoing operating and capital needs and to achieve stated policy objectives. Implementation of the proposed rate increases should provide for continued financial viability while maintaining affordable rates.

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Index to Appendices

Appendix	Subject
A	Water Facilities Inventory (WFI) Form (5 pp)
B	Water System Facilities Data (7 pp)
C	Hydraulic Model Node Diagram (2+1 pg)
D	Public Works Design and Construction Standards and Specifications (35 pp)
E	Water Use Efficiency Program (40 pp)
F	Watershed and Wellhead Protection Program (22+ pp)
G	Cross Connection Control Program (18 pp)
H	Water Quality Monitoring Plan (16 pp)
I	Integrated Water Resources Management Program (26 pp)
J	Consumer Confidence Report (6 pp)
K	Water Rights Information (82 pp)
L	Retail Water Service Area Agreements (~12 pp)
M	Snohomish County PUD No. 1 Wholesale Water Agreement (17 pp)
N	Consistency Review Checklists (~8 pp)
O	City of Arlington Resolutions (~19pp)
P	Water and Sewer Mutual Aid Agreement (13 pp)
Q	SEPA Checklist, DNS, and Addendum (~26 pp)
R	NPDES Permit for Discharging Filter Backwash Water (59 pp)
S	Brekhus-Beach Planning Information (10 pp)
T	Agency Review Comments (~69 pp)
U	Water Main Repair and Replacement Criteria and Prioritization (8 pp)

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City of Arlington

2019 Amendment to the

2015 Comprehensive Water System Plan





Prepared by:

City of Arlington

Water System ID 02950K

With assistance from:

RH2 ENGINEERS PLANNERS SCIENTISTS

and

FCS GROUP Solutions-Oriented Consulting

January 2016

Amended October 2017

Amended December 2019

Cover photos:

Foreground photo shows the Stillaguamish River and the Northern Pacific railroad trestle at confluence of the North and South Forks at Arlington. The River is one of three water sources used by the City of Arlington and can produce more than 90 percent of its annual water supply. Background photo shows the Pacific Keystone filter trains within the Water Treatment Plant. Water from riverbank wells is filtered through up to three trains with filtration media consisting of sand and anthracite. The WTP can treat 1700 gpm, or more than 2.4 MGD.

Recommended citations:

City of Arlington. 2019. 2019 Amendment to the 2015 Comprehensive Water System Plan. Released December 2019..

City of Arlington. 2017. 2017 Amendment to the 2015 Comprehensive Water System Plan. Released October 2017. Prepared with assistance from RH2 Engineering, Inc. and FCS Group Inc.

City of Arlington. 2016. 2015 Comprehensive Water System Plan, Final. Released January 2016. Prepared with assistance from RH2 Engineering, Inc. and FCS Group Inc.

Index to Appendices

Appendix	Subject
A	Water Facilities Inventory (WFI) Form (5 pp)
B	Water System Facilities Data (7 pp)
C	Hydraulic Model Node Diagram (2+1 pg)
D	Public Works Design and Construction Standards and Specifications (35 pp)
E	Water Use Efficiency Program (40 pp)
F	Watershed and Wellhead Protection Program (22+ pp)
G	Cross Connection Control Program (18 pp)
H	Water Quality Monitoring Plan (16 pp)
I	Integrated Water Resources Management Program (26 pp)
J	Consumer Confidence Report (6 pp)
K	Water Rights Information (82 pp)
L	Retail Water Service Area Agreements (~12 pp)
M	Snohomish County PUD No. 1 Wholesale Water Agreement (17 pp)
N	Consistency Review Checklists (~8 pp)
O	City of Arlington Resolutions (~19pp)
P	Water and Sewer Mutual Aid Agreement (13 pp)
Q	SEPA Checklist, DNS, and Addendum (~26 pp)
R	NPDES Permit for Discharging Filter Backwash Water (59 pp)
S	Brekhus-Beach Planning Information (10 pp)
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A WATER FACILITIES INVENTORY FORM

A.1 WFI DOWNLOADED FROM HEALTH WEB SITE SEPTEMBER 2015

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WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 10/29/2013
Printed: 9/8/2015
WFI Printed For: On-Demand
Submission Reason: Annual Update

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

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
02950 K	ARLINGTON WATER DEPT	SNOHOMISH	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 000200
DONALD R. SMITH [WATER UTILITY SUPERV] 154 W COX AVE ARLINGTON, WA 98223	ARLINGTON, CITY OF DALLAS R. SPEED 154 W COX AVE ARLINGTON, WA 98223	TITLE: LEAD WATER PLANT OPERATOR
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS 108 W HALLER CITY ARLINGTON STATE WA ZIP 98223	ATTN ADDRESS 108 W HALLER CITY ARLINGTON STATE WA ZIP 98223	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (360) 403-3507	Owner Daytime Phone: (360) 403-3528
Primary Contact Mobile/Cell Phone: 425-754-7432	Owner Mobile/Cell Phone: (425) 754-4291
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax:(360) 435-7944 | E-mail: XXXXXX	Owner Fax Phone: | E-mail: XXXXXX

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

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

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

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

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

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[ ] Special District	
[x] City / Town	[ ] Federal	[ ] Private	[ ] State	4,500,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
02950 K	ARLINGTON WATER DEPT	SNOHOMISH	A	Comm

15	16	17	18										19			20	21					22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY										USE				TREATMENT					DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING IN SPRING FIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANEANT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	InAct 05/05/2004 GWI WELL #1 HALLER BRIDGE PARK				X							X					X	X			X	40	850	SE NW	02	31N	05E
S02	GWI WELL #2 HALLER BRIDGE PARK				X							X			Y		X	X			X	40	570	SE NW	02	31N	05E
S03	GWI WELL #3 HALLER BRIDGE PARK				X							X			Y		X	X			X	40	1140	SE NW	02	31N	05E
S04	ARLINGTON AIRPORT		X									X			Y		X					152	240	SE NW	22	31N	05E
S05	GWI WF HALLER BRIDGE			X								X			Y		X	X			X	24	1710	SE NW	02	31N	05E
S06	809071 SNO PUD	80907 1										X			Y	X							1000	N E	30	31N	06E
S07	GWI WELL 1R HALLER BRIDGE PARK				X									X	Y		X	X			X	36	570	SE SW	02	31N	05E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
02950 K	ARLINGTON WATER DEPT	SNOHOMISH	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?)	0	5839	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	4582		
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	245		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	1257		
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.	598	598	
28. TOTAL SERVICE CONNECTIONS		6437	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per [illegible]? 14598

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

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

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

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	15	15	15	15	15	15	15	15	15	15	15	15

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____
DATE: _____

PRINT NAME: _____
TITLE: _____

WS ID	WS Name
02950	ARLINGTON WATER DEPT

Total WFI Printed: 1

B WATER SYSTEM FACILITIES DATA

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City of Arlington
Comprehensive Water System Plan
Well Facilities Data

Well Data

Well Name	Pressure Zone	Year Const.	Current Pumping Rate (gpm)	Max. Well Capacity (gpm)	Max Inst Water Right (gpm)	Casing Size (inches)	Well Depth (feet)	Well Screen Depth (feet)	Pump Intake Depth (feet)	Static Water Depth (feet)	Pumping Water Depth (feet)	Ground Elv (feet)
Airport Well	342	1945, 1996	220	580	580	10	185	N/A	103	33	53	132
Haller Park #1	342	1967, 2002	570	700	1,700	36	36	Range = 13.75"	29.75	N/A	N/A	71.7
Haller Park #2	342	1967, 2001	570	850	1,700*	36	38	Range = 13.75"	29.75	13	10	71.7
Haller Park #3A & 3B**	342	1906 or prior, 2001	570	850	1,700*	72	38	Range = 13.75"	29.75	19	15	71.7
					2,280							

* Haller Park Wells share a water right

** #3A and #3B pump from the same well.

Well Pump Data

Pump Name	Pump Manufacturer	Pump Model	Pump Type	Design Capacity (gpm)	Design Head (feet)	Motor Manufacturer	Motor Size (HP)	Control Valve Size & Model	Have Standby Power	Have E.G. Set Receptacle
Airport Well	Peerless	8 HDX, 10 Stage	Vertical Turbine	580	280	GE	60	Empire 6", Silent Check	EG	No
Haller Park #1	Peerless	10MA, 5 Stage	Vertical Turbine	570	138	USEM	25	6", Wafer?	EG	No
Haller Park #2	Peerless	10MA, 5 Stage	Vertical Turbine	570	138	USEM	25	6", Wafer?	EG	No
Haller Park #3A & 3B	Peerless	(2) 10MA, 5 Stage	(2) Vertical Turbine	570	138	USEM	(2) 25	6", Wafer?	EG	No

Well Pump Curve Data

Well 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)		
Airport Well	0	400	350	330	580	280		5.58 x 6.97
Haller Park #1								
Haller Park #2								
Haller Park #3A & 3B							537478D, 537478A	

Control Data

Well Name	Control Facility	Supplied Pressure Zone	Supply To Zone Priority	Well Have Telemetry
Airport Well	Gleneagle Reservoir	342	Secondary Supply	Yes
Haller Park #1	Water Treatment Plant	342	Primary Supply	Yes
Haller Park #2	Water Treatment Plant	342	Primary Supply	Yes
Haller Park #3A & 3B	Water Treatment Plant	342	Primary Supply	Yes

City of Arlington
Comprehensive Water System Plan
Pump Station Facilities Data

Pump Station Data

Name	Suction Pressure Zone	Discharge Pressure Zone	Year Constructed	Above or Below Grade	Maximum Capacity (gpm)	Meter Size & Model	Have Standby Power	Have E.G. Set Receptacle	Have Surge Protection
Water Treatment Plant	354	354		Above	1,710		EG	No	
520 Pump Station	354	520	1998	Above	790	8" Rockwell	EG	No	

Pump Data

Pump Name	Pump Mfgr	Pump Model	Pump Type	Current Pump Rate (gpm)	Design Capacity (gpm)	Design Head (feet)	Motor Mfgr	Motor Size (HP)	Control Valve Size & Model
Water Plant - Pump 1	Peerless			980	850		USE	100	
Water Plant - Pump 2	Peerless			980	850		USE	100	
Water Plant - Pump 3	Peerless			980	850		USE	100	
Water Plant - Pump 4	Peerless				1,000		USE	25	
Water Plant - Pump 5	Peerless				1,000		USE	25	
520 Pump Station - Pump 1	Peerless	C1125	End Suction	430	395	217	Baldor	40	4" CV
520 Pump Station - Pump 2	Peerless	C1125	End Suction	430	395	217	Baldor	40	4" CV

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)		
Water Plant - Pump 1								
Water Plant - Pump 2								
Water Plant - Pump 3								
Water Plant - Pump 4								
Water Plant - Pump 5								
520 Pump Station - Pump 1	200	250	395	217	600	144		9.75
520 Pump Station - Pump 2	200	250	395	217	600	144		9.75

Pump Control Data

Pump Name	Control Facility	Supplied Pressure Zone	Supply To Zone Priority	Pump Operation Priority	Station Have Telemetry
Water Plant - Pump 1	Clearwell Level	342	Primary	Primary	Yes
Water Plant - Pump 2	Clearwell Level	342	Primary	1st Lag	Yes
Water Plant - Pump 3	Clearwell Level	342	Primary	2nd Lag	Yes
Water Plant - Pump 4	Backwash of Filters	342	Backwash	N/A	Yes
Water Plant - Pump 5	Backwash of Filters	342	Backwash	N/A	Yes
520 Pump Station - Pump 1	520 Zone Reservoir	520	Secondary	Alternate	Yes
520 Pump Station - Pump 2	520 Zone Reservoir	520	Secondary	Alternate	Yes

City of Arlington
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)
Burn Road Reservoir	342	1962	Steel	500,000	38	48	305.5	342.0	305	N
Gleneagle	342	1975	Concrete	2,000,000	38	100	304.7	342.0	323	Y
520 Reservoir	520	1993	Steel	2,000,000	21	132	499.0	520.0	499	Y

Storage Data

Reservoir Name	Max Water Height (feet)	Volume Per Foot (gallons)
Burn Road Reservoir	342.0	13,699
Gleneagle	342.0	53,634
520 Reservoir	520.0	95,238

Level Control Data

Reservoir Name	Controlled Supply Facility	Reservoir Have Telemetry
Burn Road Reservoir	WTP Clear Well	No
Gleneagle	WTP Clear Well	Yes
520 Reservoir	Altitude Valve	Yes

City of Arlington
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 Inlet (psi)	Normal Pressure Outlet (psi)	Station Operation Status
PRV 1 (Highland View)	520	354		252.28	115	42	Active
PRV 2 (Woodlands Way)	520	354	1994	263.41	112	35	Active
PRV 3 (Cedarbough Loop)	520	354	1994	258.80	100	30	Active
PRV 4 (Woodbine Drive)	520	354	1994	231.76	128	35	Active
Bovee Acres PRV	520	354	2002	245.99			Active
Upper Burn Road PRV	PUD	354	2000	436.00			Active
Lower Burn Road PRV	PUD	354	2000	239.00			Active
186th Street PRV	710	520	2007	440.07			Active

PRV Set Point Data

PRV Name	Description	Valve Size (inches)	Valve Mfgr	Valve Model	Valve Elv (feet)	Valve Set Point (psi)	Valve Set Point (feet H.E.)
PRV 1 (Highland View)	Small PRV	2	Cla-Val	92G-01	247.28	38	335.06
	Large PRV	6	Cla-Val	92G-01B		33	323.51
PRV 2 (Woodlands Way)	Small PRV	2	Cla-Val	90G-01AS	258.41	30	327.71
	Large PRV	6	Cla-Val	92G-01B		25	316.16
PRV 3 (Cedarbough Loop)	Small PRV	2	Cla-Val	90G-01AS	253.80	35	334.65
	Large PRV	6	Cla-Val	92G-01BKC		20	300.00
PRV 4 (Woodbine Drive)	Small PRV	2	Cla-Val	90G-01AS	226.76	30	296.06
	Large PRV	6	Cla-Val	92G-01BKC		25	284.51
Bovee Acres PRV	Small PRV	2			240.99		
	Large PRV	6					
Upper Burn Road PRV	Small PRV	2			431.00	47	539.57
	Large PRV	8					
Lower Burn Road PRV	Small PRV	2			234.00		
	Large PRV	8					

City of Arlington
Comprehensive Water System Plan
Meter Data

Station Data

PRV Name	Water Provider	ARL Pressure Zone	Year Const.	Ground Elv (feet)	Normal Pressure (psi)	Station Operation Status
Marysville Island Crossing Meter	MAR	342	1998	125	50	Inactive
Marysville Municipal Utility Intertie	MAR	342	1978	124	50	Active
PUD Master Meter	MAR	710	2000	605	45	Active

Meter Data

PRV Name	Valve Size (inches)	Valve Mfgr	Valve Model	Valve Elv (feet)
Marysville Island Crossing Meter	6			
Marysville Municipal Utility Intertie	10			
PUD Master Meter	6 and 2			

C HYDRAULIC MODEL NODE DIAGRAM

C.1 HYDRAULIC MODEL NODE DIAGRAM PREPARED BY RH2 ENGINEERING, INC. (AMENDED 2017)

Note: For convenience, the hydraulic model node diagram in this bound Water System Plan has been placed with other oversized maps at the very back of the document.

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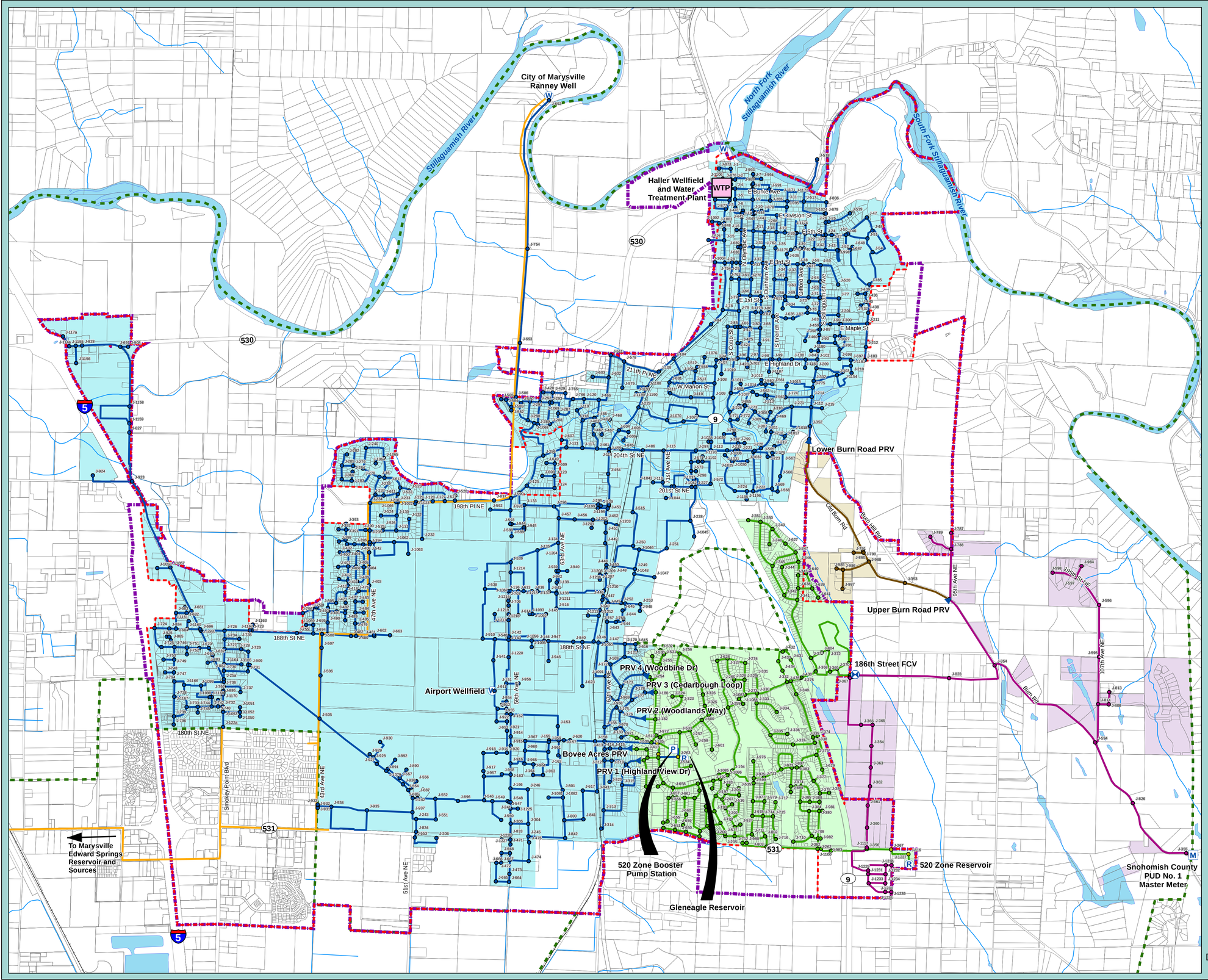

CITY OF ARLINGTON

COMPREHENSIVE WATER SYSTEM PLAN

EXISTING SYSTEM HYDRAULIC MODEL NODE DIAGRAM (AMENDED)

Legend

- City Limits
- UGA Boundary
- Future Water Service Area

Water Infrastructure

- Pump Station
- PRV
- Flow Control Valve
- Well
- Reservoir
- Intertie
- Meter

Nodes

- 342 Zone
- 520 Zone
- 540 Zone
- 710 Zone
- No Services

Water Main

- Marysville Water Main
- 342 Zone
- 520 Zone
- 540 Zone
- 710 Zone

1 INCH = 1,250 FEET

0 1,250 2,500

DRAWING IS NOT TO SCALE
IF BAR IS NOT 2" LONG

REVISION DATE: JUN 12, 2017

Z:\RICHLAND\DATA\ARL\417-057\GIS\MAPS\ARL-WSP-2017-NODE-DIAGRAM .MXD
BY: RWITHERS

D PUBLIC WORKS DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

D.1 CONSTRUCTION COMPLETION REPORT FORM

D.2 CHAPTER 4 OF JANUARY 2015 DRAFT ENGINEERING STANDARDS

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CONSTRUCTION COMPLETION REPORT FORM

In accordance with the *City of Arlington Public Works Design and Construction Standards and Specifications*, a ***Construction Completion Report*** is required for all utility construction projects. This form will be completed and filed with the City of Arlington within sixty (60) days of completion and before use of any water system facility.

Please type or print legibly in ink:

City of Arlington Water Department — DOH System ID No.: **02950K**

Name of Water System

City of Arlington — City Project ID: _____

Name of Purveyor (Owner or System Contact)

154 W. Cox Avenue — WSP CIP Number: _____

Mailing Address

Arlington, WA 98223 — Field Inspector: _____

City State Zip

PROJECT NAME AND DESCRIPTIVE TITLE: _____

PROFESSIONAL ENGINEER'S ACKNOWLEDGMENT *(Complete items below–Attach additional sheets as needed)*

The undersigned professional engineer (PE), or their designee, has inspected the above-described project which, as to layout, size, type of pipe, valves, materials, reservoir, and/or other designed physical facilities, has been constructed and is substantially completed in accordance with approved construction plans and the *City of Arlington Public Works Design and Construction Standards and Specifications*. In the opinion of the undersigned engineer, the installation, physical testing procedures, water quality tests, and disinfection practices were carried out in accordance with local (City or Snohomish County) and state regulations and principles of standard engineering practice.

P.E.'s Seal

_____
Date Signed

_____
Name of Engineering Firm

_____
Name of PE Acknowledging Construction Completion

_____
Mailing Address

_____
City State Zip

_____
Engineer's Signature

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DRAFT

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4-1 GENERAL REQUIREMENTS

4-1.01 STANDARDS

No extension or modification to the City's water system shall be made without approved construction plans with the signature of the City Engineer. Except where modified or amended in these Standards, all work and materials shall conform to the current edition of the following:

(AMC) Arlington Municipal Code
Title 13, and Title 20.6

(COA Comp Plan) City of Arlington Water Comprehensive Plan

(AWWA) American Water Works Association Standards

(WSDOT) Washington Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction.

These Standards do not include design of the City's general facilities such as wells; pump stations, storage tanks, or treatment plant. The general facilities require special design and will be reviewed and approved by the City on a case-by-case basis in accordance with all applicable codes and best standards of practice.

4-1.02 LIMITS OF PUBLIC WATER SYSTEM

Standards contained within this section shall apply to public water systems owned and maintained by the City of Arlington. Public water systems shall include all water systems within the public right-of-way up to and including water meters. Water appurtenances on the private side of the water meter shall be the responsibility of the property owner and shall be installed in accordance with applicable building and plumbing codes. For extensions of the public water main onto private property, a utility easement shall be established in accordance with Section 1-???? of these Standards.

In the event that submeters are installed by the property owner, the public water system shall be up to and including the master meter but will not include submeters nor piping behind the master meter.

For fire service lines, the public water system shall be up to but NOT including the backflow device. In the event that the backflow device is installed inside a structure, the public water system shall be up to within 5-ft of the face of building.

4-1.03 ORPHANED WATER SYSTEM

Orphaned water systems that seek connection to the City water system, either at the request

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of the development or jurisdictional requirement, shall be evaluated by the City to determine what provisions need to be addressed prior to connection. Provisions may include but not limited to a new water main network, backflow prevention device, and master meter. In the event that an orphaned water system is connected to the public water system with a backflow device and master meter, the public water system shall be up to and including the master meter and master backflow device.

4-1.04 PRIVATE WELLS

To receive water services from the City, the property owner shall decommission the existing well on the same lot in accordance with WAC 173-160-381. The owner shall provide a copy of the decommission report to the City Utilities Division.

New services will be locked until compliance is verified by the City's Cross Connection Specialist. Visual inspection of the piping is required for premises retaining active well systems.

4-1.05 WATER MAIN EXTENSION

Residential

It is the policy of the City that anyone who desires water services for more than one (1) single family residence, including single family and multi-family structures, must extend the City's water system to, and past, at least one full side of the property. In addition, the water mains must be installed through all internal streets; loop to all adjacent mains which will, in the City Engineer's opinion, extend past or through the property in the future; and stub to the property line where it is likely that they will be needed to connect to future mains. Depending on the property size, shape and the Water System Plan, the City may require mains to be constructed on more than one, and up to all, full sides of the property.

Non-Residential Properties

It is the policy of the City that anyone who desires water services to non-residential (commercial, industrial or public) property must extend the City's water system to, and past, the entire perimeter of the property and/or stub or connect to present and future mains.

The City also reserves the right to require that extra service lines be installed, at their discretion, to be used for sampling stations.

If a development is located in 2 or more pressure zones, the Developer may be required to install pressure reducing stations, isolation valves, check valves, and/or booster pump

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stations if required by the City Engineer.

Dead-end mains shall be minimized by making appropriate looping and tie-ins whenever practical in order to provide increased reliability of service and reduce head loss. Non-looped systems shall only be allowed upon approval by the City Engineer.

If the Developer's project directly benefits other property owners, the Developer may enter into a reimbursement agreement with the City per AMC 12.24.

4-1.06 HYDRAULIC REQUIREMENTS

All water mains shall be sized following a hydraulic analysis based on flow demands and pressure requirements. The system shall be designed to maintain a minimum pressure of 20 psi at ground level along the entire distribution system under all conditions of flow.

Fire flow requirements shall be determined by the City Fire Chief. The available fire flow will be determined by the City's engineering staff using the water system hydraulic model. Flow velocities in water mains shall not exceed 10 feet per second during the highest demand and fire flow.

4-1.07 WATER MAIN LOCATION

It is preferred that water mains and appurtenances are within the right-of-way of public streets and roads. Water mains may be installed within City easements across private properties. Water mains within public right-of-way shall be located on north and east sides of the centerlines. Water mains shall be in the shoulder of the roadway for rural roads, and approximately 6 feet from the street centerline for urban streets. See Standard Detail R-060. Exceptions to this requirement may be made in order to minimize the cutting and replacing of pavement, to avoid conflicts with other underground facilities, to permit sanitary sewers to be installed on the "low side" of streets, or for other approved reasons. As nearly as practical, mains shall be installed on a particular street with the distance from the property line and/or centerline varied as little as possible. Water mains shall not be located under or behind parking lanes, curbs, gutters, or sidewalks. Valve boxes shall be located outside the normal wheel track whenever possible.

If there is an easement across a paved area on private property the water main shall be installed in the driving lanes (not under parking stalls).

Water mains may be laid along road/street curves using pipe joint deflection whenever possible. Pipe joint deflections shall not exceed one-half of pipe manufacturer's recommended maximum deflections. Bends may be required to maintain proper water main alignment within the public right-of-way or easements.

4-1.08 WATER MAIN SIZING

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The minimum pipe size of public water main shall be 8-inch. Transmission mains, commercial developments, and specific areas outlined in the City's Water Comprehensive Plan require 12 inch or larger water mains or as directed by the City Engineer. 6-inch pipe is allowed for fire hydrant connections; refer to Section 4-1.15 of these Standards.

Upon approval of the City Engineer, 4 inch pipe may be used to serve water to a tract or the end of a cul-de-sac after the last fire hydrant and when no future extension is required. The length of the 4 inch water main shall not exceed 200 feet and the end of the main shall be blocked tee and a blow off assembly per Standard Detail 180

4-1.09 CONCRETE BLOCKING

When using horizontal and vertical concrete blocking, show locations and type of blocking on the plans. City Standard Details W-160 through W-175. Concrete blocking is required on all fittings including restrained joint fittings.

An 8 inch pipe at a vertical bend shall be restrained a minimum of 36 feet (2 joints) from each side of a bend. A 12 inch or larger pipe at a vertical bend shall be restrained a minimum of 54 feet (3 joints) from each side of a bend. No change in horizontal direction or diameter shall occur within 36 feet of the vertical bend. Special blocking or joint restraint designs may be necessary for poor soil, conflicting utility, etc.

4-1.10 SLOPES

Anchor blocks shall be used in conjunction with joint restraint where slopes are 20% or greater. Timber baffle/hill holders shall be required on unpaved slopes that exceed 20%, maximum spacing shall be 20' foot on center and minimum of 1 holder for each pipe length.

4-1.11 PRESSURE REDUCING STATIONS

If a development is located in two or more pressure zones, pressure reducing stations may be installed by the Developer if required by the City Engineer.

4-1.12 BLOW-OFFS

Each dead-end main shall be provided with a fire hydrant if flow and pressure are sufficient or with an approved flushing hydrant or a blow-off assembly shown in Standard Detail W-180 for flushing purposes. Flushing devices shall be sized to provide flows that will give a velocity of at least 2.5 feet per second in the water main being flushed. No flushing device shall be directly connected to any sewer. Blow-off assemblies shall be located outside the traveled portion of the roadway, behind the curb or sidewalk, and within the public right-of-way or public utility easement.

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A 2 inch blow-off assembly shall be required for testing and disinfection of new water mains, where hydrants are not available.

4-1.13 VALVES

Sufficient valves shall be provided on water mains so that interrupted service and sanitary hazards will be minimized during repairs. Valves shall be located at no more than 300 foot intervals in commercial, industrial and multi-family areas and at no more than one block or 400 foot intervals in other areas. At water main intersections, valves shall be placed on 4 legs at each cross, and 3 legs at each tee (unless tapping an existing water main). The valves shall be spaced so that no more than one fire hydrant is removed from service with any separate main shut down.

An auxiliary valve shall be installed on each hydrant run at the tee. Provide a valve at each end of an easement. Additional valves may be required for area isolation and unidirectional flushing. Valves on water mains shall, where practical, be located within paved area of the street. A valve box or chamber shall be provided for every valve.

4-1.14 COMBINATION AIR VALVES

Combination air valves as shown in Standard Detail W-260 shall be installed on high points of new water mains, where the elevation difference between the high point and the next low point exceeds one (1) pipe diameter, or as required by the City. The air valves shall be located outside the traveled portion of the roadway, preferably behind the curb or sidewalk and within the public right-of-way and the public utility easement. If possible, the water main profile shall be adjusted to eliminate the use of the air valves.

4-1.15 FIRE HYDRANTS

Fire hydrants shall be installed for buildings where water is served by the City. The final number of hydrants and their locations shall be approved by the City Fire Chief.

The maximum spacing of fire hydrants serving single-family dwellings or duplex dwellings on individual lots shall be 600 feet and not more than 300 feet from the front property line of the main body of a lot. Required distances shall be measured along the normal fire department hose laying route.

Fire hydrants serving multi-family and commercial lots shall be located not more than 300 feet on center and shall be located so that at least one hydrant is located within 150 feet of all structures or uses. Fire hydrants shall not be closer than 50 feet from multi-family or commercial buildings. On arterial streets without residential access, maximum hydrant spacing shall be 600 feet.

Fire hydrants shall be installed at the ends of each dead end line more than 300 feet in length.

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Said fire hydrants may be removed to conform to standard spacing requirements when the main is again extended with the City's approval.

4-1.16 SERVICE CONNECTIONS

Service connections including saddle, service line, meter box and appurtenances shall be installed as part of the construction of all new water system extensions. A fire sprinkler meter per City Standards shall be provided if required by the City Fire Chief. Irrigation systems, fire sprinkler systems and non-residential connections must be protected by a DOH approved backflow prevention assembly in accordance with WAC 246-290-490.

For residential developments, meter boxes shall be located in front of the lot to be served unless otherwise approved by the City. They shall be close to the property line, in a landscape area within public right-of-way or public utility easement, but not in paved areas such as sidewalk or driveway. Meters for two neighboring lots shall be installed near the common lot line to ease meter reading. Meters located close to driveways shall use boxes with traffic rating. The distance from the water main to the meter box shall not exceed 50 feet unless it is approved by the City. Meters shall be located in or as close to the public right-of-way as possible. Service lines shall be perpendicular to the water main if possible. See Standard Details W-040 for residential services and W-050 for non-residential services.

For commercial and multi-family developments, meters shall be located behind the back of a curb or sidewalk and not behind parking space or other obstructions. Meters shall be located for ease of reading.

Minimum allowable service lines from mains to meters shall be 1 inch for a single family residential buildings and 2 inch for multi-family or commercial buildings. All duplexes and triplexes must have separate services and meters for each unit. Multifamily buildings with four or more units must have separate services and meters for each building. Each building shall be served by a separate service and meter. Irrigation and fire sprinklers shall be served by separate services and meters unless otherwise approved by the City Engineer. A minimum pressure of 35 psi at the meter shall be maintained when service is flowing at anticipated maximum flow rates. If friction losses will cause the pressure at the building to drop below the minimum, the service line size shall be increased.

The standard meter size is ⅝ inch × ¾ inch for a single family residential house. Non-residential services and meter sizes (minimum ⅝ inch × ¾ inch) shall be determined by the engineer or architect per the Uniform Plumbing Code and approved by the City Building Official, and the plans shall show the locations and sizes of the services and meters.

Static service pressures at ground floor elevation shall be determined at all lots/buildings to ensure compliance with system pressure standards. Plans shall identify lots/buildings where the builder/owner will install individual pressure reducing valve (PRV). A PRV shall be on the customer side of the meter, outside of the public right of way and a minimum of 3 feet after

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water meter box. Plans shall identify location of where PRV will be installed, such as site or within structure.

4-1.17 CROSS-CONNECTION CONTROL

The City strictly prohibits interconnection of other water supplies with the City's water system.

Irrigation systems, fire sprinkler systems, commercial service connections and other water uses which may cause contamination of the City water system require a backflow prevention device to be installed. Approved backflow prevention assemblies shall meet the requirements of the WAC 246-290-490 "Cross Connection Control Regulation in Washington State", and the recommendations of the PNWS-AWWA Cross Connection Control Manual and the City of Arlington Cross Connection Control Program depending upon the degree of hazard. The types of backflow prevention devices to be used for a specific project shall be determined by the City's Cross Connection Specialist.

Fire sprinkler system connections to the City's water system shall be owned and maintained by the property owner, beginning immediately downstream of the valve where the fire sprinkler system connects to the City's water main at the property or right-of-way line.

The backflow prevention assembly on fire sprinkler system connections shall be located as close to the serving water main as possible, either on the owner's property or in an easement.

A master meter used for eight or more units in a multi-family development, or for buildings exceeding thirty feet in height, require double check valve assemblies and a bypass with equal backflow prevention to avoid loss of service during maintenance and repair.

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4-2 CONSTRUCTION

4-2.01 WATER MAIN

4-2.01(1) GENERAL REQUIREMENTS

All work shall be constructed as shown in the plans and in accordance with these Standards.

Materials shall be installed in compliance with the manufacturer's instructions and specifications, except where a higher quality of workmanship is required by the plans and these Standards. All work shall be in accordance with any applicable regulations of the State, County and local jurisdictions. The Contractor shall arrange for inspection by these agencies and shall submit evidence of their approval, if requested by the City.

4-2.01(1)A MATERIAL SUBMITTALS

The Developer/Contractor shall provide material submittals to the City for approval after the plans are approved for construction. The Developer shall assume the risk for material or equipment, which is fabricated or delivered prior to the City's approval of material submittals.

Five (5) sets of material submittals are required. The City shall either approve or otherwise indicate the reasons for disapproval. Disapproved submittals shall be resubmitted to the City for approval.

The City's review of material submittals covers only general or conformance to the plans and these Standards. The Developer is responsible for quantity determination. No quantities are to be verified by the City. The Developer is responsible for any errors, omissions or deviations from the contract requirements. Review or approval of submittals by the City does not relieve the Developer from his obligation to furnish required items in accordance with the plans and these Standards.

Each "Material Submittal" section shall follow a cover page and state the category of the materials for this section. Each submittal must have the specific part number(s) checked or highlighted along with its specific purpose. The following shows the preferred order to list the material categories:

1) Pipe, Fittings, Pipe Restraints and Casing.

2) Valves (Gate Valves, Air Valves, Blow-off, and Valve Boxes).

3) Hydrants and Attachments.

4) Service Fittings, Service Pipe, Saddles, Ball Valves, Corps, Sleeves, etc.

5) Boxes for Meters, Sampling Stations, Blow-offs, and Air Valve Assemblies.

6) Cross Connection Control Assemblies (DCDA, RPBA, RPDA, DCVA).

7) Bedding Material with Sieve Analysis.

8) Other items if required.

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4-2.01(1)B PRE-CONSTRUCTION CONFERENCE

The Developer/Contractor shall contact the Public Works Department (360-403-3500) to schedule a pre-construction conference after the material submittals, grading, and right-of-way permits are approved. The conference shall include the Developer, Developer's Engineer, and Contractor, representatives from the permit agencies, other utility companies, and City staff. An on-site tailgate meeting between the Contractor and the City Inspector shall be arranged by the Contractor at least 48 hours prior to commencing construction.

4-2.01(1)C CONSTRUCTION SCHEDULE

The Developer/Contractor shall provide the City with the construction schedule a minimum of five (5) business days prior to start of water system extension construction to arrange staking inspection and to give permitting agencies and customers two (2) business days notice. No construction is allowed until the construction plans have been approved and all appropriate permits have been obtained.

4-2.01(1)D DEVIATION FROM PLANS

No deviations from the approved plans and these Standards shall be allowed without the City's approval. Minor changes may be approved by the City Engineer. If major changes are required, the Developer's Engineer shall revise and sign the plans for the City Engineer's approval prior to restart of construction.

If the City is aware of any deviation from the approved plans and determines that it is not acceptable, the City shall give a written notice to the Developer. The project will not be accepted unless the deviation is corrected.

4-2.01(2) MATERIALS

4-2.01(2)A GENERAL

All materials shall be new and undamaged. The same manufacturer of each item shall be used throughout the work.

When specific manufacturers or models are specified in these Standards, no substitutions will be allowed without prior approval by the City. If required by the City, the Contractor shall furnish certification from the manufacturer of the materials being supplied that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of the reference Standards.

4-2.01(2)B PIPE MATERIAL

Ductile iron pipe shall be Class 52 and cement mortar lined unless otherwise specified and shall conform to AWWA/ANSI C151/A21.51. Standard thickness of cement mortar lining shall be in accordance with AWWA/ANSI C104/A21.4.

Upon approval by the City Engineer, High density polyethylene (HDPE) pipe may be used in certain circumstances and shall conform to AWWA C906 and WSDOT Section 9-30.1(6).

4-2.01(2)C PIPE FITTINGS AND JOINTS

All fittings for ductile iron pipe shall be ductile iron compact (short body) fittings conforming

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to AWWA/ANSI C153/A21.53 and shall be cement mortar lined conforming to AWWA/ANSI C104/A21.4. Ductile iron pipe fittings shall be pressure rating of 350 psi for push-on or mechanical joint fittings and 250 psi for flange joint fittings drilled in accordance with AWWA/ANSI C111/A21.11, unless otherwise noted. Pipe shall be furnished with restrained joints or rubber gasket push-on joints with "field lock" gaskets, or approved equal, unless flanged joints are required.

Horizontal or vertical bends shall be used when joint deflection would exceed one-half of the pipe manufacturer's recommended maximum deflection. Megalug restraints, or approved equal, are required on all fittings.

Gasket material for flanges shall be neoprene, Buna N, chlorinated butyl, or cloth inserted rubber.

Where restrained joints are required, they shall be either bolted or boltless design, flexible after assembly, and can be disassembled without special tools. Any device utilizing round point set screws shall not be permitted. All couplings installed underground to connect ductile iron pipe shall be manufactured of ductile iron.

Restrained fitting joints shall be Megalug Series 1100, TR Flex, Grinnell 595 shackle clamp, or approved equal.

4-2.01(2)D COUPLINGS

Flexible coupling and transition coupling cast components shall be ductile iron. Bolts and nuts shall be in accordance with ASTM A536-80, Grade 65-45-12. Bolts shall be high strength, low alloy steel track head bolts with national course rolled thread and heavy hex nuts. Gaskets shall meet AWWA/ANSI C111/A21.11 composition specifications.

4-2.01(2)E BOLTS AND NUTS

Bolts, nuts and washers used for securing fittings shall be of similar materials. Steel bolts shall meet the requirements of ASTM A307 or ASTM F568 for carbon steel or ASTM F593 or ASTM F738 for stainless steel. Nuts shall meet the requirements ASTM A563 for carbon steel or ASTM F594 or ASTM F836 for stainless steel. Iron bolts and nuts shall meet the requirements of ASTM A536, grade 65-45-12.

4-2.01(2)F DETECTABLE MARKING TAPE

Utility pipe tracer tape shall be detectable below ground surface, color coded, with utility name printed on tape. Tracer tape shall be detectable type, up to 6 inches in width, and buried 24 inches to 48 inches below finished grades. The color of the tape for water shall be blue with black printing reading "CAUTION WATER BURIED BELOW". Tracer tape shall be "Lineguard Type II Detectable", or approved equal.

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4-2.01(2)G CASING SPACERS AND END SEALS

Casing spacers and end seals shall be sized for pipe being installed and shall be manufactured by Advance Products & Systems, Cascade Waterworks, Pipeline Seal and Insulators Co., or approved equal.

4-2.01(2)H STEEL CASING

Steel casing shall be black steel pipe conforming to ASTM A53. Casing shall be as specified in City Standard Detail W-230.

4-2.01(2)I CONCRETE

Thrust blocking, encasement, or slope anchor concrete shall be mixed from materials acceptable to the City and shall have a 30-day compressive strength of not less than 2,500 psi.

The mix shall contain five (5) sacks of cement per cubic yard and shall be of such consistency that the slump is between 1 inch and 5 inches. All concrete shall be mechanically mixed.

4-2.01(2)J CONTROLLED DENSITY FILL

Controlled Density Fill (CDF) shall conform to the requirements of Section 2-???? Of these Standards.

4-2.01(2)K BEDDING MATERIAL

Aggregates for bedding material shall consist of sandy material, free from wood, bark, or other extraneous material, and shall meet the requirements of WSDOT Section 9-03.1(2)B Class 2 Fine Aggregate.

4-2.01(2)L BACKFILL MATERIAL

Backfill material shall be in accordance with Section 2-??? of these standards.

4-2.01(3) CONSTRUCTION

4-2.01(3)A GENERAL

Water mains shall be installed in accordance with WSDOT Section 7-09.3, except as modified in these Standards.

4-2.01(3)B CONSTRUCTION ON EXISTING EASEMENTS

All work on the public utility easements shall be performed in accordance with easement

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provisions. Easements shall be restored equal to or better than the original conditions. The Contractor shall not work on easement areas until specifically authorized by the City Engineer. The City and the Contractor shall coordinate with the property owner(s).

4-2.01(3)C ABANDONMENT OF EXISTING WATER MAIN

Abandonment of Water Main

Water mains no longer in service shall be removed and disposed of by the Contractor. The water main may be abandoned in place with the approval of the City Engineer.

When water mains are abandoned, the ends of the pipe and fittings shall be plugged with concrete which shall have a minimum length of 12 inches. The City may require the Contractor to fill the abandoned water mains with sand or cement grout depending on the size, material, and location of the water main.

Abandonment of Structures

Abandonment of structures shall be completed only after water facilities have been properly abandoned. All valves and valve boxes shall be removed on abandoned valves.

4-2.01(3)D COVER DEPTH

A cover depth of 3 feet (36 inches) above the top of water mains shall be maintained if possible. The cover depth shall not be less than 3 feet (36 inches) or more than 5 feet (60 inches) without the approval of the City Engineer.

If the water main is within the State or County right-of-way, the cover depths shall meet the requirements of the State or County.

4-2.01(3)E HORIZONTAL SEPARATION

Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary sewer, septic tank and/or absorption field. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, the City may allow deviation on a case-by-case basis using DOE criteria. Such deviation may allow installation of the water main closer to a sanitary sewer, provided that the water main is laid in a separate trench or on undisturbed earth shelf located on one side of the sanitary sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. Water service connections and side sewers shall have minimum horizontal clearance of 10 feet unless otherwise approved by the City Engineer.

Minimum horizontal clearances from water mains:

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Cable	5’
Gas	5’
Power	5’
Storm drain	5’
Telephone, Fiber optic	5’
Sanitary Sewer	10’

4-2.01(3)F VERTICAL SEPARATION

Wherever practical, water mains shall cross other utilities at right angles. If this is not possible, the crossing angle shall be maintained between 45 and 90 degrees. Water mains crossing sanitary sewers shall be laid to provide a minimum vertical clearance of 18 inches between the outside of the water main and the outside of the sewer. The City prefers that the water main be above the sewer main. Where a water main crosses a sanitary sewer, one full length of water pipe shall be used with the pipe centered over the sewer for maximum joint separation. When the above conditions cannot be met, the City has the right to approve a variance, but shall require that the sewer be constructed of ductile iron pipe and be pressure tested before being activated, and/or be encased as the City deems necessary. DOE criteria will also apply.

Minimum vertical clearances from water mains:

Cable	1’
Gas	1’
Power	1’
Storm drain	0.5’
Telephone, Fiber optic	1’
Sanitary Sewer	1.5’

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If the minimum vertical distance between utility pipes is less than 6 inches and such installations are approved by the permitting agency, a rigid foam pad shall be placed between the pipes. The pad shall be; outside diameter (O.D) × O.D. × 2.5 inches thick minimum or as required to protect the pipes and O.D. is equal to the outside diameter of the larger pipe. The pad shall be a polyethylene foam plank (Dow Plastics Ethafoam 220), or approved equal. Additional measures may be necessary to ensure system integrity and may be required as evaluated by the permitting agency on a case by case basis.

4-2.01(3)G SETBACK DISTANCE FROM BUILDINGS

Water mains shall be located a minimum of 5 feet from covered parking, 10 feet minimum from building and retaining walls. Refer to Section 1-??? for easement requirements.

4-2.01(3)H ASBESTOS CONCRETE PIPE CROSSING

When a proposed water main crosses existing asbestos concrete (A.C.) pipe, the City shall require removal and replacement of the A.C. pipe with ductile iron pipe at the Developer's expense. The A.C. pipe to be removed shall be disposed of in accordance with the Puget Sound Air Pollution Control Agency (PSAPCA) requirements. A permit from PSAPCA to perform the A.C. pipe removal is required prior to construction drawing approval. DIP crossings shall be connected to the existing A.C. main with Romac extended range transition couplings.

When working with asbestos cement pipe, the Contractor is required to minimize workers' exposure to asbestos material at or below the exposure limit as prescribed in WAC 296-62-07705 State and Federal Guidelines and Certification and PSAPCA requirements.

4-2.01(3)I STAKING

Staking shall be performed by or under the direct supervision of the Developer's Land Surveyor licensed in the State of Washington. Provide the City with two (2) business days notice to inspect construction staking before construction begins.

Staking shall be placed in 50 foot intervals and at all fittings on base line or edge of easement with stationing, hub elevations, and cuts to top of pipe.

4-2.01(3)J STEEL CASING

Ductile iron pipe shall be encased in a steel casing when crossing under a rockery or wall so that removal or replacement of the water main will not disturb the structures. Casings are required when crossing (1) under rockeries over 5 feet high; (2) under retaining wall footings over 5 feet wide; and (3) under reinforced earth retaining walls (both wall and reinforcing material). Casings shall extend a minimum of 5 feet past each edge of the structure, or a distance equal to the depth of pipe, whichever is greater. Minimum vertical clearance between the bottom of the wall or footing and top of the pipe or casing shall be 2 feet. The pipe trench at the casing shall be backfilled with gravel backfill material when the vertical clearance is less than 3 feet.

Ductile iron pipe shall be encased in a steel casing when crossing under a railroad or State/County highway. Casings shall extend at least 6 feet past the edges of the right-of-way.

The casing pipe and carrier pipe shall be installed in accordance with the applicable Federal, State and local regulations. In the case of railroad crossings, the project shall also comply with regulations established by the railroad company.

The carrier pipe shall be supported by casing spacers. Casing spacers shall be placed under the carrier pipe to ensure approximate centering within the casing pipe and to prevent damage

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during installation. See City of Arlington Standard Detail W-230.

Steel casings may also be required when water mains cross creeks or wetlands.

4-2.01(3)K TRENCH EXCAVATION AND BACKFILL

Trench excavation and backfill operations within State right-of-way: All excavation and backfill within the State right-of-way shall adhere to *WSDOT*.

Trench excavation and backfill operations within County right-of-way: Excavation within Snohomish County right-of-way shall conform first to Snohomish County Road Standards, and secondly to *WSDOT*.

Trench excavation and backfill operations within City right-of-way: Excavation within the City right-of-way shall conform to WSDOT Section 7-09.3. Trench backfill shall be in accordance with Section 2-??? of these Standards.

The length of trench excavation in advance of pipe laying shall be kept to a minimum and shall not exceed more than 150 feet without written approval of the City Engineer.

4-2.01(3)L CONCRETE THRUST BLOCKING

Blocking shall, unless otherwise shown or directed, be placed so that pipe and fittings will be accessible for repair. Eight-mil polyethylene sheets shall be installed around all fittings and all bolts, nuts, and glands for future dismantling.

In the event of a shut down where time does not permit the proper setting of the concrete blocking, ecology blocks shall be installed with concrete poured around the connection point of the fitting and the blocks with the approval of the City Inspector.

4-2.01(3)M CONNECTION TO EXISTING MAINS

Connections to existing water mains 8 inches and larger shall be via a hot tap shown in Standard Detail W-200 unless cut-in is required by the City in order to install additional valves. Connections to existing water mains smaller than 8 inch diameter shall be made by cutting in a tee, unless otherwise approved by the City.

4-2.01(3)N HANDLING OF PIPE

Pipe shall be delivered to the site with end caps. Any pipe delivered without end caps shall be rejected by the City.

4-2.01(3)O JOINTS AND FITTINGS

Bolts on mechanical pipe and fittings shall be tightened uniformly with a "Torque" wrench

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which measures the torque for mechanical joints as follows:

Bolt Size (in)	Range of Torque (ft*lbs)
5/8	40-60
3/4	60-90
1	70-100
1-1/4	90-120

Nuts spaced 180 degrees apart shall be tightened alternately in order to produce equal pressure on all parts of the gland.

Installation of push-on joint pipe and file lock gaskets shall be in accordance with the manufacturer's instructions.

All parts of the pipe ends, couplings, fittings and appurtenances shall be cleaned to remove oil, grit, or other foreign matters from the joints. Care shall be taken to keep the joints from contacting the soil.

4-2.01(3)P PRESSURE REDUCING STATION

Installation shall be as shown in City Standard Detail W-080, in approved plans, and in accordance with the manufacturer's recommendations. The pressure reducing valves, strainers, pressure relief, pipe and fittings shall be constructed in accordance with the applicable AWWA and Uniform Plumbing Code requirements. Pressure reducing valves 6 inches or larger shall be supported by pipe supports. Supports shall be bolted to the vault floor.

Pressure relief discharge pipe shall be placed in a location that will not be subject to damage or erosion during discharge of water. The Contractor shall schedule and perform a start-up with the presence of the PRV manufacturer's representative(s).

4-2.01(3)Q LAYING PIPE ON CURVES

Ductile Iron Pipe

When it is necessary to deflect pipe from a straight line in either the horizontal or the vertical plane, the amount of joint deflection shall not exceed one half (½) of the maximum deflection recommended by the pipe manufacturer. The Contractor shall submit to the City the pipe manufacturer's joint deflection recommendations prior to pipe installation as a part of the Material Submittals.

Where field conditions require deflection or curves not anticipated on the plans, the City will determine the methods to be used.

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4-2.01(3)R INSPECTION AND TESTING

The City Inspector shall have access to the project site for the purpose of inspections and testing at all times. The Contractor shall provide proper facilities for such access, inspection, and testing. It shall be the responsibility of the owner/contractor to notify the City at least (2) business days prior to inspection date.

If any work is covered without approval or consent of the City Inspector, it must be uncovered for inspection if required by the City Inspector.

Pressure testing against installed valves shall be only at the approval of the City Inspector.

Before a pressure test is to be observed by the City Inspector, the Contractor shall make whatever preliminary tests to ensure that the material and/or equipment are in accordance with the plans and these Standards.

Written and/or verbal notices of deficiency shall be given to the Contractor. The Contractor shall correct such deficiencies before final inspection by the City Inspector.

4-2.01(3)S SCHEDULE OF TESTS

The Contractor shall notify the City Inspector at least 2 business days before a section of water main is ready for inspection and test. The Inspector will inspect and observe the hydrostatic test. The Contractor shall contact the City at least 2 business days prior to purity test and flushing, the Contractor shall be present at the project site when the City Inspector takes water samples. The Contractor shall provide sufficient manpower and resources to accomplish the work in a timely manner. Flushing shall be done by or under direct supervision of the City Inspector.

4-2.01(3)T HYDROSTATIC PRESSURE TESTS

Sections to be tested shall normally be limited to a maximum of 1,000 feet.

The Contractor shall rent from the City an approved DCVA to fill the new water mains for testing and flushing. The new water mains shall be filled and remain under 200 psi to 210 psi pressure for 24 to 48 hours to allow air to escape and the pipe lining of the pipe to absorb water.

Prior to calling the City Inspector for pressure test, the Contractor shall have all equipment available for set up but not connected until the City Inspector is present for operation. All services shall be flushed.

4-2.01(3)U DISINFECTION AND FLUSHING OF WATER MAINS

Before being placed into service, new water mains and repaired portions of existing mains shall

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be chlorinated and a satisfactory bacteriological report obtained. Disinfection of water mains shall be accomplished by the Contractor in accordance with the requirements of the *Washington State Department of Health*, AWWA Standard C651, WSDOT Section 7-09.3(24) and in a manner satisfactory to the City. Sections shall be disinfected between adjacent valves unless, in the opinion of the City Engineer, a longer section may be satisfactorily handled. All filling and flushing shall be done through a meter with a DCVA rented from the City. Valves shall be operated by City staff only.

4-2.01(3)V FINAL FLUSHING AND TESTING

Following chlorination, chlorinated water shall be flushed from the new water main until the replacement water throughout its length shows absence of chlorine. In the event chlorine is normally used in the source of supply, the tests shall show a residual not in excess of that normally carried in the water supply system (never to exceed 2 mg/l).

After final flushing and before the new water main is connected to the distribution system. The Contractor shall schedule the sample collection with the City a minimum of two (2) business days in advance of test. The number of samples from the source and the number of representative sample points required will be determined by the City Inspector. Appropriate sample taps shall be furnished by the Contractor. No hose or fire hydrant shall be used in the collection of samples.

At least one set of samples shall be collected from every 1,200 feet of the new water main, plus one set from the end of the line and at least one set from each branch. All samples shall be tested for total coliform bacteria and for heterotrophic bacteria by the heterotrophic plate count (HPC) analysis. The maximum allowable coliform content of the flushed sample shall be zero. The maximum allowable HPC population count in all source samples shall be 80/ml. Any source sample that exceeds a count of 80/ml shall be ruled as an indeterminate test and a new set of source and construction samples for analysis shall be required. The maximum allowable HPC population count from any construction sample shall be no greater than twenty (20) counts above the highest source HPC population count.

Before placing the lines into service, a satisfactory report shall be received by the City from the certified laboratory evidencing successful tests on samples collected from representative points in the system extension.

Should the initial test result in an unsatisfactory bacteriological test, additional chlorination using the above procedure shall be repeated until satisfactory results are obtained. The Contractor shall be responsible for disposal of treated water flushed from the mains.

Chlorinated water shall never be flushed into the storm drain or a body of water. This includes lakes, rivers, streams, and stormwater drainage systems, any waters where fish or other natural aquatic life can be expected.

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4-2.02 VALVES FOR WATER MAINS

4-2.02(1) GENERAL

Generally valve sizes shall be the same as the water main. All valves smaller than 12 inch shall be resilient seated gate valves and all valves 12 inch and larger shall be butterfly type if approved by the City. If a valve is installed in gravel or unpaved area, a concrete pad shall be set around each valve box at finished grade. See City Standard Detail W-190.

4-2.02(2) MATERIALS

4-2.02(2)A GATE VALVES

All gate valves 12 inches and smaller shall be resilient seated gated valves conforming to the latest revision of AWWA C509, C515, or C550. All gate valves shall be epoxy coated and turn counter clockwise to open. All gate valves shall have ANSI flanges or mechanical joints ends.

Gate valves within below grade valve box shall be non-rising stem suitable for installation with the type and class of pipe being installed. Operating stems shall be equipped with standard 2 inch operation nut, and O-ring stem seals.

Gate valves shall be epoxy coated. The coating shall be fusion bonded (thermosetting) epoxy protective coating and shall function as a physical, chemical and electrical barrier between the base metal to which it is applied and the surroundings. The coating shall comply with AWWA C50 and shall be certified to NSF 61. The coating shall be non-toxic and shall not impart taste or odor to the water.

The coating shall have a gloss finish and shall be suitable for field over-coating and touch up without sanding or special surface preparation, or application of heat in excess of room temperature.

4-2.02(2)B BUTTERFLY VALVES

Butterfly valves shall be in accordance with WSDOT Section 9-30.3(3), Class 250B.

4-2.02(2)C COMBINATION AIR VALVES

Combination air valves shall be designed to operate with potable water under pressure to permit discharging a surge of air from an empty line when filling and relieve the vacuum when draining the system. The air valves shall also release an accumulation of air when the system is under pressure. This shall be accomplished in a single valve body designed to withstand a pressure of 300 psi.

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The body and cover shall be cast iron conforming to ASTM A48, Class 30. Floats shall be stainless steel conforming to ASTM A 240 and designed to withstand 1,000 psi. Seats shall be Buna N rubber. Internal parts shall be stainless steel or bronze. Combination air valves shall conform to AWWA C512. See City of Arlington Standard Detail W-260.

4-2.02(2)D VALVE MARKER POSTS

Valve marker posts shall be Carsonite blue plastic markers and labeled "WATER" or approved equal. See City Standard Detail W-250.

4-2.02(2)E VALVE BOXES

Valve boxes shall be installed on all buried valves. The box and lid shall be cast iron, 2 piece slip type. The cover shall have the word "WATER" cast in the upper surface. Valve boxes, lids and extensions shall be Olympic Foundry deep style lid. All castings shall be coated with asphaltic varnish.

A valve operating nut extension shall be furnished and installed on all valves where the finished grade is more than 36 inches above the valve operating nut. Extensions are to be a minimum of 12 inches long with only one extension per valve. The operating nut extension shall extend into the top section of the valve box. See Standard Detail W-190.

4-2.02(2)F VALVE VAULTS

The valve vault shall be dimensioned and sized for valve removal and replacement. The vaults shall be furnished in pre-cast concrete sections with sufficient strength to withstand H-20 traffic loading together with access frames and covers.

4-2.02(2)G TAPPING SLEEVES

Tapping sleeves shall be used in lieu of cut-in tees except at the direction of the City. Tapping valves shall be epoxy coated and resilient seat. Acceptable sleeves include:

Pipe Material	Type of Tapping Sleeve
Ductile Iron or Cast Iron Pipe	Epoxy Coated Fabricated Steel
Asbestos Cement	Fabricated Stainless Steel Full

4-2.02(3) CONSTRUCTION

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4-2.02(3)A VALVE INSTALLATION

Prior to installation, valves shall be inspected for approved part numbers/manufacturers; cleanliness of valve ports especially seating surfaces, handling damage, and cracks. Defective valves shall be rejected.

When butterfly valves are installed, the operation nuts must be on the north or east sides of the water mains or as directed by the City Inspector.

The valve and valve box shall be set plumb and centered on the valve. Valves 12 inches or larger shall be supported by a concrete block (16 inches x 16 inches x 4 inch solid concrete) on a sufficiently tamped trench bottom so that the pipe will not be required to support the weight of the valve. In no case shall valves be used to bring misaligned pipe into alignment during installation. Pipe shall be supported in such a manner as to prevent stress on the valve.

Valves shall be installed in the closed position. Where the valve operating nut is more than 3 feet below finished grade, a valve stem extension conforming to the Standard Details must be installed. See City Standard Detail W-190. Tapping valves shall be water tested prior to tapping water main.

A valve box or vault shall be provided for every valve. Valve box top sections shall be adjusted flush with the finished pavement and, in those areas to be excavated for future roadway grades, enough adjustment shall be provided in the valve box to allow the top of the box to be adjusted to the required grade.

Backfill around valves shall be carefully tamped in 6 inch lifts for the full depth of the trench with the valve box in place. Provide a minimum of 2 feet x 2 feet x 4 inch concrete pad for a single valve box and a minimum of 4 feet x 4 feet x 4 inch concrete pad for multiple valve boxes installed in gravel or unpaved areas as shown in Standard Detail W-190.

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4-2.02(3)B COMBINATION AIR AND VACUUM RELEASE VALVE

Location of the air/vac shown in the plans is approximate. The Contractor shall set the air valves at the high points of the water main. The water main profile may need adjustment so that the high point and air/vacuum valve is installed in a convenient location with the City Inspector's approval. Installation shall be as shown in City Standard Detail W-260.

4-2.02(3)C INSTALLATION OF VALVE MARKER POST

Marker posts shall be set for all valves located in unpaved areas and as directed by the City except auxiliary hydrant valves. Installation shall be as shown in City Standard Detail W-250.

4-2.02(3)D ADJUST EXISTING STRUCTURE TO GRADE

Refer to Section 2-??? Of these Standards.

4-2.03 HYDRANTS

4-2.03(1) GENERAL

Any hydrant run exceeding fifty (50) feet in length shall be 8 inches in diameter unless it is approved by the City Engineer. The joints of hydrant runs shall be restrained, bell gaskets shall be "field lock" type or have "Romac Style 611/612" type clamps with shackle rods. No domestic or fire sprinkler service shall be tapped on any hydrant run.

4-2.03(2) MATERIALS

4-2.03(2)A FIRE HYDRANTS

Fire hydrants shall be 5 ¼ inch MVO and meet or exceed the requirements of AWWA C502 as well as the following:

1) Hydrant shall have a standard 4½ inch NST pumper port and two 2½ inch NST side ports, all opening by turning counter clockwise with 1½ inch operating nut;

2) Hydrant shall be painted with two coats of hi-gloss "Federal Safety Yellow" enamel paint, with the distance from the foot valve stenciled on the hydrant; and

3) 5" Storz adaptor.

Fire hydrants shall be the "Traffic Model" type with approved breakaway features. Fire hydrants shall be

- M&H 929 Reliant or
- Mueller Super Centurion 250
- EJ Watermaster 5CD250 with Weather Cap

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4-2.03(3) CONSTRUCTION

4-2.03(3)A FIRE HYDRANT INSTALLATION

Fire hydrants shall be set as shown in the City Standard Details W-010 through W-030 and AWWA Standard C600. The portion of the hydrants above the ground shall be painted with 2 coats of high gloss "Federal Safety Yellow" paint. The entire hydrant run shall be restrain jointed.

All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb or at the City Fire Chief's discretion, with pumper nozzle facing the curb. Hydrants shall be set to the established grade. Hydrants shall be installed so that the breakaway flange

is 2 inches above finished grade.

When a dry barrel hydrant is set, drainage shall be provided at the base of the hydrant by placing 1½ inches of washed drain rock from the bottom of the trench to at least 12 inches above the drain port opening in the hydrant and to a distance of 2 foot around the elbow, the entire drain rock area shall be covered with geotextile fabric or heavy mil plastic sheeting to prevent fines from intruding into drain rock. Fire hydrants shall not be located within 10 feet horizontally of a sanitary sewer main or side sewer.

When a hydrant is installed in an unpaved area, a minimum of 3 feet × 3 feet × 4 inch concrete pad shall be poured 2 inches below the breakaway flange around the hydrant barrel to provide adequate resistance to avoid transmitting shock moment to the lower barrel and inlet connection in the case of vehicle impact. The center of the hydrant shall be at the center of the concrete pad. Prior to pouring concrete, the ground shall be compacted according to the section of Trench Backfill and Compaction in these Standards. See Standard Detail W-010.

Additional information regarding placement of hydrants can be found in AWWA Manual M17.

When fire hydrants are located in parking lots, or other areas where permitted speed limits do not exceed five miles per hour, hydrant guard posts shall be installed where the hydrant is not protected by a cement concrete curb (or extruded curb per Standard Details) on all sides where vehicles may have access. Hydrant guards may be required as directed by the City Engineer. Fire hydrants located in undeveloped or rural areas must have City of Arlington standard hydrant locks installed by the City at the owner/contractor expense.

4-2.04 SERVICE CONNECTIONS

4-2.04(1) GENERAL

4-2.04(2) MATERIALS

4-2.04(2)A WATER SERVICE PIPE

Water service pipe shall be Driscopipe CTS Class 200 Hi-Mol Poly pipe. Driscopipe shall conform to ASTM D-27370SDR9 (PE3408). CTS 110 SS liners for polypipe shall be used.

4-2.04(2)B SADDLES AND CORPORATION STOPS

Service saddles shall be ROMAC 202S and shall have stainless steel double straps. See Standard Details W-040 and W-050

Corporation stops shall be the ball valve type and shall be Ford or Mueller. Corporation stops for use with the saddle shall be of bronze in accordance with AWWA Standard C800 with AWWA IP or CC inlet by compression outlet.

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4-2.04(2)C METER

Water meters shall be furnished and installed by the City at the Owner's expense. If needed for installation of smaller meter in a larger meter box, Contractor shall provide meter adapter to be installed by City. All other meter appurtenances as shown in the Standard Details shall be furnished and installed by Owner's Contractor.

4-2.04(2)D METER BOXES

Meter boxes used for meters, sampling stations, and blow-offs shall be high density polyethylene meter boxes with solid ductile iron lids manufactured by Mid States Plastics, Inc., or approved equal. Air valves shall have double concrete meter boxes Fogtite 2T with solid steel lid. Refer to City Standard Detail W-040 and W-050 for sizes and part numbers.

4-2.04(2)E PRESSURE REDUCING STATION

The Developer's Engineer shall design a pressure reducing station for a specific project. Submit to the City for approval. A typical pressure reducing station is shown in City Standard Detail W-080.

4-2.04(2)F REDUCED PRESSURE BACKFLOW ASSEMBLY

All reduced pressure backflow assemblies (RPBA) shall be as listed on the current copy of the "Approved Backflow Prevention Assemblies" published by DOH. The assembly shall include a tightly closing resilient seated shut-off valve on each end of the body and each assembly shall be fitted with four properly located resilient seated test cocks. The RPBA shall be installed in an above ground enclosure. The enclosure shall be Hot Box, or approved equal. See Standard Details W-130 through W-150.

4-2.04(2)G DOUBLE CHECK VALVE ASSEMBLY

All double check valve assemblies (DCVA) shall be as listed on the most current copy of the "Approved Backflow Prevention Assemblies" published by DOH. The assembly shall include a tightly closing resilient seated shut-off valve on each end of the body and each assembly shall be fitted with four properly located resilient seated test cocks. See Standard Details W-090 through W-120.

4-2.04(2)H BEDDING MATERIAL

Aggregates for bedding material shall consist of sandy material, free from wood, bark, or other extraneous material, and shall meet the requirements of WSDOT Section 9-03.1(2)B Class 2 Fine Aggregate.

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4-2.04(3) CONSTRUCTION

4-2.04(3)A GENERAL

New Service Installations

Generally, corporation stops are located at ten o'clock or two o'clock positions on the circumference of the pipe, and may be screwed directly into the tapped and threaded main without any additional appurtenances if the pipe diameter is 8 inches or larger, ductile iron pipe with a thickness of Class 52 or higher. Taps may be installed with double strap stainless steel saddles. When more than one tap in an existing cast iron pipe is necessary to deliver the required flow, the taps should be staggered around the circumference at least 12 inches apart (not in line). Service line must be pressure tested before placing in service. Corporation stops with IPT threads are not acceptable, unless approved by the City or are used on large taps.
Detectable marking tape shall be installed on all service connections.

Reconnecting Existing Services

Service connections shall be installed as shown in the approved plans and Standard Details. Install services in paved areas by boring and under sidewalks and curbs by boring and tunneling. Damages shall be repaired by the Contractor. Provide 30 inch minimum cover on service lines. Install service lines at 90 degrees horizontally to the main to intercept the existing meters. Flush the service line prior to connection to the meter. A 10-ft tailpiece shall be installed on all meters.

Install angle ball meter valves, setters (if required) and boxes as shown in City Standard Details W-040 and W-050 or as directed by the City.

Existing service connections shall not be transferred to the new mainline until the new mainline has been successfully flushed, disinfected, tested and approved by the City Inspector. When transferring services from the existing mainline to the new mainline, the Contractor shall take sanitary precautions to protect the potable water supply in both the existing and new mains.

After new service connection is made the Contractor shall test the water pressure on the private side of the meter before and after connection to insure the PRV has not been by-passed or failed during construction.

4-2.04(3)B CONNECTION TO EXISTING WATER MAIN

Points of connection to existing water mains shall be exposed prior to trenching of the new mains, and not less than 48 hours prior to the anticipated connection time. Unless specifically provided for elsewhere in these Standards, the Contractor is responsible for giving at least five

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(5) business days notice to the City. The City shall be responsible for notifying the City Fire Chief and customers affected by the shut-off. Water main shut-off shall not be scheduled to take place on Fridays, or on the day before a holiday, unless otherwise approved by the City Engineer.

The Contractor shall ensure that existing fittings are in accordance with the approved plans and that the connection will be made in accordance with the plans. The Contractor shall immediately notify the City Engineer and the Design Engineer if the connection cannot be made in accordance with the plans so that the connection details may be revised and approved by the City Engineer.

Connection to the existing water system shall be done only after the new mains are flushed and have passed pressure and purity tests. All connections to the existing water system must be approved by the City and in the presence of the City Inspector. Only authorized City representatives shall operate the valves in the existing water system.

Connections to existing water system may be made under pressure with a tapping machine by determining the size and type of pipe and installing a tapping tee with a tapping gate valve. Tapping tees shall be installed as shown in City Standard Detail W-200. Work shall not start until all materials, equipment, and labor are ready. The tapping tee and valve shall be installed in a horizontal position so that the valve stem is vertical. Where cut-ins are required in existing pipes, the work shall be conducted as to minimize the interruption of service. Necessary pipe, fittings and gate valves shall be assembled at the site ready for installation prior to the shut-off of water in the existing main. Once the water main has been shut off, the work shall be prosecuted vigorously and shall not be halted until the water main is back to service.

The interiors of all pipe and fittings, particularly couplings and sleeves, to be used in final cut-in connection shall be swabbed or sprayed with a 1% hypochlorite solution before they are installed.

Flushing shall start as soon as repairs or connections are completed and shall be continued until discolored water is eliminated. Flushing shall be done by the City Inspector.

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4-2.04(3)C ABANDONING WATER SERVICES

The Contractor shall remove the service lines, corporation stops and plug saddles with MIPT brass plug.

4-2.04(3)D BORING UNDER ROOTS

Boring under the root systems of trees that cannot be removed shall be accomplished by excavating a trench or pit on each side of the tree, being careful to avoid root injury, and then

hand digging or pushing the pipe through the soil under the tree. The pit walls shall be a minimum of 7 feet from the center of the tree and shall have sufficient depth to lay the pipe at the grade shown on the plan and profile. Trees shall be removed unless otherwise directed by the City Engineer.

4-2.04(3)E SITE AND PROPERTY RESTORATION

Any landscaping and lawn damaged by the Contractor shall be restored to conditions prior to construction. The Contractor shall try to minimize the area of disturbance and restore everything as close to the original condition as possible.

4-2.04(3)F VAULT INSTALLATION

Vaults for water facilities (pressure reducing stations, valves, water service, flow meters, backflow prevention devices, etc.) shall be installed at the locations shown on the plan and as staked. It shall be constructed as shown on the plans, Standard Details and as directed by the City Engineer.

The excavation shall have a minimum of one (1) foot clearance between the vault outer surface and the earth bank. The Contractor shall use foundation gravel or bedding concrete on top of undisturbed soil to support the vault. The vault shall be plumb and watertight. The access cover shall be seated properly to prevent rocking and shall be adjusted to match the finished grade.

The vault floor shall drain to daylight, or to a location specified on the plans. Gravity drain pipe shall be a minimum of 3 inches in diameter.

Where knockout locations for the pipe do not coincide with the locations of pipe penetrations into the vault, the Contractor shall core drill openings for pipe.

A sump pump shall be required if directed by the City Engineer.

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4-3 STANDARD DETAILS

The following standard details shall be included as part of these standards. In the event that reference to the standard details is not made in the above requirements, the standard details shall still apply.

Detail Number	Detail Name
W - 010	Hydrant
W - 015	Fire Hydrant Marker
W - 020	Hydrant Pad

W - 030	Hydrant Guard Post
W - 040	Meter
W -050	Commercial Meter
W - 060	Large Meter
W - 070	Meter Location
W - 080	PRV
W - 090	DCVA Small
W - 100	DCVA Large
W -110	DCDA Outside
W - 120	DCDA Inside
W - 130	RPBA Small
W - 140	RPDA 2.5
W - 150	RPDA 3
W - 160	Thrust Block
W - 165	Thrust Block
W - 170	Thrust Vertical
w - 175	Thrust Vertical
W - 180	Blow Off
W - 190	Valve Box
W - 200	Tapping Sleeve
W - 210	Air Gap
W - 220	Fire Line
W - 225	Trench Detail
W - 230	Pipe Casing
W - 240	Sampling Station
W - 250	Valve Marker
W -260	Air Vac
W - 270	Trench Detail

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E WATER USE EFFICIENCY (WUE) PROGRAM

E.1 WUE PROGRAM REVISION FOR THIS 2015 WSP UPDATE

E.2 COOPERATIVE CONSERVATION (2012 REGIONAL WUE REPORT)

E.3 WUE GOALS AND RESULTS SINCE 2007

E.4 WATER LOSS CONTROL ACTION PLAN, MAY 2015

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E Water Use Efficiency Program

E.1 INTRODUCTION

The City of Arlington (City) recognizes that water is a valuable and essential natural resource that needs to be used wisely. This Water Use Efficiency (WUE) Program presents the City's approach to increasing water use efficiency within the City's water service area (WSA).

Two primary production sources supply water to the City's service area: the Haller Wellfield, which draws groundwater from two wells that are largely fed by the Stillaguamish River; and the Arlington Airport Wellfield, which draws groundwater from a single well in a deep aquifer. This water is blended with surface water purchased from a third source—the City of Everett's (Everett) Spada Reservoir/Sultan River supply via Snohomish County Public Utility District No. 1 (PUD). As a wholesale water purchaser of the PUD, and indirectly of Everett, the City participates and supports the regional goals and programs developed by both water systems.

The City pursues its own supply goals to assure it eliminates inefficient water use and minimizes water losses. It has also established consumption goals to help its customers use water as wisely and efficiently as possible. The City also participates in and supports the regional goals and programs developed by Everett and the PUD. The City's WUE Program that follows includes an introduction to its WUE Program elements, a statement of its goals and objectives, the evaluation and selection of alternative efficiency measures, the schedule and budget, and the method of program monitoring.

E.2 REGULATORY REQUIREMENTS

E.2.1 The Water Use Efficiency Rule

In September 2003, the Washington State Legislature passed the Municipal Water Supply – Efficiency Requirements Act, also known as the Municipal Water Law. The Municipal Water Law required the State to implement the WUE Rule. The intent of this rule is to help reduce the demand that growing communities, agriculture and industry have placed on our State's water resources, and to better manage these resources for fish and other wildlife. Municipal water suppliers are obligated under the WUE Rule to enhance the efficient use of water by the system and/or its consumers. The requirements of the WUE Rule are set forth in Chapter 246-290 of the Washington Administrative Code (WAC), Part 8.

E.2.2 Water Use Efficiency Program Requirements

The Water Use Efficiency Guidebook, 3rd edition released by the Washington State Department of Health (DOH) in January 2011, identifies the water use reporting, forecasting and efficiency program requirements for public water systems. A WUE program meeting these requirements is

a necessary element of a water system plan as required by the DOH and is necessary to obtain water right permits from the Washington State Department of Ecology (Ecology). The Water Use Efficiency Guidebook defines the necessary components of a WUE program as four fundamental elements.

1. Planning requirements, which include collecting data, forecasting demand, evaluating WUE measures, calculating distribution system leakage and implementing a WUE program to meet goals.
2. A distribution system leakage (DSL) standard of 10 percent or less based on a 3-year rolling average for systems with more than 500 connections.
3. Goal setting to provide a benchmark for achievement and to help define the success of the WUE program.
4. Annual performance reporting on progress towards meeting WUE goals.

E.3 REGIONAL WATER USE EFFICIENCY PROGRAM

As a wholesale water customer of the PUD, and indirectly of Everett, the City has historically relied on the regional water conservation program promoted by the Everett Water Utilities Committee (EWUC). The City continues to participate in the EWUC Conservation Subcommittee, and actively supports the regional goals and efforts established by the EWUC.

The Partnership for Water (formerly Partnership for Water Conservation (PWC)), another consortium in the greater Puget Sound area, whose members include cities, water districts, regional water associations, businesses and environmental groups. Its programs include organizing regional water conservation information, education, contract services and industry advocacy with regional decision-makers. The City is a member of the Partnership for Water and has benefitted from its training programs and the networking opportunities.

A primary regional effort of the City since the previous WSP is its role as a primary contributor to PWC's 2012 report *Cooperative Conservation*. The objective of the report is to demonstrate progress towards greater water efficiency among water suppliers across Washington State since adoption of the WUE rule in 2007. The report is included as **Attachment E-1** to this WUE Program.

The City has identified the EWUC, the Partnership for Water, the American Water Works Association, and the Alliance for Water Efficiency as resources for the continued advancement of its own WUE Program.

E.4 CITY OF ARLINGTON WATER USE EFFICIENCY PROGRAM

The City began increased water conservation efforts in the late 1990s in anticipation of a new water treatment plant and with a new wholesale water agreement to purchase water from the PUD. WUE efforts increased in 2004 with the establishing of conservation goals in the 2004

Comprehensive Water System Plan (WSP) and the hiring of staff with duties dedicated to WUE. Current WUE Program elements are summarized in this Program.

E.4.1 Water Use Efficiency Goals and the Public Process

Prior to adoption of the WUE Rule, the City developed and pursued goals within its Water Conservation Program. The most recent goals prior to the WUE Rule were included in the August 2004 WSP, and followed DOH guidance to develop a program with a mix of internal (supply side), external (demand side), and other customer information conservation measures. The City developed one goal for each of these three areas, as summarized in **Attachment E-2**.

Per WAC 246-290-830, WUE goals *must* be set through a public process and *shall* be evaluated and reestablished a minimum of every six years. Consistent with the WUE Rule, which became effective in January 2007, the City adopted it initial WUE Goals in January 2008. The process included public notice of a public hearing on the issues, publication of WUE trends and draft WUE goals on the City's web site, presentation and discussion at a City Council meeting, and a public hearing to present and discuss the goals. No public comments were received for consideration by the City Council and the goals were formally adopted as presented during the forum. The adopted goals were identical to those in the 2004 WSP.

The City's WUE program was presented in a WSP, consistent with the requirements of the WUE Rule, for the first time in its October 2011 WSP update. These are the goals the City has been pursuing just prior to this WSP. The goals were developed in the same public process as in January 2008, and re-established the prior goals with modifications to tighten criteria and extend schedules. Current goals for the 2009 to 2014 water system planning cycle are presented below and summarized in both **Table E-1** and **Attachment E-2**.

- Achieve system-wide average water use reductions of two percent by 2014, and five percent by 2018, from 2008 levels;
- While meeting the DSL standard of 10 percent or less based on a three-year rolling average, maintain 5 to 7 percent or lower DSL in the water system on an annual basis; and
- 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.

Proposed goals for adoption under this 2015 WSP are also presented below and summarized in both in **Table E-1** and **Attachment E-2**. These goals were developed subsequent to the evaluation which follows this section.

- Achieve system-wide average water use reductions of two percent by 2018, from 2013 levels:
    - From 210 gpd/connection to 206 gpd/connection, and
    - From 186 gpd/ERU to 183 gpd/ERU (begin favoring this parameter),

- Maintain system-wide average water use reductions at the levels of the 2018 goals through 2024 (ten years);
- Maintain the system's annual peak day factors (ratio of maximum day demand to average day demand) less than 1.75 (target range 1.50 to 1.75);
- Implement a water loss control action plan to return the three-year rolling average DSL to less than 10 percent of system inputs. Then target 5 to 7 percent or lower DSL in the water system on an annual basis; and
- 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. Emphasize outreach to apartments and other multi-family residences during this planning cycle.

Table E-1

Water Use Efficiency Goals for the 2009-2014 and 2015-2020 Planning Cycles

Focus	Action	Parameter	Units	From: Base Condition		To: Target Condition	
				Year	Value	Year	Value
2009 to 2014 Planning Cycle							
Demand	Reduce	System-wide average water use	gal/day per connection	2008	242	2014	237 (2%)
						2018	230 (5%)
Supply	Reduce	DSL	percent as 3-year running average	2008	6%	Annually	<10%
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program
2015 to 2020 Planning Cycle							
Demand	Reduce	System-wide average water use	gal/day per connection	2013	210	2018	206 (2%)
						2025	206 (2%)
Demand	Reduce	System-wide average water use	gal/day per ERU	2013	186	2018	183 (2%)
	Maintain					2025	183 (2%)
Demand	Maintain or Reduce	Peak Day Factor (MDD/ADD)	gallons per gallion	2014	Range 1.5 to 1.75	Annually	Range 1.5 to 1.75
Supply	Reduce	DSL	percent as 3-year running average	2014	13.2%	Annually	<10%
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program

E.4.2 Planning Requirements and WUE Program Activities

The City's water use data, demand forecasts and other planning requirements are contained in **Chapter 4** of this 2015 WSP. The City is committed to continue collecting water use data beyond that presented in **Chapter 4** for evaluation of its WUE Program and water use patterns, and for forecasting demands for future facilities. Consistent with WAC 246-290-810, the WUE Program effectiveness will continue to be evaluated every 6 years, even if the next WSP update is extended to 10 years (the 2015 WSP update includes 6-, 10-, and 20-year planning horizons).

Recent WUE Program activities have involved participation in regional efforts and City-led activities that have included the following.

- Distribution of outdoor and indoor water conservation kits (supplied through the EWUC).
- Public outreach and education at staffed booths each year at the Arlington Eagle Festival in February, Arlington Street Fair and Fly-in in July and the Stillaguamish Tribe's Festival of the River in August (City).
- WUE articles in the quarterly City newsletter, "Arlington Update" (City).
- Monitoring, analysis and presentation of production and consumption data for the WUE Program (City).
- Reporting of WUE efforts in the annual Consumer Confidence Report (CCR) (City). Note: The City refers to their CCR as the Water Quality Report; it contains all of the same elements as the former, it is just named differently. The Water Quality Report will be referred to as the CCR in this document.
- One of 8 pages in the CCR features a conservation focus that is delivered to each customer (City).
- Education programs and presentations in classrooms throughout the Arlington School District (EWUC).
- Rebate programs for water-efficient washing machines and toilets (EWUC) (discontinued 2012).
- Distribution of lawn water calendars (City).
- WUE reminders and usage history on utility bill inserts (City).
- WUE reminders on community access TV (City).
- Participation in regional evaluation of water use efficiency efforts (PWC).

E.4.3 Distribution System Leakage

In 2004, the City began to implement improved accounting and reporting procedures for authorized water consumption, including potable water sales and other non-revenue uses such as fire department and public works' uses. Prior to this effort, DSL was perennially high, ranging from 15 percent to 23 percent since the 1990s. The success of these practices was immediately

evident. Losses in individual years remained below 10 percent in seven of eight consecutive years percent (**Table E-2**), and were often in the four to seven percent range, and the 3-year rolling average was maintained below 10 percent for 10 consecutive years (**Figure E-1**).

The City's only supply side WUE goal established since 2004 has been to reduce and maintain DSL below 10%. Refinements to established accounting and reporting are made regularly as the understanding of water uses and departmental procedures within the City improves. However, beginning in 2012, annual DSL values increased to 11 percent to 15 percent through 2014. Effective 2014, the 3-year rolling average jumped from 8.6 to 13.2 percent (**Table E-2**). Consistent with WAC 246-290-820, since the 3-year rolling average exceeds 10 percent, a water loss control action plan has been included in this WUE Program as **Attachment E-3**. Reasons for and the City's responses to the increase in DSL are addressed in greater detail in this plan.

E.4.4 Water Use Efficiency Program Evaluation and Performance Reporting

The City will continue to evaluate overall demand, per capita water use and the amount of DSL on an annual basis. These values are reported annually to DOH, and to customers in the City's annual Consumer Confidence Report (CCR). This 2015 WUE Plan also evaluates the performance of the WUE Program and the effectiveness of implemented measures by determining the long-term trend towards reducing water usage and meeting WUE goals. Where program monitoring shows that progress towards meeting the WUE goals is not being accomplished, more rigorous program implementation or additional Program items will be considered, along with a cost-effective evaluation of measures.

Continued

Table E-2

Water Consumption and Distribution System Leakage

Water Use Classification	Calendar Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Authorized Consumption--Revenue (1,000 gallons)										
Metered Customer Use	447,647	477,747	469,602	457,677	428,421	417,996	421,812	396,705	415,446	426,611
Authorized Consumption--Non-revenue (1,000 gallons)										
WTP Backwashing--Filter Maintenance	35,571	33,455	27,134	19,504	28,125	28,218	35,873	41,813	45,063	56,809
Distribution System Flushing	721	317	388	327	1,037	423	349	265	369	433
Sanitary Sewer Collection System	16	20	19	53	42	22	19	40	40	48
Stormwater System	0	0	0	18	0	16	8	17	17	25
Street Sweeping	0	0	10	49	44	31	30	16	16	14
Unmetered Facilities[2,3]	0	0	0	0	0	0	0	0	357	524
Fire Training & Hoses Tests[4]	0	0	0	0	139	76	76	76	103	168
Heat Relief (Fire Dept)	0	0	0	0	90	0	0	0	0	0
Total Authorized Non-revenue Consumption	36,309	33,792	27,551	19,951	29,477	28,786	36,355	42,227	45,964	58,045
Total Raw Water (1,000 gallons)										
Total Raw Water Production/Supply[1]	508,989	547,087	522,651	509,073	528,057	481,969	465,893	505,769	518,131	574,121
Distribution System Leakage										
Total DSL (1,000 gallons)	25,034	35,548	25,498	31,445	70,160	35,187	7,726	66,837	56,721	89,465
Total DSL (%)	4.9%	6.5%	4.9%	6.2%	13.3%	7.3%	1.7%	13.2%	10.9%	15.6%
Rolling 3-Year Average DSL (%)	4.5%	5%	5%	6%	8%	9%	7%	7.4%	8.6%	13.2%

[1] Total raw water is equal to finished water production plus water used to backwash and maintain WTP filters.

[2] Includes flushing of WTP clearwell after water quality concern for iron and manganese.

[3] Includes 500,000 gallons for partial draining of reservoirs during cleaning.

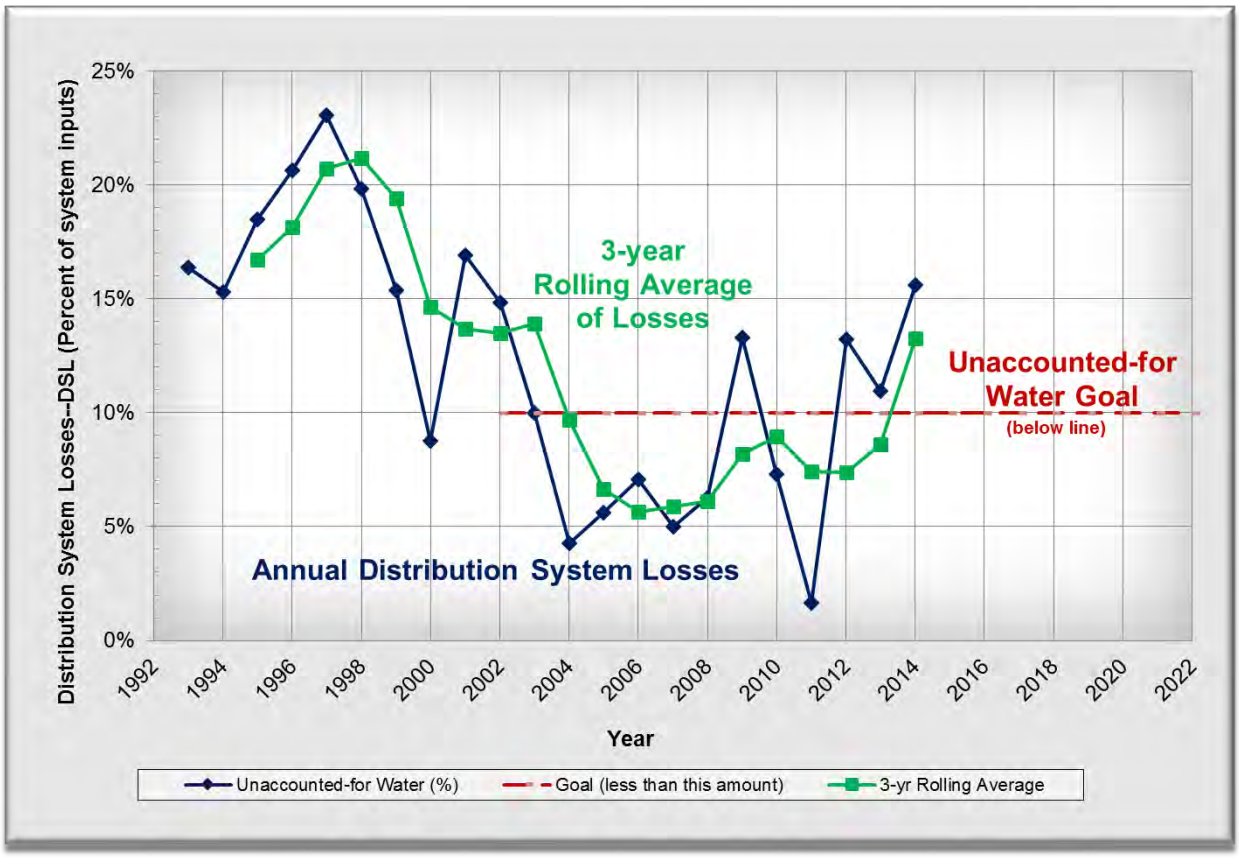
[4] 2013 and 2014 data include data from Arlington Heights Fire District 21 in addition to Arlington Fire Department.

WUE Effects on Average Day Demand

The City's primary demand-side WUE goal since 2004 has been a consistent reduction in unit consumption measured in gallons per day per connection without regard for connection type (that is, inclusive of all water customers) (**Attachment E-2; Table E-1**). The initial base year for consumption referenced in the 2004 goals is 2002, and goals have been in the range of 2 percent to 5 percent reductions by target years coinciding with WSP planning cycles.

Chart E-1

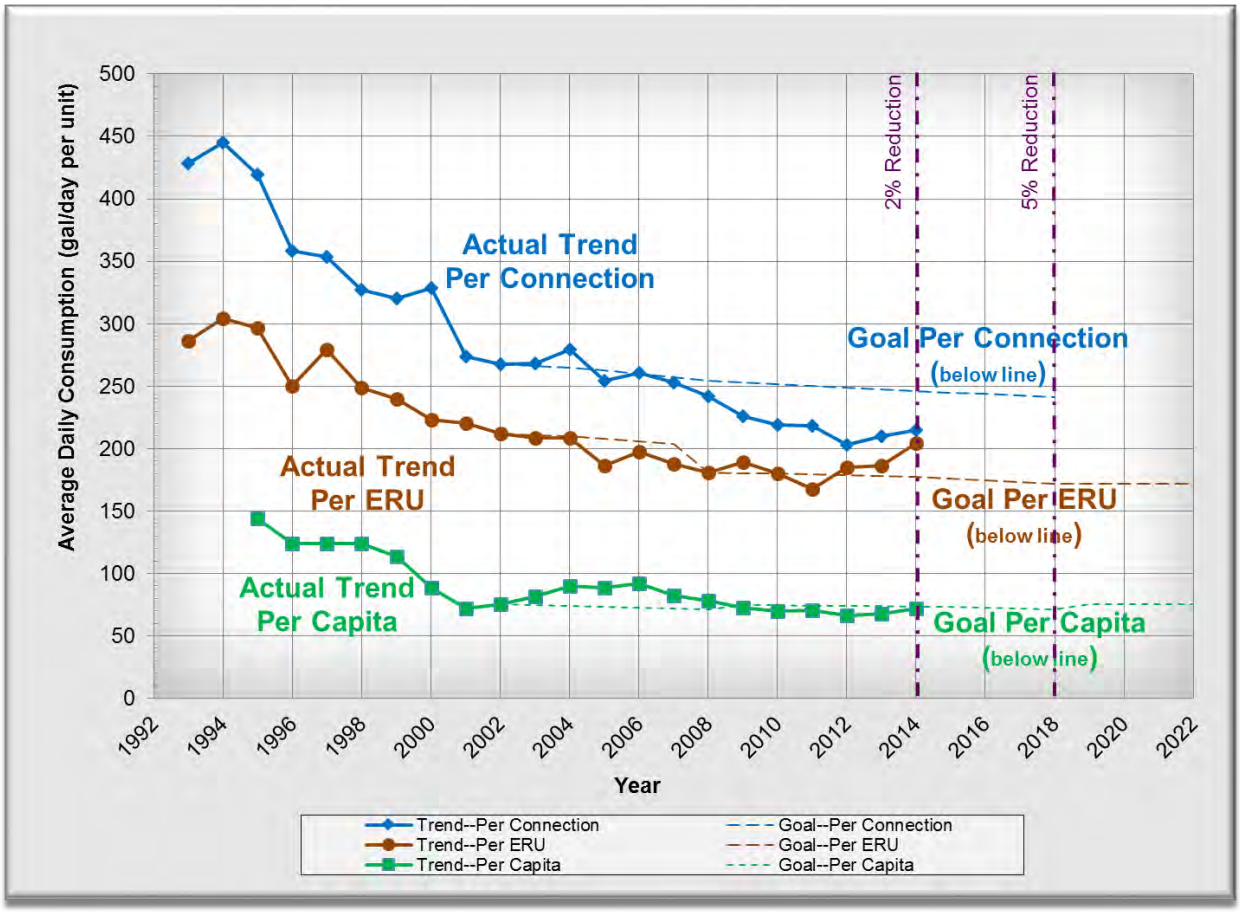
Distribution System Leakage (DSL) Evaluated Against WUE Goals, 1993 to 2014



WAC 246-290-830 (6)(b) allows a purveyor's discretion and flexibility in the actual units of measure used to track reductions in demand, so gallons per day are evaluated here on a per connection, per ERU, and per capita basis. Results indicate rapid, steady declines in consumption on a per connection basis, meeting the 2018 goal in 2009 (**Chart E-2**). Since that time, consumption per connection has continued to decline on a more gradual basis, but this is certainly due in part to the loss of commercial connections during the economic recession beginning in 2008. On a per capita basis, consumption was slow to decline, but has been maintained at or below the goal since 2009 (**Chart E-2**). Consumption per ERU is probably the most stable of the three measures. Consumption per ERU was immediately responsive to WUE measures implemented in 2004, and continued to track with goals through 2012. Because WUE also reflects non-revenue water and DSL, consumption per ERU did not meet goals for the last three years, 2012 through 2014 (**Chart E-2**).

Chart E-2

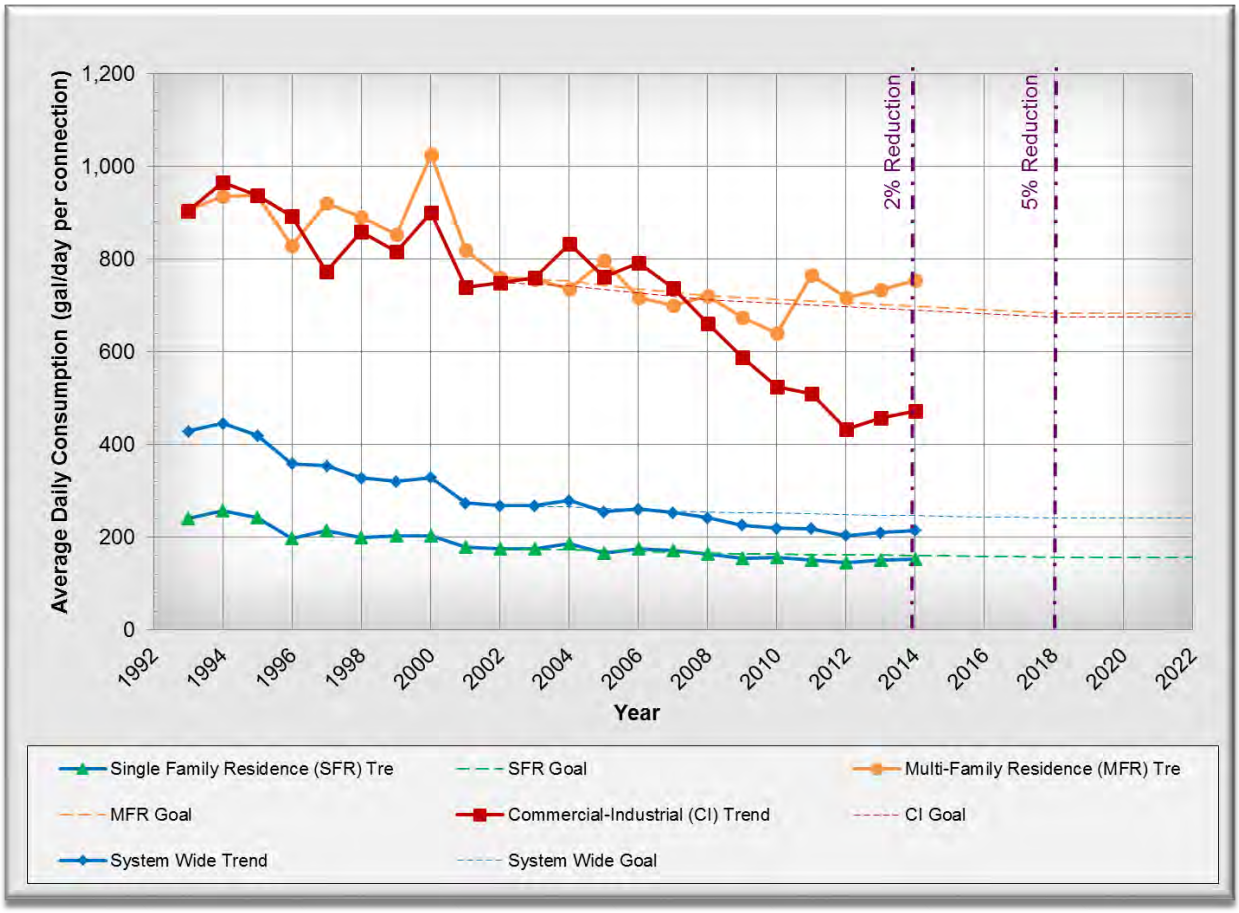
Three Average Daily Consumption-per-Unit Parameters, 1993 to 2014



Average daily consumption per connection has been the City's primary parameter for tracking customer demand. This data was graphed by customer class to assess trends by type of customer (**Chart E-3**). The large number of single family residential (SFR) customers drive the form of the system wide consumption curve, and themselves meet the weighted goal established for that customer class. Commercial and industrial customers have easily met the goal established for their customer class, but this is largely due to declines in both the number of customers and their consumption through the recession (**Chart E-3**). This suggests that at least some recovery in customer water usage may be achieved without causing this goal (or gallons per day per ERU) to be exceeded (**Chart E-3**). **Chart E-3** also reveals that multi-family residential customers are the class that is not meeting its consumption goal as of 2014. Conservation and efficiency measures targeted for multi-family residences may have the greatest influence on achieving system-wide goals.

Chart E-3

Average Daily Consumption-per Connection, by Customer Class, 1993 to 2014



Water consumption per connection has decreased by 20% from 2002 to 2014, and by 4 percent when evaluating per capita and per ERU parameters for the same period. Since the previous WSP (data through 2008), water consumption on a per connection and per capita basis has declined 11 and 8 percent, respectively. Because of the significant increases in DSL, consumption per ERU has increased by 13 percent through 2014. On a per capita basis, WUE measures and other influences on consumption have reduced consumption by more than 197 million gallons since the City began targeting demand reductions in 2002.

As it has since 2008, the City will continue to provide annual WUE performance reports to its consumers in the CCR, and will detail the results of water use monitoring and progress towards achieving the system's WUE goals. A copy of the City's 2014 CCR is included in **Appendix M** of the City's WSP. The City will comply with DOH Annual WUE Performance report requirements, due to DOH by July 1 of each year.

WUE Effects on Annual Maximum Day Demand

Since 2005, WSA population has grown from 13,636 to 16,245 in 2014, an increase of at least 19 percent (**Figure 4**). The apparent decline seen in Figure 4 is an effect of the re-assessment of

population residing in the City of Arlington's Smokey Point neighborhood, which is not served with City water. During the development of this WSP, City planners estimated 2,239 persons in Smokey Point, an increase from the previous built-out estimate of 1,633. This increase in Arlington residents outside of its WSA resulted in a decrease in the estimate of persons inside its WSA. Without this revision, the WSA population would have increased nearly 25 percent.

Despite the increasing population served, the average daily demand (ADD) required to serve that population stayed nearly the same (**Chart E-4**). At the same time, the maximum day demand (MDD) decreased 19 percent. The ratio of MDD to ADD is often used to define and evaluate fire flow and storage requirements. The City's peak day ratios have declined from approximately 2 to 1.5 over the last 10 years (**Chart E-5**). This means more water is left in mains and reservoirs for other uses, including providing fire flow and maintaining pressure.

All of the factors influencing this trend are not fully understood. During the economic recession, several large water users closed their businesses (e.g., sawmills, kilns). New meters were installed at two large users (e.g., Cascade Valley Hospital and the I-5 rest areas). Numerous other businesses also shut down, but none of these is thought to have a seasonal water demand. The high school installed artificial turf, but this did not occur until mid-2014 and would not have influenced this trend. Without a single clear driver, but appreciating the benefits, a new goal is established to maintain the maximum day demand peaking factor in the range of 1.50 to 1.75.

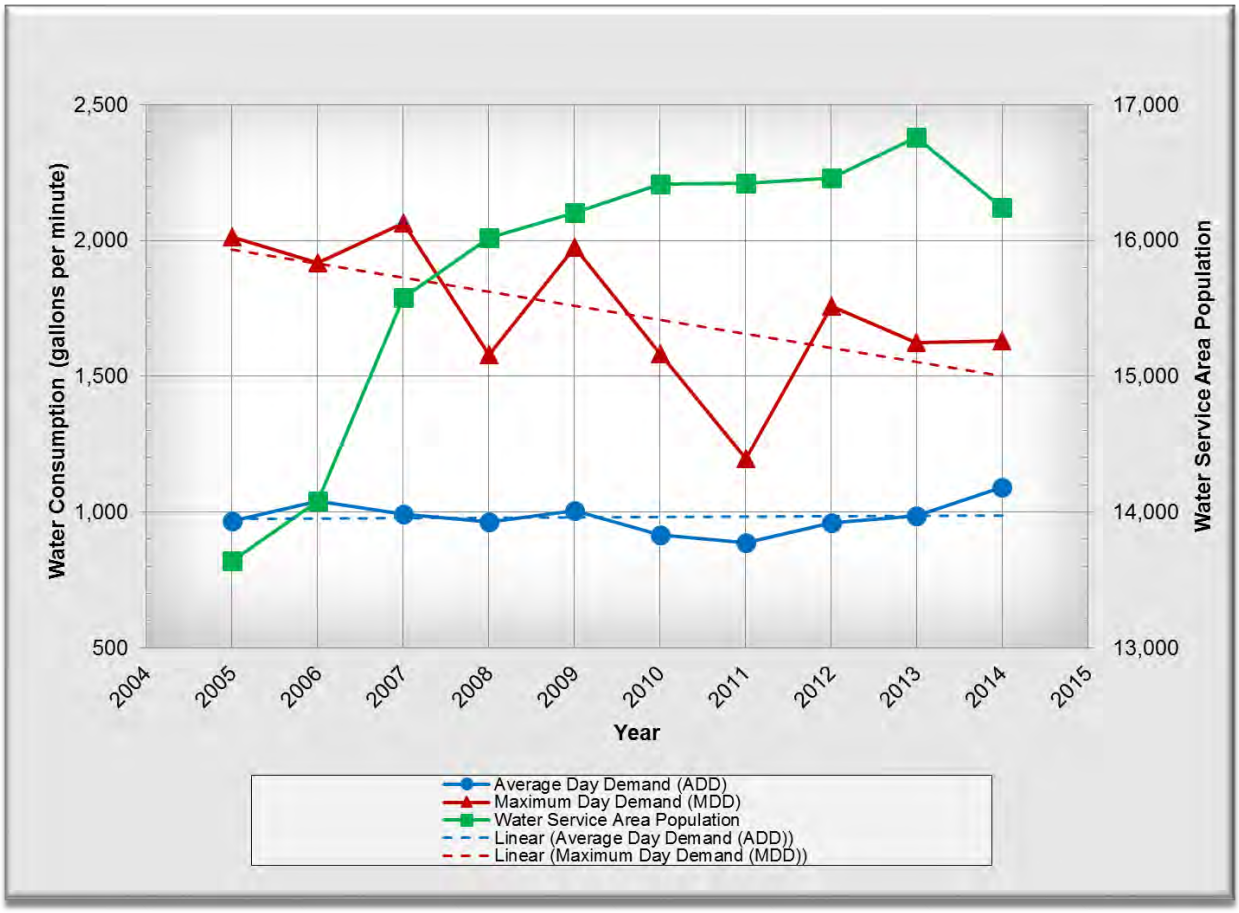
E.5 EVALUATION OF WATER USE EFFICIENCY MEASURES

The City's evaluation of WUE measures and selected levels of implementation are presented within this section. The measures fall within three categories of implementation: 1) mandatory measures that must be implemented; 2) measures that must be evaluated; and 3) additional measures selected by the City that must be either evaluated or implemented.

The City served 5,444 water service connections in 2014, and another 14 hydrant permits using portable meters. Based on the number of connections, at least six WUE measures must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the City implements or plans on implementing all of the evaluated measures presented here, a cost-effective evaluation is not required.

Chart E-4

System-wide Average Day and Maximum Day Consumption, 2005 to 2014



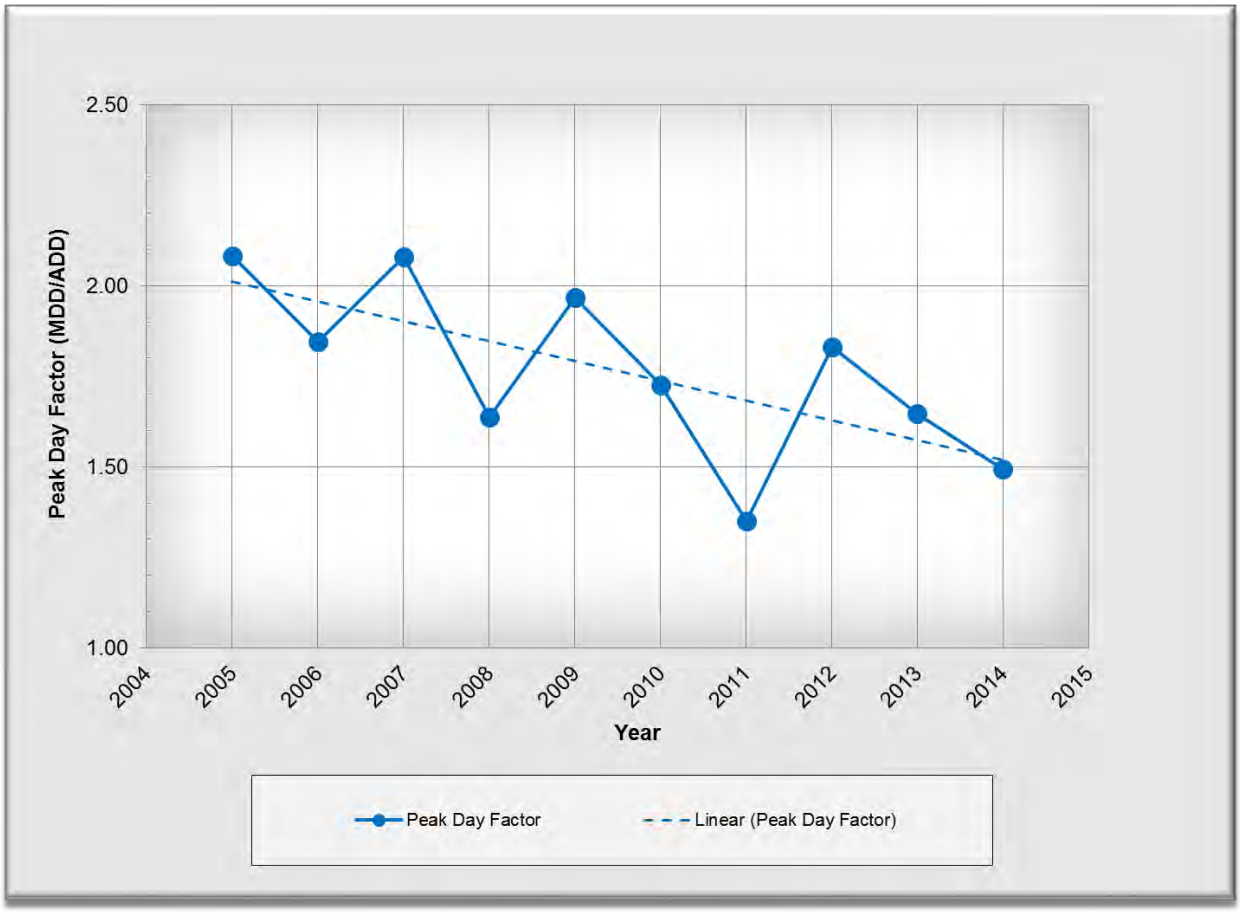
E.5.1 Mandatory Measures

Source Meters

The volume of water produced by the system's sources must be measured using a source meter or other meter installed upstream of the distribution system. Source meters are currently installed and operating at each of the City's sources. The City's Haller Wellfield source meters and PUD intertie source meter were installed in 2001; the Airport Wellfield source meter was replaced in 1995. The WTP actually uses three source meters, one on each of three treatment trains which are summed to obtain total withdrawals from the Haller Wellfield. The City is considering adding an additional source meter on the single influent main entering the WTP. Any new sources installed in the future will be equipped with a source meter.

Figure E-5

Peak Day Factor, 2005 to 2014



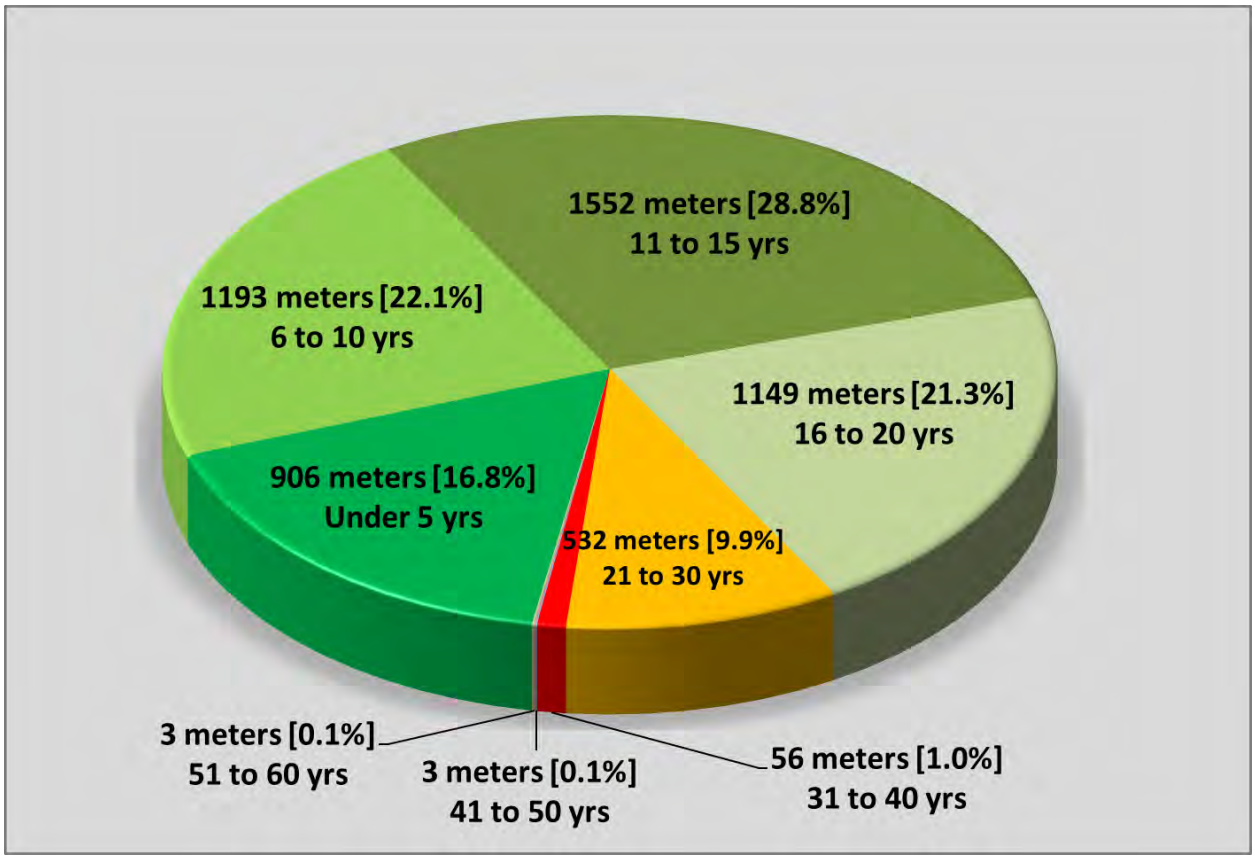
Service Meters

All public water systems that supply water for municipal purposes must install individual service meters for all water users. Service meters are currently installed and operating at all connections throughout the distribution system. The City conducts a regular meter replacement program for ½ to ¾ inch single family residential (SFR) service meters. The goal of the replacement program is to replace meters at least every 20 years, or five percent of all service meters per year. As of May 2015, 90 percent of all meters are 20 years old or less, 9.5 percent are 21 to 30 years, and 0.5 percent of these meters are older than 30 years. The City also replaces larger meters as needed. Age distribution of all customer meters follows a similar pattern (**Chart E-6**). All future connections that are installed or activated will be equipped with a service meter.

While the City does not expect to receive any additional water savings from the program, the upkeep of service meters is vital to maintain current conservation levels and accurate billing for consumption.

Chart E-6

Age Distribution of Service Meters, All Customer Classes, 2015



Meter Calibration

The City must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. Customer meter calibration is performed on an as-needed basis to validate billing accuracy. The City calibrates source meters, at a minimum, based on manufacturer guidelines. Current practice is to calibrate source meters at the WTP annually, most recently in 2014.

Water Loss Control Action Plan

To control leakage, systems that do not meet the DSL standard must implement a Water Loss Control Action Plan. The City's rolling 3-year average DSL is discussed earlier under Distribution System Leakage, including **Table E-2** and **Chart E-1**. In 2014, the City's 3-year DSL jumped to 13.2 percent, exceeding the 10 percent threshold for the first time. A Water Loss Control Action Plan has been prepared and included as Attachment 3 to this WUE Program. The goal of the several action items is to maintain a DSL between five and seven percent on an annual basis, while meeting the DSL standard of ten percent or less based on a three-year rolling average.

Customer Education

Annual customer education regarding the importance of using water efficiency is a required element of all WUE programs. Customer education is provided in the City's CCR to customers

and includes information on the system's water source, treatment method, water contaminants, water quality sampling by the City's Water Department and the PUD, average SFR water consumption, and indoor and outdoor tips for customers on using water more efficiently. Additional customer education and outreach measures are identified in the Selected Measures section.

E.5.2 Measures That Must Be Evaluated

Rate Structure

A rate structure that encourages WUE and provides economic incentives to conserve water must be evaluated, but is not required to be implemented. The City currently implements an inclining block rate structure (charge per unit of water increases with higher use) and is designed to discourage excessive water use. The base rate for water (as of January 15, 2009) was $32.15 for the first 300 cubic feet in a monthly billing cycle. Should the customer exceed the base rate, they are billed an additional $2.94 per 100 cubic feet to a total of 1,000 cubic feet. Should a customer exceed 1,000 cubic feet that month, they are billed $3.10 per each additional 100 cubic feet.

Reclamation Opportunities

Since 2011, the City owns and operates a fully functional Water Reclamation Facility (WRF) using Biological Nutrient Removal (BNR), Membrane Bioreactor (MBR), and ultraviolet disinfection (UV) technologies to produce reclaimed water of Class A (more UV exposure) or Class B (less UV exposure) quality. The City's 2014 NPDES permit is accompanied by a reclaimed water permit which authorizes re-use of Class A reclaimed water in its constructed wetland. Irrigation of the wetland sustains wetland vegetation and functions during the dry summer months, and provides opportunity to adaptively manage effluent by providing for additional polishing and treatment during critical periods (e.g. summer low flows with high temperatures and low dissolved oxygen). When not discharging to the wetland, the WRF continues to discharge effluent (reclaimed water) to the Stillaguamish River to augment stream flows and provide aquatic habitat.

The City evaluated reclamation opportunities prior to the upgrade and expansion which resulted in the WRF. Most of these opportunities are still valid, and would require Washington State Department of Ecology and DOH to issue a modified reclaimed water which specifically authorizes any of the reclaimed water reuse opportunities below.

- Summertime irrigation of a constructed stormwater/mixed use wetland (currently permitted)
- Providing supply to farmers and concrete plant down-valley (i.e. creative water right exchange opportunities);
- Providing small supply to the Bridge of Flowers, a proposed garden on the railroad trestle;
- Providing supply for irrigation of a golf course, cemetery, parks, airport, turf farm and schools (0.88 miles of purple distribution pipe covering 45 percent of the two miles from the WRF to the cemetery were installed in 2014);

- City operations and maintenance use (e.g. street sweeping, vactoring, flushing);
- Construction water and dust control (in lieu of hydrant permits); and
- Other uses, such as firefighting and toilets.

The City is committed to making reclaimed water a part of their integrated water resource management strategy.

E.6 SELECTED MEASURES

The City has chosen to implement nine different WUE measures, many of which are existing measures. The City has six different billing classes; for the purposes of water system planning in this document, those classes have been combined into four different groups: single family residential; multi-family residential; commercial/industrial; and other. The "other" user group consists of parks and open space, school districts, churches, hospitals, etc. If a single WUE measure is implemented for different customer classes, it counts as multiple WUE measures. Multiplying the nine different WUE measures across the customer classes in which they will be implemented, the City will implement a total of 32 WUE measures. This exceeds the requirement of six WUE measures based on the number of service connections.

The most significant WUE efforts the City currently makes are through active participation in the regional programs. In addition to the WUE measures conducted through these partnerships, the City plans to continue implementing its existing WUE measures including conservation rate structures, elements of customer education, mandatory lawn watering calendars and the water consumption history located on customers' bills. New or renewed WUE measures include reclaimed water use and a leak detection program.

E.6.1 Conservation Rate Structures

Evaluation of rate structures to increase water demand efficiency is required (WAC 246-290-100(4)(j)(iv)), but actual implementation of a conservation rate structure counts as a WUE measure (WAC 246-290-810(4)(d)). The City is implementing an inclining block rate structure for its customers. In 2015, the City retained the services of a financial consultant to evaluate and revise the rate structure to achieve greater incentives for efficient water use by all customer classes. A similar effort in 2010 did not result in substantive changes, and City staff and leadership feel the rate structure warrants another look. Since the rate structure applies to all customers, it is equivalent to four WUE measures.

E.6.2 Reclaimed Water

Water systems with 1,000 or more connections must evaluate reclamation opportunities (WAC 246-290-100(4)(f)(vii)), but actual use of reclaimed water counts as a WUE measure (WAC 246-290-810(4)(d)), or multiple WUE measures if the reclaimed water is used for multiple purposes. Use of reclaimed water for wetland irrigation is the primary initial (current) use for the City. Distribution of reclaimed water for re-use is a capital limitation. However, the City has begun installation of a distribution network, with 0.88 miles installed as of 2014. For the near-term,

reclaimed water re-use is considered to improve efficiency for only one the "Other" customer class for its municipal irrigation and open space uses.

Ecology does not yet recognize surface water augmentation and groundwater recharge as appropriate for the City because, despite its fully consumptive water rights, it operates with near-zero flow impacts on the Stillaguamish River by discharging its WRF effluent to the river. In order to fully utilize reclaimed water for improving water use efficiency, regulations will need to be revised to allow for re-use in situations where river or surface water impacts are negligible.

E.6.3 Customer Education

Customer education that is carried out more than once a year counts towards meeting the program requirements for WUE measures. In addition to the mandatory annual customer education in the CCR, the City educates customers to use water wisely using several tools and partnerships.

Perhaps the most effective of these efforts is the school outreach program spearheaded by the EWUC Conservation Committee. From 2008 through 2014, nearly 7,700 students in 281 classes in both high schools, both middle schools, and all four elementary schools received training in water science and management. Trained consultants using AWWA-approved curricula provided the instruction.

Other education efforts implemented by the City will include: quarterly customer education through articles and conservation tips in the City's newsletter, the "Arlington Update"; seasonal water conservation reminders in summer utility bills and on Arlington Community Television; educational booths at the city-sponsored Eagle Festival (February) and Arlington Street Fair (July); outreach at the Stillaguamish Tribe's Festival of the River (August); and participation in additional regional WUE Programs with PUD and the City of Everett. This measure will be implemented for all customer classes.

E.6.4 Outdoor and Indoor Conservation Kits

The City will offer free outdoor and indoor conservation kits to all customers through its partnership with the City of Everett and the PUD. Outdoor kits typically include nozzles, garden hose repair kits, and irrigation timers. In addition, DVDs produced by Cascade Water Alliance provide homeowner instruction on managing installed irrigation systems. Indoor kits include high efficiency showerheads and faucet aerators. Advertising efforts are made to promote the availability of these kits, which include placing notices in utility bills, links on the City's website and displaying the kits at public events. This measure will be implemented for two residential customer classes.

E.6.5 Lawn Watering Calendars

The City will continue to mail lawn watering calendars to both residential and nonresidential properties for seasonal demand management. Additional copies are made available in City offices and public facilities. This measure is implemented for all customer classes.

E.6.6 Rebate Program

The City has participated with Everett and the PUD in washing machine and toilet rebate programs where new washers and toilets must meet the highest WaterSense criteria established. The EWUC Conservation Committee discontinued toilet rebates in 2012, although some member utilities continue to offer toilet rebates on their own. Since most City residents purchase electricity through the PUD, the City continues to support and refer its customers to the washer rebate program ran through the PUD. This measure will be implemented for two residential customer classes.

E.6.7 Leak Detection Program

The City seeks to implement a leak detection program as part of their WUE efforts. It typically has conducted decommissioning type tests, where segments being decommissioned are isolated and tested at typical operating pressures to determine whether leaks are present. This approach has often validated the City's understanding of the effects of various soil characteristics on the condition of asbestos-concrete water main. The City will also implement this approach in a proactive manner in order to prioritize the remaining main in its annual main replacement program. In addition, if the Water Loss Control Action Plan associated with this WUE Program does not promptly return DSL to less than 10 percent, the City anticipates contracting with a leak detection service provider to evaluate 20 to 25 miles of distribution pipe, varying in sizes from 4-inch through 16-inch in 2016 or 2017. This measure will be implemented with benefits for all customer classes.

E.6.8 Water Bill Showing Consumption History

Since 2002, the City has operated its billing system to provide consumption and temperature information on customer bills. The current billing period's consumption and temperature information is compared to the same billing period in the previous year. This measure is implemented for all customer classes.

E.6.9 Low Impact Development and Xeriscaping

The City's land use code gives preference to low water demand landscaping and other water conservation landscaping techniques. Recently emphasized, integrated approaches that are proposed for adoption as required or preferred with the City's 2015 General Comprehensive Plan include the use of rainwater collection systems and rain gardens to reduce the need for potable water for irrigation. The City also uses native, drought resistant landscaping in many City projects. This measure is implemented for the "Other" customer class (including municipal uses), and counts as one WUE measure.

E.7 WATER USE EFFICIENCY PROGRAM SCHEDULE AND BUDGET

The WUE measures described above and selected for implementation by the City are summarized in **Table E-3** with their corresponding schedule and budget. The successful implementation of this Program is expected to maintain the goal of a five percent reduction by 2018, using 2008 as the base year, as shown in **Chart E-1**.

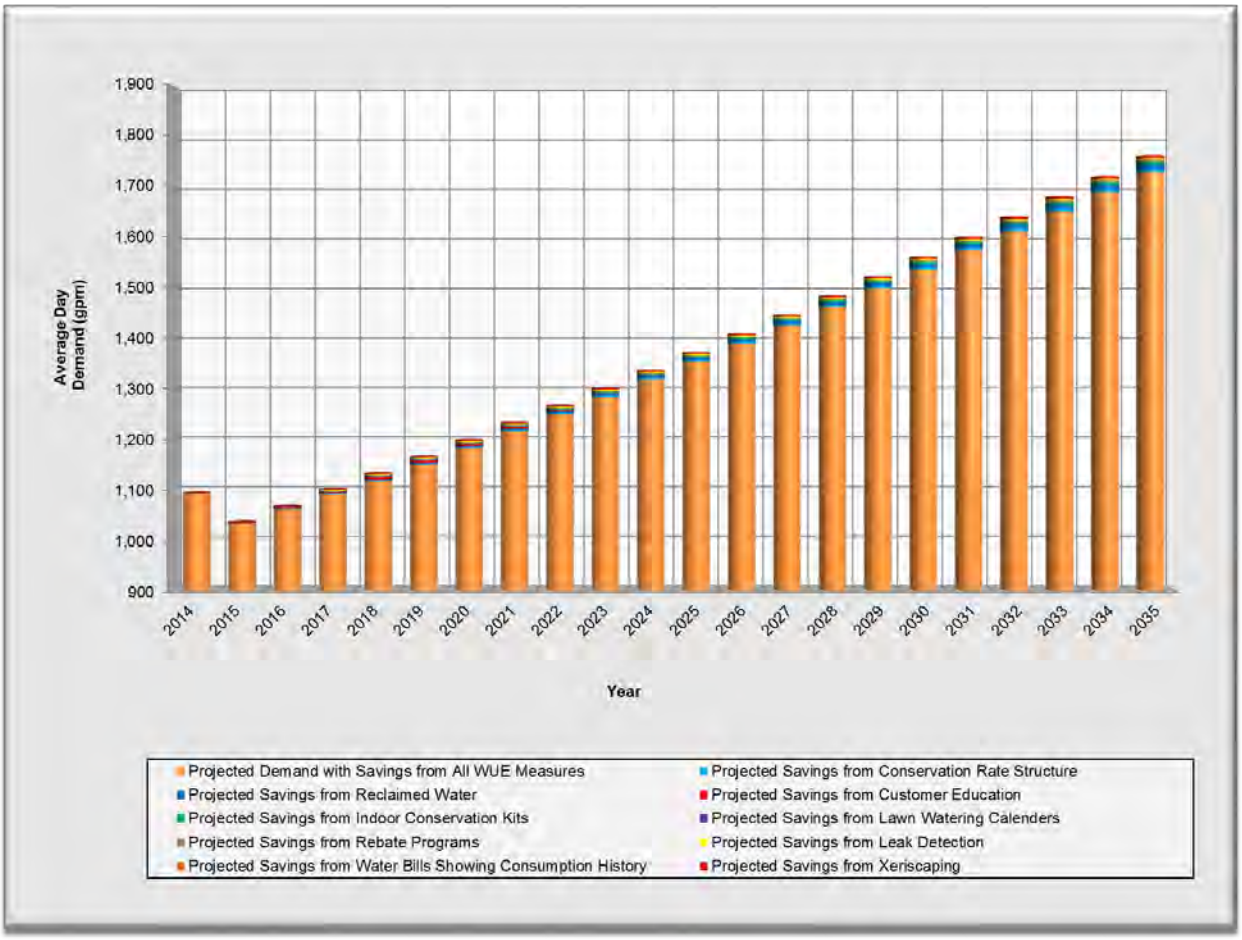
Table E-3

WUE Program Schedule and Budget

Water Use Efficiency Measure		Schedule	Budget
Mandatory Measures			
Source Meters		Ongoing	O&M Funded
Service Meters		Ongoing	O&M Funded
Meter Calibration		Ongoing	O&M Funded
Water Loss Control Action Plan		2015	N/A
Customer Education - Annual Consumer Confience Report		Ongoing	$6,000/yr
Measures That Must be Evaluated			
Rate Structure--Reevaluation		2015	N/A
Reclamation Opportunities		Ongoing	N/A
Selected Measures			
Conservation Rate Structure - To Be Implemented		2016	$5,000
Reclaimed Water Re-use for wetland irrigation		Ongoing	O&M funded
Customer Education - School Outreach, Advertising, etc.	Advertising, outreaches; Instruction in schools	Ongoing	$3,000/yr; Regional Program
Outdoor and Indoor Conservation Kits		Ongoing	Regional Program
Lawn Watering Calendars		Annually	$2,000/yr
Rebate Program		Ongoing	PUD Program
Leak Detection Program	Decommissioning pressure test; Screening contract	Ongoing 2017	O&M funded; $5,000
Water Bill Showing Consumption History		Ongoing	N/A
Low Impact Development, Xeriscaping		Ongoing	$500/yr

Chart E-7

WUE Program Projected Water Savings



Attachment E-1

Cooperative Conservation

A Report on the Implementation of
Washington's Water Use Efficiency Rule

Prepared by

Partnership for Water Conservation

November 6, 2012

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Cooperative Conservation

A Report on the Implementation of Washington's Water Use Efficiency Rule

November 6, 2012



Partnership
For Water Conservation

About the Partnership for Water Conservation

The Partnership for Water Conservation (Partnership) is a nonprofit 501(c)(3) organization dedicated to enhancing water efficiency efforts in the state of Washington. In 2004, the Partnership formed through a unique collaboration between water suppliers, environmental groups, and businesses; it has grown to approximately 85 members. The Partnership works to ensure that water supplies meet the needs of people and our state's economy, while protecting fish and supporting other environmental values that make Washington such a great place to live and work. For more information about the Partnership, please visit: www.partners4water.org

The current board members for the Partnership are Michael Brent (Cascade Water Alliance), Debbie Engel (Kitsap Public Utility District), Jeanne McNeil (Washington State Nursery and Landscaping Association), Heather Pennington (Tacoma Public Utilities), Gene Peterson (CH2M Hill), Emily Resch (Birch Bay Water and Sewer District), Beau Schilz (Pace Engineers), and Laurelin Ward (Silverdale Water District).

Acknowledgments

The Partnership expresses its sincere thanks to the Water Supply Forum for financial support of this project. For more information about the Water Supply Forum, please visit: www.watersupplyforum.org

The Partnership staff and volunteers, in consultation with the Partnership board and the Washington Department of Health, contributed to this report. Primary contributors included Allegra Abramo (consultant), Michael Dexel (Washington State Department of Health), Al Dietemann (Seattle Public Utilities), Julianna Mandler (Partnership), Daniel Muir (Tacoma Public Utilities), Janet Nazy (Partnership), Kristen Numata (Partnership), Debbie Rannfeldt (Woodinville Water District), Janet Sailer (Sammamish Plateau Water and Sewer District), Angie Sanchez-Vinoche (FCS Group), and Mike Wolanek (City of Arlington).

Disclaimer

Data for this report was obtained from water use efficiency reports and water system planning documents submitted to the Washington Department of Health (department), telephone conversations with water supplier staff, and information from water supplier websites. Every effort was made to gather factual data and objectively report the findings. This report does not represent the expressed or implied opinions, views, or policies of any state agency, local government, business, or water supplier.

Executive Summary

The Partnership for Water Conservation (Partnership) compiled this report to illustrate the status of water efficiency efforts by municipal water suppliers (water suppliers) in Washington. The Washington Legislature directed the Department of Health (department) to adopt the Water Use Efficiency (WUE) rule in response to passage of the 2003 Municipal Water Law (law), which addressed increasing demands on the state's water resources. Under the municipal water law, the Legislature directed water suppliers to use water more efficiently in exchange for certainty and flexibility of water rights to help meet future demand. The WUE rule established the mechanism for achieving compliance with the law.

The objective of this report is to demonstrate progress towards greater water efficiency among water suppliers in Washington since adoption of the WUE rule in 2007. The majority of water suppliers studied have taken significant actions to improve water efficiency including repairing leaks, implementing conservation rate structures, installing customer meters, and setting conservation goals. There are still many options available to water suppliers for increased water efficiency.

The Partnership collected and analyzed data reported to the department by 153 small, medium, and large water suppliers between 2009 and 2012. The 153 water suppliers analyzed represent 32% of the total number of water suppliers that submitted a WUE report in 2009. The main findings are as follows:

- The top three measures utilized to promote water efficiency with customers were literature/public education, conservation rates, and bills that show consumption history.
- Eighty-eight percent (88%) currently meter all service connections.
- Sixty-eight percent (68%) reported three-year rolling average leakage values below the state leakage standard of 10%.
- The average leakage percentage was 11.5%, and the median leakage percentage was 9%.
- Seventy-four percent (74%) have implemented conservation rate structures.
- Seventy-eight percent (78%) established water efficiency goals that include overall water use reduction targets, as opposed to maintaining existing water use levels.
- Sixty-five percent (65%) receive their water from groundwater sources, 24% from surface water, and the remaining use combined surface and groundwater.
- Ninety-two percent (92%) required to submit a 2009 annual water use efficiency report did so.

The Partnership developed this report in the hope that it will be a source of ideas and inspiration for water suppliers and others who want to become more active in preserving Washington's precious water resources. Future trends in municipal water use efficiency can be monitored using this baseline data.





Introduction

This report examines the progress of municipal water suppliers (water suppliers) in implementing water use efficiency (WUE) practices to meet the requirements of Washington's WUE rule, as defined in the Washington Administrative Code 246-290. It provides water suppliers, policy makers, stakeholders, and the public a glimpse of the commitments water suppliers have made across Washington to achieve efficient water use. The report establishes a baseline for measuring the progress and long-term trends of water efficiency principles and practices taken by water suppliers.

History of Water Conservation in Washington

1987 Washington experienced a prolonged drought. Water suppliers throughout the state developed management alternatives to deal with this shortage. Prior to this drought, many water suppliers had installed meters on service connections and managed leaks but rarely developed programs aimed at reducing customer demand. The 1987 drought set the stage for demand-side conservation.

1989 Changes in state building codes increased water use efficiency standards for indoor plumbing fixtures and fittings. As a result, consumers were purchasing more efficient new or replacement fixtures, leading to greater water savings.

1990 The Washington State Departments of Health and Ecology, along with the Washington Water Utility Council, developed interim guidelines for water suppliers that encouraged water use efficiency based on existing state statutes.

1992 and 2001 Additional droughts led to mandatory watering restrictions in some areas of the state. These restrictions opened a dialogue among water suppliers to establish water shortage response plans and develop voluntary water conservation programs to reduce customer demand.

1994 New federal efficiency standards for the manufacture and import of plumbing fixtures, fittings, and water-using appliances transformed the local and national marketplace. Only products meeting national water efficiency standards and state building codes could be installed in Washington. The Department of Health (department) published water conservation planning guidelines. Water suppliers followed these guidelines when completing comprehensive water system plans.

1997 The Washington Legislature allocated temporary funding to the department to provide water conservation technical assistance to water systems.

2003 The Washington Legislature passed the Municipal Water Law, leading to the adoption of the 2007 WUE rule, ultimately replacing the 1994 water conservation guidelines.

2007 The WUE rule took effect on January 22.



Competing Demands

With the passage of the 2003 Municipal Water Law, the Washington Legislature made water efficiency an issue of statewide importance in a region of seemingly abundant supply. Washington's regulatory WUE requirements are robust and compare to states that pursue efficiency due to limited water supplies, extreme water shortages, and drought situations, such as California and Texas. A recent study by the Alliance for Water Efficiency ranked Washington fourth highest in the nation for its progressive water conservation laws and policies.

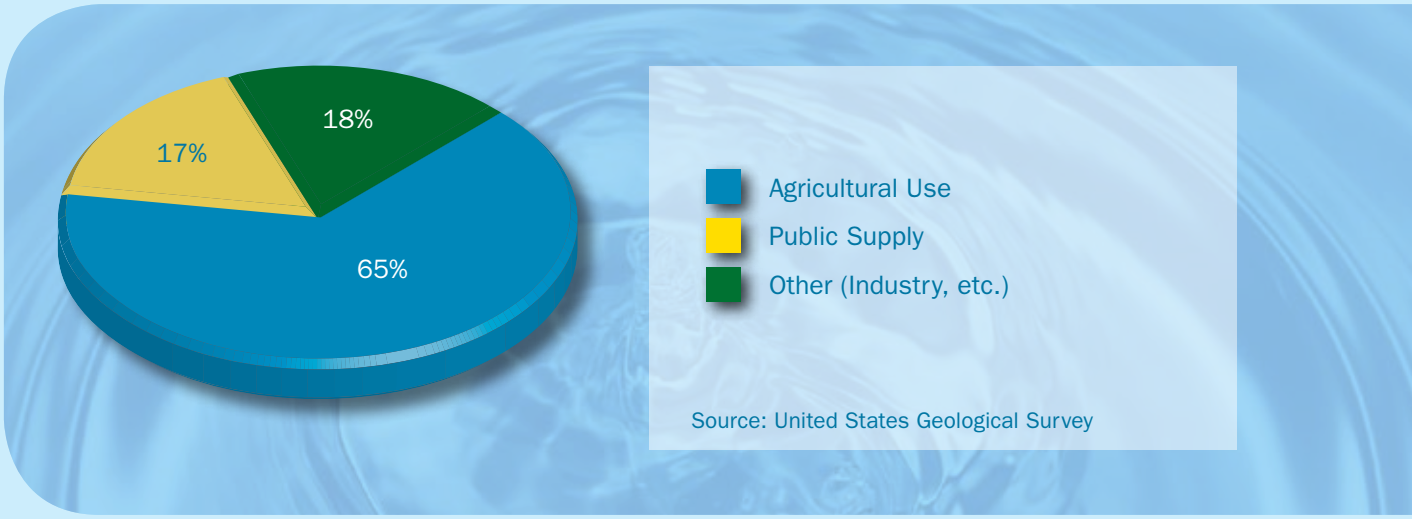
Water supplies can be scarce in many areas of the state due to local and seasonal conditions. Dry summers lead to high demand for water. Washingtonians rely on water resources not only for potable supply, but also for agricultural and industrial production, hydropower, and recreation. In some watersheds, water limitations affect the needs of both people and fish, creating unique challenges to ensure the survival of the state's threatened salmon and trout populations. The effects of climate change may also lead to greater uncertainty on future water supplies.

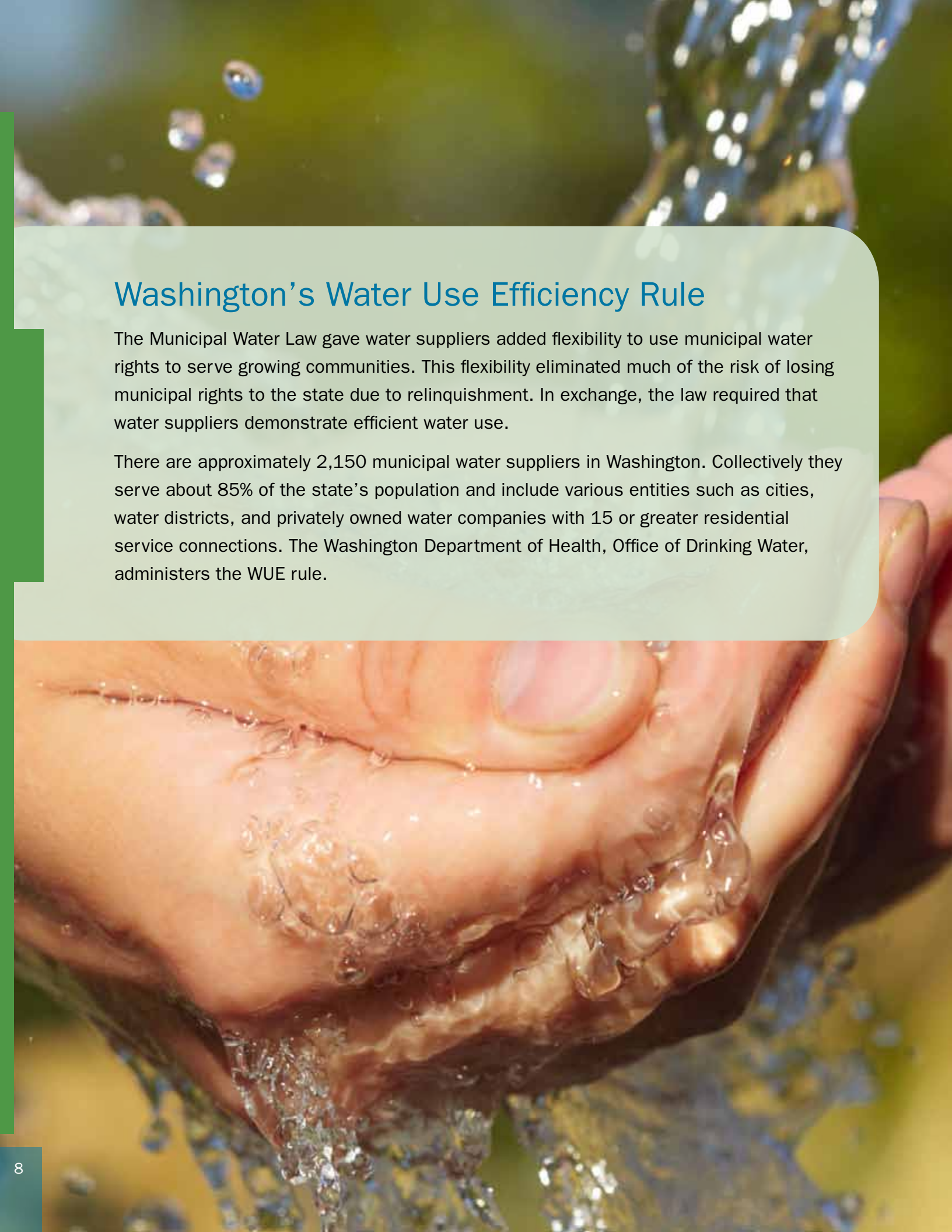
Implementing efficiency measures is generally less expensive than developing new sources of supply. Conservation can help control the long-term cost of water by delaying the need for new infrastructure. It can also help water suppliers reduce operating costs such as pumping and treatment. Efficient water use is a cost effective way to best utilize our valuable water supplies to ensure there is enough water to support a growing population, a vibrant economy, and a sustainable environment for generations to come.

According to Washington's Office of Financial Management, the state population is expected to grow by about 2 million, reaching 8.8 million in 2040. The Water Supply Forum, a regional group of water suppliers in the Puget Sound area, has indicated the demand for water will increase by 63% in Pierce and Snohomish counties and by 47% in King County during the next 50 years. A report regarding water supply and demand in the Columbia River Basin predicts that by the year 2030, an additional 117,500 acre-feet (approximately 38 billion gallons) of water per year will be needed for private and municipal supply.

In a 2009 report, the United States Geological Survey identified the most recent water use trends in Washington. Of the 5.7 billion gallons per day of total freshwater used during 2005 in Washington, public water supply accounted for 990 million gallons per day. In contrast, an average of 3.7 billion gallons per day was used for agricultural needs. As shown in Figure 1, agricultural use (crop irrigation, livestock and aquaculture) accounted for the majority of total water use in the state (65%), while public supply accounted for 17%. The remaining 18% of water use was a combination of other uses, such as industrial, mining and thermoelectric. While other sectors may be implementing water efficiency into their operations, those efforts are not the subject of this report.

Figure 1: Average Water Use by Sector, 2005





Washington's Water Use Efficiency Rule

The Municipal Water Law gave water suppliers added flexibility to use municipal water rights to serve growing communities. This flexibility eliminated much of the risk of losing municipal rights to the state due to relinquishment. In exchange, the law required that water suppliers demonstrate efficient water use.

There are approximately 2,150 municipal water suppliers in Washington. Collectively they serve about 85% of the state's population and include various entities such as cities, water districts, and privately owned water companies with 15 or greater residential service connections. The Washington Department of Health, Office of Drinking Water, administers the WUE rule.

The WUE rule requires that water suppliers accomplish the following:

Install meters on all water sources, interties, and customer connections to track, monitor, and record and report water consumption.

- Source meters were required by January 22, 2007 and customer and intertie meters are required by January 22, 2017.

Establish measurable water efficiency goals through a public process to reduce customer demand.

- Measurable water efficiency goals must be adopted through a public process every six years. At least one demand side goal is required (e.g., reduce per capita consumption by 3% in 6 years); supply side goals (e.g., reduce leakage percentage by 5% in 3 years) are optional.

Implement conservation measures, evaluate water rates that encourage efficient use by customers, and educate customers about using water efficiently.

- A measure is any water supplier initiative designed to conserve water. Depending on the number of connections served, water suppliers must evaluate or implement between one and twelve measures to help customers use water efficiently. Systems with 1,000 or more connections must also evaluate opportunities to use reclaimed water.

Meet a standard of 10% distribution system leakage on a rolling three-year average.

- Distribution system leakage is calculated on reported production and consumption values. Any water supplier that exceeds the 10% standard must implement a water loss control action plan. Water suppliers with fewer than 500 connections may request permission from the department to use a 20% distribution system leakage standard, but the water supplier must provide justification for the request.

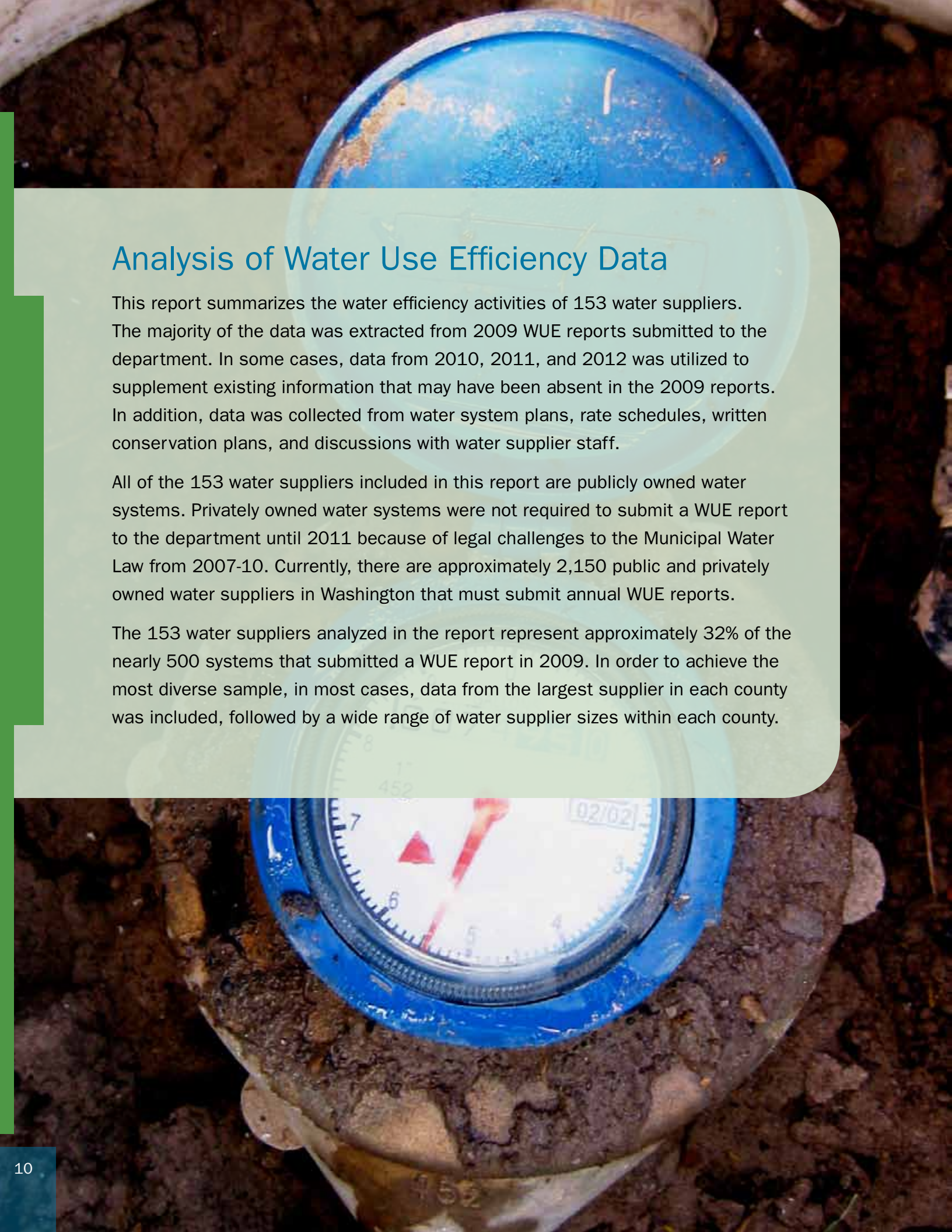
Report the production, consumption, and progress towards reaching WUE goals annually to both customers and the Department of Health.

- Annual WUE reports compiled by water suppliers measure water use trends, summarize the success of WUE programs, and verify compliance with the WUE requirements.

Develop and implement a WUE program.

- Every water supplier must complete a comprehensive WUE program. WUE programs encompass all aspects of supply and demand side efficiency and must be included as part of the comprehensive water system planning document.





Analysis of Water Use Efficiency Data

This report summarizes the water efficiency activities of 153 water suppliers. The majority of the data was extracted from 2009 WUE reports submitted to the department. In some cases, data from 2010, 2011, and 2012 was utilized to supplement existing information that may have been absent in the 2009 reports. In addition, data was collected from water system plans, rate schedules, written conservation plans, and discussions with water supplier staff.

All of the 153 water suppliers included in this report are publicly owned water systems. Privately owned water systems were not required to submit a WUE report to the department until 2011 because of legal challenges to the Municipal Water Law from 2007-10. Currently, there are approximately 2,150 public and privately owned water suppliers in Washington that must submit annual WUE reports.

The 153 water suppliers analyzed in the report represent approximately 32% of the nearly 500 systems that submitted a WUE report in 2009. In order to achieve the most diverse sample, in most cases, data from the largest supplier in each county was included, followed by a wide range of water supplier sizes within each county.

Water Supply Source

Figure 2 illustrates the source of water supply for the 153 water suppliers.

Location of Water Suppliers Studied

Sixty percent of the water suppliers in this report are located west of the Cascade Mountains, and forty percent are east of the mountains.

Water Supplier System Size

Figure 3 indicates the number of connections served by water suppliers.

Metering

Installing meters is one of the primary requirements of the WUE rule because it provides a basis for understanding water use patterns, aids in establishing measurable goals, and may be used to identify efficient versus inefficient water use. Meters provide information essential to achieving greater efficiency. Installing both production and consumption meters allow water suppliers to determine how much water is lost through leaks in the distribution system and help identify apparent losses, aiding in better water management.

Water suppliers were required to install meters on all water sources by January 22, 2007, and must install service meters by January 22, 2017. Water suppliers currently lacking service meters must document their progress of meter installation in annual WUE reports until their systems are fully metered.

Figure 4 shows that the majority of water suppliers in our sample (all publicly owned) are fully metered. However, data from the most recent 2011 WUE reports indicate that only 43% of privately-owned water systems are fully metered (not shown in Figure 4).

Figure 2: Water Supply Source for Water Suppliers

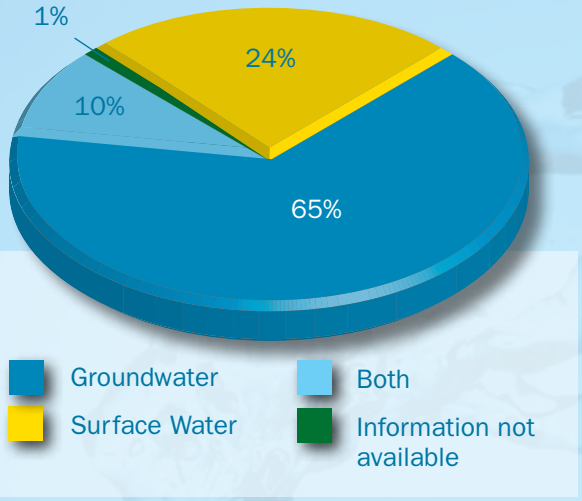


Figure 3: Water System Size

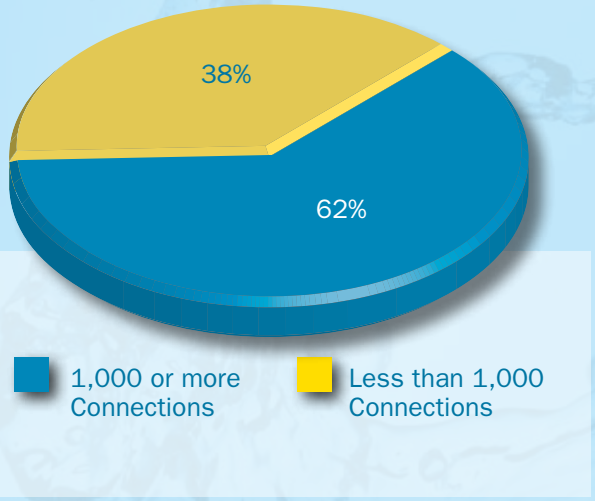
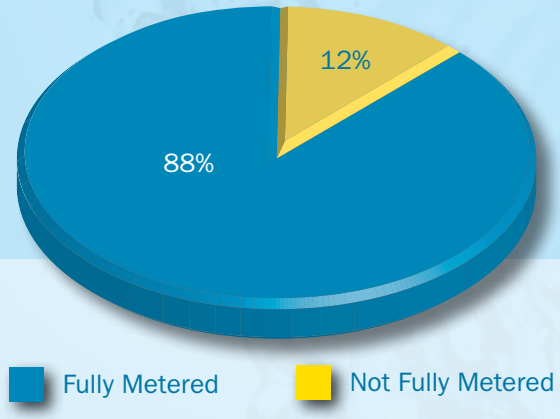


Figure 4: Publicly Owned Metered Systems



Leakage and Leak Detection

The WUE rule requires that water suppliers meet a leakage standard of no more than 10%. Each year by July 1, water suppliers must collect and report to the department the annual totals of all data from their sources, water purchased from other suppliers, and the authorized consumption (metered water use by customers plus any other estimated unmetered use).

Compliance with the 10% leakage standard is based on three years of reported data, as calculated on a rolling three-year average. Of the 153 water suppliers in the sample, 80 had submitted three years of data. Of those 80 water suppliers, 54 (68%) were below the 10% leakage standard, as shown in Figure 5. Water suppliers with greater than 10% leakage can demonstrate compliance with the leakage standard by completing and implementing a water loss control action plan.

The range, average, and median leakage percentages from the 2009 data are shown in Figures 6 and 7. The "Zero/Negative" category in Figure 6 represents negative leakage values (a result of poor data collection or inaccurate meters) and zero values for systems not fully metered.

Figure 5: 2009 Compliance with Three-Year Average Leakage Standard

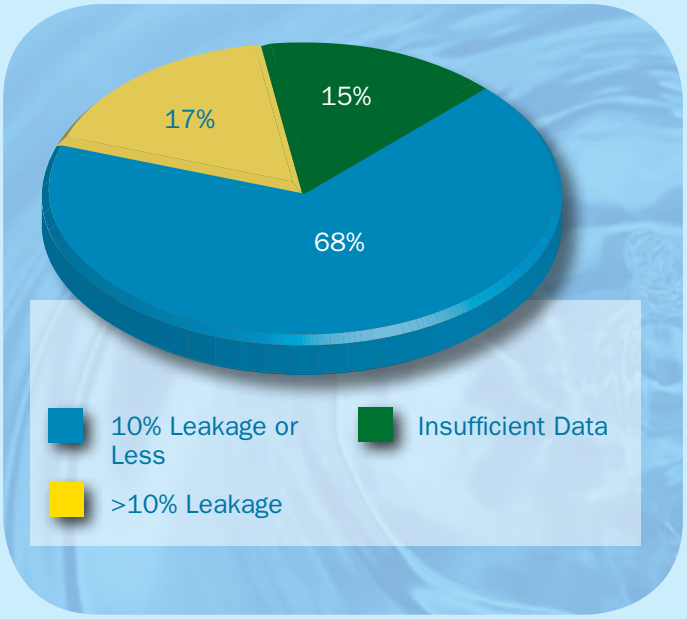


Figure 6: Range of 2009 Reported Leakage Percentage

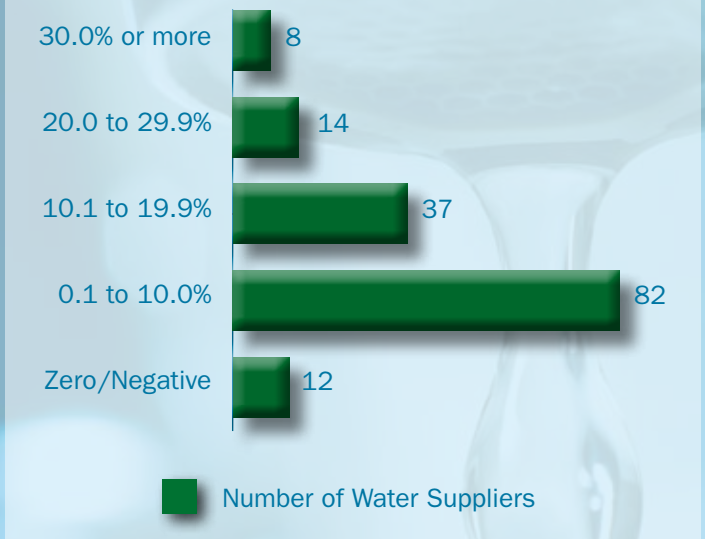
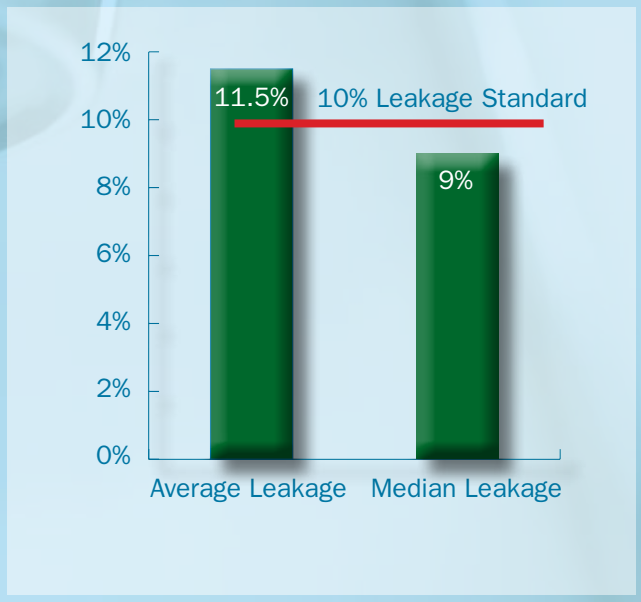


Figure 7: 2009 Average and Median Leakage Percentage





Case Study

Pasadena Park Irrigation District, Spokane County

After conducting a water audit, managers at Pasadena Park Irrigation District in Spokane County discovered their 1940's era water main was leaking in 240 places. The district serves approximately 2,300 connections, to a mostly residential population of about 6,000 people. Leakage ranged from 45-75% depending on the time of year, losing well over 1 million gallons a day during the highest peak. The district quickly realized water loss at this rate was leading to higher electricity costs and substantial wear and tear on infrastructure. To address the problem of leaking water mains and lost revenue, the district replaced over 5,000 feet of aging and failing water mains and began replacing old customer meters with an automated meter reading program with customer leak detection and water demand recording features. Leakage rates currently average 16.5%, recapturing as much as 800,000 gallons of water per day at an estimated value of $175,000 per year.

Conservation Based Rate Structures

As part of the WUE rule, water suppliers are required to evaluate the adoption of conservation based rate structures, which encourage efficient water use by their customers. Under the WUE rule, adoption of a conservation rate structure qualifies as a water use efficiency measure.

Commonly used conservation rate structures include inclining block and seasonal rates. In an inclining block rate structure, customers pay a higher rate for water at each tier of the pricing system. In a seasonal rate structure, customers pay more for peak season usage than they do during the winter months. A uniform or declining rate structure (one in which customers pay the same amount or less per unit of water) is not considered a conservation rate structure. Likewise, flat rates are not considered conservation rates because customers pay one price for water regardless of the amount of water used.

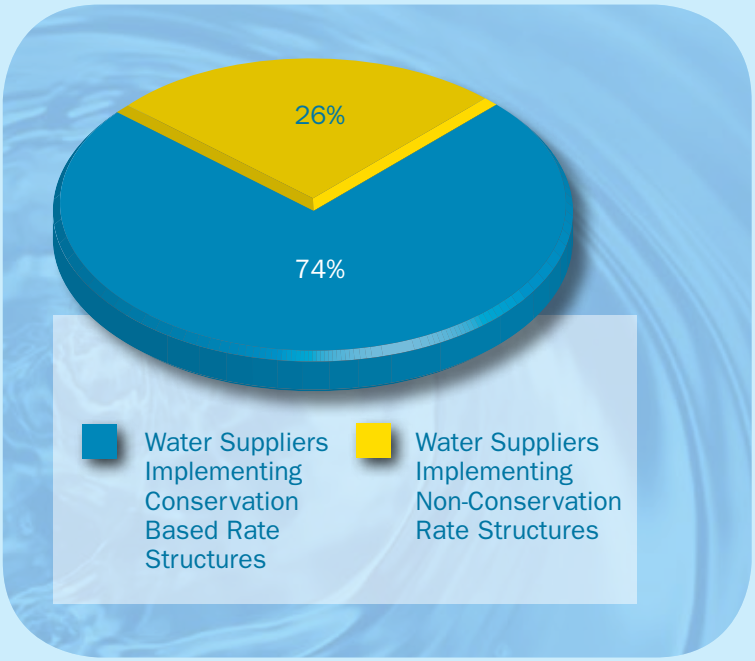
A rate structure analysis should evaluate whether water suppliers are meeting their fixed and variable costs and accumulating cash reserves while at the same time reducing customer demand. Precise valuing of water through the use of conservation based rate structures do the following:

- Keep rates reasonable at the lower tiers for consumers who use water only for basic needs.
- Encourage customers to use water wisely and to minimize water waste, particularly with discretionary uses such as landscape irrigation.
- Help water suppliers control water usage during peak season demand.

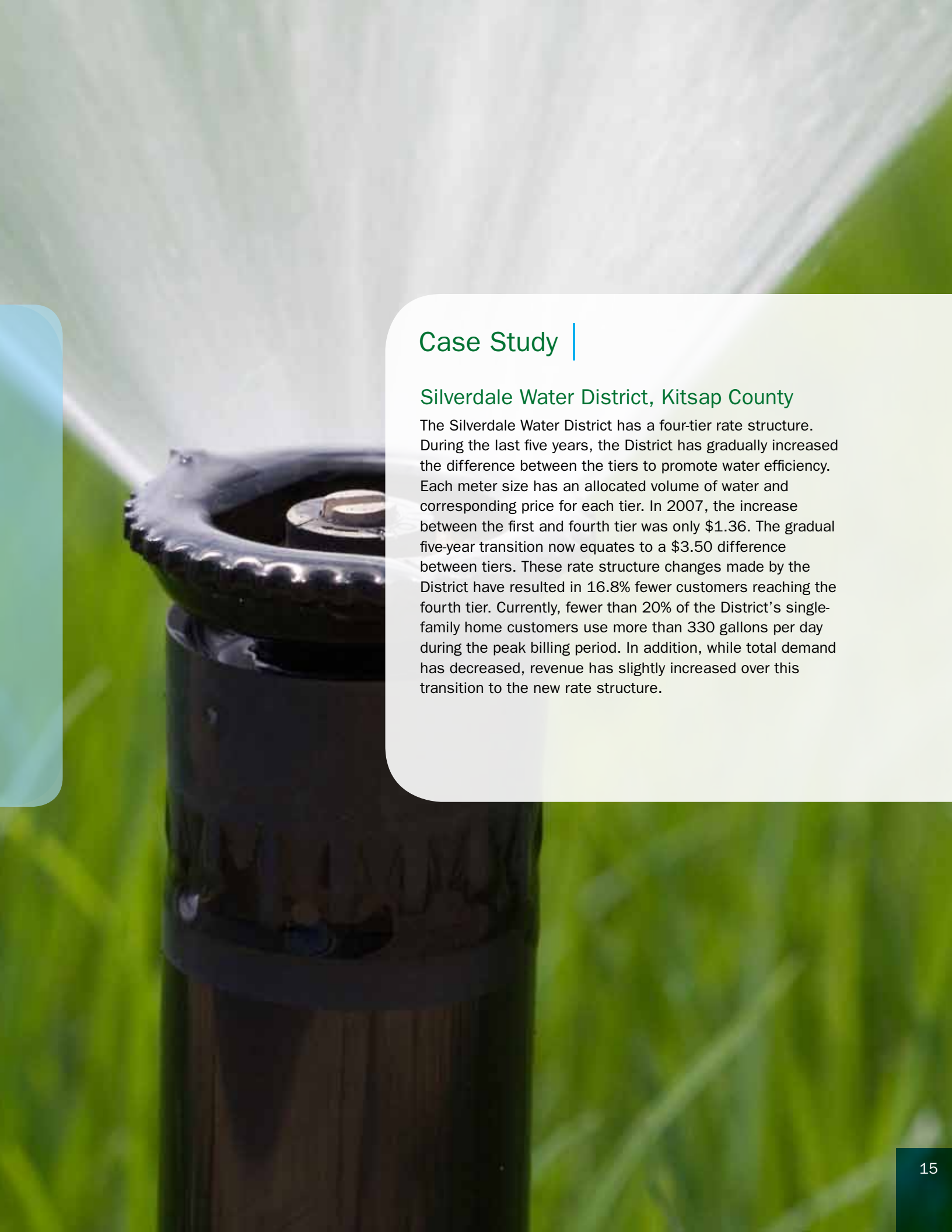
Rate Structure Analysis

For this portion of the report, only single-family residential rates for the years 2011 or 2012 were examined. As shown in Figure 8, 74% of the water suppliers had conservation based rate structures, indicating that most are encouraging their customers to use water efficiently by sending a price signal based on the amount of water used.

Figure 8: Water Rate Types for Single Family Residential Customers







Case Study

Silverdale Water District, Kitsap County

The Silverdale Water District has a four-tier rate structure. During the last five years, the District has gradually increased the difference between the tiers to promote water efficiency. Each meter size has an allocated volume of water and corresponding price for each tier. In 2007, the increase between the first and fourth tier was only $1.36. The gradual five-year transition now equates to a $3.50 difference between tiers. These rate structure changes made by the District have resulted in 16.8% fewer customers reaching the fourth tier. Currently, fewer than 20% of the District's single-family home customers use more than 330 gallons per day during the peak billing period. In addition, while total demand has decreased, revenue has slightly increased over this transition to the new rate structure.

Water Use Efficiency Goal Setting

Water suppliers must establish a WUE goal that clearly identifies a water savings target over a specified time period. Goals must be established through a public process and adopted by the elected governing board or owner of the water supplier. Goal setting engages customers in a dialogue with their water suppliers to establish water efficiency programs. A goal must be established at least once every six years.

Goal Analysis

The report found three general categories of WUE customer goals. These categories are:

- Peak season reduction (aimed at limiting outdoor water use and reducing peak demand).
- Overall reduction (general water use reduction).
- Maintaining water usage with no proposed reduction in consumption.

Figure 9 illustrates the types of conservation goals.



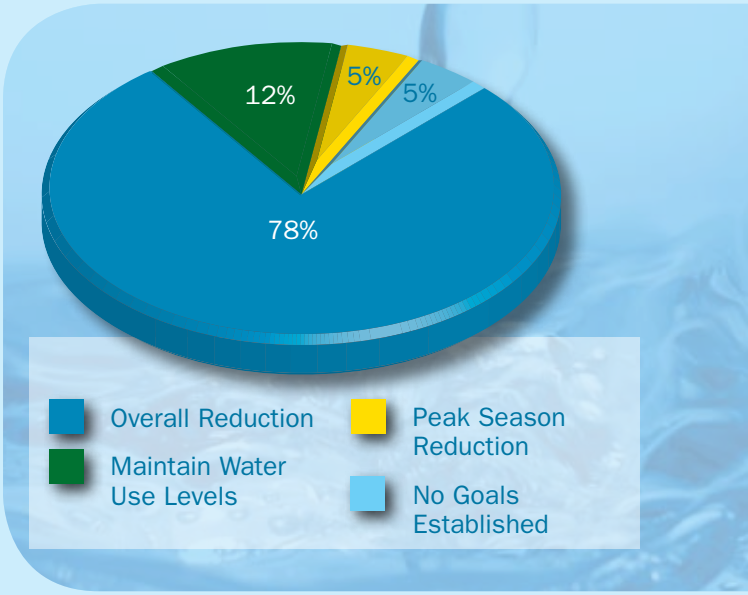
Most water systems (78%) established WUE goals with overall water use reduction targets. These included reductions in per capita use per day, average day demand, or other types or combinations of general reduction targets. This trend indicates a clear pattern to reduce current consumption within customer bases.

General Trends in Goal Setting

There was no notable difference in water reduction targets between Eastern and Western Washington's water suppliers. Some of the general trends in WUE goal setting are summarized here and illustrated in Figure 10:

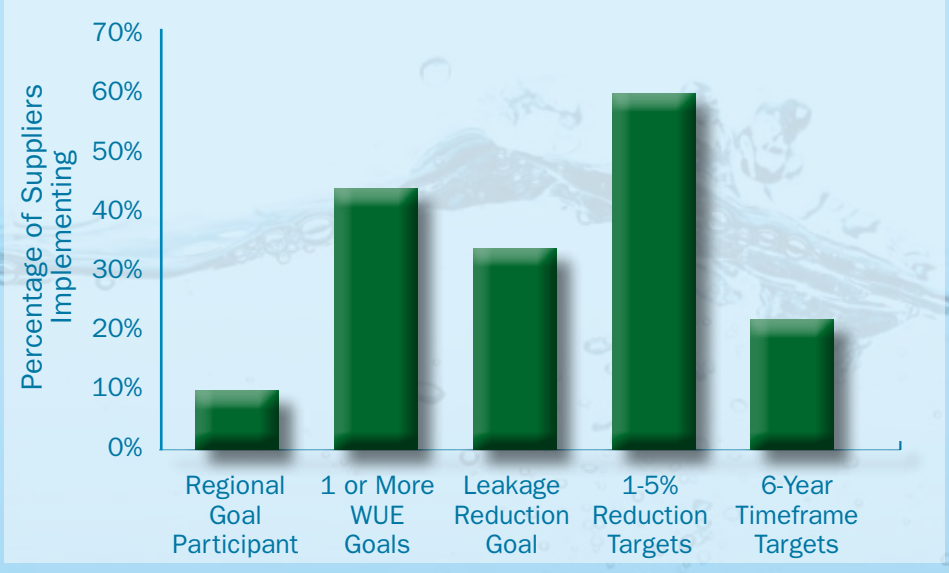
- About 10% of water suppliers are participating in a regional goal program, administered by a separate water supplier. The Saving Water Partnership (Seattle area), City of Everett, and Cascade Water Alliance (suburban King County) have all established regional water conservation goals for participating water suppliers in their respective areas.
- Forty-four percent (44%) of water suppliers established more than one goal to achieve water savings. This is noteworthy because the department only requires one demand reduction goal to be in compliance. Some water suppliers established two or more demand reduction goals, while others included a supply side goal to supplement the demand side goal.

Figure 9: Conservation Goal Types



- Thirty-four percent (34%) established a goal to reduce leaks
- Of the water suppliers that established overall reduction targets in water use, 60% of the targets were in the range of 1-5 % demand reduction per year.
- Twenty-two percent (22%) established goals with a six-year horizon.

Figure 10: Trends in Conservation Goal Setting



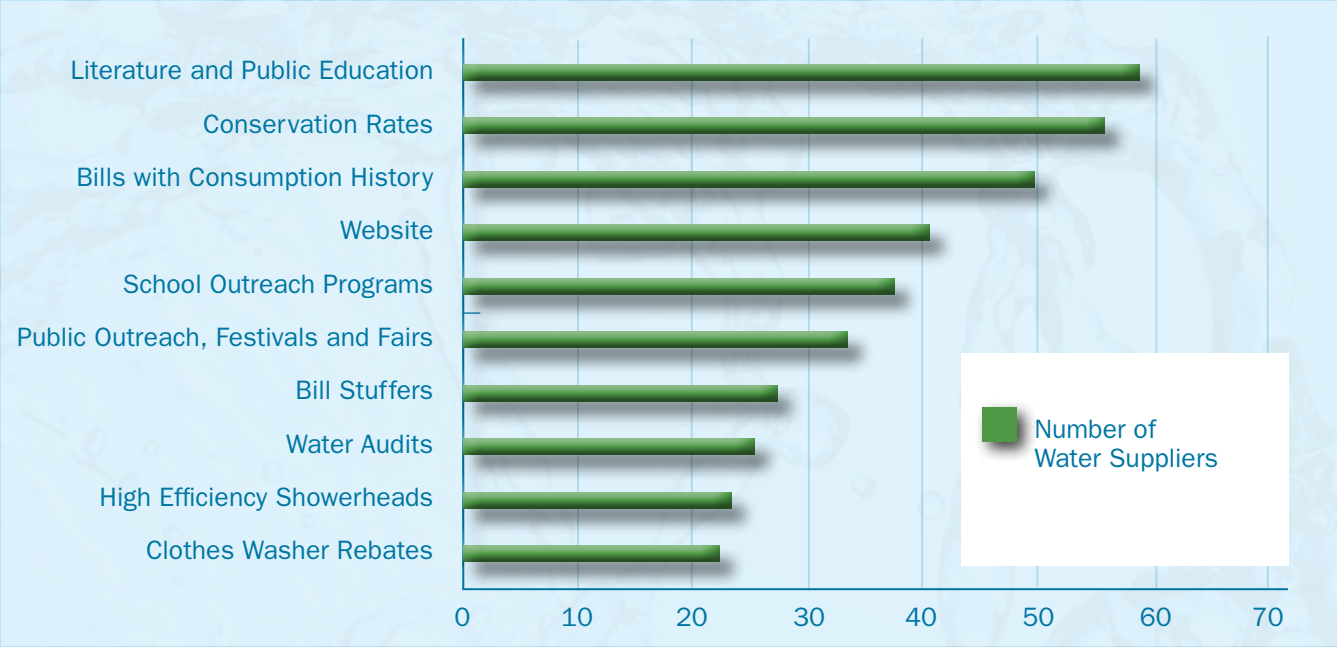
Measures

Water use efficiency measures are tools water suppliers can use to meet their goals. Measures may include water efficient devices, actions, business practices, or policies or ordinances that promote efficient water use. Water suppliers must implement mandatory measures such as installing source and service meters, performing meter calibration, or implementing a water loss control action plan (if leakage is greater than 10%), and, at least once per year, educating customers on how to use water efficiently. In addition, water suppliers must evaluate rates that encourage water efficiency, and suppliers with more than 1,000 connections must evaluate water reclamation opportunities. The number of measures that must be implemented is determined by water supplier size.

The report identified 42 measures that have been implemented by water suppliers. In addition to the top ten measures shown in Figure 11, many suppliers reported pursuing other innovative conservation actions, such as rebates for high-efficiency fixtures and appliances, peak season demand management, indoor and outdoor conservation kits, rainwater harvesting, rebates for commercial conservation programs, and a great variety of public outreach and education techniques.

Most water suppliers analyzed have made concerted efforts to meet the WUE requirements. The report revealed the most common measures are public education and rates. Hardware programs and audits are also popular with many water suppliers.

Figure 11: Top Ten Measures Implemented by Water Suppliers



Case Studies

Issaquah zHome, King County

The Issaquah zHome project is the nation's first community of WaterSense labeled homes. zHome units have the most efficient fixtures and appliances available. Rainwater harvesting for toilets and clothes washers means that zHome residents will use, on average, only 29 gallons of municipal drinking water per person per day, compared to the Environmental Protection Agency (EPA) national average of 100 gallons per person in a typical existing home. With support from Cascade Water Alliance, all zHome units received certification through the EPA's WaterSense New Homes Program.



Issaquah zHome, King County

Northwest University, King County

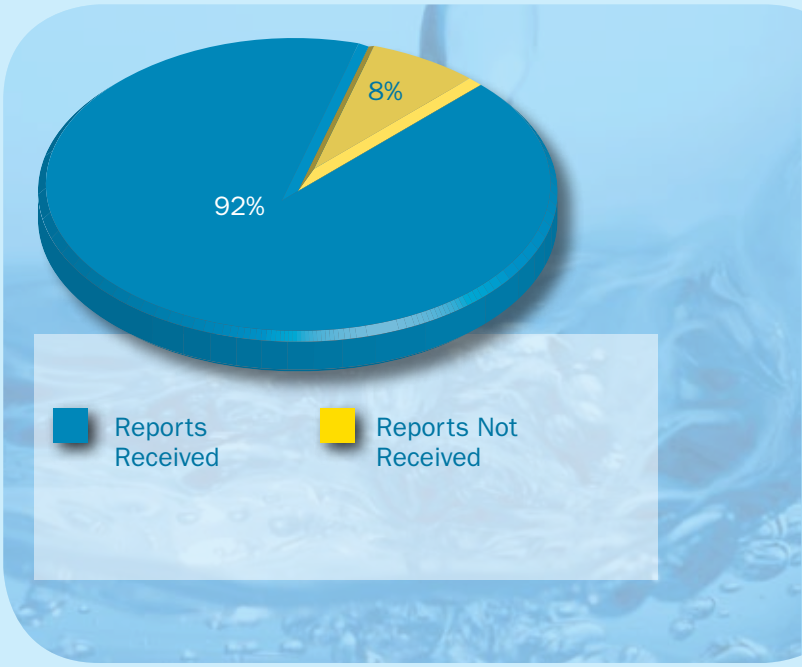
The Northwest University in Kirkland has a beautiful 56-acre campus, including large expanses of irrigated grass. In 2010, the University undertook a major renovation of its automatic irrigation system. The system was antiquated, prone to leaks and expensive to operate. The project included installing weather-based controllers, pressure reduction valves, flow sensors with automatic shut offs, and hundreds of efficient sprinkler heads. The results were dramatic: total irrigation water use for 2011 showed an astounding 50% drop compared to the previous five years, from an average of 9.9 million gallons in 2010 to 4.9 million gallons in 2011, resulting in tens of thousands of dollars saved in reduced water bills. Moreover, the campus and landscape are just as beautiful as ever.

Reporting

The WUE rule contains an annual reporting requirement. Water suppliers must report production totals, authorized consumption, and progress toward achieving the supplier's water saving goals to both the department and its customers.

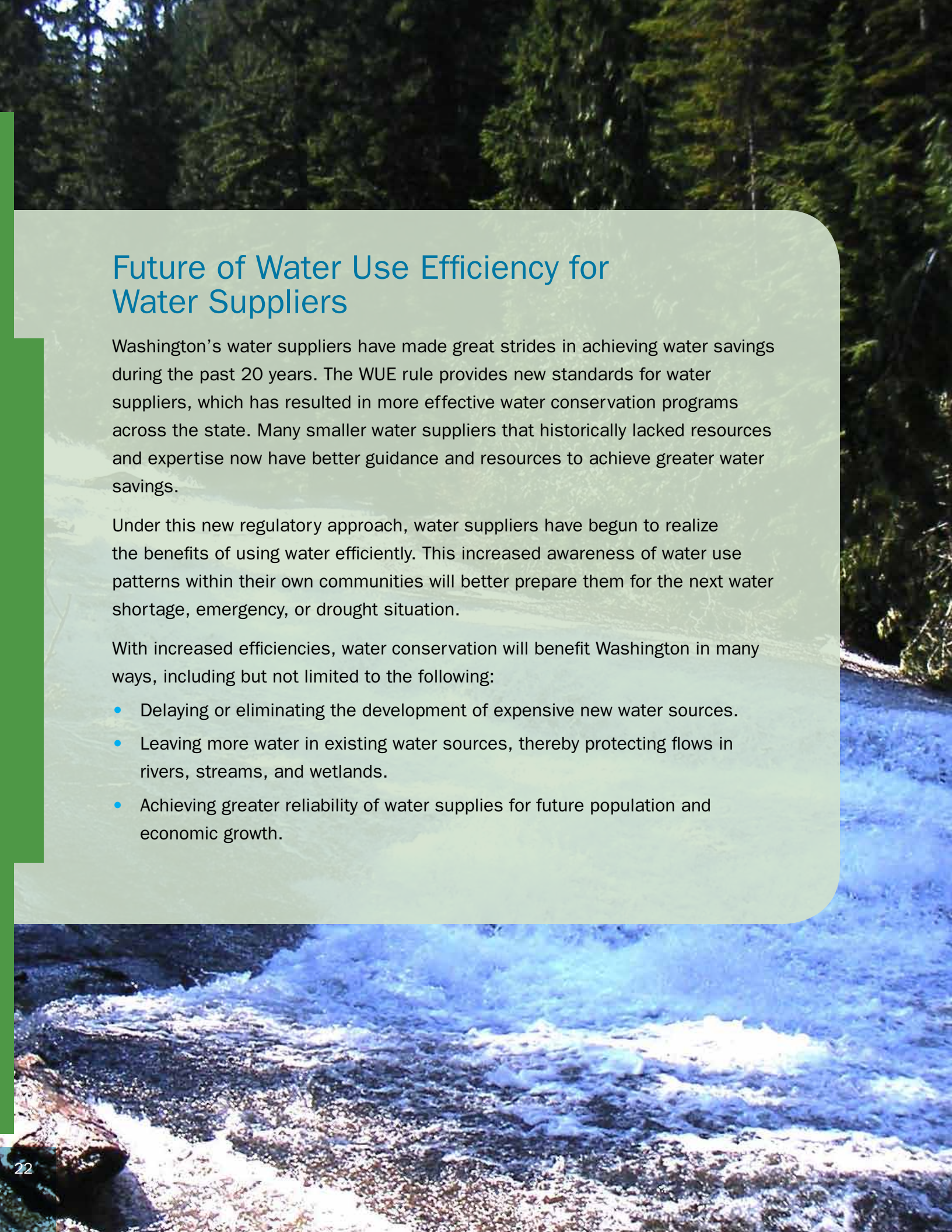
Figure 12 indicates that the majority of water suppliers submitted their water use efficiency reports to the department in 2009.

Figure 12: Annual Reports Submitted to the Department by Water Suppliers, 2009









Future of Water Use Efficiency for Water Suppliers

Washington's water suppliers have made great strides in achieving water savings during the past 20 years. The WUE rule provides new standards for water suppliers, which has resulted in more effective water conservation programs across the state. Many smaller water suppliers that historically lacked resources and expertise now have better guidance and resources to achieve greater water savings.

Under this new regulatory approach, water suppliers have begun to realize the benefits of using water efficiently. This increased awareness of water use patterns within their own communities will better prepare them for the next water shortage, emergency, or drought situation.

With increased efficiencies, water conservation will benefit Washington in many ways, including but not limited to the following:

- Delaying or eliminating the development of expensive new water sources.
- Leaving more water in existing water sources, thereby protecting flows in rivers, streams, and wetlands.
- Achieving greater reliability of water supplies for future population and economic growth.

Examples of Potential Savings

In 2011, roughly 1,100 Washington water suppliers consumed an average of 715 million gallons per day of water. If those water suppliers achieved a combined average 5% reduction in their current water use, it would save 36 million gallons of water per day. That is enough to supply water to more than 200,000 new homes built to EPA's WaterSense New Homes specifications.

About 900 water suppliers lost roughly 26 billion gallons of water in 2011 due to leaks and unauthorized use. If those water suppliers achieved a 1% reduction in total volume lost, it would result in 260 million gallons of water saved. This volume of water would be enough to serve the drinking water needs for the 6,000 water customers of the City of Bainbridge Island for an entire year.

Achieving these kinds of water reductions will not happen overnight, but there are approaches Washington's water suppliers can utilize to reach greater conservation savings. There are new technologies and avenues that remain largely unexplored, including:

- Encouraging customers to purchase WaterSense labeled products.
- Research the use of advanced metering infrastructure, which provides instantaneous water use information to customers and helps water suppliers identify water use patterns in real-time.
- Utilize more effective rate structures that encourage customers to conserve.
- Promote new irrigation technologies such as weather-based "smart" controllers and efficient sprinkler heads.
- Consider alternative sources for non-potable use, such as rainwater harvesting or grey water harvesting.

Water use efficiency has a promising future in Washington. The Partnership is dedicated to helping all stakeholders, including water suppliers, businesses, and environmental groups across the state to work together to use our precious water resources wisely and create a more sustainable future.



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Attachment E-2

City of Arlington Water Use Efficiency Goals and Results Since 2007 by Date and Decision Document

Focus	Action	Parameter	Units	From: Base Condition		To: Target Condition		Actual Condition		Goal Achieved?	Comments
				Year	Value	Year	Value	Year	Value		
2004 WSP--Adoption by City Council											
Demand	Reduce	System-wide average water use	gal/day per connection	2002	268	2008	255 (5%)	2007	253 (5.5%)	Yes	
						2018	241 (10%)	2008	242 (9.6%)	On target	Nearly met 10 yrs early
Supply	Reduce	Un-accounted for water	percent	2002	16%	Annually	<10%	2004 to 2007	Range 4% to 7%	Yes	
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program	Annually	Per program	Yes	
2008 City Council Resolution											
Demand	Reduce	System-wide average water use	gal/day per connection	2002	268	2008	255 (5%)	2008	242 (9.6%)	Yes	Achieved twice the intended reduction in 6 years
						2018	241 (10%)	2010	219 (18%)	On target	Exceeded reduction by 80% in half the time
Supply	Reduce	Distribution system leakage (DSL)	percent as 3-year running average	2004	12%	Annually	<10%	2006 to 2008	Range 5% to 6%	Yes	
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program	Annually	Per program	Yes	
2011 WSP--Adoption by City Council											
Demand	Reduce	System-wide average water use	gal/day per connection	2008	242	2014	237 (2%)	2014	215 (11%)	Yes	Achieved 5 times the intended reduction in 6 years
						2018	230 (5%)	2014	215 (11%)	On target	Doubled the target reduction with 4 years left
Supply	Reduce	DSL	percent as 3-year running average	2008	6%	Annually	<10%	2009 to 2013, 2014	7% to 9%, 13%	Yes No	Individual years >10% since 2012
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program	Annually	Per program	Yes	
2015 WSP--Adoption by City Council											
Demand	Reduce	System-wide average water use	gal/day per connection	2013	210	2018	206 (2%)	2014	209 (-2.3%)	Going backward	
						2025	206 (2%)	--	--	TBD	
Demand	Reduce	System-wide average water use	gal/day per ERU	2013	186	2018	183 (2%)	2014	204 (-9.5%)	Going backward	
	Maintain					2025	183 (2%)	--	--	TBD	
Demand	Maintain or Reduce	Peak Day Factor (MDD/ADD)	gallons per gallion	2014	Range 1.5 to 1.75	Annually	Range 1.5 to 1.75	--	--	TBD	
Supply	Reduce	DSL	percent as 3-year running average	2014	13.2%	Annually	<10%	TBD	TBD	TBD	
Both	Increase	Awareness, Education	Qualitative	Annually	Per program	Annually	Per program	TBD	TBD	TBD	

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Attachment 3

City of Arlington

Water Loss Control Action Plan

Developed to Reduce Distribution System Losses

Per WAC 246-290-820 (4)

Prepared by

Arlington Water Department

May 2015

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EE Water Loss Control Action Plan

EE.1 INTRODUCTION

EE.1.1 Background

Since passage of the Municipal Water Law in 2003, the City of Arlington Water Department has seen marked and consistent reductions in its "unaccounted for" water. For 3 years prior to the implementation of the Water Use Efficiency Rule (Rule) in 2007, the City was well under the threshold of (i.e., no more than) 10% established for distribution system losses (DSL) measured as a 3-year running average [WAC 246-290-820(4)]. For the 2012 through 2014, however, the City's DSL were 13.2 percent, 10.9 percent, and 15.6 percent. Consequently, in 2014, the City's 3-year running average DSL jumped from 9 percent to 13 percent.

The Rule requires utilities whose 3-year average DSL exceeds the threshold to develop and implement a water loss control action plan with control methods commensurate with the level of leakage. The water loss control action plan is submitted to the Department of Health with the City's water use efficiency program. This action plan is a key component of the Water Use Efficiency program submitted with the City's 2015 WSP.

EE.1.2 Consistency with Regulatory Requirements

WAC 246-290-820 indicates the following five items shall be included in a water loss control action plan for utilities with DSL between 10 percent and 20 percent. The subsection in parentheses indicates where that requirement may be found in this plan.

- The control methods necessary to achieve compliance with the distribution system leakage standard (E.3);
- An implementation schedule (E.4);
- A budget that demonstrates how the control methods will be funded (E.5);
- Any technical or economic concerns which may affect the system's ability to implement a program or comply with the standard including past efforts and investments to minimize leakage (E.6); and
- If the average distribution system leakage is greater than ten and less than twenty percent of total water produced and purchased, the water loss control action plan must assess data accuracy and data collection (E.3; E.6).

EE.1.3 Format of this Action Plan

Following this introduction, this water loss control action plan addresses:

- 5.2 Water Balance History—a quantitative history of the various components of the Water Department's Water Balance.
- 5.3 Summary of Control Methods—Recommendation identified under the Discussion section are brought forward and summarized here by water balance component.
- 5.4 Implementation Schedule—for a 6-year cycle.
- 5.5 Budget
- 5.6 Discussion of Water Balance Components—a review of trending and rationale for recommendations made for each component.

EE.2 WATER BALANCE HISTORY

A water balance for the period 2005 through 2014 is presented in **Table EE-1** *(found at the back of this water loss control action plan).*

EE.3 SUMMARY OF CONTROL METHODS

Recommendations for reducing water loss are summarized by water balance component in **Table EE-2**. Each recommendation is ranked qualitatively based on the proportion of the balance affected, and the ease of implementation.

Table EE-2

Recommended Actions for Reducing Distribution System Losses

Water Balance Category	Description	Percent of Total Supply	Recommendation	Priority
Total Water Supply by Source (1,000 gallons)				
Water Supply (Production and Purchase Sources)	Haller Wellfield (production)	88.5%	A. Install single source meter on WTP raw water line. B. Request vendor re-calibration of suspect meter. C. 3rd party validation of meter calibrations. D. Portable meter for in-house quality control.	H H M L
	Airport Wellfield (production)	3.3%	E. Calibrate meter	H
	PUD (purchase)	8.3%	None	--
	Marysville intertie (purchase)	0.0%	N/A	--
Water Demand by Revenue Type (1,000 gallons)				
Authorized Revenue Water Demand	Metered, Billed	77.6%	A. Audit utility billing software--structure B. Audit utility billing software--queries C. Audit utility billing process (data input, mgt) D. Review meter replacement schedule, priorities E. Review capability for customer meter testing	H H H M L
	Hydrant meters, Billed	0.1%	F. Test meters and calibrate as needed	M
	Bulk water, Estimated, Billed	0.0%	None	--

Table EE-2, continued

Recommended Actions for Reducing Distribution System Losses

Water Balance Category	Description	Percent of Total Supply	Recommendation	Priority
Water Demand by Non-Revenue Type (1,000 gallons)				
Authorized Non-Revenue Water Demand	WTP Backwash Waste	9.0%	A. Conduct trend & mass balance analysie on all meters involved in measuring backwash processes	M
	Water Quality Monitoring	--	None	--
	Distribution System Flushing	0.1%	B. Purchase hose/diffusers w/ built in flow meters. C. Enter data monthly or quarterly. D. Send bi-annual email reminder.	M L M
	Unmetered Facilities	0.1%	None	--
	Metered, Unbilled Facilities	0.0%	None	--
	Sanitary Sewer Collections	0.0%	E. Send bi-annual email reminder.	L
	Stormwater System	0.0%	F. Review procedures for each activity w/ M&O lead. G. Address one M&O staff meeting. H. Send bi-annual email reminders.	L L M
	Street Sweeping	0.0%		
	Airport Seasonal Watering	0.0%		
	Parks Seasonal Watering	0.0%		
	Fire Training & Hoses Tests	0.0%	I. Evaluate data & assumptions in light of literature. J. Develop bi-annual (April, Oct) email reminder. K. Tips for standardizing methods to increase accuracy.	L M L
	Heat Relief	0.0%		
	Fire Suppression	0.0%		
	Other Fire Depts (Arlington Hts)	0.0%	L. Contact Fire Chief and recommend log book. M. Provide portable meter for filling from hydrants. N. Send bi-annual email reminders. O. Consult other area Depts.	M L M M
Total Unauthorized Water Demand by Type (1,000 gallons)				
Unauthorized Water Demand	Theft	ND	None	--
	Errors	ND	A. See Water Supply and Revenue Water recommendations B. Intra-departmental audit of all water budget procedures using AWWA's free audit software	H - H -
	Leaks	5.2%	C. Implement leak detection surveys	H
	Breaks (mains, hydrants)	0.1%	D. Implement a main break database within the City's asset management system (Cartegraph). E. Develop form to facilitate post-repair data collection	M - L -
	Unaccounted-for Water	11.5%	None	--

EE.4 IMPLEMENTATION SCHEDULE AND BUDGET

The recommendations developed in **Table EE-2** are scheduled for implementation and budgeted over three years in **Table EE-3**. Estimated cost for implementing all recommendations is $13,250.

Table EE-3.

Schedule and Budget of Action Plan Recommendations

Number	Recommendation	Priority	Schedule	Budget
	1. Water Supply and Source Recommendations			
1A	Install single source meter on WTP raw water line.	H	2016	$0
1B	Request vendor re-calibration of suspect raw water meter on WTP train.	H	2015	$250
1C	3rd party validation of WTP meter calibrations.	M	2016	$500
1D	Portable meter for WTP in-house quality control.	L	2017	$1,000
1E	Calibrate airport well source meter	H	2016	$500
1	Total for Source and Supply			$2,250
	2. Revenue Water Recommendations			
2A	Audit utility billing software--structure	H	2016	$1,000
2B	Audit utility billing software--queries	H	2016	$1,000
2C	Audit utility billing process (data input, mgt)	H	2016	$1,000
2D	Review meter replacement schedule, priorities	M	2015	$0
2E	Review capability for customer meter testing	L	2017	$0
2F	Test hydrant meters and calibrate as needed	M	2016	$500
2	Total for Revenue Water			$3,500
	3. Authorized Non-revenue Water Recommendations			
3A	Conduct trend & mass balance analysie on all meters involved in measuring WTP backwash processes	M	2015	$0
3B	Purchase hose/diffusers w/ built in flow meters for distribution system flushing.	M	2016	$500
3C	Enter water main flushing data monthly or quarterly.	L	2016	$0
3D	Send bi-annual email reminder to Water staff.	M	2015	$0
3E	Send bi-annual email reminder to Wastewater staff.	L	2015	$0
3F	Review accounting procedures w/ M&O leads for Stormwater maintenance, street sweeping, airport maintenance, and park watering.	L	2016	$0
3G	Address one M&O staff meeting.	L	2016	$0
3H	Send bi-annual email reminders.	M	2015	$0
3I	Evaluate data & assumptions for fire water demands in light of literature.	L	2015	$0
3J	Develop bi-annual (April, Oct) email reminder to Arlington Fire Dept staff.	M	2015	$0
3K	Develop tips for standardizing Fire Dept accounting methods to increase accuracy.	L	2016	$0
3L	Contact Chiefs of neighboring Fire Depts and recommend log book.	M	2016	$0
3M	Provide portable meter to neighboring Fire Depts for filling from hydrants.	L	2017	$1,000
3N	Send bi-annual email reminders to neighboring Fire Depts.	M	2016	$0
3O	Consult other area Fire Depts. Re: accounting procedures and possible use of Arlington water.	M	2016	$0
3	Total for Authorized Non-revenue Water			$1,500

Table EE-3, continued

Schedule and Budget of Action Plan Recommendations

Number	Recommendation	Priority	Schedule	Budget
	4. Unauthorized Water Recommendations			
4A	See Water Supply and Revenue Water recommendations re: metering and accounting errors..	H	2016	N/A
4B	Intra-departmental audit of all water budget procedures using AWWA's free audit software.	H	2015	$0
4C	Implement leak detection surveys.	H	2017	$6,000
4D	Implement a main break database within the City's asset management system (Cartegraph).	M	2016	$0
4E	Develop form to facilitate post-repair data collection on	L	2016	$0
4	Total for Unauthorized Water			$6,000
	Totals			
Totals by year			2015	$250
			2016	$5,000
			2017	$8,000
Grand Total				$13,250

EE.5 DISCUSSION—WATER BALANCE COMPONENTS

EE.5.1 Water Supply

After completion of a cost of water supply in 2011, the City made the decision to produce more of its own water and reduce its reliance on the PUD. Over the course of several months in late 2011, the City reduced its demand for wholesale water from PUD from nearly 40 percent to less than 10 percent. It compensated by increasing reliance on the Haller well field and WTP from about 60 percent up to nearly 90 percent. This change in the City's water portfolio could compound any measurement errors made with source meters. Source meters at the WTP have not changed, and they are calibrated annually. One meter on each of three treatment trains measures the raw water influent through each train. These values are read and summed to quantify WTP input. Finished water production is metered on the single discharge line leaving the WTP. The difference between WTP influent and discharge is calculated as backwash waste for filter maintenance. On occasion, meters received back from the service provider calibrating the source meters appear to result in aberrant data—evident when trending pre- and post-calibration measurements from each of the meters. Corrective measures may include: installation of a single influent meter on the line from

the Haller well field into the WTP; re-calibration of meters producing spurious results; confirmation of calibrations using a 3rd party service provider; periodic duplicate measurements using a portable meter; etc.

The PUD regularly maintains the meter monitoring the water purveyed to the City, and the City regulates the flow from the PUD through a flow control valve. It is not suspected as a source of error.

The meter at the airport well has not been recently calibrated. It provides about three percent to six percent of the City's water on an annual basis. Calibration of the airport meter is warranted and recommended.

EE.5.2 Authorized Revenue Water

Regarding revenue water, the City's Finance Department changed accounting software in 2012, and the Water Department transitioned from bi-monthly to monthly billing that same year. It may be possible that errors in the programming of city procedures within the software were made, or that database fields or query procedures within the software are not fully understood. Given the timing of these events with the increased magnitude and consistency of unaccounted for water, it is thought that these changes are the most likely explanations.

Water usage from hydrants by contractors is understood to be well-documented by the City's hydrant permit system and use of portable meters leased from the Water Department. The City's only bulk water filling station near the WTP operated using its own permit system was discontinued in 2008 for safety and security reasons during construction of wastewater reclamation facilities. This reduced one source of loss, but could conceivably have increased theft by users from more remote hydrants. Recommendations include testing and re-calibration of portable meters, and reconsideration of a bulk water station.

EE.5.3 Authorized Non-Revenue Water

WTP Backwashing

Authorized, non-revenue uses of potable water include Water Department operations, other public works' uses, and Fire Department operations. By far the greatest non-revenue uses are filter maintenance and water main flushing by the Water Department. Backwashing of the clarifiers and filters in each of the three treatment trains in the WTP uses approximately 10 percent of the raw water drawn from the Haller well field, and 8 percent of all water into the system. As described earlier in this section, the installation of a single source meter on the raw water line from the Haller well field into the WTP could reduce possible errors introduced by reading and summing the values from meters on the three individual trains. Existing meters at the WRF headworks and at the inlet to the constructed wetland (both of which receive backwash waste) measure could be analyzed to help validate the accuracy of WTP meters which quantify the backwash at its source.

Water Main Flushing

Water main flushing to maintain water quality, particularly in dead-end mains, is a regular practice within the Water Department. It is the second greatest authorized use of water for nonrevenue purposes, but uses less than one percent of the water used in backwashing. Multiple staff conduct flushing for regular preventative maintenance, for disinfection during construction, and in response to water quality complaints (calls regarding high chlorine levels and brown, manganese-stained water are most common). Each flushing event is documented on a form developed for this purpose. However, flow estimates appear to vary by observer, and perhaps through time for each staff person. Use of a diffuser with a pitot tube or flow meter or another gage at the hydrant would remove the variability and error in these flow estimates. Alternatively, staff could benefit from the development of a flow rate chart, using physical data (e.g., pressure zone, elevation, data from previous flow tests) and empirical data (e.g., characteristics of the discharge stream, deflection of the fire hose) to help develop flow estimates.

Other Public Works' Uses

Other divisions of the City's Publics Works Department are authorized to use water from hydrants without a fee. The Wastewater Department uses water for sewer flushing. The Maintenance and Operations (M&O) Department uses water for maintenance of storm sewers, street sweeping, and beautification of parks, planters, and the municipal airport. Lead staff report usage on an annual basis, except Wastewater staff record water usage on an event or work order basis in their asset management program. Recommendations for improvement include meeting with the M&O lead to review procedures for each activity, addressing one M&O staff meeting, and sending out e-mail reminders to lead staff every 6 month.

Fire Department Uses

Authorized, non-revenue uses by the Arlington Fire Department include training, testing of hoses and pumps, fleet maintenance (washing), and occasional heat relief for area children. Current procedure is that the Fire Dept. Training Capt. reports annually using Fire Department records. Reports are made within a spreadsheet containing all prior year estimates and rationale. The Training Captain position has high turnover; and the assumptions made and estimates provided have not been audited, but use of the same spreadsheet each year is intended to maintain consistency in the uses tracked and reported. Recommendations include an evaluation of historic fire data and assumptions in light of the literature. Bi-annual (April, Oct) email reminders for Fire Dept. uses should include tips for standardizing methods and improving the accuracy of estimates, and should be sent through the Chief to the Captains.

Use of hydrants for emergency fire suppression is obviously an authorized use, but has been tracked within the WUE Program under Unauthorized Uses as an apparent loss. This is based on the premise that metering at hydrants or through fire trucks during emergency procedures is unrealistic or technically infeasible. Neither has it been assumed that fire fighters would consciously determine or estimate the flows used in fighting any particular fire. Without hard estimates of flow rates and durations for fire suppression, requested data has been limited to

number of fires where water has been used. Nevertheless, in recent years, the Arlington Fire Department has provided estimates of water used even in firefighting. Recommendations with regard to the water budget include: evaluate historic data and assumptions in light of the literature; evaluate billing data for revenue water charged to the Fire Department; develop a bi-annual (April, Oct) email reminder to Fire Captains through the Chief, including tips for standardizing methods and improving accuracy of water use estimates.

At least one other Fire District (Arlington Heights No. 21) obtains its water from hydrants served by the City. Based on a single conversation with the Assistant Fire Chief, a lump sum estimate of 75,000 gallons has been entered in the water budget. Recommendations include contacting the Fire Chief to request a log book and standardized procedures for typical operations, sending bi-annual email reminders, and querying other area fire departments as well. The City may also consider providing a portable meter for filling from hydrants.

EE.5.4 Unauthorized Water and DSL

Total unauthorized uses are divided into apparent losses and real losses. Apparent losses include emergency fire suppression, theft from hydrants, theft from unauthorized connections, and errors of all types. Real losses include main and hydrant breaks and leaks. Estimates are provided for these classes when known.

Apparent Losses

Theft from hydrants is thought to be limited by the use of 93 hydrant locks in the more remote parts of the WSA. The biggest likely offender is thought to be hydroseeders. Theft from unauthorized connections is also relatively rare. One illicit connection was discovered and corrected at an industrial facility on the airport in 2014. Errors cannot be known until they are discovered. The best way to reduce them is to define and implement, careful, consistent procedures, and to audit those procedures on a regular basis. As an example, it was an audit of billing and tracking procedures in 2004 that consumption from meters measuring in gallons was being combined with consumption from meters measuring cubic feet, and that exports for tracking purposes were being converted, with errors, to hundred cubic feet. As mentioned above, it is perceived that errors in the current billing and reporting procedures explain a significant fraction of unauthorized uses (distribution system losses) experienced from 2012 through 2014. Recommendations include an inter-departmental review of current revenue water procedures as described previously, as well as an intra-departmental audit of all water budget procedures using AWWA's free audit software.

Real Losses

Volumes of real water loss through main breaks and hydrant breaks are typically not estimated, but numbers and locations of breaks are maintained in a log book at the Water Department. SCADA controls and careful production management have prevented any reservoir overflows in the corporate memory of Water Department staff (up to 30 years). Recommendations include implementation of a main break database within the City's asset management system (Cartegraph). A form should be developed and implemented to facilitate collection of appropriate field data using

appropriate procedures. Once in the database, operations staff can evaluate main break information and distribution system management practices relating to main breaks in order to prioritize water mains within future replacement programs.

Any leaks that may be discovered are typically addressed within hours. The City has not executed a pro-active leak detection program in the past 10 years, and has instead focused its annual main replacement program on those segments where breaks had been most frequently occurring. With the completion of the annual program in 2014, all of the Water Department's high priority segments have been replaced (i.e., older AC main in areas with wet [till-based] soils and a history of repeated main breaks). In areas where main has replaced or abandoned in place, the City has conducted "post-mortem" pressure checks to validate its assumptions that, though replaced, the line was still competent to provide service without leaks at water pressures greater than the typical service pressure. To date, these efforts have successfully validated staff opinions that the preventatively replaced mains were indeed not leaking. Recommendations include implementation of this same procedure on remaining AC main and the older DI main in the distribution system to facilitate the development of an updated main replacement program.

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Table EE-1

City of Arlington Potable Water Balance

Water Budget Category	Description	Calendar Year 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Averages of Selected Years as Percent of Category: 2008, 2010, 2011	2012--2014	Averages of Selected Years as Percent of Total Supply: 2008, 2010, 2011	2012--2014
Total Water Supply by Source (1,000 gallons)															
Water Supply (Production and Purchase Sources)	Haller Wellfield (production)[1]	334,604	341,210	337,884	311,015	334,292	307,264	324,928	448,713	477,628	485,625	54.3%	88.5%	54.3%	88.5%
	Airport Wellfield (production)	17,612	7,807	10,404	9,507	12,369	19,069	12,038	13,502	9,587	30,052	1.3%	3.3%	1.3%	3.3%
	PUD (purchase)	153,183	196,910	173,369	187,517	181,396	155,636	128,928	43,554	30,917	58,445	19.8%	8.3%	19.8%	8.3%
	Marysville intertie (purchase)	2,756	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Total Water Supply		508,989	547,087	522,651	509,073	528,057	481,969	465,893	505,769	518,131	574,122	100%	100%	100.0%	100.0%
Water Demand by Revenue Type (1,000 gallons)															
Authorized Revenue Water Demand	Metered, Billed[2]	447,647	477,747	469,602	457,677	428,421	417,996	421,812	396,705	415,446	426,611	100.0%	100.0%	84.3%	77.6%
	Hydrant meters, Billed[3]	721	317	388	327	1,037	423	349	265	369	433	0.0%	0.1%	0.0%	0.1%
	Bulk water, Estimated, Billed[3]	16	20	19	53	42	22	19	40	40	48	0.0%	0.0%	0.0%	0.0%
Total Demand for Revenue Water		447,647	477,747	469,602	457,677	428,421	417,996	421,812	396,705	415,446	426,611	100%	100%	84.3%	77.6%
Water Demand by Non-Revenue Type (1,000 gallons)															
Authorized Non-Revenue Water Demand	Water Treatment Plant Backwash Waste[4,5]	35,571	33,455	27,134	19,504	28,125	28,218	35,873	41,813	45,063	56,809	97.1%	98.2%	4.0%	9.0%
	Inline Water Quality Monitoring[4,5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Distribution System Flushing[4]	721	317	388	327	1,037	423	349	265	369	433	0.5%	0.7%	0.0%	0.1%
	Unmetered Facilities[4,8]	0	0	0	0	0	0	0	0	357	500	0.0%	0.5%	0.0%	0.1%
	Metered, Unbilled Facilities[4,8]	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
	Sanitary Sewer Collection System[4]	16	20	19	53	42	22	19	40	40	48	0.0%	0.1%	0.0%	0.0%
	Stormwater System[6]	0	0	0	18	0	16	8	17	17	25	0.0%	0.0%	0.0%	0.0%
	Street Sweeping[6]	0	0	10	49	44	31	30	16	16	14	0.0%	0.0%	0.0%	0.0%
	Airport Seasonal Watering[6]	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	0.0%	ND	0.0%
	Parks Seasonal Watering[6]	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	0.0%	ND	0.0%
	Fire Training & Hoses Tests[7]	0	0	0	0	139	76	76	76	103	93	0.1%	0.2%	0.0%	0.0%
	Heat Relief[7]	0	0	0	0	90	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
	Fire Suppression[7]	ND	ND	ND	ND	55	76	ND	ND	42	25	0.3%	0.1%	0.0%	0.0%
	Other Fire Depts (Arlington Heights)[4]	ND	ND	ND	ND	ND	ND	ND	ND	75	75	ND	0.1%	ND	0.0%
Total Demand for Non-Revenue Water		36,309	33,792	27,551	19,951	29,532	28,862	36,355	42,227	46,081	58,046	100%	100%	4.0%	9.1%
Total Unauthorized Water Demand by Type (1,000 gallons)															
Unauthorized Water Demand	Apparent Losses: Theft (hydrants, illicit connections	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Apparent Losses: Errors (metering, accounting)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Real Losses: Leaks	ND	ND	ND	ND	ND	ND	ND	ND	ND	30,000	ND	33.5%	ND	5.2%
	Real Losses: Breaks (mains, hydrants)	ND	ND	ND	ND	ND	ND	ND	ND	ND	500	ND	0.6%	ND	0.1%
	Unaccounted-for water	25,034	35,548	25,498	31,445	70,105	35,111	7,726	66,837	56,604	58,965	100%	65.9%	5%	11.5%
Total Unauthorized Water Demand		25,034	35,548	25,498	31,445	70,105	35,111	7,726	66,837	56,604	89,465	100%	100%	5%	13.2%
Distribution System Leakage (DSL)															
Total DSL (1,000 gallons)		25,034	35,548	25,498	31,445	70,105	35,111	7,726	66,837	56,604	89,465				
Total DSL (%)		4.9%	6.5%	4.9%	6.2%	13.3%	7.3%	1.7%	13.2%	10.9%	15.6%				
Rolling 3-Year Average DSL (%)		4.5%	5%	5%	6%	8%	9%	7%	7.4%	8.6%	13.2%				

[1] Total raw water from Haller well field influent to WTP and upstream of filters and backwash processes.

[2] Billed by Finance Dept.

[3] Billed by Water Dept.

[4] Data tracking by Public Works Dept. Utilities Division

[5] Difference between WTP finished and raw water meters. A negligible amount of water used for inline water quality monitoring and sampling is included with backwash.

[6] Data tracking by Maintenance & Operations Dept.

[7] Data tracking by Fire Dept

[8] Includes flushing of WTP clearwell after water quality concern for iron and manganese (2013), and 500,000 gallons for partial draining of reservoirs during cleaning (2014).

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F WATERSHED AND WELLHEAD PROTECTION PROGRAM

F.1 2011 WSP VERSION NOT REVISED FOR THE 2015 WSP UPDATE

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F Wellhead Protection and Watershed Control Program

F.1 INTRODUCTION

All federally defined Group A public water systems that use groundwater as their source are required to develop and implement a wellhead protection program. In addition, purveyors of water systems using groundwater under the direct influence of surface water (GWI) sources are also required to develop and implement a watershed control program. The Washington State Department of Health (DOH) has concluded that the City of Arlington's (City) Haller Wellfield is in hydraulic continuity with the Stillaguamish River (1994 *Comprehensive Water System Plan*); therefore, subject to the watershed control program requirements. The following information is a combined wellhead and watershed protection control plan for the City.

F.1.1 Wellhead Protection and Watershed Control Elements

The DOH administers the Washington State wellhead protection program. The required elements for wellhead protection and watershed control programs are contained in Washington Administrative Code (WAC) 246-290-135 which include:

- Description of the watershed (location, hydrology and land ownership);
- Documentation of source water quality trends;
- Identification of current watershed control measures and monitoring activities;
- Completed susceptibility assessment of each water source;
- Delineation of wellhead protection areas for each water source;
- An inventory of known and potential contaminant sources (this inventory list must be updated every two years);
- Documentation of the purveyor's notification to all owners/operators of known and potential sources of contamination within 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; and
- Documentation of the purveyor's coordination with local emergency spill responders (i.e. police, fire and health departments) regarding wellhead protection area boundaries, source susceptibility and contingency plans.

In addition to the requirements of the wellhead protection program, purveyors of water systems using surface water or GWI sources are required to develop and implement a watershed control program. The City withdraws water from a groundwater wellfield that is in hydraulic continuity with the Stillaguamish River and is therefore subject to the watershed control program requirements. The minimum required elements of a watershed control program for water systems in Washington State are as follows.

- A description of the watershed that includes its location, hydrology and land ownership, and the identification of activities that may have a negative impact on source water quality.
- An inventory of all potential sources of surface water contamination, including the locations of owners/operators located within the watershed that have a significant potential to contaminate the source water quality.
- Watershed control measures that include documentation of ownership and relative written agreements as well as monitoring activities and water quality.
- System operation and emergency provisions.
- Documentation of water quality trends.

F.1.2 Description of the Watershed

The City is located in northwestern Snohomish County, Washington, at the confluence of the north and south forks of the Stillaguamish River. The City is located primarily on glacial outwash terraces above the Stillaguamish River flood plain. The last glacial epoch, ending approximately 13,000 years ago, deposited meltwater and sediment from receding glaciers. Once the glacier receded, the Stillaguamish River eroded the floodplain created by the glacier and produced alluvial terraces in the river valley.

The water service area's geology is typical of recessional outwash terraces and alluvial deposits composed of primarily sand and gravels. The sand and gravels are from 100 to 200 feet deep and provide good drainage throughout those areas. Alluvial formations are primarily located near the Haller Wellfield, due to its immediate proximity to the Stillaguamish River.

Soils in the terrace area are generally classified as Everett gravelly sandy loam, which are very permeable and slightly erosive. The characteristics provide a good soil for development, although shallow excavations are difficult to construct. South and east of the alluvial terrace soils are

primarily Tokul gravelly loam soils. Two to four feet of impermeable hardpan is usually found beneath the glacial till soils, which may result in high water tables during wet seasons.

The topography of the City's water service area varies greatly in elevation. The lowest elevations within the service area are located near Interstate 5 at Island Crossing where the elevation is approximately 40 feet above mean sea level (NAVD 88). A majority of the water service area is on a terrace above the Stillaguamish River's flood plain. Ground elevations range from 40 feet near the crossing of Interstate 5 and State Route 530 to 400 feet near the crossing of State Route 9 and State Route 531. The highest areas served are in the eastern portion of the service area where elevations along Burn Road reach approximately 600 feet. Steep slopes are located along the Stillaguamish River, where elevations drop 80 to 100 feet, and along transitions between the Getchell Plateau and the Marysville Trough, and between the Marysville Trough and the alluvium of the Stillaguamish floodplain.

F.2 DOCUMENTATION OF SOURCE WATER QUALITY TRENDS

The quality of the City's sources has been good and meets or exceeds all drinking water standards, except for slightly higher than allowable levels of manganese at the Airport Wellfield, which was only apparent in 2001. Monitoring of inorganic compounds (IOC) and physical substances was accomplished once per year since 2001. The City received a waiver that only required one complete IOC sample from January 2002 through December 2010. Nitrate monitoring has also been performed once per year since 2001. The results of this monitoring indicate that IOC primary and secondary standards were met. Volatile organic compounds (VOCs) were also monitored and all standards were met. The results of radionuclide monitoring performed in September 2004 indicated that all of the City's sources were in compliance with the regulations. As required by DOH, the City sampled for the chemical ethylene dibromide (EDB), which was once commonly used as a pesticide and gasoline additive, and the chemical dibromo-chloropropane (DBCP) in 1998 and 2001. The results of the EDB and DBCP monitoring indicated that the City is meeting the regulatory requirements. Since then, the City has been granted a state waiver for these synthetic organic chemical (SOC) compounds through 2010. Most recently, the City collected annual arsenic samples from 2001 through 2008 and found that the levels were well below the maximum contaminant levels (MCLs), per the arsenic rule.

In the Fall of 2009, increased fish activity within the Stillaguamish River generated increased organic compounds. This impacted the water supply from the Haller Wellfield, which led to taste issues and numerous customer complaints. While the finished water from the treatment facility met all safe drinking water regulations, the treatment process does not have a granular activated carbon filter or similar process to improve tastes and odors.

F.3 IDENTIFICATION OF CURRENT WATERSHED CONTROL MEASURES AND MONITORING ACTIVITIES

The City's efforts toward protection of its water resources include:

- Restricting access to wellfields;
- Limiting development activity near wellfields;
- Requiring parks and airport maintenance staff to discontinue the use of herbicides/pesticides around wellhead sites;
- Daily monitoring of river water quality, which affects the Haller Wellfield;
- Daily inspection of all source of supply and well sites;
- Daily water quality monitoring of well sources; and
- Being observant of potential harmful activities that can eventually affect the sources of supply.

F.4 SUSCEPTIBILITY ASSESSMENTS

Susceptibility assessments, initial wellhead protection zone mapping and a contaminant source inventory were completed by the City in the mid-1990s. DOH assigned a moderate susceptibility rating to the Airport Well and a high susceptibility rating for the Haller Wells, based on the results of the susceptibility assessment survey for each source.

F.5 DELINEATION OF WELLHEAD PROTECTION AREAS

The City's wellhead protection capture zones were delineated in a memo prepared Pacific Groundwater Group in February 2007, which is included as **Appendix 1**. The wellhead protection capture zone delineations are shown in **Figure 1**.

F.6 INVENTORY OF POTENTIAL CONTAMINANT SOURCES

An essential element of wellhead protection and watershed control program is an inventory of all potential sources of contamination throughout delineated wellhead protection and watershed control areas. The purpose of the inventory is to identify past, present and proposed activities that may pose a threat to the sources of water supply. The watershed control component of the Haller Wellfield requires an inventory of potential surface water contaminant sources located within the Stillaguamish River watershed.

F.6.1 Inventory Approach

An inventory of potential sources of groundwater contamination and a compilation of Stillaguamish River water quality data was conducted in 2010 during preparation of the City's 2010 *Comprehensive Water System Plan*.

Washington State Department of Ecology (DOE) maintains a Facility/Site Database online that lists facilities and sites that could pollute the air or water. These include:

- State cleanup sites;
- Federal superfund sites;
- Hazardous waste generators;
- Solid waste facilities;
- Underground storage tanks;
- Dairies; and
- Enforcement.

The DOE information that was compiled for this report is included in **Appendices 2 and 3**.

Stillaguamish River water quality data was obtained from Section 303(d) lists of the Clean Water Act and is included in **Appendix 4**.

F.6.2 Inventory Findings

The inventory efforts described above revealed multiple potential sources of contamination within all of the wellhead protection zones as shown in **Table F1**. These potential sources include leaking underground storage tanks, airplane fuel storage and hazardous waste sites. A detailed assessment of existing potential sources is needed.

Appendices 2 and 3 include contaminant source inventory data for the six-month, one-year, five-year and 10-year time-of-travel zones, and their associated buffers, for the Haller Wells and the Airport Well, respectively. This inventory data represents primarily database research with very limited field assessment. A more exhaustive field inventory and assessment is needed. Future assessments shall include examination of septic system databases available from the Snohomish County Health District.

F.6.3 Stillaguamish River Contaminants

The Haller Wellfield is located within the Stillaguamish River drainage basin, which is shown in **Figure 2**. The basin consists of approximately 694 square miles of land, ranges from 6,844 feet to sea level in elevation and has over 4,600 miles of streams and creeks. The north and south forks of the Stillaguamish River originate in the Cascade foothills and they come together to form the mainstem Stillaguamish River near the Haller Wellfield. The waters of the Stillaguamish are classified as Class A from its mouth to several miles into the north and south forks, and Class AA up into the headwaters of each of the forks (WAC 173-201A-130).

Table F-1

Potential Contaminants in Time of Travel (TOT) Zones

Potential Contaminant Type	6-Month Buffer	6-Month	1-Year Buffer	1-Year	5-Year Buffer	5-Year	10-Year Buffer	10-Year
Haller Wells								
Hazardous Waste	0	1	0	0	0	3	0	0
Leaking Underground Storage Tanks	0	0	0	1	0	1	0	0
Spills	0	0	0	0	0	1	0	0
Stormwater Discharge[1]	0	1	0	1	0	0	0	1
Underground Storage Tanks	0	0	0	1	0	1	0	0
Private Septic Systems	Unknown							
Haller Wells Totals per TOT Zone	**0**	**2**	**0**	**3**	**0**	**6**	**0**	**1**
Airport Well								
Hazardous Waste	1	0	0	0	0	0	0	0
Leaking Underground Storage Tanks	0	1	0	0	0	0	0	0
Stormwater Discharge[1]	1	0	0	0	0	1	0	0
Toxic Cleanup Site	1	1	0	0	0	0	0	0
Private Septic Systems	Unknown							
Ariport Well Totals per TOT Zone	**3**	**2**	**0**	**0**	**0**	**1**	**0**	**0**

(1) Construction sites that disturb 1 or more acres of land through clearing, grading, excavating or stockpiling of fill material that discharge stormwater to State waters.

The DOE maintains several water quality monitoring stations on the Stillaguamish River, near and upstream of the City. Section 303(d) of the Clean Water Act requires Washington State to maintain a list of surface waters throughout the State that are impaired by pollutants. Contaminants that exceed water quality standards in the Stillaguamish River are fecal coliform, ammonia-N, mercury, lead, copper and arsenic. Other parameters which exceed water quality standards include temperature, dissolved oxygen and pH.

The development of a Total Maximum Daily Load (TMDL) is required for waters placed on the 303(d) list. A TMDL is currently available for the Stillaguamish River for fecal coliform, dissolved oxygen, pH, mercury, oxygen and temperature. Copies of these publications can be found on the DOE website. DOE is also considering the addition of other parameters and other water bodies. Under consideration are water bodies in hydrologic connection with the Airport Wellfield aquifer, including Portage Creek and Quilceda Creek.

F.6.4 Other Potential Sources

Other potential sources of contamination that were not inventoried at this time include:

Agricultural Practices – Agricultural activities within the wellhead protection areas can be a threat to the City's groundwater sources.

Creeks – Creeks located within wellhead protection areas can carry contaminants that may pose a threat to the City's groundwater sources.

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.

Hazardous Spills from Highways, Railways or Airways – The Burlington Northern Railway passes through the six-month, one-year and five-year wellhead protection zones of the Haller Wellfield. State Route 530 passes through the five-year and five-year buffer wellhead protection zones of the Airport Wellfield. State Route 9 passes through the ten-year buffer wellhead protection zone of the Airport Wellfield. Automobile or train accidents within these sections of the highway or railway could result in spills of gasoline or other transported hazardous materials that would threaten the aquifers of the Haller or Airport Wellfields. In addition, chronic long-term inputs of highway related pollutants may impact the wellfields. The Airport Wellfield's aquifer location beneath the Arlington Airport puts it at risk for spills related to airport operations and airplane accidents.

Home Oil Furnace Tanks – Some residents in the City may be using oil furnaces to heat their homes. The fuel for oil furnaces can be stored in above-grade or buried tanks.

Pesticide and Herbicide Use Along Roads – Pesticides and herbicides are often applied along the State highways by the Washington State Department of Transportation.

Private Wells – Improperly abandoned wells may pose a threat to the City's groundwater sources. Wells with insufficient seals can provide a pathway for contaminants to enter the aquifer used by the City's wells.

Septic Systems – Septic systems for wastewater disposal and treatment may be 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.

Stormwater – Stormwater runoff can potentially contaminate the City's groundwater sources. 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. The City's consideration of regional detention and infiltration facilities could potentially impact the aquifers. The City plans to work with the DOE accordingly.

Wastewater Treatment Plant – The City's wastewater treatment plant is located within the six-month wellhead protection zone of the Haller Wellfield. The probability of contamination from effluent released by the treatment plant is reduced because it discharges to the Stillaguamish River downstream of the wellfield. Upland activities at the wastewater treatment plant need to be carefully evaluated and monitored to avoid groundwater contamination.

10.1.1Inventory 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. It is recommended that the timing of the updates be scheduled such that every third update is accomplished at the same time as the re-evaluation of the wellhead protection area boundaries, which is required during each six-year Comprehensive Water System Plan (WSP) update.

F.7 DOCUMENTATION AND NOTIFICATION

The City will be conducting the following.

- Documentation of the purveyor's notification to all owners/operators of known and potential sources of contamination within 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.
- Documentation of the purveyor's coordination with local emergency spill responders (i.e. police, fire and health departments) regarding wellhead protection area boundaries, source susceptibility and contingency plans.

F.8 CONTINGENCY PLAN

An Emergency Response Plan and a vulnerability assessment have been prepared that conform to the requirements of the Bioterrorism Act of 2002. The documents contain a vulnerability assessment of the City's water system facilities, a contingency operation plan for responding to emergency events, a list of water personnel responsible for making decisions in emergency situations and other elements. The Vulnerability Assessment and Emergency Response Plan also contain detailed action plans and other confidential information that is exempt from public disclosure under the provisions of Revised Code of Washington (RCW) 42.56.210.

A summary of the contingency operation plan for the wells in the event of contamination of the water sources is as follows.

F.8.1 Emergency Condition: Aquifer Contamination

Impact on System: Potentially major impact. Water not suitable for potable use causing a major loss of supply. The City currently uses two independent aquifers for supply: Marysville Trough Aquifer (Airport Wellfield); and Stillaguamish Aquifer (Haller Wellfield).

Emergency Response:

1. Shut down the wells that pump water from the aquifer and obtain water quality samples.
2. Notify DOH of the aquifer contamination.
3. Notify all customers of the problem and instruct them to boil all water to be used for consumption and cooking, if boiling is effective for the type of contamination.
4. Close distribution main valves to isolate the area of contamination within the distribution system.
5. Analyze water quality of water within reservoirs and dispose of properly if contaminated.
6. Disinfect reservoirs, treatment plant and water mains, as necessary, to remove contaminated residuals, if disinfection is effective for the contamination type.
7. Adjust control of system facilities, as necessary, to provide supply from storage facilities if water within them is not contaminated.
8. Flush and disinfect the well as needed to remove contaminant from aquifer. Flush to sewer, if approved by wastewater treatment plant.
9. Monitor water quality at affected well field and investigate cause of contamination.
10. Implement water use reduction measures, as necessary, to ensure an adequate supply of water.

The City's plan to pursue long-term alternative sources of supply, including groundwater wells, wholesale interties and emergency interties, will improve the City's ability to maintain uninterrupted water supply during times of source water quality emergencies.

F.9 RECOMMENDATIONS

The City's Wellhead Protection and Watershed Control Program is an ongoing effort that requires staffing and resources to ensure its effectiveness in protecting the source of drinking water that is supplied to the City's customers. As discussed previously in this document, the regulations require that the City perform an inventory of all potential sources of groundwater contamination throughout the delineated wellhead protection areas every two years. At a minimum, the City must re-evaluate the wellhead protection area boundaries during the WSP update process, which occurs every six years.

The following tasks are recommended for ongoing wellhead and watershed protection.

- Perform a more detailed inventory and assessment of potential sources of groundwater contamination within the wellhead protection areas. Especially review leaking

underground storage tanks, fuel/petroleum (large quantity) storage facilities, septic systems and agricultural practices.

- Perform a more detailed inventory of potential sources of surface water contamination within the Stillaguamish River Watershed and monitor the status of the TMDL currently under development for the watershed.
- Confirm location, condition and proper closure of abandoned private wells, especially those within one-year time of travel zones.
- Perform a more accurate delineation of the wellhead protection area boundaries utilizing analytical models, hydrogeologic mapping and computer flow models.
- Distribute the required notifications as a result of updated 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.
- Develop and adopt a wellhead protection ordinance that addresses permitted uses and performance standards for properties located within designated wellhead protection areas. Evaluate restricting land uses in the one-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 Snohomish 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 the City's drinking water source that is vulnerable to surface activities.

APPENDICES

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APPENDIX 1

Pacific Groundwater Group

Wellhead Protection Capture Zone Memo

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APPENDIX 2

DOE Pollution Facilities/Site

Haller Wellfield Wellhead Protection Capture Zone

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APPENDIX 3

DOE Pollution Facilities/Site

Airport Wellfield Wellhead Protection Capture Zone

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APPENDIX 4

Clean Water Act Section 303(d)

Stillaguamish River

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G CROSS CONNECTION CONTROL PROGRAM

G.1 2011 WSP VERSION NOT REVISED FOR THE 2015 WSP UPDATE

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G Cross-Connection Control Program

G.1 INTRODUCTION

A cross-connection control (CCC) program is a proactive and ongoing effort of a water purveyor to protect the health of its customers by preventing contamination of the municipal water supply. This is done by preventing backflow of contaminants or pollutants through cross-connection. A cross-connection is any physical connection, actual or potential, between a water system and any source of non-potable substance. All public water systems in Washington State are required to implement a CCC program. All required elements of a local CCC program must be documented and included in either the Comprehensive Water System Plan (applicable to the City of Arlington) or Small Water System Management Program document (not applicable). The State mandate for CCC programs and the required elements of a CCC program are contained in Washington Administrative Code (WAC) 246-290-490 Cross-Connection Control, which became effective in April of 1999. The minimum required elements in a CCC program are as follows.

- An adopted local ordinance, resolution or code that establishes the purveyor's legal authority, describes operating policies and the corrective actions of a CCC program.
- Develop and implement procedures and schedules for evaluating new and existing service connections to assess hazards.
- Develop and implement procedures and schedules that eliminate or control cross-connections and ensure approved backflow preventers are properly installed.
- Ensure that personnel, including one certified Cross-Connection Control Specialist (CCS), are provided to develop and implement the CCC program.
- Develop and implement procedures to ensure approved backflow preventers are properly inspected and tested.
- Develop and implement a backflow prevention assembly testing quality control assurance program.
- Develop and implement procedures for backflow incident response.
- Include CCC program information in customer education materials.
- Develop and maintain CCC program records.
- Meet any additional CCC requirements if reclaimed water is distributed or received in the water service area.

G.2 PURPOSE AND SCOPE

This document establishes minimum standards for the City of Arlington (City) to protect the public water supply from possible contamination from backflow. This document also describes minimum CCC program operating policies and provides guidelines for installation, testing and maintenance of approved backflow assemblies. In addition, permitting and inspection requirements for existing and new backflow prevention assemblies are described. The document concludes with recommendations the City is advised to address in order to comply with the updated CCC program requirements.

G.3 AUTHORITY

The Federal Safe Drinking Water Act of 1974 and the statutes of the revised code of Washington (RCW) Title 43 require purveyors to protect the public water systems from contamination. In addition, WAC 246-290-490 establishes CCC program requirements for the State. In Washington State, the Department of Health (DOH) and the Department of Community, Trade and Economic Development are the lead agencies for the development and administration of the State's CCC program. The City adopted a CCC ordinance on September 5, 2006; it is located in Chapter 13.32 of the Arlington Municipal Code (AMC). This code establishes the City's authority in implementing a CCC program and prohibits cross-connections.

G.4 RESPONSIBILITY

The City is responsible for protecting its public water supply from contamination due to backflow of pollutants through water service connections. If the City determines that a backflow prevention assembly is necessary at a customer's premises, the City will notify the customer to install an approved backflow assembly. Installation of said backflow assembly shall be a condition of continued water service from the City. Upon installation, the customer shall notify the City and arrange for inspection and testing of said assembly. The customer will be responsible for all applicable testing and inspection fees.

G.5 FAILURE TO COMPLY

Any person, firm, or corporation who violates any of the provisions of this document or AMC Chapter 13.32, may be punished in accordance with the AMC. 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 premises. Discontinuance of the City's potable supply to the premises shall remain in effect until corrective action, as required by the City, is completed, tested and approved.

G.6 CROSS-CONNECTION CONTROL PROGRAM

The City has implemented the required elements of the CCC program as listed above. This document is the City's current CCC program, and discusses program elements that the City needs to continue. The City is committed to protecting the public water supply from contamination by eliminating potential cross-connections. The City's CCC program that follows includes a

statement of its goals and objectives, the evaluation of CCC elements, the program implementation schedule and recommendations.

G.6.1 Cross-Connection Control Program Goals and Objectives

The goals and objectives of the City's CCC Program consist of:

- Preventing contamination of the public water supply by eliminating or properly protecting actual or potential cross-connections;
- Taking inventory of all potential cross-connections; and
- Establishing an inspection and testing program for all backflow prevention assemblies.

The City will achieve these goals and objectives through the implementation of the CCC program that follows.

G.6.2 Evaluation of Cross-Connection Control Program Elements

The City is required to develop and implement a CCC program. All required elements of a local CCC program must be documented and included in the City's Comprehensive Water System Plan. The evaluation of the City's CCC program elements and current level of implementation are presented below.

G.6.3 Cross-Connection Control Ordinance

This CCC program element requires that the purveyor "adopt a local ordinance, resolution, code, bylaw, or other written legal instrument" outlining the purveyor's program. In addition, this document must establish the purveyor's legal authority to implement a CCC program. Operating policies, technical provisions and corrective actions of the CCC program must also be addressed in the legal document. Ordinance 1398 was adopted by the City on September 5, 2006, to establish the City's authority to enforce CCC requirements, thereby creating Chapter 13.32 of the AMC. Under Chapter 13.32, the City has the authority to enforce the CCC requirements specified by WAC 246-290, and to implement a CCC program that relies on premises isolation as defined in WAC 246-290-010. The City is also responsible for the administration of CCC for in-premises protection defined in WAC 246-290-010.

Documents adopted by reference in Chapter 13.32 include the City of Arlington Plumbing Code as adopted by ordinance and administered and enforced by the City building official for the purpose of CCC, the City's current Public Works Construction Standards and Specifications, and the most current edition of the Cross-Connection Control Manual, Accepted Procedure and Practice, as published by Pacific Northwest Section of the American Water Works Association (PNWS-AWWA).

This CCC program meets the requirements of AMC Chapter 13.32 and contains all of the elements required in WAC 246-290-490.

G.6.4 Evaluation of Service Connections

This CCC program element requires that the purveyor develop and implement procedures for evaluating existing and new service connections to assess the degree of hazard of connecting the consumer's premises to the purveyor's public water system. This element also requires that the purveyor notify the consumer within a reasonable time frame of the evaluation results. New connections are required to be evaluated prior to service. Existing connections shall be inspected on a schedule acceptable to DOH.

The City has an established procedure for evaluating new service connections for potential cross-connection. The City reviews all new permit applications for CCC requirements. The CCS determines the appropriate backflow prevention assembly for commercial and industrial water service customers (an Air Gap or reduced pressure backflow assembly (RPBA)) according to the degree of hazard. In addition to new connections, all mobile homes, recreational vehicle parks and wholesale customers will be assessed for the degree of hazard and required to install a backflow assembly. The City keeps inventory of all installed backflow prevention assemblies. The City will inform the owner or contractor that final approval shall not be granted or water service restored until the CCC requirements are met (proper installation, inspection and testing is completed). Periodic inspections are conducted of severe and high-health hazard facilities, and then other facilities with a lesser degree of hazard. The City will coordinate a CCC program with the wholesale administrator.

All premises inside or outside City limits desiring to connect to the City's potable water system must properly disconnect and decommission all auxiliary water sources per Washington State Department of Ecology standards.

The City will inspect and monitor all temporary water connections used for water main construction. This inspection will be for proper disinfections sampling and backflow applications. The City will require the contractors to provide their own assembly, tested by an approved backflow assembly tester (BAT), and will require a copy of the test report. No contractor shall operate any water system valves.

Existing customers are evaluated during the building permit review process for structure alterations or additions and during the business license review process. If a backflow assembly is required as a result of this evaluation, the assembly, owner's name, property address and other pertinent information is recorded in a database that is maintained at the City's Utilities Administration Office. The CCS shall contact the owner or tenant of the facility and schedule an appointment for inspection with the owner or person familiar with the property or building in question within (5) working days. Following inspection, the CCS will write a Cross-Connection Inspection Report (CCIR) indicating the assembly required to meet compliance. The schedule for CCC program compliance for the various levels of hazard is as follows.

- Customers with an immediate high health hazard cross-connection must eliminate them immediately, or the water service will be terminated and shall not be restored until the purveyor water system is protected to the satisfaction of the CCS.
- Customers with a cross-connection that does not pose an immediate high health hazard shall have 15 days to install the required assembly to meet compliance and have the assembly tested. The customer will schedule an inspection by the CCS and provide a copy of the test report.
- Customers with a low health hazard cross-connection shall have 30 days to install the required assembly to meet compliance and have the assembly tested. The customer will schedule an inspection by the CCS and provide a copy of the test report.

All backflow prevention assemblies shall appear on the current University of Southern California (USC) *Manual of Cross-Connection Control* List of Approved Backflow Assemblies and be tested by a certified State of Washington BAT.

The priority for reevaluation of backflow protection assemblies is as follows.

1. Facilities that pose an immediate high health hazard cross-connection have the highest priority.
2. Facilities with severe or high hazard cross-connections.
3. Facilities with high hazard equipment.
4. Annually, when backflow assembly testing is due.
5. When there is a history of backflow incidents.
6. When there is a history of failed backflow test reports.
7. When there is a change in the use of the premise.
8. When a plumbing permit is issued and the premise becomes high hazard.
9. When there is a backflow incident.

Known sites with severe or high hazards will have a routine evaluation annually as time and resources allow.

Table G-1 lists standard acronyms for backflow prevention assemblies. These acronyms will be used in the tables that follow.

Table G-1

Cross Connection Control Acronyms

Abbreviation	Description	Level of Production
AG	Air Gap	1
RPBA	Reduced Pressure Backflow Assembly	2
RPDA	Reduced Pressure Detector Assembly	2
DCVA	Double Check Valve Assembly	3
DCDA	Double Check Detector Assembly	3
PVBA	Pressure Vacuum Breaker Assembly	4
AVB	Atmospheric Vacuum Breaker	5
SVBA	Spill Resistant Vacuum Beaker	5

Table G-2 lists the severe and high-health hazard cross-connection premises that are required to have isolation by an air gap or reduced pressure backflow assembly to prevent contamination of the public water system.

Table G-2

Premises Requiring Mandatory Service Isolation by AG or RPBA

Premises	Premises
Agricultural (farms and dairies)	Mortuaries
Beverage Bottling Plants	Nursing Homes
Car Washes	Petroleum Processing or Storage Plants
Chemical Plants	Piers and Docks
Commercial Laundries and Dry Cleaners	Premises with Potable and Reclaimed Water
Dental Clinics	Survey Access Denied or Restricted
Film Processing Facilities	Wastewater Lift Stations
Premises with Separate Irrigation Systems Using City Water with Chemical Addition	Radioactive Material Processing Plants and Nuclear Reactors
Food Processing Plants	Wastewater Treatment Plants
Hospitals, Medical Centers and Clinics	Unapproved Auxiliary Supply
Laboratories	Veterinary Clinics
Metal Plating Industries	

Table G-3 shows the appropriate backflow protection device for a given degree of hazard, as recommended in WAC 246-290-490.

Table G-3

Appropriate Methods of Backflow Protection

Degree of Health Hazard	Application Condition	Appropriate Approved Backflow Preventer
High	Backsiphonage or backpressure backflow	AG, RPBA or RPDA
Low	Backsiphonage or backpressure backflow	AG, RPBA, RPDA, DCVA or DCDA

Table G-4 lists fixtures, equipment and areas that have the potential to contaminate the public drinking water system, and the minimum protection required by the City to prevent such contamination. Any known used water (such as water used for water cooling and heating equipment) will have installed a backflow assembly commensurate with the degree of hazard at each point of connection, per WAC 246-290-490.

Table G-5 summarizes the number of each type of backflow prevention assembly protecting the distribution system as of June 6, 2011. City staff inspects all air gaps and backflow preventers at the Cascade Valley Hospital on an annual basis. All other backflow prevention assembly devices are inspected on an as-needed basis, such as a change in ownership of a building. The compliance rates for these devices have been 100 percent in recent years.

All trucks and equipment that are constructed with holding tanks for water, and have requested to fill their holding tanks within the City's service area must draw water from a designated water source (fire hydrant). They shall have an approved AG. The CCS shall inspect their truck or equipment for approval. In the event the AG is not present the City will provide an approved backflow assembly.

Table G-4

Fixtures, Equipment and Areas with Backflow Potential

Fixtures, Equipment and Areas	Protection	Fixtures, Equipment Areas	Protection
Air Compressors	DCVA	Janitor Sinks	AVB
Air Conditioning Systems	RPBA	Kitchen Equipment	AVB
Air Washers	RPBA	Laboratory Equipment	RPBA
Aquarium Make-Up Water	AG/RPBA	Laundry Machines, Commercial	RPBA
Aspirators, Medical	AVB	Lavatories	AVB
Aspirators, Vault Drain	RPBA	Livestock Drinking Tanks	DCVA
Aspirators, Weedicide/Herbicide/Pesticide	RPBA	Make-Up Tanks	AG/RPBA
Autoclaves	RPBA	Mobile Carpet Cleaners	RPBA
Autopsy Tables	RPBA	Mop Sinks	AVB
Baptismal Fountain	RPBA,AG/AVB	Outboard Motor Test Tanks	AG/RPBA
Bathtub, Below Rim Filler	Not Allowed	Perchlorethylene Reclaim	AG/RPBA
Bedpan Washers	RPBA	Pesticide Applicator Trucks	AG/RPBA
Beverage Dispensers using CO_2	RPBA	Photo Developing Tanks and Sinks	RPBA
Bidets	AVB/AG-Internal	Photostat Equipment	RPBA
Boat Lifts	RPBA	Pipette Washers	AVB
Boiler Feed Lines	AG/RPBA	Potato Peelers	AVB
Bottle Washing Equipment	RPBA	Poultry Feeders	RPBA
Box Hydrants	DCVA	Private Hydrants	DCVA
Brine Tanks	AG/DCVA	Processing Tanks	AG/RPBA
Can Washing Equipment	RPBA	Pump Seal Water	AG/RPBA
Chemical Feeder Tanks	AG/RPBA	Pumps, Pneumatic Ejector	RPBA
Chilled Water Systems	RPBA	Pump Prime Lines	RPBA/DCVA
Chlorinators	RPBA	Pumps, Water Operated Ejector	RPBA
Coffee Urns	AG/AVB	Radiator Flushing Equipment	RPBA
Computer Cooling Lines	AG/RPBA	Recreational Vehicle Dump Stations	RPBA
Condensate Tanks	AG/RPBA	Serrated Faucets	AVB
Cooking Kettles	AG/AVB	Service Sinks	AVB
Cooling Towers	AG/RPBA	Sewer Connected Equipment	AG
Decorative Ponds	AG/RPBA	Sewer Flushing	AG
Degreasing Equipment	RPBA	Shampoo Basins/Hose Rinse	AVB
Demineralized Water System	RPBA	Showers, Telephone	AVB
Dental Cuspidors	RPBA	Sitz Baths	AVB
Detergent Dispensers (Dishwasher)	AVB	Soap Mixing Tanks	AG/RPBA
Dialysis Equipment	RPBA	Solar Heating Systems	RPBA
Dishwashers	AVB	Solution Tanks	AG/RPBA
Drinking Fountains	AG	Spas	AG/RPBA
Dye Vats and Tanks	AG/RPBA	Specimen Tanks	AG/RPBA
Dynamometers	DCVA	Starch Tanks	AG/RPBA
Emergency Generators	RPBA	Stream-Air Sprays	RPBA
Etching Tanks	AG/RPBA	Steam Cleaners	RPBA
Fermenting Tanks	AG/RPBA	Steam Ejectors	RPBA
Fertilizer Injection Equipment	RPBA	Steam Generating Facilities	RPBA
Film Processors	RPBA	Sterilizers	RPBA
Fire Department Connections w/o chemicals	DCVA/DCDA	Stills	RPBA
Fire Department Connections with chemicals	RPBA/RPDA	Sumps	AG
Fire Sprinkler Systems w/o chemicals	DCVA/DCDA	Swimming Pools	AG/RPBA
Fire Sprinkler Systems with chemicals	RPBA/RPDA	Toilets (Internal)	AG
Floor Drains	AG	Trap Primers	AG
Flushing Floor Drains	AVB	Ultrasonic Baths	AG
Foamite Systems	RPBA/RPDA	Urinals (Internal)	AG
Fountains, Ornamental	AG/RPBA	Used Water Systems	RPBA
Fume Hoods	RPBA	Vats	AG/RPBA
Garbage Can Washers	RPBA	Washing Pools	AG/RPBA
Garbage Disposals	RPBA	Wall Hydrants	AVB

Continued on Next Page

Table G-4 (Continued)

Fixtures, Equipment and Areas with Backflow Potential

Table Continued			
Heat Exchangers	RPBA	Wash Basins	AG/AVB
Heat Pumps	RPBA	Wash-Up Sinks	AG/AVB
High Pressure Washers w/o chemicals	DCVA	Wash Tanks	AG/RPBA
High Pressure Washers with chemicals	RPBA	Wastewater Lines	AG
Hose Bibs	AVB	Water-Air Sprays	DCVA
Hoses, Kitchen Rinse	AVB	Water Closets (Internal)	AG
Hot Tubs	AG/RPBA	Water Cooled Equipment	RPBA
Hot Water Heating Systems	RPBA	Water Ejectors	RPBA
Hot Water Boilers	RPBA	Water Recirculating Systems	DCVA
Humidifier Tanks and Boxes	AG	Water Settling	RPBA
Hydraulically Operated Equipment	RPBA	Water Treatment Tanks	AG/RPBA
Hydrotherapy Baths	RPBA	Water Trucks	DCVA
Ice Makers	RPBA	Wet Vacuum Systems	RPBA
Industrial Fluid Systems	RPBA	Whirlpool Baths	AVB/DCVA
Interties (Looped) Water Systems	DCVA	Windshield Washer Fluid Aspirators	RPBA
Irrigation Systems w/o chemicals	DCVA	X-Ray Processors	RPBA
Irrigation Systems with chemicals	RPBA	Yard Hydrants	RPBA

Table G-5

Summary of Backflow Prevention Assemblies

Type of Device	Quantity
AG	3
RPBA	283
DCVA	306
PVBA	1
SVBA	1
AVB	N/A
DCDA	73

G.6.5 Cross-Connection Control and Elimination

This CCC program element requires that the purveyor eliminate existing cross-connections whenever possible. If elimination is not possible, approved backflow prevention assemblies should be properly installed to reduce the risk of contamination.

The City will endeavor to eliminate potential cross-connections where possible, pursuant to AMC 13.32.080. When cross-connections cannot be eliminated, they are controlled by the installation of an approved backflow assembly commensurate with the degree of hazard, pursuant to AMC 13.32.090. Approved backflow assemblies are to be installed according to WAC 246-290-490 subsection (6).

- The CCS may require the installation of a backflow assembly for a single-family residence based upon issuance of a plumbing permit where a backflow assembly is required (i.e. irrigation or private fire sprinkler system).
- The CCS will review commercial facility construction plans where fire sprinkler systems are required and approve/request an assembly commensurate to the degree of hazard. A fire system without chemical addition will require a DCVA or DCDA. A fire system with chemical addition will require a RPBA or RPDA.
- If a change of facility use or plumbing requires the addition of chemical at an existing commercial or residential facility with a low hazard fire system, a RPBA or RPDA shall be installed within 30 days of a notification letter from the CCS.
- The City will contact the Local Administrative Authority (LAA), Snohomish Health District (SHD), DOH and the City attorney when an immediate health hazard exists on a required fire protection system. The City will install/contract the installation of appropriate backflow assembly at the right of way line to protect the public water system and water users.

Owners shall be responsible for following the provisions of the City's CCC program. Owners are responsible for the elimination or protection of all cross-connections on their premises and will be held responsible for damage caused to City owned appurtenances within the easements on the Owner's premises, including damage caused by steam, hot water, chemical, etc. Failure on the part of any service customer to eliminate or control cross-connections, or refusal of a facility survey inspection, is sufficient cause for the termination of water service to the premises. Water service is not resumed until the appropriate assembly is installed or the cross-connection is removed and the CCS has inspected the premises. The City keeps an inventory of existing backflow assemblies that it currently operates, maintains and inspects and of all assemblies on customers' premises that are the responsibility of the customer to maintain on file at the Utilities Administration Office.

G.6.6 Personnel Certification

WAC 246-290-490 requires that personnel, including one certified CCS, are provided by the purveyor to develop and implement a CCC program. **Table G-6** shows the City's personnel certifications. Mr. Don Smith; Mr. Dallas Speed; Mr. Bill Cochinella; Ms. Carrie Kneeland; Mr. Gus Tararan; Mr. Gary Schlagel; Mr. Brian Fritts; and Mr. Jeff Pitman are all certified as CCSs. The City has the properly certified staff to implement and maintain a CCC program as outlined by the State. The CCS will keep abreast of all new instructions and materials for CCC by attending classes and seminars, and retaining certificates needed for their position. The City will continue to provide properly certified personnel to implement the CCC program.

Table G-6

Water Department Personnel Certification

Name	Position	Certification
Earl Anderson	Lead Water Distribution Specialist	WDS, WTPO-IT, CCS
Bill Cochinella	Water Treatment Plant Operator	WTPO-2, CCS
Brian Fritts	Water Service Specialist	WDS, CCS
Carrie Kneeland	Senior Water Service Specialist	WDM-2, WDS, WTPO-IT, CCS
Jeff Pitman	Senior Water Distribution Specialist	WDM-2, WDS, WTPO-2, CCS
Gary Schlagel	Senior Water Distribution Specialist	WTPO-IT, WDS, CCS
Don Smith	Water Utility Supervisor	WDM-2, WDS, WTPO-3, CCS
Dallas Speed	Senior Water Treatment Plant Operator	WTPO-2, CCS
Gus Tararan	Cross-Connection Specialist	BAT, WDS, WTPO-IT, CCS

Certification Definitions

BAT - Backflow Assembly Tester
CCS - Cross-Connection Control Specialist
IT - In Training
WDM - Water Distribution Manager
WDS - Water Distribution Specialist
WTPO - Water Treatment Plant Operator

G.6.7 Backflow Assembly Inspection and Testing

DOH requires that all backflow assemblies are routinely inspected and tested by certified personnel. Inspections are required at the time of installation, annually thereafter, after a backflow incident, and/or after the assembly is repaired, reinstalled or relocated.

The City is responsible for maintaining those assemblies that are installed on the public water distribution system, not including those assemblies installed after a meter on private premises. The customer will be subject to all applicable testing, maintenance and repair fees. On new installations, the City: 1) provides an on-site evaluation and/or inspection of plans to determine the type of backflow device, if any, that will be required; 2) issues permits; and 3) performs inspection of the existing premises, the City performs evaluations and inspections of plans and/or premises and informs Owners by letter of any corrective action deemed necessary, the method of achieving the correction and the time allowed for the correction to be made. Ordinarily, corrections must be made within 30 days; however, the City may shorten this time period depending on the degree of hazard involved and the history of the device(s) in question. The City then inspects the premises on or after the expiration date of the required action to correct a cross-connection. If found to not be in compliance with the City's request, the owner receives written notice that water service to the premises will be discontinued. If the owner informs the City of extenuating circumstances as to why the correction has not been completed within five working

days of receipt of the notice of termination, the City may grant a time extension up to, but not exceeding, 30 days.

Inspection and testing of devices shall be performed: 1) during the initial installation; 2) during on-site reviews of existing installations; 3) after any repairs or maintenance; 4) after any relocation; and 5) on an annual basis. When an initial installation or annual test indicates that a backflow device is not functioning properly, the Owner shall correct the malfunction within five working days as directed by the City. The Owner shall contact the City after correcting the problem for re-inspecting and testing of the device(s).

The Owner shall be responsible for the payment of all fees for permits, annual or semi-annual device inspection/testing, re-testing if the device fails to operate correctly and any re-inspections for non-compliance with City requirements.

G.6.8 Testing Quality Control Assurance Program

This program element requires development and implementation of a quality control assurance program for the testing of backflow prevention assemblies. Successful implementation of this program element assures that all backflow prevention assemblies are tested in a similar manner and kept in optimal condition.

The City shall ensure that all testing procedures are completed in a consistent manner. Only certified personnel shall be utilized to test backflow assemblies. The City has a process for approving backflow assembly testers and only testers appearing on the City's approved list may be used for testing and repair. To be admitted to the City's list of qualified BATs, personnel must submit their current BAT validation card, current instrument calibration certificate, Washington State business license and insurance certificate.

Testing shall be recorded on the proper forms and maintained at the City's Utilities Administration Office. Examples of testing forms can be found in the AWWA *Recommended Practice for Backflow Prevention and Cross-Connection Control* manual. Personnel shall be trained as outlined by the State, fulfilling all necessary requirements in order to comply with WAC 246-290-490.

Testing procedures accepted by the City conform to DOH testing procedures. Testing personnel shall adhere to the following steps: 1) use only properly operating and calibrated gauge equipment; 2) follow proper field test procedure; 3) consult the manufacturer's repair and maintenance manual when disassembly is required; 4) use only original manufacturer spare parts; and 5) retest the backflow assembly immediately after repair or maintenance.

In addition to the above steps, the following testing procedures shall be performed by a certified test personnel: 1) advise customer of an impending test/inspection so that the customer's staff may participate; 2) notify the fire department when shut down of a fire service is necessary; 3) flush residual dirt through test cocks before attaching test gauges; 4) ensure that the high and low pressure bypass hoses of the test kit are connected to the proper test cocks (open test cocks slowly

when bleeding air through the bypass hoses); 5) test gauges shall be properly calibrated by a certified testing agency; and 6) assemblies should be tested before the warranty expiration date. For further testing details, refer to the AWWA manual.

G.6.9 Incident Response

This CCC program element requires that the purveyor develop a backflow incident response plan. The following paragraph outlines the City's response to a backflow incident. Other emergency response procedures are included in the *City of Arlington Emergency Response Plan*.

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. Shut down the affected mains if possible to contain the contaminants.
2. Notify the City CCS personnel.
3. Notify DOH and SHD of the backflow incident no later than the end of the next business day.
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.

This document and the *City of Arlington Emergency Response Plan* outline procedures to be followed if an emergency arises. When a CCC emergency is called into the Arlington Police Department or other emergency responder during non-business hours, the responder will notify the Public Works Department on-call person. This person assesses the emergency and will notify any Water Department personnel as deemed necessary, depending on the severity of the emergency. Until the Utilities Manager position is filled, all emergencies are reported to Mr. Don Smith, who is responsible for coordinating with Water Department personnel, as well as other emergency responders, if necessary.

The City includes all backflow incidents report(s) in the Annual Summary Report (ASR). The City of Arlington Utilities Division maintains on file all of the water quality complaints (i.e. dirty water, odors, etc.) Also on file for reference is the *Backflow Incident Investigation Procedure* published by PNWS-AWWA.

G.6.10 Public Education

Another CCC program requirement is that educational information of the CCC program be included in existing water system materials that are distributed to customers. Educational materials can be included in pamphlets, brochures, bill inserts, public service announcements and consumer confidence reports.

The City currently makes available a supply of handouts at the Utility Administration Office explaining the intent and responsibility of the CCC program, with contact information for the CCS. With every new water service, a Cross-Connection Survey application is required for submittal to the CCS, who reviews the application and then sends the applicant a requirement for the installation of a backflow assembly or approves the survey as is without further requirements.

G.6.11 Record Keeping

Purveyors must also develop and maintain records of their CCC program, as mandated by DOH. At a minimum, purveyors must maintain the following records:

- A master list of service connections and/or premises where backflow prevention assemblies are protecting the public water system or fixtures;
- Assessed hazard level of each backflow assembly;
- Inventory information on approved AGs, including location, degree of hazard, installation date, inspection history, inspection results and personnel conducting inspections;
- Backflow assembly inventory information, including location, assembly description, installation date, inspection history, test and repair history, test results, and inspecting personnel;
- An AVB and SRVB inventory, including location, description, installation date, inspection history and inspecting personnel; and
- A program summary and backflow incident reports.

The City currently maintains program records, including hazard reports and backflow assembly inspection reports, at the Utilities Administration Office.

G.6.12 Reclaimed Water Requirements

The final CCC program requirement is for systems that distribute or receive reclaimed water within their water service area. For these systems, additional CCC requirements may be imposed by DOH in any permits issued in accordance with Chapter 90.46 RCW.

The City's wastewater treatment plant uses reclaimed water from its effluent for maintenance and operation activities within the wastewater treatment facility, but these facilities are not connected to the City's domestic water system. Otherwise 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, the City will follow all requirements of the permits issued under Chapter 90.46 RCW.

G.7 PROGRAM IMPLEMENTATION AND RECOMMENDATIONS

The City's CCC program is an ongoing effort that requires staffing and resources to ensure its effectiveness in protecting the quality of drinking water in the distribution system. The City should continue its inspection practices of installed approved backflow devices and documenting inspection to comply with regulatory requirements.

The City should continue its hazard evaluation program based on risk to the public drinking water supply. The City should continue its CCC elimination program, following the schedule provided above based on hazard levels.

The City is in the process of developing an interlocal agreement between the City building department and Snohomish County that will track in-premises assemblies and send annual test notices.

The City currently meets the regulatory requirement of having at least one CCS within the Water Department to administer its CCC program. The City is encouraged to continue its active training program in order to comply with these requirements.

Finally, it is recommended that the City update its disseminated public education materials to include information on the City's CCC program. The City currently makes available a supply of handouts at the Utilities Administration Office explaining the intent and the responsibility of the CCC program, with contact information for the CCS. The City could add its educational material regarding the CCC program to existing material that is disseminated to customers, like bill inserts or the consumer confidence report.

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H WATER QUALITY MONITORING PLAN

H.1 REVISED FOR THE 2015 WSP UPDATE

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H Water Quality Monitoring Plan

H.1 INTRODUCTION

This Water Quality Monitoring Plan presents the requirements for monitoring water quality at the sources and in the distribution system in accordance with the drinking water regulations contained in Washington Administrative Code (WAC) 246-290-300. This plan also provides a summary of the existing water system facilities and system operation.

H.2 EXISTING WATER SYSTEM DESCRIPTION

H.2.1 Water System Information

The City of Arlington (City) is a municipal corporation that owns and operates a public water system. Water system data on file at the Washington State Department of Health (DOH) for the City's system is as follows in **Table H-1**.

Table H-1

Water System Ownership Information

Information Type	Description
System Type	Group A - Community - Public Water System
System Name	Arlington Water Department
County	Snohomish
DOH System ID Number	02950K
Owner Number	200
Address	154 West Cox Avenue, Arlington, WA 98223
Contact	Mr. Donald Smith, Utilities Manager
Contact Phone Number	(360) 403-3507

H.2.2 Water System Operation and Control

Overview

Water supply is provided by two wellfields and a wholesale purchase agreement with the Snohomish County PUD No. 1 (PUD), with the primary source of water coming from the City's three wells at the Haller Wellfield.

Haller Wellfield

The Haller Wellfield is located near the Stillaguamish River and supplies water to the water treatment plant where the water is treated via direct filtration methods. Treated water is supplied to the Gleneagle Reservoir, which combine to directly serve the City's 342 Zone. During periods of high demands or emergency conditions such as a fire event, water supply to the 342 Zone is supplemented from upper zones through six pressure reducing valves (PRVs).

Airport Wellfield

The Airport Wellfield Well is controlled by water levels in the Gleneagle Reservoir, and directly supplies the City's 342 Zone. The water treatment plant operator inputs reservoir operating set points into the main control panel to operate the well as needed. Water from the Airport Wellfield is disinfected with sodium hypochlorite prior to entering the City's distribution system.

Snohomish County PUD No. 1 Master Meter

The City has one connection to the PUD water system and has entered into a wholesale water agreement to withdraw a maximum of 1,000 gallons per minute (gpm). The PUD connection and a pressure reducing station on Burn Road at 95th Avenue NE provide a continuous source of supply to the City's customers in the 540 and 710 Zones along the Burn Road Transmission Line.

The 520 Zone is supplied with water purchased from the PUD, through the 186th Street flow control valve (FCV) from the 710 Zone. The 186th Street FCV is currently set as a continuous source of supply to the 520 Zone and the 520 Zone Reservoir. The 520 Zone can also be supplied by the 520 Zone Booster Pump Station, which has two pumps that are not normally in operation.

H.2.3 Pressure Zones

A list of the City's existing pressure zones and their respective maximum hydraulic elevations is presented in **Table H-2**. The table also shows the estimated connections and population in each pressure zone in 2008, based on a review of 2008 water supply data.

Table H-2

Pressure Zones

Name	Maximum Hydraulic Elevation	Water Demand Allocation	Connections in 2014	Population in 2014
342	342 feet	74%	4,027	12,031
520	520 feet	25%	1,380	4,124
540	608 feet	0.1%	3	9
710	710 feet	1%	28	83
Totals			5,438	16,245

H.2.4 Water Sources

A list of the City's existing water sources is presented in **Table H-3**.

Table H-3

Water Sources

Well	Pressure Zone	Year Drilled	Pumping Capacity (gpm)	Well Depth (feet)	Well Diameter (inches)	Pump Type	Pump Motor Size (hp)	Water Treatment[1]	Control Facility
Airport Well	342	1945, 1996	220	166	10	Vertical Turbine	60	NaOCl	Gleneagle Reservoir
Haller No. 1	342	~1963, 2002	570	36	16	Vertical Turbine	25	NaOH, NaOCl	Water Treatment Plant
Haller No. 2	342	1961, 2001	570	38	36	Vertical Turbine	25	NaOH, NaOCl	Water Treatment Plant
Haller No. 3	342	1906 or prior, 2001	570	38	72	(2) Vertical Turbine	(2) 25	NaOH, NaOCl	Water Treatment Plant

(1) NaOH: Sodium hydroxide corrosion control; NaOCl: chlorination.

H.2.5 Water Storage

A list of the City's existing water storage facilities is presented below in **Table H-4**.

Table H-4

Water Storage Facilities

Reservoir	Location	Pressure Zone	Year Constructed	Material	Capacity (MG)	Diameter (feet)	Base Elevation (feet)	Overflow Elevation (feet)	Overflow Height (feet)
Gleneagle	17913 Oxford Drive	342	1975	Concrete	2	100	304.7	342.0	37.3
520 Zone	17003 91st Ave NE	520	1993	Steel	2.0	132	499.0	520.0	21.0

H.2.6 Pump Stations

A summary of the City's existing booster pump station is presented in **Table H-5**.

Table H-5

Booster Pump Station

Pump Station	Suction Pressure Zone	Dischrage Pressure zone	Year Constructed	Existing Pumping Capacity (gpm)	Number of Pumps	Pump Type	Pump Motor Size (hp)
520 Zone Booster Pump Station	342	520	1998	790	4 (3 Operating)	End Suction	(3) 40

H.2.7 Pressure Reducing Stations

The City's water system has a total of seven pressure reducing stations and one FCV. A list of the City's existing pressure reducing stations and FCV is presented below in **Table H-6**.

Table H-6

Pressure Reducing Stations

Name	Location	Pressure Zone (From)	Pressure Zone (To)	Valve Size (inches)	Pressure Setting (psi)	Hydraulic Grade Setting (feet)
Pressure Reducing Valves						
PRV 1 (Highland View)	17700 Highland View Drive	520	342	6 and 2	38	340
PRV 2 (Woodlands Way)	6850 Woodlands Way	520	342	6 and 2	30	333
PRV 3 (Cedarbough Loop)	Cedarbough Loop and Woodbine Drive	520	342	6 and 2	35	340
PRV 4 (Woodbine Drive)	Woodbine Drive and Silverleaf Place	520	342	6 and 2	30	301
Bovee Acres PRV	6900 Bovee Lane	520	342	6 and 2	38	334
Lower Burn Road PRV	Burn Road and 209th Street NE	540	342	8 and 2	35	320
Upper Burn Road PRV	Burn Road and 95th Avenue NE	710	540	8 and 2	45	540
Flow Control Valves						
186th Street FCV	8756 186th Street NE	710	520	6	---	---

H.2.8 Water Treatment

The water treatment plant, originally constructed in 1924 and replaced in 2001, is located within the City's Utilities Compound, and treats water from the Haller Wellfield. Water is pumped from the Haller Wellfield to the direct filtration system, which consists of three filter beds. Primary coagulant and filter aid are added to the combined filter influent, which is also chlorinated prior to filtration. The total capacity of the filtration system is 1,710 gpm. The plant operates with one or two filter beds in the winter and increases to three in the peak of the summer. Filtered water is then chlorinated by a 0.8 percent chlorine solution as it enters a 270,000 gallon clear well which provides adequate contact time for disinfection and provides storage. The chlorine solution is produced by an on-site sodium hypochlorite generation system. As the water exits the clear well, sodium hydroxide is added to adjust the pH level for corrosion control, and the water is disinfected in the distribution system as outlined below. Three pumps are available for pumping the water into the distribution system, although only two can operate simultaneously. The design pumping capacity with one pump operating is 910 gpm and 1,710 gpm with two pumps operating. For unknown reasons, capacity was reduced to 1,650 gpm approximately 7 to 10 years ago. With just

one pump running, capacity has declined to about 800 to 850 gpm. Two additional pumps are available for backwashing the filter beds.

The City's water is disinfected in the distribution system by flow-pacing diluted sodium hypochlorite during operation of the pump at the Airport Wellfield. Bulk 12.5 percent sodium hypochlorite is diluted and then injected into the City's pumped water through metering pump feed systems with a target dose of 0.5 milligrams per liter (mg/L).

H.3 SOURCE WATER QUALITY MONITORING

The City is required to perform water quality monitoring at each of its active sources for inorganic chemicals and physical substances, organic chemicals, unregulated inorganic and organic chemicals, and radionuclides. The monitoring requirements that the City must comply with are specified in WAC 246-290-300. The City must comply with the requirements for both groundwater and groundwater under the influence of surface water. **Table H-7** summarizes the source water quality monitoring requirements for the next several years. Source water quality monitoring for GWI sources also includes monthly fecal coliform numeric counts. The table is based on information available at the time that this document was prepared and may change in the future.

H.3.1 Monitoring Requirements and Procedures

Inorganic Chemical and Physical – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Monitoring for primary and secondary inorganic chemical (IOC) and physical substances, except for nitrate, nitrite, and asbestos, shall be accomplished once every three years. If a maximum contaminant level (MCL) is exceeded, quarterly sampling is required for at least two quarters. The City has an IOC waiver that allows for only one IOC sample for each source between January 2011 and December 2019. The City obtained all required samples for this monitoring period in 2013, and should prepare for sampling again in 2020 or after. However, the City has been taking IOC optional (investigative, non-compliance) samples at each source on an annual basis.

Monitoring for nitrate shall be accomplished once per year. The repeat monitoring frequency shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 percent of the MCL for nitrate or nitrite.

Monitoring for asbestos requires one sample during the nine-year compliance cycle, which started January 1, 2011. Systems not vulnerable to asbestos contamination at the source or in the distribution system (due to systems with less than 10 percent asbestos cement pipe) may apply to the State for a waiver of the monitoring requirements. Since the City's distribution system contains 10.4 percent asbestos cement pipe, asbestos monitoring is required. A sample must be taken at a customer tap served by an asbestos cement pipe where asbestos contamination is most likely to occur. The City has been sampling asbestos on an annual basis, and Health accepted the September

13, 2013 taken from Cobb Avenue for compliance purposes. If the MCL is exceeded, quarterly sampling is required for at least two quarters. The City is scheduled to collect its next asbestos sample in 2020; however, it is likely that the City will qualify for a permanent sampling waiver before then as it's AC main replacement program should have reduced the length of AC pipe in operation to much less than 10 percent by that time.

Volatile Organic Chemicals – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Monitoring for volatile organic chemicals (VOCs) shall be accomplished once every three years for each compliance period (2014—2016, 2017—2019, etc.). If an MCL is exceeded, quarterly sampling is required for at least two quarters. The State may then allow annual monitoring, if the results are satisfactory. After three consecutive annual samples that comply with the MCLs, a waiver for reduced monitoring (once every three-year compliance period) may then be applied for again. The City currently is under a 6-year waiver at the Airport Well Field with the May 14, 2015 sample qualifying for compliance purposes. At the Haller Well Field, the sample with the same date qualified for compliance on a standard 3-year cycle.

Synthetic Organic Chemicals – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Monitoring for synthetic organic chemicals (SOCs) shall be accomplished once every three years for each compliance period (2014—2016, 2017—2019, etc.), if a monitoring waiver is not provided by the State. If an MCL is exceeded, quarterly sampling is required for at least two quarters. The State may then allow annual monitoring, if the results are satisfactory. After three consecutive annual samples that comply with the MCLs, a waiver for reduced monitoring may then be applied for again. The City monitors for herbicides, general pesticides, and insecticides. A State waiver removes the responsibility to monitor for ethylene dibromide (EDB), other soil fumigants, dioxin, endothall, diquat and glyphophate. The City will sample again for herbicides after its 9-year waiver in June 2020.

Unregulated Inorganic Chemicals – Sulfate is the only unregulated inorganic chemical that must be monitored under the current State regulations. A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Initial monitoring had to be completed prior to December 31, 1995. Monitoring, thereafter, is required at least once every five years, unless a waiver is granted by the State. The City monitors for sulfate when monitoring is done for regulated inorganic compounds.

Unregulated Volatile Organic Chemicals – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Initial monitoring had to be started no later than January 1, 1991. Monitoring, thereafter, is required at least once every five years. The City monitors for unregulated VOCs when samples for regulated VOCs are taken.

Table H-7

Monitoring Schedule for 2015 through 2020

When	Monitor	Monitoring Group	Test Method	Upon Violation
		2015		
March	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
May	All Active Sources	Volatile Organic Chemicals	VOC - 524.2	Quarterly for 2 Quarters
May	All Active Sources	Radionuclides	RAD	Quarterly
June	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
July	30 Homes in Arlington	Lead and Copper	LCR	(2) - 6 Month Periods
September	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
December	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
		2016		
March	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM	1 per Plant per Quarter
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
June	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM	1 per Plant per Quarter
September	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM	1 per Plant per Quarter
December	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM	1 per Plant per Quarter
		2017		
February	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
May	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
August	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
November	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
		2018		
February	All Treatment Plants	Stage 2 Disinfection Byproducts	TTHM and HAA5	1 per Plant per Quarter
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
April	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
July	30 Homes in Arlington	Lead and Copper	LCR	(2) - 6 Month Periods
August	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
November	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
		2019		
February	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
May	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
August	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
November	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
		2020		
February	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
April	All Active Sources	Nitrate	NIT	Quarterly for 1 Year
April	All Active Sources	Inorganic Contaminants+SO_4+Mn	IOC	Quarterly for 1 Year
April	All Active Sources	Volatile Organic Chemicals	VOC - 524.2	Quarterly for 2 Quarters
May	One Site in Distribution	Asbestos	ASB	Quarterly for 2 Quarters
May	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
June	All Active Sources	SOCs, herbicides, pesticides	SOC - 515.2, 525.2, 531.1	Quarterly for 2 Quarters
July	All Active Sources	Radionuclides	RAD	Quarterly
July	30 Homes in Arlington	Lead and Copper	LCR	(2) - 6 Month Periods
August	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year
November	Four Sites in Distribution	Stage 2 Disinfection Byproducts	TTHM and HAA5	2 per Site per Quarter for 1 Year

Unregulated Synthetic Organic Chemicals – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Initial monitoring had to be completed prior to December 31, 1995. Monitoring, thereafter, is required at least once every five years, unless a waiver is granted by the State.

Radionuclides – A minimum of one sample shall be taken after treatment at the entry point to the distribution system for each source. Initial monitoring for gross alpha particle radioactivity, radium-226 and radium-228 required four consecutive quarterly samples. Monitoring thereafter requires four consecutive quarterly samples at least once every 48 months. The analysis for radium-226 and radium-228 may be omitted, if the results from the gross alpha particle radioactivity analysis are less than 5 picocuries per liter (pCi/L). In addition, if the results of the initial analysis are less than half of the established MCL, the required monitoring may be reduced to a single sample collected every 48 months. The initial radionuclide samples collected in 1999 resulted in levels much less than the MCL and close to detection limits. The City may now monitor for radionuclides once every six years. The most recent samples were collected May 14, 2015 for the period 2014 through 2019. The next samples will be collected in 2020 or after.

H.4 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, disinfection by-products, lead and copper, and THMs in accordance with WAC 246-290.

H.4.1 Monitoring Requirements and Procedures

Coliform Bacteria Routine Sampling – Specific requirements are contained in WAC 246-290-300. Based on providing water service to 16,245 people in 2014, a minimum of 15 samples per month are required from different locations throughout the system. The City currently takes 15 samples a month to obtain an adequate representation of the pressure zones, reservoirs and distribution system.

Table H-8 lists the locations of the City's routine sampling sites, including the upstream and downstream sampling locations in the event that repeat sampling is necessary. The sample sites are also shown in **Figure 1** and correspond to the assigned numbers in the table.

A total of 15 system samples and one source sample are collected each month in accordance with the schedule shown in **Table H-8**. Some of the sampling sites are the same each month and others alternate every other month allowing for a thorough sampling of all parts of the system. The schedule repeats every other month.

When the actual population served by the City increases beyond 17,200 people, 20 total samples will be required each month. The future sampling locations will include the existing locations shown in **Table H-8**, and five additional sampling sites.

Coliform Bacteria Repeat Sampling – In the event that 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. **Table H-8** shows the repeat sampling locations for the City. 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 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 WAC 246-290-495.

Disinfectant Residual Concentration – The City must comply with disinfectant residual concentration requirements for treated groundwater and groundwater under the influence of surface water. Disinfection requirements applicable to City's Airport Well are contained in WAC 246-290-451, which states that a disinfectant residual concentration shall be detectable in all active parts of the distribution system. Disinfection requirements applicable to the City's Haller Wellfield are contained in WAC 246-290-662 for filtered systems, which states that a minimum 0.2 mg/L disinfectant residual concentration shall be maintained at the point the water enters the system and that the disinfectant residual concentration in the distribution system is detectable in at least 95 percent of the samples taken each calendar month. The City's chlorination target is to maintain a residual disinfectant concentration of at least 0.2 mg/L throughout the distribution system.

Samples collected and submitted for coliform testing shall also be tested for disinfectant residual concentration to ensure the disinfectant residual meets the regulatory requirements and achieves the target levels set by the City.

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). Initial monitoring, beginning July 1992, required 40 samples for each 6-month monitoring period for the City's population. After two consecutive 6-month monitoring periods of meeting the lead and copper action levels, 20 samples taken during June, July, August or September were required once per year. After three consecutive years of monitoring and meeting the lead and copper action levels, 10 samples taken during June, July, August, or September are required every three years. If the lead and copper action levels are exceeded during the first two consecutive 6-month monitoring periods, the system is required to implement corrosion control treatment. Within 36 months of optimal corrosion control installation, systems of the City's size are required to monitor for lead and copper during two consecutive monitoring periods. If the water quality parameters are met during the follow-up monitoring, the system may reduce monitoring to once per year or less frequently as required by the State.

Table H-8

Coliform Monitoring Sampling Locations

Sample Number	Sample Type	Address	Pressure Zone
1	**Routine**	520 Pump Station	520
	Repeat	17916 Oxford Drive	520
	Repeat	17910 Oxford Drive	520
	Repeat	17904 Oxford Drive	520
	Repeat	Inside the 520 Pump Station	520
2	**Routine**	Airport Well	342
	Repeat	Old Prop Stop	342
	Repeat	Airport Office	342
	Repeat	Tap by Hydrant North of Airport Well Site	342
	Repeat	18306 59th Avenue NE	342
3	**Routine**	High Clover Boulevard and 200th Street NE	342
	Repeat	4623 200th Street NE	342
	Repeat	4628 200th Street NE	342
	Repeat	4619 200th Street NE	342
	Repeat	4624 200th Street NE	342
4	**Routine**	Crown Ridge Boulevard and Knoll Drive	520
	Repeat	7923 Crown Ridge Boulevard	520
	Repeat	7915 Crown Ridge Boulevard	520
	Repeat	7907 Crown Ridge Boulevard	520
	Repeat	7831 Crown Ridge Boulevard	520
5	**Routine**	Water Treatment Plant	342
	Repeat	Waste Water Office	342
	Repeat	Waste Water Lab	342
	Repeat	Utilities Office	342
	Repeat	Water Department Office	342
6	**Routine**	S 100 Block French Avenue	342
	Repeat	418 E 1st Street	342
	Repeat	124 S French Avenue	342
	Repeat	118 S French Avenue	342
	Repeat	202 S French Avenue	342
7	**Routine**	520 Reservoir	520
	Repeat	Espresso Stand	520
	Repeat	Shooting Range	520
	Repeat	7818 Condor Drive	520
	Repeat	East Room of Reservoir	520
8	**Routine**	River Crest	342
	Repeat	6115 204th Street NE (Gray's)	342
	Repeat	20326 61st Drive NE (Green)	342
	Repeat	6024 206th Street NE	342
	Repeat	6014 206th Street NE	342

Table H-8

Coliform Monitoring Sampling Locations – Continued

9	**Routine**	51st Avenue Lift Station	342
	Repeat	17600 51st Avenue NE - West Side of Airport	342
	Repeat	17600 51st Avenue NE - West Side of Airport	342
	Repeat	17600 51st Avenue NE - West Side of Airport	342
	Repeat	Hayford's Hanger	342
10	**Routine**	Norwood Condo's	342
	Repeat	307 S Hamlin Drive (Senff)	342
	Repeat	1003 E Union Street (Bennett)	342
	Repeat	301 S Hamlin Drive	342
	Repeat	910 Medical Center Drive (Building G)	342
11	**Routine**	Sweet Water - 20505 66th Drive NE (Lot 31)	342
	Repeat	20506 66th Drive NE (Lot 32)	342
	Repeat	20514 66th Drive NE (Lot 33)	342
	Repeat	20511 66th Drive NE (Lot 28)	342
	Repeat	20517 66th Drive NE (Lot 27)	342
12	**Routine**	Walnut Ridge - 4410 189th Place NE	342
	Repeat	18926 45th Drive NE	342
	Repeat	4404 189th Place NE	342
	Repeat	4410 189th Place NE	342
	Repeat	4416 189th Place NE	342
13	**Routine**	Eagle Heights (Park) - 8321 179th Place NE	520
	Repeat	8326 179th Place NE	520
	Repeat	17910 83rd Drive NE	520
	Repeat	8330 179th Place NE	520
	Repeat	Park	520
14		No Current Sampling	
15		No Current Sampling	
16		No Current Sampling	
17	**Routine**	Falcon Ridge - 19231 107th Avenue NE (Lot 4)	710
	Repeat	19226 107th Avenue NE (Lot 1)	710
	Repeat	19310 107th Avenue NE (Lot 2)	710
	Repeat	19322 107th Avenue NE (Lot 3)	710
	Repeat	19323 107th Avenue NE (Lot 5)	710
18	**Routine**	20820 Smokey Point Boulevard	342
	Repeat	20613 Smokey Point Boulevard	342
	Repeat	19829 Smokey Point Boulevard	342
	Repeat	2313 SR 530	342
	Repeat	20850 Smokey Point Boulevard	342
19	**Routine**	Brickwood - 18119 31st Avenue NE	342
	Repeat	18113 31st Avenue NE	342
	Repeat	18125 31st Avenue NE	342
	Repeat	18129 31st Avenue NE	342
	Repeat	18203 31st Avenue NE	342

The City collected 20 samples for each of the two consecutive 6-month monitoring periods during 1992 and 1993. Approximately 10 samples were also collected during two consecutive 6-month periods in 1997. Ten samples were taken during the winter of 1998 and another set of ten samples was taken in 1999. The results indicated that the 90th percentile concentration of lead from each group of samples exceeded the action level, except for 1999 when the 90th percentile equaled the action level of .015 mg/L. The 90th percentile concentration of copper exceeded the action level in the initial monitoring periods, but did not exceed the action level in recent triennial monitoring. The City changed the corrosion control treatment technique from the addition of blended polyphosphate to pH adjustment with sodium hydroxide in 2000 at the new water treatment plant, which was a more successful procedure. Lead and copper monitoring completed in 2002 and 2003 indicated lead and copper levels were below the action levels at the 90th percentile. Lead and copper monitoring must now be completed at 30 customers' homes within a three-year cycle (2013 – 2015, 2016 – 2018, 2019 – 2021.

Sample sites shall be selected based on the known existence of lead pipes, copper pipes and copper pipes with lead solder in accordance with 40 CFR 141.86(a). All samples, except for lead service line samples, shall be "first draw tap samples" taken at a cold water tap in which water has not been drawn from the tap for at least six hours. Lead service line samples shall be collected in one of three ways in accordance with 40 CFR 141.86(b). The locations of future sample sites shall be the same as past sample sites, unless unavoidable conditions prevent sampling at the same locations.

Fluoride Concentration – Specific requirements are contained in WAC 246-290-460 for systems that are fluoridating drinking water. The City does not currently fluoridate its water. The wholesale water purchased from the PUD is treated with fluoride and it is the responsibility of the PUD to monitor the concentrations. For informational purposes, the City samples for fluoride concentration within the distribution weekly at several sample sites. During the course of a month, all established sample sites are sampled once and a running log of fluoride concentration levels, including average concentration, for each sample site is kept. By tracking fluoride levels, the City is able to provide their customers with information regarding current and/or average fluoride concentration levels near their home. All customers inquiring about fluoride concentration levels are advised to consult with their dental or health professional regarding fluoride supplements. The City also works closely with the dental health professionals at Snohomish County Health District so they can properly advise customers living in the City.

If the City decides to fluoridate the water supply in the future, the concentration of fluoride shall be maintained in the range of 0.7 through 1.3 mg/L. Determinations of fluoride concentrations shall be made daily, and reports of the analyses shall be submitted to DOH within 10 days of the end of the reporting month. Monthly check samples shall be taken downstream of each fluoride injection point, at the first sample tap where adequate mixing has occurred.

Disinfection Byproducts – Specific requirements are contained in WAC 246-290-300. The City is required to monitor for total trihalomethanes (TTHM) and haloacetic acids (HAA5) quarterly at each of four sample locations throughout the distribution system. The City may reduce to one sample per treatment plant per quarter if monitoring results qualify.

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I INTEGRATED WATER RESOURCE MANAGEMENT PROGRAM

I.1 2011 WSP VERSION NOT REVISED FOR THE 2015 WSP UPDATE*

* Note that, since this appendix was not updated in the 2015 WSP, references to TDR Receiving Areas in Section I.2.1 do not reference changes to receiving areas made in the City's 2015 General Comprehensive Plan. The 2015 update identifies West Arlington as a TDR Receiving Area, and discontinues that designation for Brekhus-Beach.

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I Framework for an Integrated Water Resource Management Program

I.1 INTRODUCTION

The City of Arlington is interested in developing a program to integrate the management of the City's multiple water uses within the framework of the natural climate, water resources, and other water uses of the Stillaguamish and Quilceda basins. The Integrated Water Resource Management Program (IWRMP) is intended to develop policies and actions that flexibly manage the City's water resources to cost-effectively improve water availability and reliability while also improving environmental quality. The City actively manages sources of surface water (Haller Well Field) and groundwater (Airport Well Field) for municipal supply; provides sanitary sewer collection, treatment and discharge; and manages stormwater runoff and discharge within City limits. The City also purchases out-of-basin water, originating in the Sultan River, from the City of Everett and Snohomish PUD. The City has an interest in larger regional water resource and land use issues within the Stillaguamish and Quilceda basins that affect the generally availability and quality of water in the watersheds. The IWRMP area includes those lands where beneficial water use is actively managed by the City and where land uses both inside and outside City jurisdiction could affect the quantity and quality of water resources under City control. The IWRMP is intended to provide rationale, objectives, and recommendations for City planning and policy development for land and water resources. The City intends the IWRMP to provide guidance for incorporating IWRMP objectives into City policies.

This summary of the IWRMP includes:

1. Identification of the IWMRP area including service areas and natural features.
2. A summary of quantities and types of water in the natural environment and under active management.
3. A summary of regulatory compliance requirements for all beneficial water use and management, and identifies the current degree of compliance and challenges of meeting new regulations (e.g., water use efficiency, TMDL and ESA)
4. Potential opportunities for innovative and adaptive water management in the IWRMP to efficiently improve water resource use, environmental sustainability, redundancy, and security.

I.2 SUMMARY OF IWRMP AREA

The IWRMP area includes areas of active water use management, including the North Snohomish County Coordinated Water System Plan (CWSP), City water service area, City sanitary sewer service area, City boundary/urban growth area, and special protection areas within the City, including wellhead/watershed protection areas, stormwater comprehensive plan (SCP) planning area, critical areas, and areas identified for the transfer of development rights (TDRs). Portions of some or all of these areas may overlap. The IWRMP also includes those lands where water flows and water quality are of direct concern to the City but not under its jurisdiction; in these regions, the City is one of several land and water management stakeholders. The stakeholder area includes the watershed protection area for the Haller Well Field which extends upstream to include the entire North Fork and South Fork basins of the Stillaguamish River.

Detailed summaries of the management or service areas are presented in the respective comprehensive plans. The following provides an overview of each type of management area.

I.2.1 Land Management Areas

Within the City limits, the City manages land use and urban growth under its Comprehensive Plan. The City also tracks the implementation of Snohomish County Surface Water Division resource management programs, the Stillaguamish Watershed Chinook Salmon Recovery Plan, and participates in its own critical areas planning that matches similar management of critical areas by Snohomish County

Environmentally Critical Areas

The City has established regulations for the protection of Environmentally Critical Areas to provide long-term preservation of natural systems and their functions through prohibitions, mitigation requirements, and minimum standards for the use and development of properties that contain or adjoin environmentally critical areas. The areas include fish and wildlife conservation areas, frequently flooded areas, geologically hazardous areas, surface water bodies, wetlands, and aquifer recharge areas.

The City conducted a hydrogeologic conceptual study in 2007 in preparation for the update of its wellhead and watershed protection plans and to improve the understanding and performance of its groundwater supply. Wellhead protection areas for the Airport well field and the watershed protection area for the Haller well field have been designated to support public awareness of potential risks to groundwater supply and to influence land use policy in the protection areas.

TDR Management Areas

The City has developed a transfer of development rights (TDR) program. The Stillaguamish Valley Transfer of Development Rights (TDR) program is a partnership between the City of Arlington, Snohomish County and landowners of the sending and receiving areas to preserve the

farmed land of the Stillaguamish River Valley, located between Interstate 5 and Highway 9 along the Highway 530 corridor. The following summarizes elements of the City's TDR program.

TDR Sending Area: Located in the Stillaguamish Valley northeast of Arlington. The area is roughly bordered by Interstate 5, Highway 9, the northern City limits of Arlington, and the Stillaguamish River. The valley was historically dominated by dairy farms which have all closed. Those farmers who knew dairying are ready to retire and don't want to re-tool for a new type of agriculture. In order to make it economically equitable for those retired farmers to keep the farms in large acreages the TDR program was developed. A farmer can sell the development rights while retaining ownership of the entire farm along with the rights to continue farming. Currently, farmland is worth more to break in to 10-acres lots to be sold as small "farmettes", than it is to sell a large 100-acre farm as a single unit. There are over 3,000 acres of land in the valley with about 2,500 of those acres that are eligible to participate in the program.

TDR Receiving Areas: The current City regulations require that a developer has to purchase TDR Certificates to develop in the Brekhus/Beach Area, comprised of 337 acres with a significant portion of those areas being protected critical areas. This area was annexed into the City of Arlington in 2007, with the clear notion that it would be a designated receiving area for TDR certificates. That regulation was agreed to between the City, County and a majority of the landowners in the receiving area as a means to be included in the City of Arlington Urban Growth Area. A developer can build up to four homes or two high density dwelling units in exchange for a TDR Certificate. The area also allowed a specified amount of commercial development. The City is trying to plan for and build modern walkable communities and would like to encourage small corner markets for basics such as milk, bread and locally grown products.

The City has also identified the West Arlington area along Smokey Point Blvd. as a prospective receiving area for the development of commercial and high density residential parcels.

Economic Development Planning Areas.

In 2004 the City Council authorized development of a plan that would guide the City on activities related to business attraction and retention. The policy document, completed in 2005, is known as the Economic Development Plan, and it has become an important part of the City's Comprehensive Plan. The Economic Development Plan is comprehensive and long term. The original Plan offers the reader a complete overview of the analysis and public input that went into this blueprint for the City's development.

I.2.2 Water Service Area

The City of Arlington manages potable water supply in the water service control area WSCAs and WHPAs and watershed.

The City CWSP retail water service area extends beyond the City limits and will likely increase with the addition of an area along the current western border of the service area. Five small water systems operating within the City retail water service area, and several individual lots, rely upon wells for supply. The City is currently pursuing additional groundwater sources to meet its projected 50-year demand.

The City of Arlington relies on multiple water sources for potable municipal supply. The primary source (63% in 2007) derives from the Haller well field on the shoreline at the confluence of the North and South Fork of the Stillaguamish River. The Haller well field naturally filters Stillaguamish River water by drawing it through the riverbank into wells at the surface water/groundwater interface. The City derived 2 percent of its supply in 2007 from groundwater aquifer at its Airport well field. These two groundwater sources are replenished by natural runoff and recharge of precipitation. The City imported 35 percent of its supply in 2007 via an intertie with Snohomish PUD, which receives water from the City of Everett's Spada Reservoir near the headwaters of the Sultan River. The City also has a minor source from its interties with the City of Marysville. **Figure I-1** identifies the location of the sources. **Table 1** summarizes the natural flows and withdrawals of water within the retail service area.

I.2.3 Stormwater Management Area

The City is preparing a Stormwater Comprehensive Plan (SCP) that updates the Stormwater Management Plan completed in 1995. The update presents current conditions of the stormwater infrastructure in the city and Urban Growth Area (UGA), revises or adds hydraulic and water quality modeling, identifies issues and challenges facing stormwater utility management (infrastructure, operations, regulations), and presents capital improvement project (CIP) options for stormwater management along with associated cost of each CIP option.

In 1995, the City developed its most recent SCP to address the management of stormwater quantity and quality issues, including local flooding and stormwater pollution problems. Since that time, the city has experienced many changes, including continuing land development, annexations, regulatory updates/additions, and improved inventories of its stormwater infrastructure and natural environment. These changes are extensive, and require that stormwater management within the City of Arlington be updated.

The SCP is not to be confused with the separate Stormwater Management Program (SWMP) required under the NPDES Phase II Municipal Stormwater Permit. The SWMP will serve as an annual work plan to meet permit requirements.

The SCP focuses primarily on stormwater infrastructure and management in those areas currently within the city limits and those located within the Growth Management Act (GMA) urban growth area (UGA) boundary. While not currently within the city limits and the UGA, basins west (downstream), south (downstream), and southeast (upstream) of Arlington are included in the SCP

planning area (Figure I-1). These areas also contribute stormwater runoff to the streams and aquifers

Table I-1

Summary of City of Arlington Water Resources

Water Resource	Annual Flows (typical range)
Natural Flows in Stillaguamish Basin	
Stillaguamish River Flow at Confluence	500 to 5,000 cfs
Portage Creek Flow	5 to 15 cfs
March Creek Flow	2 to 5 cfs
Groundwater recharge to aquifers	~ 1.5 cfs per square mile
Groundwater underflow in Alluvial Well Field Aquifer at Confluence	10 to 100 cfs
Groundwater underflow in Airport Well Field Aquifer into Portage Basin	5 to 15 cfs
Beneficial Withdrawals from Stillaguamish Basin	
Groundwater Withdrawal (GWI) at Haller Well Field	1.3 cfs (2007)
Groundwater Withdrawal at Airport Well Field	0.04 cfs (2007)
(Imported surface water from Snohomish PUD)	0.7 cfs (2007)
(Imported water from Edwards Springs – Cougar Creek)	< 100,000 gpd (2007)
Private well groundwater withdrawals	1-3 cfs; estimated, assuming 500 wells
Managed Discharge into Stillaguamish Basin	
Discharge from WWTP to Stillaguamish River	1.7 cfs (2007)
Loss from Water Distribution	<< 1 cfs
Discharge from domestic septic systems within City limits	< 1 cfs
Stormwater runoff from City into SF Stilly upstream of Confluence	10 cfs; 20 inches of runoff from 5,000 acres
Stormwater runoff from City into Portage Creek and March Creek	<< 1 cfs
Natural Flows in Quilceda Sub-Basin	
Quilceda Creek Flow (Type 1 Stream)	5 to 20 cfs
Edgecomb Creek Flow (Trib of MF Quilceda Cr)	2 to 5 cfs
Groundwater recharge to aquifers	~ 1.5 cfs per sq. mile; annual average (PGG, 2007)
Groundwater underflow in Airport Well Field Aquifer to Quilceda Basin	5 to 15 cfs
Beneficial Withdrawals from Quilceda Sub-Basin	
Groundwater Withdrawal at Airport Well Field	0.04 cfs; average in 2007
Private well groundwater withdrawals	0.2-1 cfs; assuming 100 wells
Managed Discharge into Quilceda Sub-Basin	
Stormwater runoff from City into Quilceda Creek	<< 1 cfs
Stormwater runoff from City into Edgecomb Creek	<< 1 cfs
Loss from Water Distribution	<< 1 cfs
Discharge from domestic septic systems within City limits	< 1 cfs

by which the City benefits, and for which the City is partly responsible. Portions of these drainages are also likely areas for future growth.

I.2.4 Sanitary Sewer Service Area

The City provides sanitary sewer service to an area of approximately 9.1 square miles under its Comprehensive Sewer Plan. Much of the sewer service area boundary follows the City limits,

with the exclusion of the southwest corner of the City (served by the City of Marysville), and the inclusion of areas outside the City but inside the Urban Growth Area located near the rest areas along I-5 and near the intersection of SR 530 and SR 9. Some areas within the City are not connected to sewer, however, and rely upon septic systems for sanitary waste treatment and disposal.

I.3 SUMMARY OF WATER USES

The City, through its direct management of water resources and land use policies, impacts the natural condition of water quantity and quality. The significance of the impact varies according to the location of natural water systems, the rate and timing of natural water flows and the quantities of water that the City withdrawals for beneficial use and discharges after, collection and treatment, and the extent of the land use policies. The IWRMP would consider the significance of the impacts as part of the identification of important objectives. The following summarize the types of natural and managed water systems within the IWMRP area.

I.3.1 Natural Flows

Natural water systems within the IWRMP area include surface water and groundwater which the City influences through withdrawals and discharges into these systems. In general, the natural flows are not measured except at a few gauges on the mainstem Stillaguamish River and its main forks.

Surface Water

Precipitation within the Stillaguamish River and Quilceda Creek watersheds ultimately supply all surface water in the IWMRP. The distribution and patterns of precipitation and runoff affect the locations and patterns of stream flow within each surface water body. Precipitation ranges from approximately 80 inches per year at the headwaters of the Stillaguamish River and 32 inches per year at the confluence of Portage Creek and the Stillaguamish River. Runoff reaches maximum flows in late spring (April May) and lowest flows during fall (September October). **Table 1** summarizes the typical flows of the Stillaguamish River mainstem and its tributaries and of Quilceda Creek.

Groundwater

Precipitation patterns and seasonal patterns also ultimately control all groundwater within the IWMRP. The amount of groundwater is also controlled by proximity to areas of higher recharge and to areas of greater exchange of surface water. The Stillaguamish River aquifer, the large alluvial groundwater system underlying and adjacent to the mainstem and forks, is recharged through some precipitation recharge within the alluvial aquifer but is largely controlled by the exchange of water with the Stillaguamish River. In contrast, the Airport aquifer, a glacial sediment groundwater system, is largely controlled by recharge from the surrounding area and uplands to the east of the airport. Groundwater in the Stillaguamish River discharges in the direction of the Stillaguamish River, whereas, groundwater in the airport aquifer discharges towards Portage

Creek, and partially towards Quilceda Creek. More detailed summaries of groundwater systems are available in the wellhead protection program documents and CWSP.

Table 1 summarizes the estimates of groundwater flow within the two primary groundwater systems for comparison to the surface water flow.

I.3.2 Arlington Beneficial Use of Water and Discharge of Collected and Treated Water

City Water Withdrawals

The City withdraws groundwater from two sources: the Haller well field at the point of hydraulic connection between the Stillaguamish River mainstem and the adjacent alluvial aquifer; and from the "Airport Aquifer" at the Airport well field. The City also receives water from the Snohomish PUD from Spada Lake outside the Stillaguamish basin and from the City of Marysville. The importation of water from these sources increases the natural water balance of the Stillaguamish River basin water resources.

The impacts of the withdrawals from the Haller and Airport wells vary according to the condition of the source at the time of withdrawal and the quantity of withdrawal. Potential impacts include changes in water flow rates, volume of water storage, and/or temperature of the water in the Stillaguamish River, and to a minor degree in the alluvial aquifer adjacent to the river. Much of the municipal water is returned to the environment via WWTP discharge, but a percentage is lost from the natural water balance. Municipal water loss results primarily from evaporation of landscape irrigation. Any unaccounted leakage from water and sewer line returns to the alluvial and/or Airport aquifers and is not actually lost from the total water balance.

Future impacts of water withdrawals at current points of withdrawal are expected to increase with projected population growth. New impacts could arise when the City brings new sources of supply on line from new points of withdrawal obtained from transferred or new water rights. The City is currently considering acquiring new water rights from individuals and corporations and would transfer their points of withdrawal to the Haller and Airport well fields. Although no current plans exist, in the future the City may incorporate and connect individual and small water systems that currently use local groundwater wells for supply. These connections could result in greater groundwater storage in aquifers and potentially increase groundwater flow and seepage to surface water. Increasing importation of water from Spada Lake would increase the overall water balance.

City Water Discharges

The City manages stormwater runoff within the City stormwater utility service area and manages municipal wastewater from the treatment plant (WWTP) 400 feet downstream of the Haller wells. Discharge of these waters increases surface water flow, and potentially reduces water quality at the points of discharge, depending on the location and condition of the receptor at the time of discharge. The City is upgrading its WWTP to comply with discharge limits, support TMDL

implementation, reduce energy costs, and generate a source of non-potable reuse water. Smaller quantities of discharge within City limits include the discharge from septic systems in non-sewered areas, and discharge to surface water from non-point stormwater runoff from residential and agricultural lands not served by the stormwater utility.

Future impacts of water discharges are expected to increase with population growth. The City is constructing the WWTP to handle up to 2.7 MGD of capacity, which is projected to meet 2025 flows. The City may connect unsewered areas to the sewer distribution system, which would reduce the quantity of groundwater recharge in these areas and potentially impact shallow groundwater storage and discharge to surface water.

Indirect Uses or Impacts of Water within IWMRP

The City relies upon water resources that are replenished in areas outside the City's control. Objectives of the IWRMP could include participation in regional land use and water resource policies to achieve the reliability and sustainability objectives of the IWRMP. Potential water discharges or uses that the City may address in subsequent phases of the IWRMP development include:

- Discharges from POTW, septic, NPDES and non-point stormwater discharges into the Stillaguamish River basin upstream of Haller and the Portage basin up-gradient of the Airport well field.
- Discharge from septic systems or stormwater within City limits
- Consumptive groundwater withdrawals from exempt wells and small water systems up-gradient of the Haller and Airport well fields

The City intends to periodically update the watershed and wellhead protection plans to protect sources of supply in areas that are outside City limits.

I.3.3 Conceptual Water Balance

A schematic water balance conceptualizes the relationships between natural and City-managed water resources by schematically connecting the water resources and their direction of flow (**Chart I-1**). The diagram illustrates the complexity of water distribution and exchanges within the City management areas. Further development of the water balance during implementation of City water resource management will guide the City's prioritization of integrated water management strategies.

Figure I-1
Potable water sources in the planning area

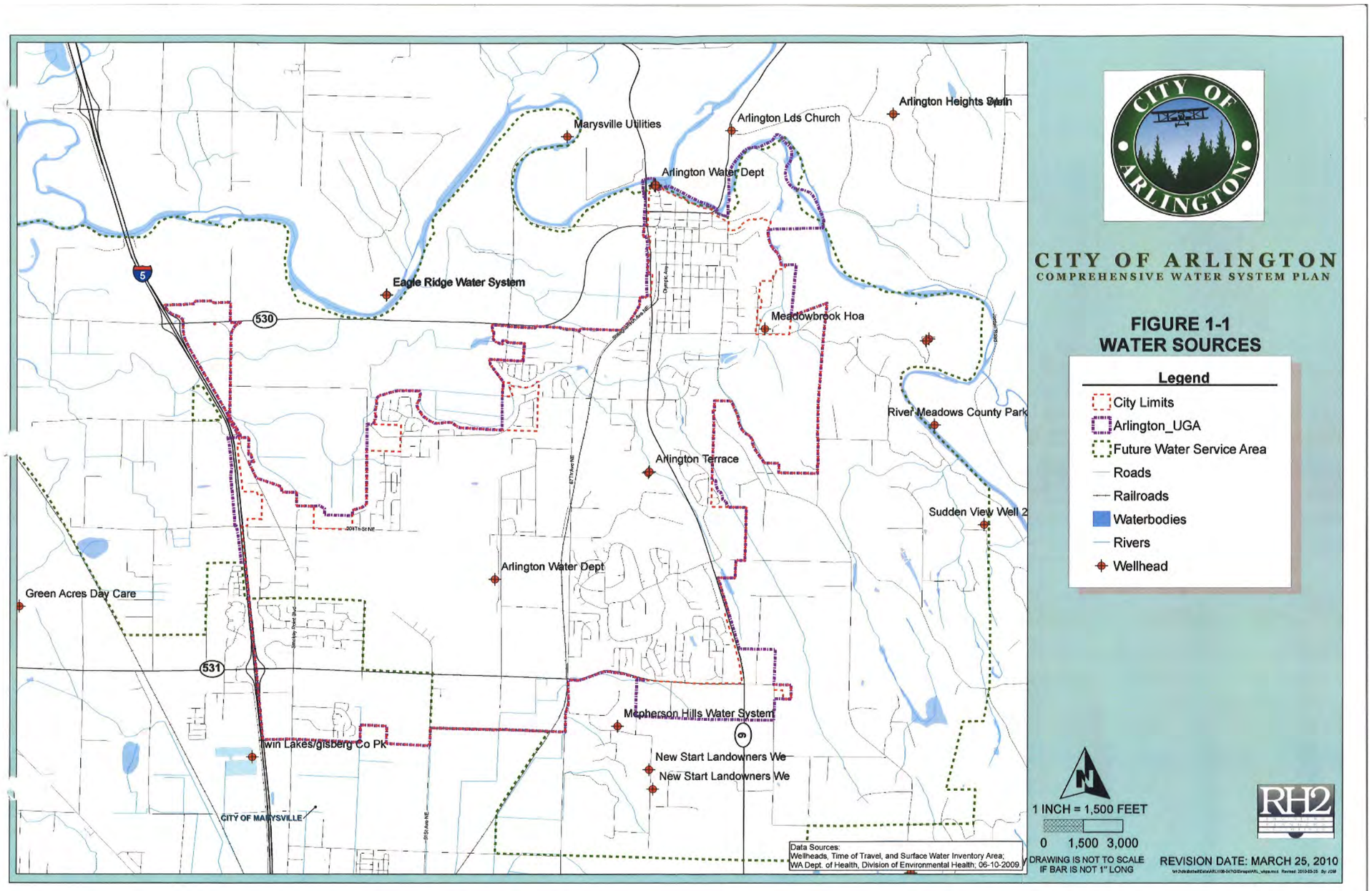
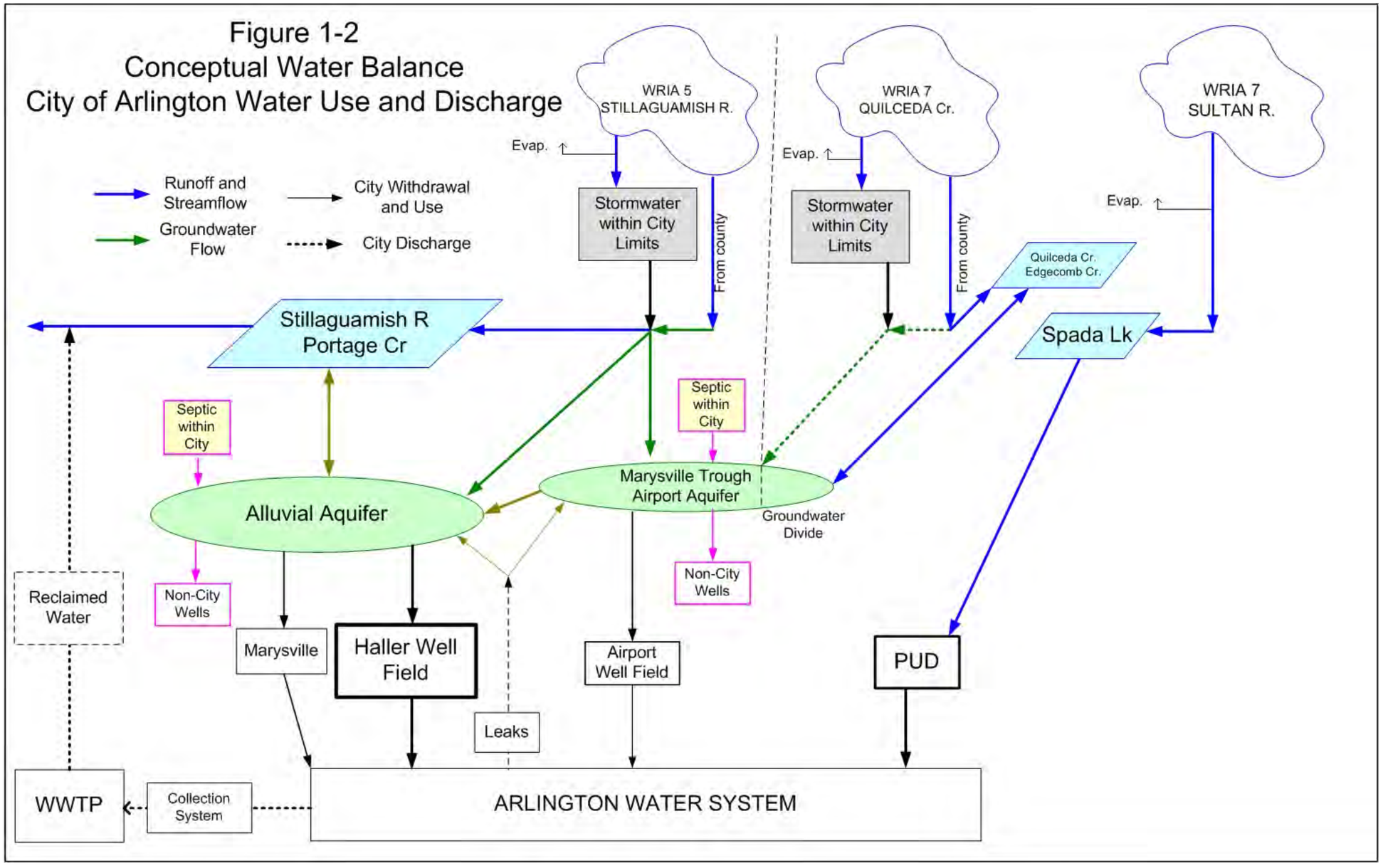


Chart I-1

Natural and City-managed water resources in a conceptual water balance



I.4 SUMMARY OF COMPLIANCE REQUIREMENTS

I.4.1 Beneficial Water Use

The initial phase of developing the IWRMP includes documenting regulatory compliance requirements for all water withdrawals, uses and releases. The City use and discharge of water resources is regulated primarily by City and State authority. **Table 2** summarizes the regulations affecting the City's water resource use and discharge into a water resource, and summarizes current and potential challenges of compliance with current regulations.

Water withdrawals for municipal use are regulated by the City's water rights (Washington Department of Ecology; Chapters 90.03 and 90.44 RCW), and Group A water system permit (Washington Department of Health; Chapter 246-290 WAC). The City's certificated and inchoate (not yet perfected) rights have priorities that are senior to the 2005 Stillaguamish Instream Flow Rule (WAC 173-505) which restricts junior right holder withdrawal of water that is in hydraulic continuity with the river and with its tributaries, including Portage Creek. Therefore, changes to existing water rights and new rights that could affect stream flow would be junior to the Stillaguamish Instream Flow Rule and would be subject to curtailment during low stream flow unless impacts are mitigated. Resolving the status of the City's PSPL water right will result in additional inchoate water that would be derived from the Haller source.

Water supply from the Haller wells is under the influence of surface water; water treatment is regulated by DOH under WAC 246-290. The Airport well supply is untreated.

The Municipal Water Law that governs designation and current and future use of water for municipal supply is under legal challenge at the Washington State Supreme Court. Pending the resolution of the challenge, DOE and DOH have implemented interim policies to regulate changes to existing and establishment of new municipal rights. Once the Supreme Court has issued its decision, the decision will need to be carefully evaluated to determine how and to what degree it affects the City's water rights.

I.4.2 Water Discharges

Treated wastewater discharge is regulated by the City's NPDES permit for the WWTP. In 1998, the City upgraded its WWTP to a sequencing batch reactor (SBR) treatment facility. Sudden growth in the City subsequent to the 1998 expansion caused the wastewater treatment plant to be near capacity by 2004. This required the City to enhance the existing treatment process and begin planning for an expansion to the treatment plant to meet projected flows (from 1.1 MGD in 2007 to 2.7 MGD in 2025). As part of the State's clean-up efforts for the Stillaguamish River under the TMDL implementation plan, increasingly stringent discharge limits were placed on the treatment plant's discharge, requiring an increase in treatment technology to produce cleaner effluent. The City has completed a draft comprehensive sewer plan in 2008. The City plans to treat all sewer influent at the WWTP and is considering adaptive management alternatives to reuse the water including a constructed wetland next to the Stillaguamish River or other beneficial uses. Reuse of

Table I-2

Summary of water use and discharge regulations in the City of Arlington

Water Resource	Regulatory Agency	Application to City	Current performance	Compliance Challenges
Withdrawals for Municipal Use under Group A Permit				
Groundwater from Stillaguamish River /Alluvial Aquifer at Haller Wells	Dept. of Ecology RCW 90.03 RCW 90.44	Provisions define quantity, location, type, and timing of use	• Current withdrawals comply with water right provisions.	• *Pursuing additional water rights to meet future demand.*
Groundwater from Airport Aquifer at Airport Well – Portage Basin				• *Resolution of Municipal Water Lawmay affect designation of inchoate rights.*
Groundwater from Airport Aquifer at Airport Well – Quilceda Basin				• *Stillaguamish Instream FlowRule constrains water right changes and*
Groundwater from Stillaguamish River /Alluvial Aquifer at Haller wells	Dept of Health WAC 246-290	Wellhead and Watershed Protection Plans	• Protection plans are in effect.	• *The City is updating the wellhead protection plan.*
Groundwater from Airport Aquifer at Airport Well – Portage Basin		Water Use Efficiency Rule	• Current Distribution System Leakage is 5%	• *The City has an active leak reduction program.*
Groundwater from Airport Aquifer at Airport Well – Quilceda Basin		Water treatment rules	• Water treatment is in compliance.	• *Reclaimed water use from WWTP would be regulated by Reclaimed Water Rule in development*
Groundwater from Stillaguamish River /Alluvial Aquifer at Haller wells	Dept of Ecology /EPA Clean Water Act (303d)	TMDL listing - reduced flow in river	• TMDL for Temperature • TMDL for fecal coliform, DO, pH, Hg, As	• *Cleanup plan in place; IWMRP should reduce or flatten overall water*
Discharges to Water Resources				
Discharge from WWTP to Stillaguamish River; Leaks from sewer distribution system	Dept of Ecology /EPA Clean Water Act (303d)	NPDES Permit to discharge treated wastewater	• TMDL for fecal coliform, DO, pH, Hg, As • Sewer Utility complies with NPDES permit.	• *Cleanup Plan promulgated and under implementation; TMDL implementation plan is supported by WWTP upgrade, and performance of Phase II Stormwater Permit*
Stormwater runoff within City limits discharging to Stillaguamish R	Dept of Ecology /EPA Clean Water Act	NPDES Phase II stormwater discharge Permit	• TMDL for fecal coliform, DO, pH, Hg, As	
	Arlington Municipal Code	Other City land use agencies that affect stormwater discharge.	• 303d list for Fecal Coliform	
Stormwater runoff within City limits discharging to Portage Creek	Dept of Ecology /EPA Clean Water Act	Non point and permitted (NPDES) discharge from City	• TMDL for fecal coliform, DO, pH, Hg, As	
	Arlington Municipal Code	City land use policies and stormwater utility that regulate stormwater runoff		
Stormwater runoff within City limits discharging to Quilceda Creek	Dept of Ecology /EPA Clean Water Act	Non point and permitted (NPDES) discharge from City	• 303d list for turbidity	• *A bacterial pollution control plan (BPCP) and program is a permit condition for the Snohomish TMDL and is anticipated under the*
	Arlington Municipal Code	City land use policies and stormwater utility that regulate stormwater runoff	• TMDL for Fecal Coliform and DO	
Discharge from septic systems within City limits	Arlington Municipal Code	Septic system regulations, building code	• Active permitting and enforcement in place through Snohomish Health District, although minor leaks and failing systems likely occur.	• *SCP planning did not attempt to analyze the potential for septic systems in the vicinity of Arlington to contribute to fecal coliform loads in area streams. The Stillaguamish TMDL identifies an assessment of septic systems in Arlington and their soil characteristics and proximity to streams in order to prioritize septic systems for performance evaluations.*

the effluent would be regulated under the reclaimed water regulation which is under development by DOE.

The City is responsible for managing all aspects of stormwater within its jurisdiction. The City operates and maintains drainage facilities that are located within the public right of way or public easements. The current stormwater permit was issued by Ecology on January 17th, 2007. The City is developing its Stormwater Management Program (SWMP) 2009 work plan as part of requirements under the NPDES Phase II Stormwater Permit which include addressing goals of the Stillaguamish and Quilceda TMDL implementation plan. Future development of the stormwater management program would incorporate the objectives of the IWRMP.

Only the Snohomish River Tributaries TMDL for fecal coliform has current regulatory requirements defined for the City. The City's obligations under the Stillaguamish TMDLs for fecal coliform, dissolved oxygen, temperature, and other parameters will not be required as permit conditions until the NPDES permit renews in 2012. Nevertheless, the City intends to meet its responsibilities in the Stillaguamish basin during the current cycle as the TMDL is complete and the City's tasks are clearly defined.

In and near the City of Arlington, a number of stream and river segments are identified as impaired, and three water clean-up plans are in place for a number of priority pollutants, particularly fecal coliform, dissolved oxygen, and temperature. In all TMDLs, the City is identified as a contributor to these impairments, either through point discharges from its wastewater treatment plant, or point and nonpoint discharges of stormwater, or both. The City has water clean-up and monitoring responsibilities under TMDLs prepared by Ecology (with assistance from the City), which are intended to restore water quality. The NPDES Phase II permit is the regulatory authority for implementing TMDL requirements.

The following TMDLs for water bodies within the City of Arlington have been promulgated:

- Lower Snohomish Tributaries Fecal Coliform Bacteria TMDL: this TMDL applies in part to the Quilceda Creek basin, the upper portion of which lies within the City, including Edgecomb Creek, a Quilceda Creek tributary.
- Stillaguamish River Temperature TMDL
- Stillaguamish River Multi-Parameter TMDL: this TMDL addresses fecal coliform bacteria, dissolved oxygen, pH, arsenic and mercury in the Stillaguamish River and some of its tributaries including Portage Creek and March Creek.

I.4.3 Indirect Regulation of Water Resources that Affect Arlington

Regional land use and watershed regulations or policies may also affect the City's use of water resources. This includes implementation of the Snohomish County Surface Water Division resource management programs, the Stillaguamish Watershed Chinook Salmon Recovery Plan,

Snohomish County planning and critical areas ordinances, the Stillaguamish and (Lower) Snohomish Tributaries TMDL implementation plans, and Washington State and Federal environmental policies that regulate fisheries and habitat including the Chinook Salmon Recovery Plan. Again, the IWRMP may include participation in developing regional land and watershed resource policies to achieve the reliability and sustainability objectives of the IWRMP.

I.5 POTENTIAL OPPORTUNITIES FOR ADAPTIVE MANAGEMENT OF WATER RESOURCES

The City intends the IWRMP to guide the sustainable use of water resources and increase reliability and security while reducing costs and environmental impacts. The following summarizes potential objectives for consideration as the IWRMP is developed and identifies preferred or more feasible options.

I.5.1 Potable Supply

Increase availability and sustainability of water quantity

- Protect watershed runoff to maintain natural flows that supply current and future sources
- Protect critical aquifer recharge areas and identify areas to enhance natural recharge that supplies current and future sources
- Protect legal access to current and inchoate sources of water to meet forecasted demand
- Implement long-term monitoring program to document trends in:
    - Water balance and performance of IWRMP , particularly relationship between precipitation and runoff, and surface water-groundwater interactions Demand from growth – update growth trends to modify demand-based actions
    - Climate change - update water flow data and compare to forecasted short-term and long-term climate trends
    - Environmental effects - - update water flow and quality data and compare to development impacts and management (e.g., LID, density, stormwater systems)
- Identify opportunities to reduce demand and improve beneficial water use efficiency
    - Discharge reclaimed water (see wastewater) to replace other potable water uses (e.g., park irrigation, industrial use)
- Identify opportunities to improve supply-side conservation
    - Production and Distribution costs – identify opportunities to reduce energy, improve efficiency, and effectively maintain infrastructure
    - Treatment costs – identify opportunities to reduce reliance on poor quality water

Improve source water quality protection and reduce vulnerability

- Implement (and update when warranted) wellhead and watershed protection objectives.
- Develop UIC program to increase groundwater protection
- Develop septic system maintenance program and/or schedule for sewering priority parcels

Increase reliability of water infrastructure

- Maintain contingencies (and improve where needed) for source security, flexibility, and redundancy for natural events (drought, global climate change, seasonal water quality changes) and artificial events (spills, power loss, accident) – focus on wellhead and watershed protection areas
- Identify storage improvements to mitigate peak demands
- Identify ASR opportunities to store surplus stormwater for summer withdrawal and use
- Identify ASR opportunities to store reclaimed water for summer withdrawal and use
- Implement well inspection and maintenance program to improve system reliability
    - Identify useful lifetime of points of withdrawal, and anticipate replacement well or potential well field requirements
- Implement seasonal or variable water source management (e.g., decision criteria for reduction of source impacts) addresses. Adjust withdrawals to:
    - Improve instream flows
    - Minimize drought impacts
    - Minimize water quality risks and concerns
    - Minimize source (well and distribution) operation and maintenance
- New vs. expanding sources
- Interties - Maintain working relationship with the Snohomish PUD to sustain imported water sources
- Identify and secure future sources of water to meet forecasted demand
    - Exempt or small systems that may be cost-effectively retired or absorbed into system
    - Water right transfers in both Stillaguamish River and Quilceda basins
    - Develop and expand airport wellfield
    - Use of other city irrigation water rights (three-Hammer, Cemetery, Airport)

Improve water use efficiency

- Reuse or recharge of water reclaimed from wastewater to offset potable use or potable impact
- Reuse or recharge of treated stormwater to improve water availability and minimize withdrawal impact – e.g., "purple pipe" distribution to non-potable uses (identify potential recipients); groundwater recharge; stream enhancement; small package/scalping plants
- Implement conservation-based rate structures and other conservative BMPs

I.5.2 Improve environmental conditions in IWRMP Area

- Flow enhancement along depleted streams – e.g., stream flow augmentation using reclaimed water
- Habitat enhancement in exchange for beneficial water uses; includes identification of potential receptors
- Construct wetland to support wastewater/stormwater return
- Quality enhancement - improve WWTP and stormwater treatment

Surface water management opportunities

- Implement TMDLs for streams adjacent to city
- Attain wasteload allocations for wastewater and (generally) stormwater discharges
- Manage Monitor and manage surface water quality in Stillaguamish River, which affects drinking water quality and/or treatment costs
- Cooperate with or influence upstream land uses in Stillaguamish basin, which affects surface water quality
- Comply with stormwater management goals under NPDES II to protect surface water quality affects drinking water and wastewater treatment requirements and costs, and vice versa
- Develop watershed control program to protect water quantity and quality in upper Stillaguamish River basin

Wastewater management opportunities

- Convert WWTP to WRF (reclamation facility) to produce water of reclaimed quality
- Discharge reclaimed water to river to maintain flows
- Discharge reclaimed water to constructed storm wetland for temperature reduction and nutrient (DO) polishing

- Discharge reclaimed water to ground/infiltration for groundwater recharge and instream mitigation
- Pretreatment program to reduce toxics in waste stream and receiving waters
- Pharmaceuticals take-back and education program to reduce EDCs in waste stream and receiving waters

Stormwater management opportunities

- Identify potential discharges that may significantly affect surface water quality and identify corrective measures; focus on stormwater wetland near river
- Correct untreated outfalls to surface waters to improve surface water quality with focus on 303d parameters and TMDL commitments
- Implement UIC program to address infiltration system effects on groundwater and aquifer quality

I.6 GEOGRAPHIC INFORMATION SYSTEM FOR INTEGRATED WATER RESOURCE MANAGEMENT

The City has compiled water, land, and land use information in GIS format illustrating the distribution of natural and infrastructure systems in its management areas as specific map layers with descriptive attributes for each specific layer type. The City regularly updates the GIS database as new data and priorities develop. The current GIS database contains layers as summarized in **Table 3**. Maps to support the development of an IWRMP may be prepared from the GIS database to illustrate areas where resource management activities coincide and may readily benefit from joint management of a water resource. For example, areas where stormwater conveyance traverse areas of high soil permeability could be considered for groundwater recharge. Managing the GIS database to readily allow interactive comparisons of natural and infrastructure layers could promote the development of new opportunities for integrated water resource management and to facilitate the prioritization of opportunities based on potential benefits and challenges to implementation.

Table I-3

Summary of City of Arlington GIS Mapping Data

GIS Layer	Attributes for Each Layer
Managed Areas	
City Boundary	Limits, area
UGA	Limits, area
Land Use	Limits, type, area
Parcels	Limits, type, area
Zoning	Limits, type, area
PLSS	Township, Range, Section
TDR	Limits, area
Natural Systems	
Topography	10-foot contours
LIDAR	Sub-meter contours (from PS Lidar)
Soils	Limits, class (from NRCS)
Geology	Limits, class (from WADNR)
Wetlands	Limits, class
Fish and Wildlife Conservation Areas	Limits, class
Geo Hazards	Limits, conditions (from Sno. Co.)
Average Annual Precipitation	Area, Rate
Surface Water	
Surface Water Bodies	Mean, min, max flow
WRIA Boundaries	Limits, designation
Surface water points of withdrawal	Quantities, rights
TMDL listed waters	Component, criteria
303d listed waters	Component, criteria
Watershed protection areas	Limits, class
Shorelines	Limits, class, restrictions
FEMA floodplains	Limits, class, restrictions
ESA listed waters	Reach, species,
Groundwater	
Wellhead Protection Areas	Time-of-Travel limits
Water Rights points of withdrawal	Location, quantities, conditions
Aquifers	Limits, characteristics
Critical Aquifer Recharge Areas	Limits, conditions
Exempt wells	Depth

Table I-3, continued

Summary of City of Arlington GIS Mapping Data

GIS Layer	Attributes for Each Layer
Potable Water	
Conveyance	Diameter, composition
Storage	Volume
Points of Withdrawal	Type, water right
Treatment	Capacity, system
Wastewater	
Conveyance	Diameter, composition
Storage	Volume
Points of Discharge - NPDES	Type, conditions, permit
Treatment	Capacity, system
Stormwater	
Surface Conveyance - Water pipes and pumps, wastewater pipes and pumps, drain points, channels	Diameter, volume, composition, capacity
Surface Storage – Detention centroids, lines, ponds; drain points, channels, basins	Diameter, volume, composition, capacity
Sub-Surface Conveyance – catch basins, stormpipes	Diameter, volume, composition, capacity

I.7 PRIORITIZATION OF POTENTIAL ACTIVITIES FOR ADAPTIVE MANAGEMENT OF WATER RESOURCES

As the City considers opportunities to adaptively manage water resources under its jurisdiction, the City will identify and prioritize possible actions that would improve one or more conditions of a water resource or an environmental quality that directly or indirectly benefits water resources. Actions include developing new sources of supply or adaptively managing existing resources to meet a water resource management objective. Potential evaluation criteria that consider the objectives described in Section 4 include, but are not necessarily limited to, increasing water quantity; improving water quality and environmental sustainability; reducing operational costs; and increasing water supply redundancy and security. This section evaluates potential new sources against these criteria and provides planning level costs for developing or implementing the potential new source.

I.7.1 Evaluation Criteria for Proposed Activities

Developing a new potable source or adaptively managing existing water resources of water are expected to advance a water resource management objective. Implementation of the IWRMP is expected to improve conditions when one or more improvement criteria are clearly met. Prioritizing management activities could be based on ease of implementation (low cost, few restrictions), greatest degree of benefit, or whether the activity has an area-wide or long-term benefit.

As the IWRMP is developed, criteria for prioritizing water resource management activities may become more specific or weighted more heavily if greater benefits are achieved with increasing understanding of effectiveness and implementation challenges. The weighting of the prioritization criteria could also be modified by the cost limitations, regulatory restrictions, natural variability, public participation, or enforceability of the implemented activity. The effectiveness of an action that would improve a condition or the management of a water resource may be measurable through monitoring or calculation, or incremental, where the benefit is long-term or regional. Examples of activities that measurably improve a condition include acquiring new water rights, constructing peaking storage, or reducing water loss or demand. Qualitative, non-measurable improvements that promote a water resource management objective would include increased public awareness of water resource management goals, changes in land use policy that reduce non-point source loads, or implementation of low impact development (LID) policies in the IWRMP area.

Table 4 illustrates an evaluation matrix for potential water management actions identified in Section 4. This type of matrix facilitates prioritization of possible actions through side-by-side comparison of potential limitations and benefits of implementing the action.

Potential benefits include:

- Measurable benefits that can be directly monitored or calculated
- Incremental benefits that cannot be directly measured, but there is a high probability of improvement or increase
- Long-Term benefits endure for more than 10 years or are permanent

Potential limitations include:

- Limited opportunity – difficult to acquire or implement
- Cost - Total cost or over cost over 10 years
- Medium Cost - $50,000 to $500,000;
- High Cost – greater than $500,000
- Seasonal benefits only occur during a part of the year
- Short-term benefits endure for less than 10 years
- Permitting implementation involves multiple regulatory agencies and stakeholders for approve

continued

Table I-4

Potential Water Resource Management Actions, Benefits, and Limitations

Current and Future Potential Actions	Evaluation Criteria						
	Potential Limitations	Potential Benefits					
		Increases availability of source water quantity instantaneous or annual rights	Improves source water quality by reducing contaminants in sources	Improves long-term sustainability through source protection and redundancy	Reduces total or peak demand for potable water	Reduces operational cost through efficiency, energy use, maintenance	Improves environmental conditions or reduces impacts
Surface Water Sources							
Promote watershed control program to protect quantity and quality of watershed runoff that supplies current and future sources	Medium Cost	Incremental, Long-Term	Incremental, Long-Term, Medium Cost	Incremental, Long-Term, Medium Cost	-	-	Incremental, Long-Term
Implement surface water monitoring program to document trends in surface water runoff from urbanization and climate change	Medium Cost	Incremental, Long-Term	-	Incremental, Long-Term	-	-	Incremental, Long-Term
Protect legal access to current and inchoate sources of water to meet forecasted demand	Medium Cost	Incremental, Long-Term	-	Incremental, Long-Term	-	-	-
Acquire new sources of surface water supply, primarily irrigation rights	Limited	Measurable, Long-Term	-	Measurable, Long-Term	-	-	-
Groundwater Sources							
Implement groundwater monitoring program to document trends in groundwater recharge from urbanization and climate and other withdrawals	Medium Cost	Incremental, Long-Term	-	Incremental, Long-Term	-	-	Incremental, Long-Term
Identify and develop new sources of groundwater supply – Airport well field, exempt wells, small domestic system, convert City irrigation rights	Limited, High cost, Permitting	Measurable, Long-Term	-	Incremental, Long-Term	-	-	
Protect critical aquifer recharge areas and identify areas to enhance natural recharge that supplies current and future sources	Medium Cost	Incremental, Long-Term	Incremental, Long-Term	Incremental, Long-Term	-	-	Incremental, Long-Term
Promote passive and active groundwater recharge of stormwater	High cost, Permitting, Seasonal	Incremental, Long-Term	-	Incremental, Long-Term	-	-	Incremental, Long-Term
ASR using surplus Haller Well Field supply	High cost, Permitting	Incremental, Long-Term	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	-	-
ASR using reclaimed water	High cost, Permitting	Incremental, Long-Term	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	-	-
ASR using stormwater	High cost, Permitting, Seasonal	Incremental, Long-Term	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	-	-
Coordinate with Ecology to enforce UIC program to increase groundwater protection	Medium Cost	-	Incremental, Long-Term	Incremental, Long-Term	-	-	Incremental, Long-Term
Implement groundwater well inspection and maintenance program – useful well life, replacement well locations	Medium Cost	-	-	Incremental, Long-Term	-	Incremental, Long-Term	-
Develop septic system maintenance program and/or schedule for sewering priority parcels	Medium Cost	-	Incremental, Long-Term	Incremental, Long-Term		-	Incremental, Long-Term
Adjust seasonal withdrawals for economic benefit – energy costs, treatment and maintenance costs	Medium Cost	-	-	-	Measurable, Long-Term	Measurable, Long-Term	-
Adjust seasonal withdrawals for environmental benefit – instream flow, habitat	Medium Cost	-	-	-	Measurable, Long-Term	-	Measurable, Long-Term

Table I-4, continued

Potential Water Resource Management Actions, Benefits, and Limitations

Current and Future Potential Actions	Evaluation Criteria						
	Potential Limitations	Potential Benefits					
		Increases availability of source water quantity instantaneous or annual rights	Improves source water quality by reducing contaminants in sources	Improves long-term sustainability through source protection and redundancy	Reduces total or peak demand for potable water	Reduces operational cost through efficiency, energy use, maintenance	Improves environmental conditions or reduces impacts
Potable Water System							
Mitigate peak demand with reservoir storage	High Cost	-	-	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	-
Intertie maintenance – regular communication with interties	Medium Cost	-	-	Incremental, Long-Term	-	-	-
Meet irrigation and industrial demand with reclaimed water	High Cost, Permitting	Measurable, Long-Term	-	-	Measurable, Long-Term	-	Measurable, Long-Term
Implement efficiency rules	Medium Cost	Measurable, Long-Term	-	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term
Rate structure to reduce demand	Medium Cost	Measurable, Long-Term	-	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term	Measurable, Long-Term
Wastewater							
Develop septic system maintenance program and/or schedule for sewering priority parcels	Medium Cost	-	Incremental, Long-Term	Incremental, Long-Term	-	-	Incremental, Long-Term
WWTP to WRF (reclamation facility) produces water of reclaimed quality	High Cost, Permitting	Measurable, Long-Term	-	Measurable, Long-Term	Measurable, Long-Term	-	Incremental, Long-Term
Discharge reclaimed water to river to maintain flows	High Cost, Permitting	-	-	-	-	-	Incremental, Long-Term
Discharge reclaimed water to constructed storm wetland for temperature reduction and nutrient (DO) polishing	High Cost, Permitting	-	-	-	-	-	Measurable, Long-Term
Discharge reclaimed water to ground/infiltration for groundwater recharge and instream mitigation	High Cost, Permitting	Incremental, Long-Term	-	Incremental, Long-Term	-	-	Incremental, Long-Term
Pretreatment program to reduce toxics in waste stream and receiving waters	High Cost, Permitting	-	-	-	-	-	Incremental, Long-Term
Pharmaceuticals take-back and education program to reduce EDCs in waste stream and receiving waters	High Cost, Permitting	-	-	-	-	-	Incremental, Long-Term
Improve WWTP discharge to reduce waste allocation	High Cost, Permitting	-	-	-	-	-	Measurable, Long-Term
Stormwater							
Identify potential non-point source discharges that may significantly affect surface water quality and identify corrective measures; focus on stormwater wetland near river	Medium Cost	-	-	-	-	-	Measurable, Long-Term
Correct untreated outfalls to surface waters to improve surface water quality with focus on 303d parameters and TMDL commitments	High Cost, Permitting	-	-	-	-	-	Measurable, Long-Term
Implement UIC program to address infiltration system effects on groundwater and aquifer quality	Medium Cost	-	-	Incremental, Long-Term	-	-	Incremental, Long-Term
Promote passive (LID) and active groundwater recharge (ponds) of stormwater	High Cost, Permitting	Incremental, Long-Term	-	Incremental, Long-Term	-	-	Incremental, Long-Term

I.8 CONCLUSIONS AND RECOMMENDATIONS

The City intends to adaptively manage water resources and associated water infrastructure and influence land use policies that affect water resources under its jurisdiction. The complex interaction of natural water systems and City-managed water infrastructure creates a challenging management environment to monitor the natural and man-made effects of the quantity and quality of water as it flows into the City management areas is put to beneficial use, and flows out of the City management area. The City recognizes its responsibility as a steward of its water resources for public and environmental benefit by regular updating and implementation of comprehensive plans for water, wastewater, and stormwater, and sees an integrated water resource management program as a way to achieve similar objectives for the planning efforts and avoid direct or inadvertent conflicts of water resource management actions.

This initial summary of the objectives, information, and opportunities to compare water resource management actions provides the framework to proceed with more detailed evaluation of how to implement an integrated water resource management program. Much of the work set forth in the scope to develop the IWRMP strategy are presented in this summary. Time and budget constraints have reduced the opportunity to refine the prioritization of adaptive management actions, and to establish the means to integrate the existing water management programs into an effective integrated approach.

Recommendations for the next step toward developing an integrated approach would include using the available GIS database to identify areas of water resource management overlap and review existing programs for aligned objectives or potential conflicts. The prioritization table in Section 6 could be further refined to assign greater weight to those benefits that current water management programs have identified as priorities. Subsequent water resource planning updates could be structured to identify objectives and priorities that are also identified in other programs to elevate the priority and awareness of a potential action based on its multiple benefits. Finally, developing an IWRMP will require a team approach and team leader to be aware of the City's water and land resource management objectives and responsibilities and to connect each water resource program to achieve their complementary objectives.

J CONSUMER CONFIDENCE REPORT

J.1 REVISED FOR THE 2015 WSP UPDATE

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City of Arlington
Annual Water Quality Report

Water Testing Performed in 2014

PWS ID# 02950K



Continuing Our Commitment

The City of Arlington is pleased to report that your drinking water is of high quality and compliant with all state and federal drinking water laws. We are committed to delivering the best quality drinking water, and to that end, we make more than 16,000 water quality observations and tests every year. This edition of our annual water quality report summarizes only the key findings of testing completed from January through December 2014. For more information about this report, or for any questions relating to your drinking water, please call the Water Department at (360) 403-3526.



Where Does Our Water Come From?

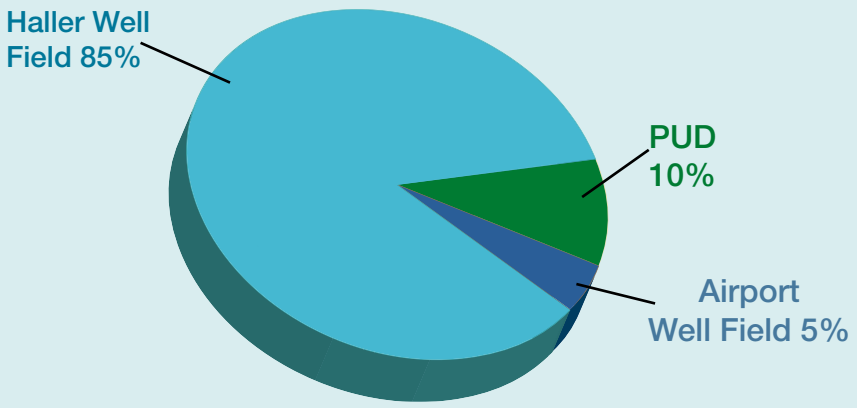
Three primary sources supply water to the Arlington service area. Arlington produces most of its water from the Haller and Airport well fields. The Haller well field naturally filters Stillaguamish River water by drawing it through the riverbank. The Airport well field draws groundwater from a deep aquifer. The origin of both these sources is precipitation that falls across the Stillaguamish Basin and infiltrates the ground surface.

The water we produce is blended with water the City purchases from its third source, Snohomish County Public Utility District (PUD). This water is obtained



from the City of Everett's Spada Reservoir near the headwaters of the Sultan River.

The graph shows how each source contributed to our total water production of 1,762 acre-feet in 2014.



ARLINGTON WATER SUPPLY 2014

HOW IS MY WATER TREATED AND PURIFIED?

Haller Well Field

Groundwater drawn from our well field located near the Stillaguamish River is treated in several steps at Arlington's water treatment facility. First, raw (untreated) water is pumped from the well field to the treatment plant, where a primary treatment chemical is added that causes small particles to stick together and form bigger particles called floc. Next, polymer is added to aid the filtering process and the water is passed through a clarifying filter where 60% to 70% of the floc is removed. The water then passes through a finishing filter where the remaining floc is taken out, and chlorine is added for disinfection. Finally, we add sodium hydroxide to adjust the pH level, making the water less corrosive to your pipes and plumbing fixtures.

Airport Well Field

Water drawn from our well near the Arlington Airport does not require filtration, but we do add chlorine for disinfection.

PUD

Drinking water purchased from Snohomish County PUD is treated at the City of Everett water treatment plant using a treatment process similar to the process used by Arlington. Everett adds fluoride to the water for enhanced dental protection.

Working Hard to Bring You the Best Water in the State — Efficiently



Under the Safe Drinking Water Act (SDWA), the U.S. Environmental Protection Agency (EPA) is responsible for setting national limits for hundreds of substances in drinking water, and also specifies various treatments that water systems must use to remove these substances.

Arlington Water Department continually monitors for these substances and reports our findings to the Washington Department of Health (DOH), who confirms you are receiving clean water. DOH records indicate ***we consistently provide you with clear, high quality water meeting stringent standards, and have done so for 14 consecutive years!***

For more information see:

www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/SourceWater/RapidRateFiltration

and

www.doh.wa.gov/Portals/1/Documents/4200/wt0911.pdf.

This report you are holding conforms to the regulation under SDWA requiring water utilities to provide detailed water quality information to each of their customers annually. We are committed to providing you with this information about your water supply because ***customers who are well informed are our best allies in supporting improvements necessary to maintain the highest drinking water standards.***

Sampling Results for 2014

In 2014, the City collected hundreds of water samples and made thousands of measurements to test for biological, inorganic, volatile organic, synthetic organic or radioactive contaminants. The table below lists only those contaminants that were detected. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All of the results shown here are less than Maximum Contaminant Level Goals (MCLGs) which are established with a safety margin for the protection of consumer health.

Since we purchase some of our water from the PUD, the table also includes data for the City of Everett water supply. This information is particularly useful to those in our service area that receive PUD water before it is blended with water pumped from our wells. This includes any service connections along Burn Rd and 186th Street.

DOH requires utilities to monitor for lead, copper and other contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Regulated Substances

Samples were collected in finished water at our sources and/or throughout the distribution system				Arlington Water Department		Snohomish County PUD		Definitions of these terms are found at the bottom of this page	
Substance (units)	**Year**	**MCL (MRDL)**	**MCLG (MRDLG)**	**Amount**	**Range**	**Amount**	**Range**	**Compliant?**	**Typical Sources**
Arsenic (ppb)	2014	10	0	1	ND – 1	2	ND - 2	Yes	Erosion of natural deposits
Barium (ppm)	2014	2	2	0.009	0.008 – 0.01	0.01	ND - 0.01	Yes	Erosion of natural deposits, drilling fluids
Chlorine (ppm)	2014	(4)	(4)	0.79	0.10 – 1.75	0.57	0.20 – 0.79	Yes	Water additive used to control microbes
Chromium (ppm)	2014	100	100	4	ND - 4	ND	NA	Yes	Erosion of natural deposits
Fluoride (ppm)	2014	4	4	0.10	ND – 0.77	0.55	0.15 – 0.78	Yes	Water additive which promotes strong teeth; erosion of natural deposits
HAAs [Haloacetic Acids] (ppb)	2014	60	NA	12.6	6.6 – 34.7	34.3	0.0 – 37.6	Yes	By-product of drinking water disinfection
Nitrate (ppm)	2014	10	10	0.90	0.3 – 1.5	0.05	0.01 – 0.09	Yes	Runoff from fertilizer use; Leaching from septic tanks, and animal wastes; Erosion
TTHMs [Total Trihalomethanes] (ppb)	2014	80	NA	17.7	9.5 – 35.8	42.1	2.7 - 55.4	Yes	By-product of drinking water disinfection
Turbidity (NTU)[1]	2014	TT	NA	0.055	0.022 – 0.055	0.11	ND – 0.11	Yes	Soil runoff, sediment

Lead and Copper

Tap water samples were collected for lead and copper analyses from homes throughout the service areas				Arlington Water Department		Snohomish County PUD			
Substance (units)	**Year[2] sampled**	**AL**	**MCLG**	**90th Percentile**	**Homes Above AL/ Total Homes Sampled**	**90th Percentile**	**Homes Above AL/ Total Homes Sampled**	**Compliant?**	**Typical Sources**
Copper (ppm)	2012	1.3	1.3	0.430	0 / 31	0.109	0 / 108	Yes	Corrosion of household plumbing Erosion of natural deposits
Lead (ppb)	2012	15	0	3	0 / 31	2	0 / 108	Yes	Corrosion of household plumbing Erosion of natural deposits

Unregulated Subtances[3]

Samples were collected in finished water at our sources and at one location in the distribution system			Arlington Water Department		Snohomish County PUD			
Substance (units)	**Year sampled**	**Detection Limit**	**Amount Detected**	**Range Low-High**	**Amount Detected**	**Range Low-High**	**Compliant?**	**Typical Sources**
Chlorate (ppb)	2013-2014	20	69.1	44 – 110	44.9	34 – 67	NA	Degradation of disinfectant
Chromium-6 (ppb)	2013-2014	0.03	0.50	0.13 – 3.04	0.25	0.22– 0.30	NA	Erosion of natural deposits; industrial discharges
Strontium (ppb)	2013-2014	0.3	62.5	36 – 140	33.5	14 – 102	NA	Erosion of natural and pipe deposits
Vanadium (ppb)	2013-2014	0.2	0.57	0.2 – 1.5	ND	ND	NA	Erosion of natural and pipe deposits

Footnotes
1 Turbidity, a measure of the cloudiness of water, is monitored because it is a good indicator of the effectiveness of the filtration system.
2 Lead and copper samples are collected from area homes every 3 years. Samples in both the Arlington and PUD service areas were collected in 2012, and are scheduled for collection again 2015.
3. These substances are not yet regulated in drinking water, but monitoring was required under the third round of the Unregulated Contaminant Monitoring Rule. Only the listed parameters were detected at the ranges given. These or other parameters may be regulated in the future.

Table Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

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 (e.g. chlorine, chloramines, chlorine dioxide).

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 Units): A measure of the clarity, cloudiness, or turbidity, of water.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

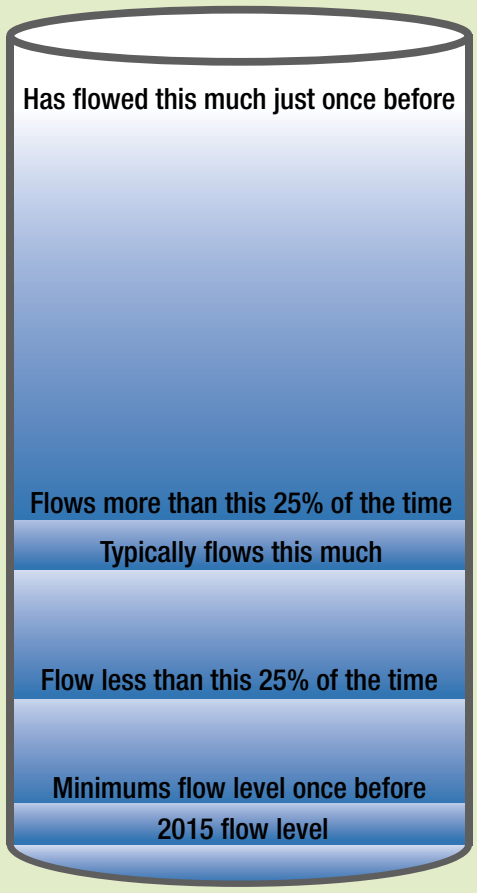
TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

90th Percentile: Out of every 10 homes sampled, 9 had lead and copper concentrations at or below this level.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/ Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

About the Drought



The graphic shows the historic condition of the Stilly in June. We are in unprecedented territory. We think riverbank filtration at our Haller wells will serve us well regardless of river stage, but it will be a test for us. Our multiple types and sources of supply (see page 1) should help us be resilient and sustain unrestricted operations.

However, customers are urged to use their water wisely and efficiently, especially their outdoor use. Follow your lawn watering calendar and water deeply every 3 days. If restrictions do become necessary, we will contact customers via utility bills, web site, and the press.

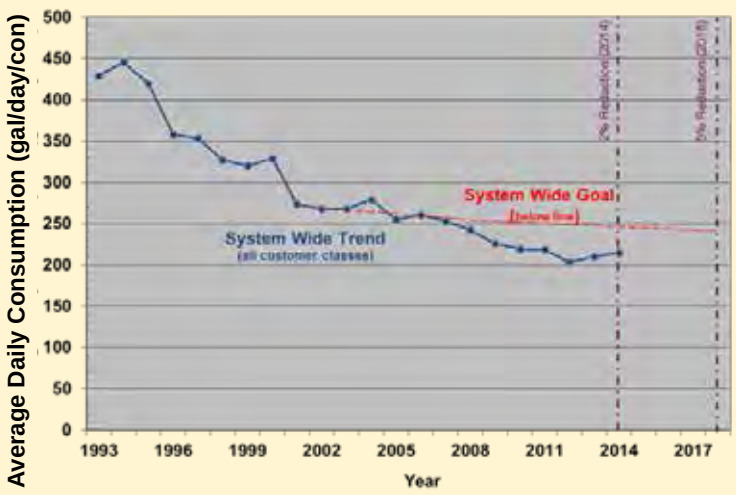
Water Use Efficiency Information

Arlington is making great progress toward goals required by the state's 2007 Water Use Efficiency (WUE) Rule. The City's WUE goals were developed after a public hearing and City Council approval of the October 2011 Water System Plan.

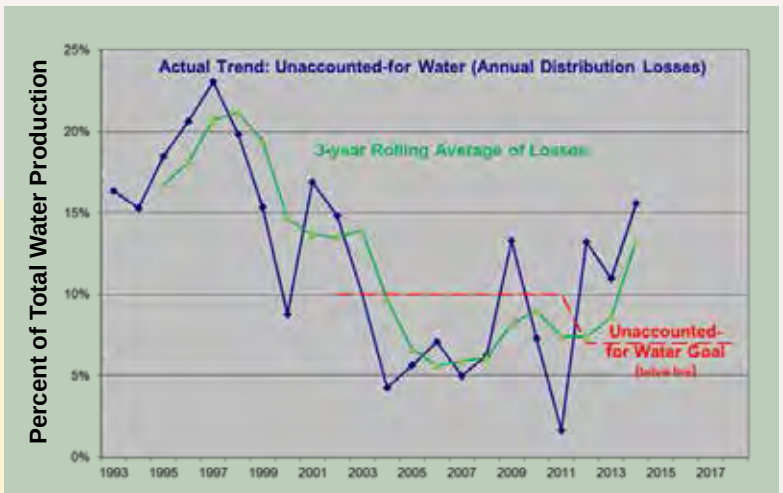
2014 Arlington Water Use Statistics

Total water into the system (gallons)	574,120,924
Total authorized, quantified uses (gallons)	484,631,739
Unauthorized and/or unquantified uses and leaks (gallons)	89,489,185
Unauthorized and/or unquantified uses and leaks (percent)	15.6%

Goal: Achieve additional system-wide average water use reduction of 2 percent by the year 2014, and 5 percent by the year 2018, with 2008 as the base year.



When it comes to supplying water to a growing community, wise and efficient use of our existing water sources is much cheaper than the development of new supplies. Results indicate our customers are increasingly conscientious of their water use. Water consumption has dropped more than 11% by 2014 to 215 gallons/ day/ connection. We are on track for meeting our 2018 goal of 230 gal/day/connection. With these efforts in place, the City's savings from 2002 to 2025 will exceed 122 million gallons.



Goal: Reduce unaccounted for water to 7 percent or less.

The WUE Rule requires that we account for at least 90% of the water we make, but we are holding ourselves to 93%--with unaccounted for "losses" from our distribution system at less than 7%. We exceeded this level for the last 3 years with losses up to 15%. Staff is investigating this increase. Possible sources include water main leaks, water theft, meter calibration and accounting issues. Our 3-year rolling average of 13% losses exceeds the State limit of 10%. We have prepared an action plan to correct our water losses.

Substances That May Be in Your Drinking Water



To ensure that tap water is safe to drink, the Department of Health and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and the Washington Department of Agriculture regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

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 can pick up substances resulting from the presence of animals or from human activity. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791).

Contaminants That May Be Present In Source Water

- ***Microbes*** — viruses, parasites and bacteria, from sewage treatment plants, septic systems, pets, livestock and wildlife
- ***Inorganic materials*** — salts and metals, naturally occurring or from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and farming
- ***Pesticides and herbicides*** — from agriculture, urban stormwater runoff, and residential uses
- ***Organic Compounds*** — synthetic and volatile organic compounds from industrial processes, petroleum production, gas stations, urban stormwater runoff, and septic systems
- ***Radioactive contaminants*** — naturally-occurring or the result of oil and gas production and mining activities

Questions and Answers



I don't have any water.

If your water bill has not been paid: call Utility Billing at 360-403-3421.

Otherwise, call Public Works Administration at 360-403-3526. We'll need to know your name, phone number, address, how long have you been without water. A water service specialist will contact you to solve the problem.

I need my water shut off.

If you are stopping service: call Utility Billing at 360-403-3421.

If you are doing repairs: call Public Works Administration at 360-403-3526. We'll need your name, phone number, address and when you want the water shut off. A water service specialist will shut the water off, or call you to arrange a time to do so.

I need my water turned on.

If you are moving in: call Utility Billing at 360-403-3421.

If you are doing repairs: call Public Works Administration at 360-403-3526. We'll need your name, phone number, address, and when you want the water turned on. A water service specialist will turn the water on, or will call you to arrange a time to do so.

I need to report a leak.

Call Public Works Administration at 360-403-3526, or the emergency pager at 360-386-5926. Tell us your name, phone number, and the address of the leak.

If the leak is located:

In the house: you will need to call a plumber, but we will send a water service specialist to turn the water off if needed.

At the meter box: we will send a water service specialist out to investigate and repair the leak. They will call you with the results.

In the street: we will send a water service specialist out to investigate immediately. Let us know if it is gushing or trickling down the street, gushing up in the air, and/or associated with a hydrant break or construction accident.

Is there fluoride in my water?

Water we produce has low natural concentrations of fluoride, while water we purchase is "fully fluoridated" for dental protection by the City of Everett. While primarily distributed in distinct zones, these sources do blend to create a small area of moderate fluoride concentrations. Only services east of SR 9 and south of about 200th Street receive appreciable fluoride. The City's fluoride brochure compares this range of fluoride levels to the dental needs for children promoted by the ADA. Copies are available on-line, at Public Works Administration, or where utility bills are paid at City Hall.

Community Participation

You are invited to participate in our public city council meetings and voice your concerns about your drinking water. Arlington City Council meets the first and third Monday of each month beginning at 7 p.m. at the Council Chambers, 110 E. Third Street, Arlington, WA (enter off of Olympic Avenue near City Hall). For meeting information, call City Hall at (360) 403-3421, or visit our Web site at www.arlingtonwa.gov.

This Could Be Your Last Issue!!

Actually, we have to—and want to—provide you with this once a year Consumer Confidence Report on the quality of the water your family enjoys every day. However, the law now provides the opportunity to provide it to you electronically, and you have the opportunity to get the information you need in a format to your liking. Please watch your mail later this year—probably your utility bill—for the opportunity to specify your preference:

- ✔ Receive a paper copy in the mail
- ✔ Type a direct link found on my water bill in my web browser
- ✔ Click a direct link in an e-mail notifying me of my bill
- ✔ Receive a pdf attachment to an e-mail
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City of Arlington
154 W. Cox Avenue
Arlington, WA 98223

K WATER RIGHTS INFORMATION

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

NOV 30 2011

Michael Wolanek
City of Arlington
154 West Cox Avenue
Arlington, WA 98223

RE: Administrative Order No. 11WRNR – DE 7563 to Ground Water Certificate 5169

Dear Mr. Wolanek:

Enclosed is Administrative Order No. 11WRNR – DE 7563 to change Ground Water Certificate 5169.

If you have any questions, please contact Doug Wood at 425.649.7077 or at Doug.Wood@ecy.wa.gov.

Sincerely,

Jerry Liszak, LHG
Acting Section Manager
Water Resources Program

jl/dw/mc

By certified mail: 7010 3090 0000 1910 0791

Enclosure(s): Order No. 11WRNR – DE 7563

BEFORE THE
DEPARTMENT OF ECOLOGY
STATE OF WASHINGTON

IN THE MATTER OF CERTIFICATE OF GROUND WATER RIGHT 5169 ISSUED July 2, 1965 TO THE CITY OF ARLINGTON	))))	REPORT OF INVESTIGATION, FINDINGS OF FACT, DETERMINATION, AND ORDER DOCKET NO. 11WRNR – DE 7563

REPORT OF INVESTIGATION

Background

Certificate of Ground Water Right 5169 (GWC-5169) was issued on July 2, 1965 to the City of Arlington, Washington. The maximum instantaneous quantity allocated is 1,700 gallons per minute (gpm) and the annual quantity is 1,344 acre-feet per year (af/yr) for municipal supply purposes. The priority date of the application is February 12, 1965.

The issuance of this water right was initiated after the City of Arlington had contacted the Division of Water Resources (predecessor to the Department of Ecology) in September 1964 seeking information on the extent of their water rights.

In September 23, 1964, a letter to the Division of Water Resources, the City of Arlington requested information on water rights associated with the Haller Wellfield and the Airport Well. In September 29, 1964, a reply to the City of Arlington, Robert H. Russell, Assistant Supervisor of the Division of Water Resources stated that a search did not find any water rights issued to the City of Arlington for its wells.

In a second letter to the Division of Water Resources dated October 1, 1964, the City of Arlington suggested looking for water rights issued to Puget Power and Light, which had originally operated the water system. An October 6, 1964, a reply from Robert H. Russell at the Division of Water Resources stated that a search for Puget Sound Power and Light water rights was similarly unsuccessful. He further recommended that the city complete applications for new water rights for both the Haller Wellfield and the Airport Well.

It is apparent that the 1964 searches were limited to the files for ground water. Records for ground water rights were kept separate from records for surface water rights prior to the early 1970, when both were incorporated into Ecology's current water right tracking system. If they had also searched the files for surface water rights in 1964, the search would almost certainly have found the file for Certificate of Water Right (SWC) 194, issued to Puget Sound Power and Light Company on June 21, 1927.

SWC 194 was issued for 5 cubic feet per second (cfs) to serve the domestic needs of the City of Arlington. The priority date is established as the date the application was accepted on October 10, 1924. The description of the point of diversion and water works in the file are clearly same as the Haller Wellfield, with the addition of a water intake pipe extending into the Stillaguamish River.
Puget Light and Power Company had operated the Haller Wellfield beginning in 1916 to serve the town of Arlington. The surface water right was added to its existing ground water wells due to supply problems that were likely associated with a barrier to flow within the alluvial aquifer of the Stillaguamish River.

City of Arlington has supplied documents that indicate the Haller Wellfield operated as a hybrid SW/GW supply between 1926, when SWC 194 was issued, and 1939, when the city ceased direct diversions from the Stillaguamish River. This decision was based on a recommendation by the Department of Health, and on rehabilitation work on the Haller wells which encountered more reliable groundwater flow in their recently deepened well (see Figure 1).

The City of Arlington managed the Haller Wellfield from 1939 until 1964 and added the Airport Well sometime in the late 1940's when the military transferred control of the airport to the city.

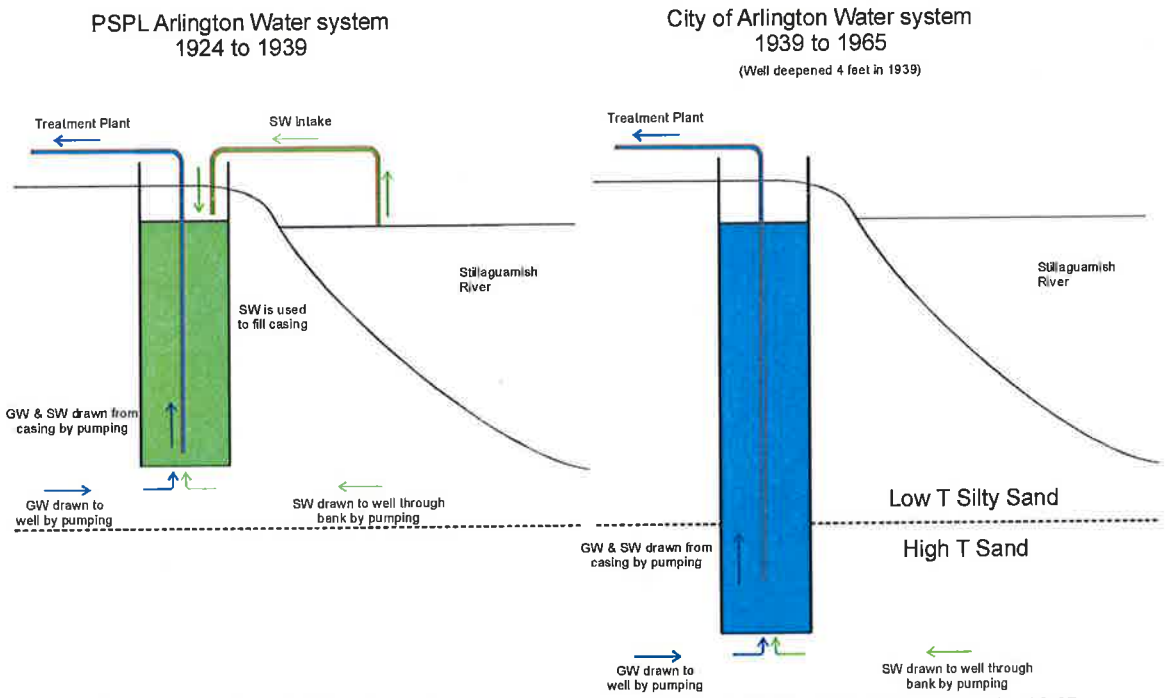

Figure 1: Haller Wellfield as it was configured in 1924 to 1939, and as modified in 1965.

A review of the facts regarding the fate of SWC 194 has convinced the Water Resources Program that this right has been in constant use since the right was developed. The modifications made to the system, both in 1926 and in 1939 are viewed by the program as de-facto changes to the right. While the true priority date of the groundwater portion of the right likely extends back to 1916, when the Arlington Water Works were first constructed, October 10, 1924 is the priority date of relevance to SWC 194.

The Water Resources Program has encountered many similar de-facto changes during the course of over 90 years of managing water rights. Our methods of dealing with such changes however have changed over time. Prior to the 1970's nearly all rights for surface and groundwater rights were kept separate. As noted above, this separation extended to keeping separate records for each type of water right. It was therefore quite likely that separate groundwater rights would have been issued for the Haller Wellfield in 1965 regardless of whether there were existing rights for surface water from the same project.

However, during the 1960's agency practice for the issuance of groundwater rights to entities that held sufficient quantities of water under surface water rights was to issue what were termed "supplemental" rights. These "supplemental" rights would issue for independent Qi (pumping rate) but share Qa (annual consumptive use) with a "primary" surface water right. Depending on the potential for expansion, the Qi may also have been made "supplemental" to the primary right. The purpose of issuing "supplemental" rights was to help preserve the priority of municipal rights.

In the case of SWC 194 and GWC 5169 the agency would almost certainly have tied the rights together to preserve the priority of the town water supply had the agency known of SWC 194 in 1965. A review of the files for GWC 5169 suggests that the 1,700 gpm and 1,344 af/yr allocated under that right was sufficient for the then size of the community for planned growth until 1975.

The term "supplemental" is no longer used. In its place the Water Resources Program now uses the term "non-additive" to indicate that a water right includes quantities that are not added to the total portfolio of rights held. Both Qi and Qi can be issued as being either "additive" or "non-additive" with respect to the total portfolio of quantities held by an entity.

FINDINGS OF FACT

The Division of Water Resources erred in its 1964 search for existing water rights for the City of Arlington, and specifically failed to search both the surface and ground water files for a water right issued to Puget Sound Power and Light Company. Had the division searched the surface water rights files they almost certainly would have found SWC 194 and recognized that this right was issued for the City of Arlington Haller Wellfield water supply facility.

In order to rectify the error the best course of action is to treat the issuance of GWC 5169 as being partly issued in error, in so far as this right would likely have been issued in 1965, but as a "supplemental" or non-additive right attached to SWC 194 for all or a portion of its Qi and Qa.

DETERMINATION AND ORDER

Based on the above, it is ORDERED that instantaneous annual quantities allocated through Groundwater Certificate 5169 (G1-*07494) be amended to reflect the history of water use by the City of Arlington though its Haller Wellfield.

Specifically, Ground Water Certificate 5169 (G1-*07494C) shall be amended so that both instantaneous and annual quantities (Qi and Qa) be referenced as "Non-Additive" and that total instantaneous and annual quantities associated with Water Right Certificate 194 (S1-*01194C) and Ground Water Certificate 5169 (G1-*07494C) shall not exceed the maximum quantity allocated through Water Right Certificate 194 (S1-*01194C).

The maximum instantaneous quantity allocated through Water Right Certificate 194 (S1-*01194C) is 5 cubic feet per second (2,244.15 gpm). Continuous diversion at a rate of 5 cfs can produce 3,619.84 af/yr, which is typically recognized as the maximum annual quantity (Qa) for surface water rights that were issued without specified Qa limits.

The Table below shows the relationships between the three water rights which share the Haller Wellfield as of the date of this order.

Haller Wellfield Water Rights – per this Order									
Ecology Tracking #	Certificate #	Priority	Qi Cert (gpm)	Qi Add (gpm)	Qi N Add (gpm)	Qa Cert (af/yr)	Qa Add (af/yr)	Qa N-Add (af/yr)	Source
G1-*07494C	GWC 5169	2/12/1965	1,700		1,700	1,344		1,344	Haller Wellfield
S1-*01194C	SWC 194	10/10/1924	2,244.15	2,244.15		3,619.84	3,619.84		Haller Wellfield
G1-300889CL(A)†		1931	135	135		72.18	72.18		Haller Wellfield

† Transferred to the City of Arlington in 2009

You have a right to appeal this action to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this document. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this document:

- File your appeal and a copy of this document with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this document on Ecology in paper form - by mail or in person. (See addresses below.) Email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 Pollution Control Hearings Board Environmental Hearings Office 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Department of Ecology Attn: Appeals Processing Desk P.O. Box 47608 Olympia, WA 98504-7608 Pollution Control Hearings Board P.O. Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov

To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser

Dated at Bellevue, Washington this 30 day of November, 2011.

Jerry Liszak
Acting Section Manager
Water Resources
Northwest Regional Office
Department of Ecology

City of Arlington Public Works
Administration • Water • Sewer • Storm

January 3, 2012 (sent by email and postmarked)

Jerry Liszak
NWRO Water Resources Acting Section Manager
Washington Department of Ecology
3190 160th Ave SE
Bellevue, WA 98008-5452

RE: Administrative Order No. 11WRNR—DE 7563 to Groundwater Certificate 5169

Dear Mr. Liszak:

The City of Arlington received the above administrative order on December 2, 2011. We wish to clarify some facts in the Report of Investigation section of the Order. The City has spent considerable time researching the history behind nearly 50-year old administrative errors which this order corrects. We would like the record to accurately reflect these findings.

The corrections in the attached table will not affect your decision. This is not an appeal, and we are not requesting revision of the decision document. We hope you will include this letter in Ecology's files for SWC 194 and GWC 5169. If you have any questions about this information, please don't hesitate to call me at 360-403-3541. Please confirm your decision and handling of this matter with me at your convenience.

We appreciate the efforts and professionalism of your staff in correcting historic administrative errors and validating these critical components of the City's water rights portfolio.

Sincerely,

Michael D Wolanek

Michael D. Wolanek
Water Resources Planner

Cc: Doug Wood, (Ecology)

154 W. Cox Avenue | Arlington, WA 98223 | Phone: 360.403.3526 | Fax: 360.435.7944

Clarifications of Facts within the Report of Investigation Section of Administrative Order 11WRNR—DE 7563

Page	Paragraph	Sentence within the Order reads	Sentence with Corrected information (bold, underlined)
1	6	The surface water right was added to its existing ground water wells due to supply problems that were likely associated with a barrier to flow within the alluvial aquifer of the Stillaguamish River.	The surface water right was added to its existing ground water wells due to **water quality** problems that were likely associated with **pile driving adjacent to the well during bridge construction across** the Stillaguamish River.
2	1	City of Arlington has supplied documents that indicate the Haller Wellfield operated as a hybrid SW/GW supply between 1926, when SWC 194 was issued, and 1939, when the city ceased direct diversions from the Stillaguamish River.	City of Arlington has supplied documents that indicate the Haller Wellfield operated as a hybrid SW/GW supply between **1924**, when **direct surface water augmentation of the well was initiated**, and 1939, when the city ceased direct diversions from the Stillaguamish River.
2	2	The City of Arlington managed the Haller Wellfield from 1939 until 1964 and added the Airport Well sometime in the late 1940s...	The City of Arlington managed the Haller Wellfield **as a single well** from 1939 until 1964**, when it was expanded to three wells. The** Airport Well **was added** sometime in the late 1940s...
2	3	The modifications made to the system, both in 1926 and in 1939...	The modifications made to the system, both in **1924** and in 1939...

Background information on the Puget Sound Power & Light Water Right SWC194

a surface water right with a priority date of October 10, 1924, for withdrawal of water from the Haller Wellfield (SWC 194). In the early 1900s, a well at the Haller Wellfield location on the south bank of the Stillaguamish River was used by a shingle mill to provide water and power supply to the City. Rapid recharge of the well from the river provided adequate water supply to operate a steam generator for mill operations and the City's water and power supply. With the decline of the shingle industry, the City continued to operate the well for distribution through its wood stave mains. In 1916, the City awarded Puget Sound Power and Light Company (PSPL) a franchise to operate the water utility. PSPL operated the same shallow well used by the shingle mill. In 1924, pile driving adjacent to the Haller Wellfield location for bridge construction fractured substrata and released high levels of manganese and/or iron into the wellfield. As a result, PSPL completed improvements in 1924, including a water treatment plant and a pipe to the river to dilute the well water within the well. The treatment plant, which was used until 2001 and which still stands today, pumped the blended water from the same well as it did when the water was untreated.

In 1927, PSPL received a surface water certificate (SWC 194) with a priority date of October 10, 1924, for domestic supply of 5.0 cubic feet per second (cfs) for the Town of Arlington. Although no annual quantity was specified, historical records suggest that PSPL intended to and did operate a continuous diversion. In 1939, PSPL deepened the well and exposed strata to improve the well's recharge rate and water quality. With the improved water quality recharging the well, engineers from the Washington State Department of Health required PSPL to remove piping connecting the Stillaguamish River and the well. Later in 1939, PSPL conveyed back to the City "the water system in and adjacent to the City of Arlington, Washington…" This conveyance included "… all public and private grants or rights of way and operating rights for the operation of said water works."

Through the previous transitions, from shingle mill to the City to PSPL and back to the City, the well source at the Haller Wellfield location remained the same. It remains active today as Haller Well No. 3 and is in direct hydraulic continuity with the river at the original point of withdrawal..

In the early 1960s, the City was anticipating a period of rapid growth. Arlington had recently re-acquired the airport from the military. It was expecting development of a business park, and was, with Olympia, vying for selection as the seat of what was to become Evergreen State College. Development and long-term protection of adequate water supplies was a big part of the City's efforts, due to concerns about the impact on the City's water supply of various proposals for upstream water diversions.

In 1964, following the construction of Haller Wells No. 1 and No. 2, the City began a series of inquiries with Ecology's predecessor agency, the Department of Conservation's Division of Water Resources, in an attempt to document and protect its water right. After several file searches and exchanges of letters, the Department of Conservation advised the City that it could not locate any

record of a water right for Arlington or for PSPL. The Department advised the City to apply for a new water right for the Haller Wellfield. Based upon the State's erroneous failure to discover the PSPL right and its connection to the City, the City filed applications for water rights for the Haller Wellfield as well as for the airport. The City received water right certificate GWC 5169 for the Haller Wellfield with a priority date of February 12, 1965. GWC 5169 authorizes 1,700 gpm instantaneous withdrawal, and an annual volume of 1,344 acre-feet. But for the Department's failure to locate the PSPL water right, the City probably would not have applied for GWC 5169 as a new water right; if it had, it is likely that GWC 5169 would have been issued as a "supplemental" (non-additive) right to SWC 194

From 2004 to 2005, the City was in discussion with Ecology over the development of the pending Stillaguamish Instream Flow Rule (IFR). In addition to the quantification of minimum instream flow levels for various seasons, the IFR threatened to close the basin, thus preventing the development of new water appropriations. The City advocated and petitioned for a municipal reserve within the IFR, but it was not granted. The final IFR suggests that future municipal water supplies would be obtained through the transfer of existing water rights, development of reclaimed water, and other alternatives to new water rights.

In response to the pending IFR, City staff began an evaluation of the existing water rights recognized in the IFR that might be transferable to the City. It was during this time that City staff discovered the record of the PSPL water right, which is still listed as an active water right in Ecology's records. Subsequently, staff performed extensive research into the history of this water right and the Haller Wellfield. The City alerted Ecology to the record of the PSPL right, and in 2008 began discussions with Ecology regarding a process for appropriate recognition of the right and its continuous use by the City. Ecology's records identify this right as a surface water right, although the water has continuously been withdrawn from the riverbank wellfield, which is in direct and immediate hydraulic continuity with the river, somewhat similar to a Ranney-type well. In light of the hybrid nature of this water diversion/withdrawal, it may be appropriate to formally document the current water source as groundwater under the influence of surface water. However, regardless of the outcome of these discussions, the City's continuous use of the PSPL right makes it appropriate for inclusion in the City's water rights portfolio in this WSP update.

The PSPL right authorized the withdrawal of 5.0 cfs and did not specify an annual quantity. If water were continuously withdrawn at the rate of 5.0 cfs – the intent described in the public notice for the water right application – the annual volume would be 3,619.84 acre-feet. The total water right amounts for Haller Wellfield in the 2011 and 2015 WSPs include SWC 194 (the PSPL water right) and GWC 5169 (the latter as non-additive to SWC 194 for both instantaneous and annual quantities).

Ecology issued an administrative order # _____ regarding SWC 194, reco

All of these water rights, including SWC 194, are recognized by Ecology as active in 2005 with the passage of the Stillaguamish IFR, and remain so today. And all of these water rights, including SWC 194, were recognized and treated as 100-percent consumptive, out-of-stream uses when Ecology quantified minimum instream flows in the IFR.

Ground Water Permit No. 7040

CERTIFICATE OF GROUND WATER RIGHT

Recorded in the office of the State Supervisor of Water Resources, Olympia, Washington, in Book No. 11 of Ground Water Right Certificates, on page 5169-A, on the 2nd day of July 19 65.

STATE OF WASHINGTON,
County of _____ } ss.

I certify that the within was received and duly recorded by me in Volume _____ of Book of Water Right Certificates, at page _____, on the _____ day of _____, 19____

_____

STATE PRINTING PLANT OLYMPIA, WASH., 1964

S. F. No. 7361—1-64—3M. 83360.

1792798

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CERTIFICATE RECORD NO. 11 PAGE NO. 5169-A

STATE OF WASHINGTON, COUNTY OF Snohomish

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.

THIS IS TO CERTIFY *That* CITY OF ARLINGTON

of Arlington, Washington, *has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the ground waters of* two (2) wells

located within Government Lot 7

Sec. 2, *Twp.* 31 *N., R.* 5 *E. W.M.,*

for the purpose of municipal supply for a population of 6,000 as of 1975

under and subject to provisions contained in Ground Water Permit No. 7040 *issued by the State Supervisor of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume* 11 *at page* 5169-A; *that the right hereby confirmed dates from* February 12, 1965; *that the quantity of ground water under the right hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 1,700 gallons per minute; 1,344 acre-feet per year for municipal supply.

Special provisions required by the Supervisor of Water Resources: A master meter, individual service meters or other suitable measuring devices shall be installed in this system to measure the total amount of the withdrawal.

A description of the lands to which such ground water right is appurtenant:

City of Arlington

1792798

DEEDS

VOL. OF PAGE RECORDED
REC. OF State of Wash
Dept of Conservation
1965 JUL 6 AM 9 24

STANLEY D. [illegible], AUDITOR
SNOHOMISH COUNTY, WASH.
DEPUTY W. S. Doyle

Helen Bergen
City Clerk
Arlington, Wash

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Water Resources affixed this 2nd *day of* July, 19 65.

STATE OF WASHINGTON
DIVISION OF WATER RESOURCES
DEPT. OF CONS. & DEV.

Robert H Russell
asst State Supervisor of Water Resources.

ENGINEERING DATA

DEEDS VOL. 830 PAGE 646

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CERTIFICATE OF CHANGE OF POINT OF WITHDRAWAL OF GROUND WATER

In accordance with the provisions of Chapter 263, Laws of Washington for 1945, and the regulations of the State Director of Ecology.

THIS IS TO CERTIFY That the City of Arlington, Washington, has complied with all of the requirements of the Revised Code of Washington 90.44.100 and is hereby granted the right to change the point of withdrawal of waters of two wells in the amount of 1,700 gallons per minute, 1,344 acre-feet per year, as granted in Ground Water Certificate No. 5169-A.

That the water is being used for the purpose of municipal supply and that water has been withdrawn from said two wells at two points situated in Government Lot 7 of Section 2, Township 31 North, Range 5 East W.M.

That the City of Arlington has retained the above two points of withdrawal and has added a third point of withdrawal at a point situated about 50 feet west and 135 feet north from center of Sec. 2, All being within Government Lot 7 of Sec. 2, T. 31 N., R. 5 E.W.M., Snohomish County, Washington.

Given under my hand and seal of this office at Olympia, Washington, this 4th day of June, 1971.

JOHN A. BIGGS, Director
Department of Ecology

By Glen H. Fiedler
GLEN H. FIEDLER, Supervisor
Central Operations Division

RECORDED:
Volume 3, page 1150
Records of Change of
Point of Withdrawal
of Ground Water

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SNOHOMISH COUNTY, WASH.
DEPUTY

City of Arlington
City Hall - Bridge Olympic

OFFICIAL RECORDS
VOL 509 PAGE 675
ENGINEERING DATA
O.K.

Ground Water Permit No. 7041

CERTIFICATE OF GROUND WATER RIGHT

Recorded in the office of the State Supervisor of Water Resources, Olympia, Washington, in Book No. 11 of Ground Water Right Certificates, on page 5170-A, on the 2nd day of July 19 65.

STATE OF WASHINGTON,
County of _____ } ss.

I certify that the within was received and duly recorded by me in Volume _____ of Book of Water Right Certificates, at page _____, on the _____ day of _____, 19____

_____

STATE PRINTING PLANT OLYMPIA, WASH., 1964

S. F. No. 1361—1-64—3M. 85366.

1792799 1627 5/12 63

CERTIFICATE RECORD NO. 11 PAGE NO. 5170-A

STATE OF WASHINGTON, COUNTY OF Snohomish

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.

THIS IS TO CERTIFY *That* CITY OF ARLINGTON

of Arlington, Washington, *has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the ground waters of a* well

located within SE¼NW¼ (Arlington Airport)

Sec. 22, *Twp.* 31 *N., R.* 5 E. *W.M.,*

for the purpose of municipal and industrial supply

under and subject to provisions contained in Ground Water Permit No. 7041 *issued by the State Supervisor of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume* 11 *at page* 5170-A; *that the right hereby confirmed dates from* February 12, 1965; *that the quantity of ground water under the right hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 200 gallons per minute; 320 acre-feet per year for municipal supply (a population of 2,000 as of 1975) and industrial use.

Special provisions required by the Supervisor of Water Resources: A master meter, individual service meters or other suitable measuring devices shall be installed in this system to measure the total amount of the withdrawal.

A description of the lands to which such ground water right is appurtenant:

Area served by the City of Arlington

DEEDS RECORDED VOL. OF PAGE REQ. OF Dept of Natural Resources JUL 6 1965 AM 9 24 STANLEY DEBUQUE, AUDITOR SNOHOMISH COUNTY, WASH. DEPUTY

1 036139

Helen Bergan City Clerk - Arlington, Wash.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or premises hereinabove described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

In witness whereof, the seal and signature of the State Supervisor of Water Resources affixed this 6th *day of* July, 19 65.

STATE OF WASHINGTON DEPARTMENT OF CONSERVATION WATER RESOURCES

Robert H Russell
State Supervisor of Water Resources.

PROCESSING DATA

DEEDS VOL 890 PAGE 647

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
September 17, 1986	G1-24900	G1-24900P	G1-24900C

NAME
City of Arlington

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
238 North Olympic Avenue	Arlington	Washington	98223

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

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
--	580	*696.0

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal supply - continuously

*Supplemental to existing rights.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1000 feet north and 100 feet west from center of Section 2.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SE¼NW¼	22	31	5E	5	Snohomish

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by City of Arlington

City of Arlington
238 North Olympic Avenue
Arlington, WA 98223

RECORDED
89 SEP 28 AM 11:11
SNOHOMISH COUNTY, WASH.

8909280151

VOL. 2268 PAGE 0600

ECY 040-1-2 (Rev. 4-81) (SEE REVERSE SIDE) CERTIFICATE

PROVISIONS

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Prior to final approval and certification, the applicant must provide data to this office on the actual pumping capacity of the well and average daily pumping duration.

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

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

Given under my hand and the seal of this office at Redmond *Washington, this* 15th *day of* September, *19* 89.

ENGINEERING DATA
OK

Department of Ecology

by Herman H. Huggins
Herman H. Huggins, Section Supervisor Water Resources

FOR COUNTY USE ONLY

VOL. 2268 PAGE 0601

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23738. S. F. No. 369—1925. Approved as to Form by Dept. of Efficiency.

CERTIFICATE RECORD NO. One, PAGE NO. 194

STATE OF WASHINGTON, COUNTY OF Snohomish

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

This is to certify, that Puget Sound Power & Light Company, *of* Everett, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Stillaguamish River, *a tributary of* Stillaguamish River, *for the purposes of* domestic use, *under* Appropriation *Permit No.* 902, *of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* One, *at Page* 194, *on the* 21st *day of* June, *19* 27; *that the right hereby confirmed dates from* October 10, *19* 24; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* Five *cubic feet per second.*

A description of [redacted] *the place where such water is put to beneficial use, is as follows:*

Township	Range	Section	Forty-Acre Tract	[redacted]	[redacted]
31 N.	5 E.	2	SE¼ of the NW¼	Point of Diversion	

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 21st *day of* June, *19* 27.

State Supervisor of Hydraulics.

STATE OF WASHINGTON, } ss.
COUNTY OF THURSTON.

This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions: If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Hydraulic Engineer

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed --Five-----*cubic feet per second, or its equivalent in case of rotation. The priority date of this permit is* October 10, 1924

Actual construction work shall begin on or before May 23, 1928 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* May 23, 1929

Complete application of the water to the proposed use shall be made on or before October 23, 1929

WITNESS my hand this 23rd *day of* May, *19* 27.

R. K. TIFFANY
State Hydraulic Engineer.

This form approved by the State Hydraulic Engineer, 1917.

Application No. 1194 *Permit No.*

PERMIT

To Appropriate the Public Waters of the State of Washington

Filed by Puget Sound Power & Light Company / *County of* Snohomish

This instrument was first received in the office of the State Hydraulic Engineer, Olympia, Washington, on the 10th *day of* October, *19* 24, *at* 8:35 *o'clock* A. M.

Returned to applicant for correction

Corrected Application received *Approved* May 23, 1927

R. K. TIFFANY
State Hydraulic Engineer.

Before your certificate of water right is issued it will be necessary for you to fill out and file with the State Hydraulic Engineer a copy of the following reports:

1st. Notice of water right appl
2nd. Notice to begin construct
3rd. Notice of prosecution of with diligence.
4th. Notice of completion of construction.
5th. Notice of application of water to a beneficial use.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Hydraulic Engineer will issue a water right certificate.

Certificate # 194 issued June 31, 1927

*Permit No. .....

APPLICATION FOR A PERMIT

To Appropriate the Public Waters of the State of Washington

I, Puget Sound Power & Light Company (Name of Applicant),

of Everett (Postoffice), *County of* Snohomish,

State of Washington, *do hereby make application for a permit to appropriate the following described public waters of the State of Washington subject to existing rights:*

If the applicant is a corporation, give date and place of incorporation July 8, 1912, Massachussetts

1. *The source of the proposed appropriation is* Stillaguamish River (Name of stream), *tributary of* Stillaguamish River

2. *The amount of water which the applicant intends to apply to beneficial use is* Five *cubic feet per second.*

3. *The use to which the water is to be applied is* Domestic (Irrigation, power, mining, manufacturing, domestic supply, etc.)

4. *Time during which water will be required each year* Continuously

5. *The approximate point of diversion is located* North 7 degrees 54 minutes West (Give distance and bearing to section corner) Distance 397.0 feet from the center of Section 2, Township 31 North Range 5 E. W.M.

being within the SE¼ of the NW¼ (Give smallest legal subdivision) *of Sec.* 2, *Tp.* 31 N. (No. N. or S.), *R.* 5 E. (No. E. or W.), *W. M., in the county of* Snohomish

6. *The* pipe line (Main ditch, canal or pipe line) *to be* 150 feet ~~xxx~~ *in length, terminating in the* SE¼ of the NW¼ (Smallest legal subdivision) *of Sec.* 2, *Tp.* 31 N. (No. N. or S.), *R.* 5 E. (No. E. or W.), *W. M., the proposed location being shown throughout on the accompanying map.*

7. *The name of the ditch, canal or other work is* source of supply for the Town of Arlington, Snohomish County, Washington.

8. *Estimated cost of development necessary to fully utilize the appropriation herein asked for $* 26,000.00

DESCRIPTION OF WORKS.

DIVERSION WORKS—

9. (*a*) *Height of diversion dam* ..... *feet; length on top* ..... *feet; length at bottom* ..... *feet; material to be used and character of construction* ..... (Loose rock, concrete, masonry, rock and brush, timber crib, etc., wasteway over or around dam)

(*b*) *Description of headgate* Suction pipe in river. (Timber, concrete, etc., [illegible])

CANAL SYSTEM—

10. (a) *Give approximate dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: Width on top (at water line)* ..... *feet; width on bottom* ..... *feet; depth of water* ..... *feet; grade* ..... *feet fall per one thousand feet.*

(b) *At* ..... *miles from headgate: Width on top (at water line)* ..... *feet: width on bottom* ..... *feet; depth of water* ..... *feet; grade* ..... *feet; depth of water* ..... *feet; grade* ..... *feet fall per one thousand feet.*

.....

.....

.....

.....

FILL IN THE FOLLOWING INFORMATION WHERE THE WATER IS USED FOR:

IRRIGATION—

11. *The land to be irrigated has a total area of* ..... *acres, described as follows:* ..... (Give legal subdivision by section, township and range)

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... (If more space is required, attach separate sheet)

DUTY OF WATER—

12. *Character of soil: Depth* ....., *sandy* ....., *volcanic ash* ....., *loam* ....., *clay* ....., *Etc.* .....; *Annual precipitation* ..... *inches, precipitation during growing season* ..... *inches; Depth of irrigation water required* ..... (Expressed in feet or inches)

.....

.....

POWER, MINING, MANUFACTURING, OR TRANSPORTATION PURPOSES—

13. (a) *Total amount of power to be developed* ..... (Theoretical horsepower) *H. P.*

(b) *Total fall to be utilized* ..... (Head) *feet.*

(c) *The nature of the works by means of which the power is to be developed* .....

.....

.....

.....

(d) *Such works to be located in* ..... (Legal subdivision) *of Sec.* ....., *Tp.* ..... (No. N. or S.), *R.* ..... (No. E. or W.) *W. M.*

(e) *To what stream is the water to be returned* ..... *Sec.* .....,

(f) *Locate point of return* ..... *Tp.* ..... (No. N. or S.), *R.* ..... (No. E. or W.) *W. M.*

(g) *The use to which power is to be applied is*

MUNICIPAL SUPPLY—

14. *To supply the* ~~city~~ Town *of* Arlington (Name)

Snohomish *County, having a present population of* 2000

and an estimated population of 4000 *in 19*30.

15. *Estimated present requirement* 1 cu. foot per second

16. *Estimated future requirement* 4 cu. feet per second

17. *Construction work will begin on or before* October 15, 1924

18. *Construction work will be completed on or before* December 31, 1924

Duplicate maps of the proposed ditch or other works, prepared in accordance with the rules of the State Hydraulic Engineer, accompany this application.

Puget Sound Power & Light Co.
(Name of Applicant)
Northeastern District
Geo. Newell
Manager

Signed in the presence of us as witnesses:

(1) A. M. Chitty (Name), Everett, Washington (Address of Witness)

(2) Frances H. Durr (Name), Everett, Washington (Address of Witness)

Remarks:

STATE OF WASHINGTON, } ss.
COUNTY OF THURSTON. }

This is to certify that I have examined the foregoing application (Received (Date)*) together with the accompanying maps and data, and return the same* (Date of return)

for correction or completion as follows:

In order to retain its priority, this application must be returned to the State Hydraulic Engineer, with corrections, on or before , 19 .

WITNESS my hand this day of , 19 .

State Hydraulic Engineer.

23628. S. F. No. 380—1923. Appr[illegible] as to Form by Dept. of Efficiency.

Application No. ..... *Permit No.* 902

COUNTY OF Snohomish

RECEIVED

PROOF OF APPROPRIATION OF WATER

From Stillaguamish, *tributary of*

1. *Name* Puget Sound Power & Light Company
2. *Postoffice address* Arlington
3. *For what purpose is water used?* Domestic water supply
4. *Did you begin the actual construction of the* Pumping plant *ditch (or other distributing works described in said permit), on or before* Oct. 15th, 1923 -Yes ?
5. *Give the date of completion of such construction work* June 15th, 1925
6. *When was all the water completely applied to the proposed use?* June 15th, 1925
7. *The description of land given below corresponds to that found in your permit covering land to be irrigated, or, if for other purposes, the place of use. In the blank column on the right, headed "No. acres actually irrigated," fill in the number of acres you have irrigated in each of the tracts described.*

Township	Range	Section	Forty-Acre Tract	No. Acres Described in Permit	No. Acres Actually Irrigated
Not used for irrigation purposes					

8. *During what months is water beneficially used?* All year
9. *State the character of the soil and kind of crops raised* ----
10. *Does the map filed with your permit show correctly the location of diverting works and area of land where water is used?* Shows diverting works
11. *If not, state wherein such map is in error*
12. *If the dimensions of your ditch or dam do not correspond to those described in your permit and the plans and specifications now on file in the office of the State Supervisor of Hydraulics, state what changes have been made, giving dimensions of ditch (or other distributing works)* Original permit correct
13. *If water is used for power, mining, domestic, municipal, storage, manufacturing, or any other purpose than irrigation, give the extent and method of such use* All used for domestic purposes

PUGET SOUND POWER AND LIGHT COMPANY
By Geo. Newell
Manager, Northeastern District

STATE OF WASHINGTON,
County of Snohomish } *ss.*

I, Geo. Newell Manager N.E. Dist. Puget Sound Power & Light Co *, being first duly sworn, depose and say that I have read the above and foregoing proof of appropriation of water; that I know the contents thereof; and that the facts therein stated are true.*

IN WITNESS WHEREOF, I have hereunto set my hand this 11th *day of* June *, 192*7

Subscribed and sworn to before me this 11th day of June 1927.

[illegible]
Notary Public

Geo. Newell

23625. S. 1 No. 379—1923. Approv[illegible]s to Form by Dept. of Efficiency.

Notice of Complete Application of Water to a Beneficial Use

I, P Sound Power & Light Company, holder of Permit No. 902 issued by the State Supervisor of Hydraulics of Washington for the appropriation of 5 second-feet of the waters of the Stillaguamish River, in accordance with the tenor of such permit and the limitations endorsed thereon by the State Supervisor of Hydraulics, completely applied the waters a beneficial use on the 15th day of June, 1925, being within the time limitation as fixed in said permit or extended by the State Supervisor of Hydraulics for the complete application of water to a beneficial use.

If all water granted in the permit has not been fully applied to benefical use, give amount used in percentage to the whole, so that subsequent appropriators may have notice. If permit is for irrigation use, state per cent of lands not now watered.

Domestic water supply

IN WITNESS WHEREOF, I have hereunto set my hand this day of, 19

(Present Address)

Puget Sound Power & Light Co.,
(Signature of Applicant) N. E. District
By [signature]
Manager

Affidavit of Publication

STATE OF WASHINGTON, }
County of Snohomish, } ss.

I, C. L. Larsen being first duly sworn on oath depose and say: That I am the head clerk of the EVERETT DAILY HERALD, a daily newspaper printed and published in the City of Everett, County of Snohomish, and State of Washington; that said newspaper is a newspaper of general circulation in said County and State, and that the notice of water right application

a printed copy of which is hereunto attached, was published in said newspaper proper and not in supplement form, in the regular and entire edition of said paper on the following days and times, namely:—

four times October 14th to October 17th

and that said newspaper was regularly distributed to its subscribers during all of said period.

C. L. Larsen

Subscribed and sworn to before me this 20th day of October, 1924

[illegible]

Notary Public in and for the State of Washington, residing at Everett, Snohomish County.

Legal Notice

NOTICE OF WATER RIGHT APPLICATION

State of Washington.
Office of Supervisor of Hydraulics, Olympia.

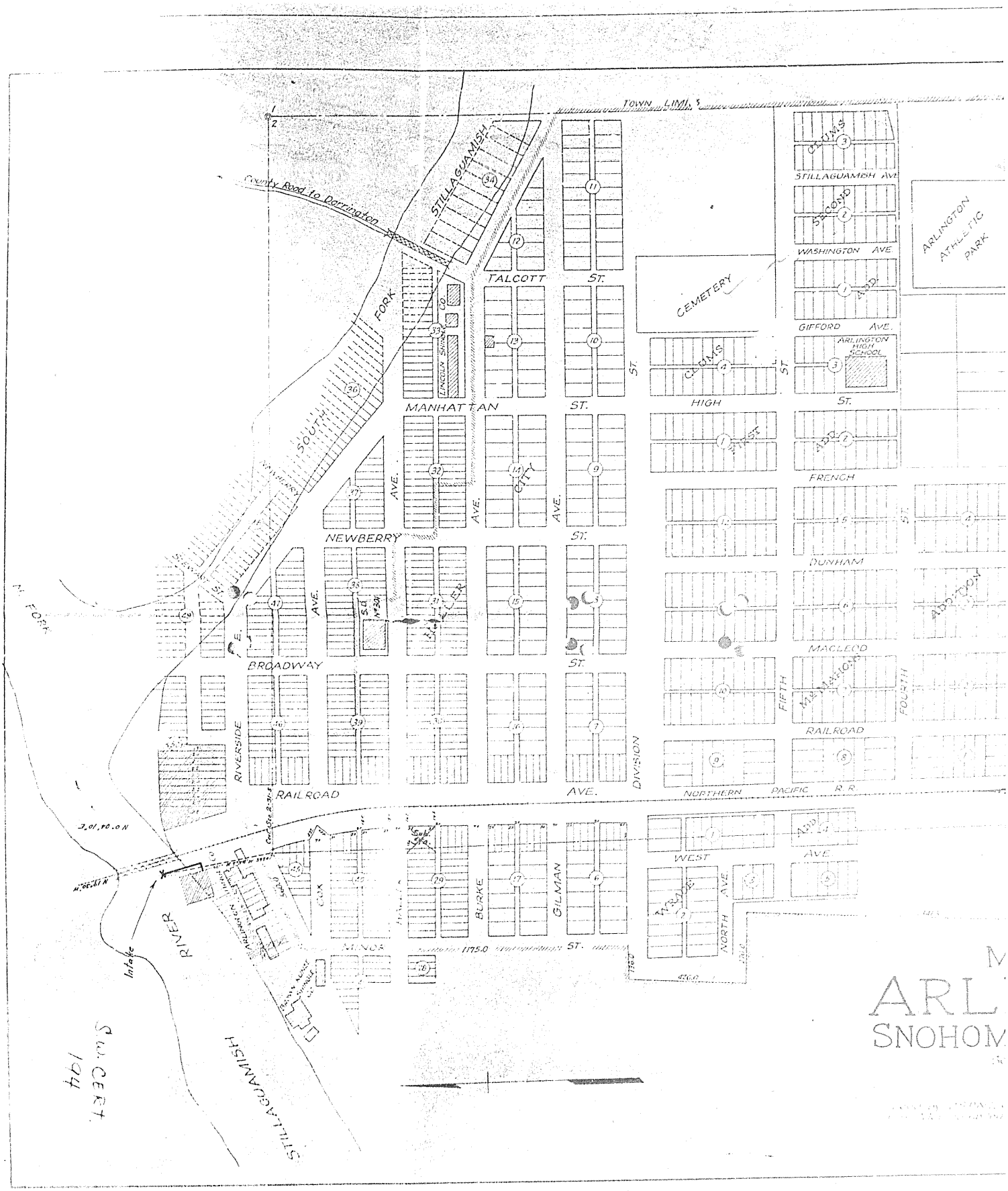
To Whom it May Concern:

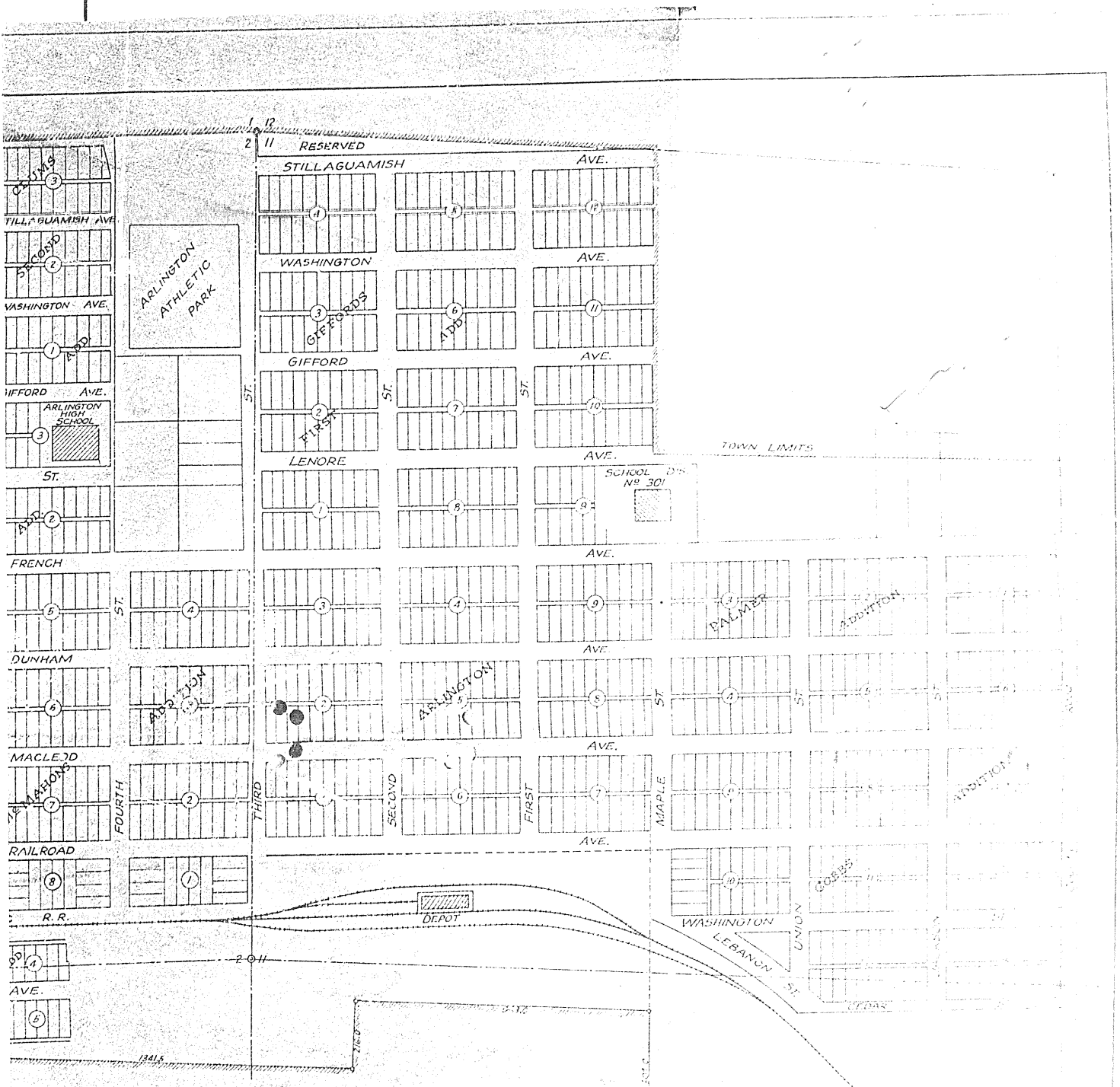
Notice is hereby given that Puget Sound Power and Light company, of Everett, County of Snohomish, State of Washington, under date of October 10, 1924, filed with the state supervisor of hydraulics, Olympia, Washington, an application for a permit to divert the public waters of Stillaguamish river, tributary of Stillaguamish river, in an amount of five second feet, subject to existing rights, continuously of each year, for the purpose of domestic supplies that the approximate point of diversion is located in se¼ of nw¼ of section 2, township 31 north, range 5 east, W. M. A map showing the location and dimensions of said canal and the place of the proposed diversion and use is on file in the office of the state supervisor of hydraulics, Olympia, Washington, together with such other information as is required by law.

Any person, firm or corporation whose right will be injuriously affected by the said application may file with the state supervisor of hydraulics, at Olympia, Washington, such objection or representations, in writing, as he may desire to make, within thirty (30) days after date of last publication, which date is November 15, 1924.

Witness my hand and official seal this 11th day of October, A. D. 1924.

(Seal) MARVIN CHASE,
State supervisor of hydraulics.


TOWN LIMITS
County Road to Darrington
STILLAGUAMISH
SOUTH FORK
TALCOTT ST.
MANHATTAN ST.
NEWBERRY ST.
BROADWAY ST.
RIVERSIDE AVE.
RAILROAD AVE.
DIVISION ST.
CEMETERY
CLUMS
STILLAGUAMISH AVE
SECOND
WASHINGTON AVE.
ADD.
GIFFORD AVE.
ARLINGTON HIGH SCHOOL
ARLINGTON ATHLETIC PARK
HIGH ST.
FIRST
FRENCH
DUNHAM
MACLEOD
ADDITION
FIFTH
FOURTH
RAILROAD
NORTHERN PACIFIC R.R.
WEST AVE.
NORTH AVE.
WRADE
COX
BURKE
GILMAN
MINOR ST.
1175.0
Intake
RIVER
STILLAGUAMISH
S.W. CERT. 194
ARL
SNOHOM



MAP OF
ARLINGTON
SNOHOMISH CO. WASH.

SCALE 1" = 200 FEET

Traced by P.S.P.&L. Co. Seattle Div. - Nov. 15th 1922.
From Map compiled by Coast Eng. Co. - Everett, Wash.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

JUN 11 2009

CERTIFIED MAIL
7007 3020 0000 3068 5106

City of Arlington
238 North Olympic Avenue
Arlington WA 98223

Re: Change to Water Right Claim Application No. CG1-300889CL(A)@1

Dear Sir or Madam:

Enclosed is a copy of the Department of Ecology's *Report of Examination for Change.* This report contains our decision regarding your application.

A copy of this *Report of Examination for Change* has been sent to the protestant(s).

Your application has been approved.

You must meet the provisions of your change authorization before we will issue a final *Certificate of Change of Water Right.* We are enclosing a *Proof of Appropriation of Water form* which is to be filed when the water has actually been put to full beneficial use. This form will need to include your County Assessor's Parcel Number and must be notarized. If you cannot put the water to full beneficial use by **December 31, 2028,** you must contact this office to apply for an extension.

You have a right to appeal this decision. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:

The Pollution Control Hearings Board
PO Box 40903
Olympia WA 98504-0903

OR Deliver your appeal in person to:

The Pollution Control Hearings Board
4224 – 6th Ave SE Rowe Six, Bldg 2
Lacey WA 98503

2. To serve your appeal on the Department of Ecology

Mail appeal to:

The Department of Ecology
Appeals & Relief Coordinator
PO Box 47608
Olympia WA 98504-7608

OR Deliver your appeal in person to:

The Department of Ecology
Appeals & Relief Coordinator
300 Desmond Dr SE
Lacey WA 98503

3. And send a copy of your appeal to:

Andrew B. Dunn
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue WA 98008

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov . To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser .

If you have any questions, please contact Noel Philip at 425-649-4451.

Sincerely,

Andrew B. Dunn, LG, LHG
Section Manager
Water Resources Program

AD/ng
CG1-300889CL(A)@1

cc: Mike Wolanek, Representative for City of Arlington

Enclosures: Report of Examination for Change
Proof of Appropriation of Water
Your Right To Be Heard

DEPARTMENT OF ECOLOGY
State of Washington

STATE OF WASHINGTON

PROTESTED REPORT OF EXAMINATION FOR CHANGE TO WATER RIGHT CLAIM

Water Right Control Number CG1-300889CL(A)@1

Purpose [X] Place of Use [X] Point of Diversion/Withdrawal [X] Season [ ] Consolidation [ ]

PRIORITY DATE	CLAIM NO.	PERMIT NO.	CERTIFICATE NO.
1931	300889CLA		

NAME
Arlington, City of

ADDRESS/STREET	CITY/STATE	ZIP CODE
238 North Olympic Avenue	Arlington, WA	98223

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	WRIA	COUNTY
Well	5	SNOHOMISH

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	135	72.18

QUANTITY, PURPOSE OF USE, PERIOD OF USE
72.18 acre-feet, Municipal, Seasonal (March 1- September 30), year-round
Of the 72.18 acre-feet authorized for change, 68.94 acre-feet are for seasonal (March 1 - September 30) use, and 3.24 acre-feet are year-round use.

Ecology performed a tentative determination of extent and validity to split vested water rights per Water Right Claim 300889CL into two separate claims: 300889CL(A) and 300889CL(B). A report of examination issued to file 300889CL(B) details the transfer of 50 gallons per minute (gpm) and 30 acre-feet per year (afy) of the claim to Noah Israel and Kay Crabtree (Godstream Technologies). The remaining volume and rate of water use is claimed by 300889CL(A) and transferred to City of Arlington as detailed in this report of examination.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Haller Well Field 160 feet north and 100 feet west of the center of Section 2, Township 31N, Range 05 E. W.M.

SOURCE	PARCEL	QTR/QTR	SECTION	TOWNSHIP	RANGE	COUNTY
Well 1R	00461804400000	SE/NW	2	31	05E	Snohomish Co.
Well 2	00461804400000	SE/NW	2	31	05E	Snohomish Co.
Well 3	00461804400000	SE/NW	2	31	05E	Snohomish Co.

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

The place of use (POU) of this water right is the service area described in the most recent Water System Plan/Small Water System Management Program approved by the Washington State Department of Health, so long as Arlington City is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

DESCRIPTION OF PROPOSED WORKS

As detailed in City of Arlington Water System Plan; prepared to satisfy Washington State Department of Health requirements.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
		December 31, 2028

PROVISIONS

STANDARD PROVISIONS

1. **Wells, Well logs and Well Construction Standards**

1.1. All wells constructed in the state shall meet the construction requirements of WAC 173-160 titled "Minimum Standards for the Construction and Maintenance of Wells" and RCW 18.104 titled "Water Well Construction". Any well which is unusable, abandoned, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard shall be decommissioned.

1.2. All wells shall be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

1.3. Installation and maintenance of an access port as described in WAC 173-160- 291(3) is required.

2. **Measurements, Monitoring, Metering and Reporting**

2.1. An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

2.2. Water use shall be recorded daily and submitted according to the guidelines in Section 2.6 (below).

2.3. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above or any other conditions set forth by Ecology, and to inspect at reasonable times any measuring device used to meet the above conditions.

2.4. Reported water use data shall be submitted via the Internet. To set up an Internet reporting account, access https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/. If you do not have Internet access, contact the Northwest Region Office for forms to submit your data.

2.5. WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements". http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

2.6. In order to maintain a sustainable supply of water, pumping must be managed so that static water levels do not progressively decline from year to year. Water levels shall be measured and recorded monthly, using a consistent methodology. The length of the pumping period or recovery period prior to each measurement shall be constant, and shall be included in the record. Data for the previous year shall be submitted by January 31 to the Department of Ecology.

Static water levels data shall be submitted in digital format and shall include the following elements:

1. Unique Well ID Number
2. Measurement date and time
3. Measurement method (air line, electric tape, pressure transducer, etc.)
4. Well status (pumping, recently pumped, etc.)
5. Water level accuracy (to nearest foot, tenth of foot, etc.)
6. Description of the measuring point (top of casing, sounding tube, etc.)
7. Measuring point elevation above or below land surface to the nearest 0.1 foot
8. Land surface elevation at the well head to the nearest foot.
9. Static water level below measuring point to the nearest 0.1 foot.

3. **Department of Health Requirements**
Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

4. **Municipal Place of Use**
If the criteria in RCW 90.03.386(2) are not met and a Water System Plan/Small Water System Management Program was approved after September 9, 2003, the place of use of this water right reverts to the service area described in that document. If the criteria in RCW 90.03.386(2) are not met and no Water System Plan/Small Water System Management Program has been approved after September 9, 2003, the place of use reverts to the last place of use described by The Department of Ecology in a water right authorization.

5. **Water Use Efficiency**
Use of water under this authorization shall be contingent upon the water right holder's maintenance of efficient water delivery systems and use of up-to-date water conservation practices consistent with established regulation requirements and facility capabilities.

FINDINGS OF FACT AND ORDER

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER the requested change to purpose and place of use, and point of diversion under Groundwater Change Application No. CG1-300889CL(A)@1, subject to existing rights and the provisions specified above.

You have a right to appeal this decision. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your *Notice of Appeal.*
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:	OR	Deliver your appeal in person to:
The Pollution Control Hearings Board PO Box 40903 Olympia WA 98504-0903		The Pollution Control Hearings Board 4224 – 6th Ave SE Rowe Six, Bldg 2 Lacey WA 98503

2. To serve your appeal on the Department of Ecology

Mail appeal to:	OR	Deliver your appeal in person to:
The Department of Ecology Appeals Coordinator P.O. Box 47608 Olympia WA 98504-7608		The Department of Ecology Appeals Coordinator 300 Desmond Dr SE Lacey WA 98503

3. And send a copy of your appeal to:

Andrew B. Dunn, LG, LHG
Section Manager
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Bellevue, WA 98008-5452

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov . To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser .

If you have any questions, please contact Noel Philip of Ecology at (425) 649-4451.

Signed at Bellevue, Washington, this 10th day of June, 2009.

Andy B. Dunn, LG, LHG
Section Manager
Water Resources Program
Northwest Region Office

INVESTIGATOR'S REPORT
Noel S. Philip, LG, Department of Ecology
Water Right Control Number CG1-300889CL(A)@1

BACKGROUND

Description and Purpose of Proposed Change

City of Arlington is acquiring water from Split Claim 300889CL(A). Ecology processed a change request in 2006 to split and transfer a portion of the parent claim (300889CL), resulting in two claims 300889CL(A) and CG1-300889CL(B). Water Right Claim 300889CL(B) is authorized for 50 gallons per minute (gpm) and 30 acre-feet per year (afy). The amount of water available in Water Right Claim 300889CL(A) is based on the appropriated volume and rate Donald A and Beverly J. Klein put to beneficial use less the amount authorized for claim 300889(B). WestWater Research, a consultant firm retained by City of Arlington, compiled evidence including photographs, utility records, affidavits, etc. in its report to City of Arlington in 2007 detailing Kleins' water use. The purpose, point of diversion, and place of use are subject to change with this application.

Attributes of the Change Application and Proposed Change

Table 1. Summary of Proposed Changes to Water Right Change Application No. 300889CLA@1

Attributes	Existing	Proposed
Name	Donald A. and Beverly J. Klein	Arlington City
Priority Date	1931	
Date of Application for Change	February 26, 2007	
Instantaneous Quantity	135 gpm	135 gpm
Annual Quantity	72.18	72.18
Source	well	Well 1R (emergency Well) Well 2 Well 3
Point of Withdrawal	Approx. 1600 feet North and 1800 feet east From SW corner of Sec. 35	Haller Well Field: SE/NW T31N/R05E-2
Purpose of Use	IR, ST, DM	MU
Period of Use	Seasonal, year-round	Seasonal, year-round
Place of Use	NE/SW T32N/R05E-35	Detailed in City of Arlington water system plan

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed change in purpose, point of diversion, place of use, and season of use.

- **Public Notice**

  ArlingtonTimes, December 5 and 12, 2007. Tulalip Tribes protested the application. Discussion of the protest is found on Page 10 of this Report of Examination.

- **State Environmental Policy Act (SEPA)**

A water right application is subject to a SEPA threshold determination (i.e., an evaluation whether there are likely to be significant adverse environmental impacts) if any one of the following conditions are met.

- It is a surface water right application for more than 1 cubic feet per second, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cubic feet per second, so long as that irrigation project will not receive public subsidies;
- It is a groundwater right application for more than 2,250 gallons per minute;
- It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above;
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA);
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

Because this application does not meet any of these conditions, it is categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion, place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights.

The Washington Supreme Court has held that Ecology, when processing an application for change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*

RCW 90.03.380 states the holder of the right may change the manner or purpose of use. A change in the purpose of use can be approved only after the water has first been applied to beneficial use.

RCW 90.44.100(1) states that a ground water permit can be amended to replace or add wells.

INVESTIGATION

History of Water Use

The history of use by Donald A. and Beverly J. Klein is documented back to 1931. A compilation of data providing evidence of this assertion is presented in a report from WestWater Research, a consultant retained by the applicant. Ecology verified the methods of calculating beneficial use quantities and evidence of historic use.

Department of Ecology (Ecology) personnel investigated Water Right Claim 300889 to tentatively determine the actual quantity Donald Klein (Klein) historically put to beneficial use on the property formerly farmed and used to keep stock (through 2004). While ultimate quantities hadn't been quantified, Ecology determined enough water existed to process a water right split-claim change application (CG1-300889CL(B)). Noah Israel and Kay Crabtree (Crabtree) received a portion of the water right claim in the amounts of 50 gallons per minute (gpm) and 30 acre-feet per year (afy). The water right is in permit status as a Report of Examination on file with Ecology. Klein holds a Certificate of Change to Water Right Claim CG1-300889CL(A) authorizing a 300 gpm and 90 afy withdrawal.

City of Arlington submitted water right split-claim change application to Ecology February 26, 2007, to transfer ownership of the remaining right, and appurtenance from the Klein farm acreage to its municipality. The application seeks change to the purpose and place of use, and point of withdrawal.

Ecology determined same source with respect to the Klein and Crabtree points of withdrawal. While in relatively close proximity to one another, investigation is made to determine whether the same can be stated for the City of Arlington and Klein points of withdrawal and their relative affect on the Stillaguamish River.

The period of use varies due to the nature of the multiple applications of water on the dairy farm Klein historically operated at this place of use. Thus, a portion (68.94 afy) is designated seasonal (March 1 - September 30), and 3.24 afy designated year-round (Table 3). The season of use is taken from a climate station close to Arlington found in the December 17, 1992 update to the 1985 version of the Washington Irrigation Guide.

Proposed Use

City of Arlington seeks a change to the claim to provide water for municipal purpose.

Other Rights Appurtenant to the Place of Use

The Department of Ecology Water Rights Application Tracking System (WRATS) and Well Log databases show the existence of 3 water right certificates, and 13 water right claims within a 1/2-mile radius of Haller Well Field. At least four of the 10 wells of record within one half mile are likely tied to these water rights, and some are likely exempt from the application process. Still others may be sources for existing water right certificates or claims under a different name.

A water right claim is a statement describing the beneficial use of water occurring prior to the adoption of the water right codes and is not authorized by a state-issued permit or certificate. It is unknown whether the nearby claims are valid, not valid, or once valid and now relinquished back to the state. The Department of Ecology cannot verify the validity of these claims, as water right claims can only be confirmed in an adjudication by the Washington State Superior Court. Thus, no investigation is made into their validity. Exempt withdrawal of public groundwater is defined in RCW 90.44.050.

Hydrologic/Hydrogeologic Evaluation

Snohomish County/WRIA 5 Hydrogeology

Snohomish County extends westward from Cascade Mountain Range to Puget Sound. WRIA 5 is an administrative area assigned to coincide with the Stillaguamish River watershed. Newcomb describes the geology and occurrence of groundwater in USGS Water Supply Paper 1135. USGS Professional Paper 1424-C released in 1999 corroborates Newcomb's analysis at a smaller, regional scale.

The formerly glaciated topography shows features commonly associated with such events. In the lowlands, unconsolidated units mantle pre- Tertiary and Tertiary materials. These include Vashon Drift members showing generally horizontal stratification and great lateral extent. Among these are quaternary glacial till of Pleistocene age, along with Admiralty and Pilchuck Clays and Esperance Sands. Unconsolidated sediments transition generally eastward to pre-Vashon deposits in the foothills, and further east to older volcanic, igneous, and metamorphic rocks in the mountainous side of the county. The largest streams run west and northwest to Puget Sound and the geology shows typical geomorphic activity associated with large river valleys; each is home to a continuous veneer of alluvium.

Most wells produce from beneath the Vashon glacial till from sand and gravel aquifers where they are positioned to receive percolating precipitation and store groundwater. Wells tapping ancient stream channels and more recent alluvium also produce in quantities sufficient to sustain single- and multi- family development depending on well construction. However, these wells are typically in direct hydraulic continuity with nearby streams and have an impact on local instream flow in many cases. Wells completed in igneous and metamorphic upland rock formations are not typically viable unless they penetrate a fractured area that holds a groundwater body.

Hydrogeology Near CG1-300889CL(A)@1

The Arlington well described by Newcomb in 1952 is part of the Haller Well Field, less than 500 feet from the confluence of the North and South Forks of the Stillaguamish (Attachment 1). Three production wells are currently completed approximately 36 feet below ground surface (bgs), within 50 feet of one another. Wells 2 and 3AB are the primary supply wells, and Well 1R is the designated emergency well. A fourth well, Well 1, was decommissioned in May, 2002 (Ecology Well Log Notice of Intent #A43038). These and the Klein wells, described in Table 1, withdraw water from the same source: an unconfined aquifer in direct hydraulic connection with the Stillaguamish. Geology mapped in Newcomb's report shows the Stillaguamish sand member extending throughout the river valley. The Stillaguamish sand member is sand, silt, clay, and gravel deposited in the valley to thicknesses of 300 feet. It is classified a moderate producing hydrogeologic unit in areas where material is coarser.

The well logs from the Klein property and Arlington's wells describe material downhole closely resembling that described in the Newcomb report. This serves as a check to local conditions described in the report because it used one of Arlington's wells as a well representative of the area. All wells discussed in this memo produce water from a screened interval (or open bottom) in a zone of sand and gravel.

A report submitted by Pacific Groundwater Group in November, 2002, details the lithology to 38 feet below ground surface (bgs) at Well 1R. The Stillaguamish sand member terminates at 35 feet bgs upon the occurrence of low-grade metamorphic bedrock.

Table 2. Wells of interest in the split to Claim CG1-300889CLA@1.

Owner	Name	Well Tag	Completion Date	Completion Depth	Casing Diameter[0]	Wellhead MSL[1]	Static Water MSL	Screened Interval MSL
Arlington	Well 2	AGB 953	12/1961	36	36	72.8[2]	53[2]	38-50
Arlington	Well 3[3]	AGB 951	1921[2]	36	72	72.8[2]	53[2]	38-50
Arlington	Well 1R	AFT 307	5/8/2002	38	20,16,18	72.8[2]	DNA	39-45
Klein		AGO 219	8/1/2001	35.5	6	62[1]	58[5]	open bottom
Klein		207038[4]	2/3/1993	36	6	62[1]	56[5]	open bottom

Notes:

DNA = Did not attempt. Ecology personnel measured static water level with e-tape 11/05/2008.

0) Units are inches

1) MSL= feet relative to mean sea level; taken from Ecology GIS database Zone 10 DEM

2) information reported by applicant

3) Well 3 is fitted with two pumps Ecology Well Log database Notice of Intent (start card) no.

4)Ecology Well Log database Notice of Intent (start card) no.

5) Taken from Ecology Well Log Database well log image files and converted to elevation

Water Availability, Pump Test Data (PGG, 2002)

Arlington has been pumping water from the Haller Well Field (point of withdrawal) for decades, and a typical constant rate pumping test to determine water availability and aquifer productivity is not necessary. It is sufficient to observe the results from extended pumping to determine adequacy of availability. However, it is helpful to make determinations regarding drawdown at distance from the point of withdrawal to ascertain whether there is risk of impairment to water rights in the immediate vicinity. To that end, this report looks to data recorded during a pumping step test Pacific Groundwater Group (PGG) performed in Well 1R during 2002. It provides more recent insight into the aquifer characteristics and its ability to transmit and store water.

A step drawdown test that included an extended final step (over four hours), shows Well 1R sustained a withdrawal rate of 570 gpm during the final 240 minutes of the test. Water levels in the pumped well declined approximately 6.5 feet, reaching this level in 240 minutes. The report contains no raw data, but Figure 2 shows recovery occurring rapidly to pre-pumping conditions. The remainder of the image shows a plot of background water levels and pumping step test water levels. It is noteworthy how closely (and how rapidly) the water levels in the wells respond to Stillaguamish River stage. It is a more realistic indicator of the city's ability to pump water from all three wells at once with respect to instream flows. The PGG report discusses the inability of the well field to produce from all three wells at their maximum pumping capacity in periods of low stage in the river, and mitigating pumping schemes during these times.

The pump step test data confirm the source of these wells is the Stillaguamish River. The groundwater source of the Klein withdrawal is known to be in direct hydraulic continuity with Armstrong Creek, a named tributary of the South Fork Stillaguamish River in WAC 173-505-040[1], the administrative rule setting minimum flows in the Stillaguamish through the year. It is important to note Armstrong Creek is a tributary stream of the Main Stem Stillaguamish. Thus, the water source for these two withdrawals is the same, as it pertains to this change application.

Impairment Considerations

Drawdown of approximately 9 inches in Well 1 during the test approximately 25 feet from the pumping well (Figure 2) shows how the aquifer responds at distance within the well field between wells.

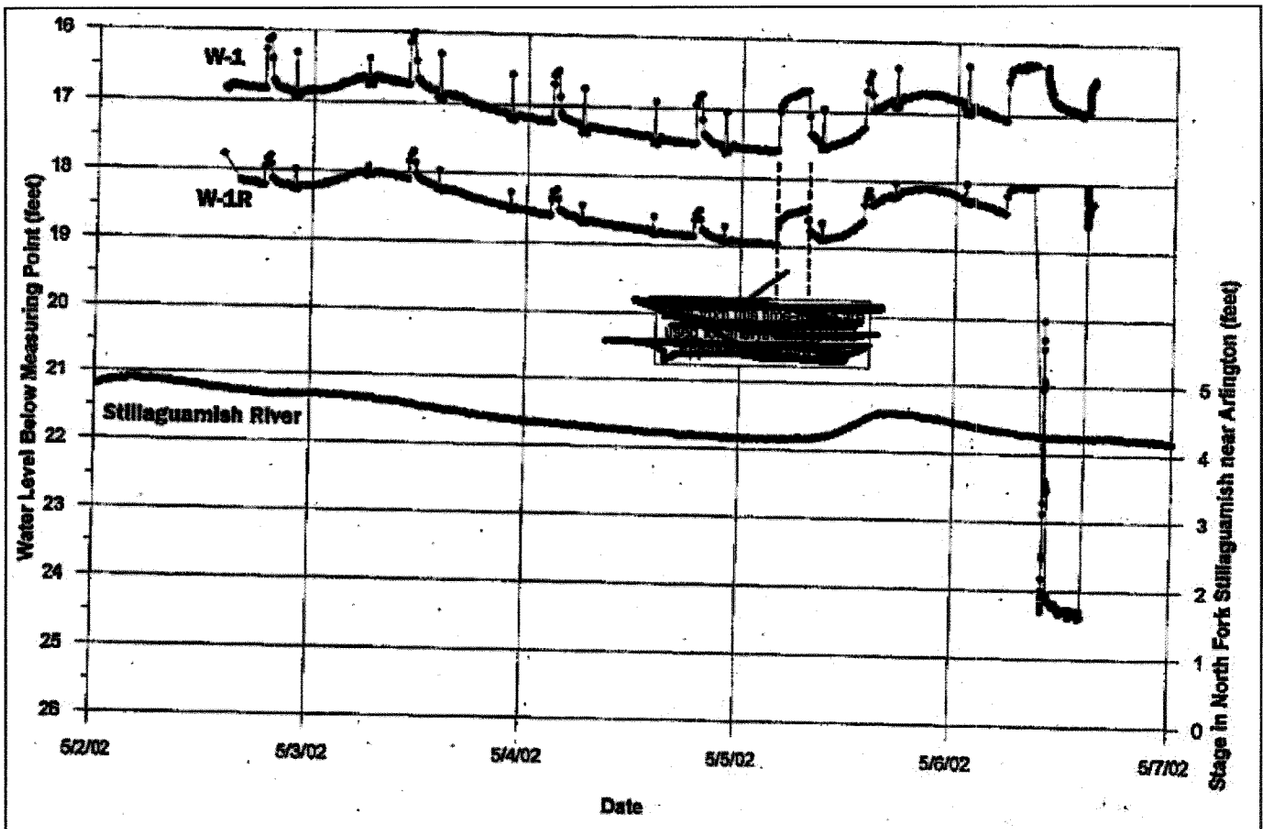

Figure 2. Pumping step test data showing close correlation between water levels in wells and river stage. W-1 is Well 1, W-1R is Well 1R. Modified from PG&G, 2002.

Extrapolating this response shows negligible theoretical drawdown outside the well field. Washington water law does not consider drawdown to be an impairment of existing water rights, unless the affected wells fully penetrate the aquifer and can no longer produce their allocations. Therefore, impairment to any senior water rights due to pumping at the Haller Well Field wells is unlikely.

Impairment, Qualifying Ground Water Withdrawal Facilities, and Well Interference

There are three concepts that are important when considering whether a withdrawal of water from a well would impair another existing water right. The concepts are defined as follows:

Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection i.e. water rights that are both senior and junior in priority to the right the applicant seeks to change.

Qualifying ground water withdrawal facilities are defined as those wells which in the opinion of the Department are adequately constructed. An adequately constructed well is one that (a) is constructed in compliance with well construction requirements; (b) fully penetrates the saturated thickness of an aquifer or withdraws water from a reasonable and feasible pumping lift (WAC 173-150); (c) the withdrawal facilities must be able to accommodate a reasonable variation in seasonal pumping water levels; and (d) the withdrawal facilities including pumping facilities must be properly sized to the ability of the aquifer to produce water.

Well interference may occur when several wells penetrate and withdraw ground water from the same aquifer. Each pumping well creates a drawdown cone. When several wells pump from the same aquifer, well density, aquifer characteristics, and pumping demand may result in individual drawdown cones that intersect and form a composite drawdown cone. At any point in an aquifer, the composite drawdown caused by pumping wells will be greatly influenced by the transmissivity (T) of the aquifer. In aquifers with high Ts, composite drawdown will generally be much less than in aquifers with similar properties but with low Ts. Transmissivity is related to hydraulic conductivity (K) and the saturated thickness (b) of an aquifer by the relationship T=Kb.

An aquifer's hydraulic conductivity (K) is derived from the physical properties of both the fluid and geologic materials that form an aquifer. Once formed, an aquifer's saturated thickness (b) becomes important in evaluating its transmissivity. For regions of similar K in an aquifer, a large saturated thickness will result in a much higher T than a small saturated thickness. As a result, regions of similar K in an aquifer with a large saturated thickness will experience less composite drawdown or well interference than with a small saturated thickness.

Some conditions, however, will increase or steepen composite drawdown in an aquifer. For instance, where characteristics (such as very fine, clay-rich, or poorly sorted sediments) of an unconfined aquifer cause significant drawdown relative to the saturated thickness, the composite drawdown will increase as saturated thickness is reduced and T becomes smaller. Additionally, in regions where negative or no-flow boundaries occur, such as near the edges of a valley fill aquifer where it is bounded by bedrock, composite drawdown will be steeper than in the central part (generally the greatest thickness region) of the aquifer. Consequently, it is commonly understood that the greatest composite drawdown or well interference is more likely to occur in regions of low transmissivities, thin saturated thicknesses and near negative or no-flow boundaries than in regions of high transmissivities, large saturated thicknesses, and away from negative or no-flow boundaries.

Enlargement

The City of Arlington is receiving a transferred quantity based on a tentative determination of extent and validity. Only that water put to beneficial use is transferred, and only that amount is authorized to be withdrawn (by this authorization) from the wells in Haller Well Field. Thus, no enlargement is anticipated.

Public Interest Considerations

Factors considered in determining whether this use of water is in the public interest include but were not limited to: consideration given to exempt wells; existing water right certificates, applications, and claims; potential impacts to the aquifer subject to withdrawal as it pertains to drawdown and water quality (i.e. aquifer degradation); beneficial use of water as a resource defined in this report. No detriment to the public interest could be identified during the investigation of the subject application. Available data show existing wells in the area are not expected to be impaired by the anticipated operation of the subject wells.

Consideration of Protests and Comments

Tulalip Tribes submitted a protest April 30, 2007, detailing a number of concerns regarding this change application. They are identified and addressed individually for clarity and completeness in addressing the protestant's arguments:

"...Tulalip objects to the transfer of a groundwater claim used seasonally for irrigation and year round for three homes to year round municipal uses. This action changes a claim, which is subject to relinquishment, to a municipal water right which is not subject to relinquishment." A water right is relinquished if it endures 5-year period of unjustifiable non-use, and is thus not a water right. There is tentatively established beneficial use from the present extending back in time to 1931. The water right in question is not subject to relinquishment. The seasonality of the change from irrigation to municipal supply is discussed elsewhere in this report.

"...seasonal use of the majority of the claimed water for irrigation would at least return water to the groundwater system." Wastewater from Arlington is channeled away from the city via surface water, a source shown to be in direct hydraulic connectivity with groundwater in the river basin.

"...we find that Arlington, with its ability to purchase water from Snohomish PUD and Marysville, does not need the transfer..." The ability to purchase water is not a vested water right. The city still has a right to apply for change to existing rights and augment its supply to provide water for its population growth estimates supported in documentation in a water system plan. While it's possible the city may have water rights adequate for the present, they have demonstrated a determined future development in their water system plan requiring the acquisition of additional water rights to provide for their citizens in the future.

Tulalip Tribes are worried withdrawal will negatively affect summer flows in the Stillaguamish. The season of irrigation use is March 1 to September 30 each year. Arlington is within its rights to pump during the summer regardless of flows, due to the seniority of the water right to instream flows.

CONCLUSIONS

The Klein claim (300889CLA) is tentatively determined valid in the amounts given below (Table 3) for irrigation (seasonal use), stockwatering, and domestic purposes ("Classification column" and associated figures). West Water Research arrived at the values based on water use data not including metering data, and affidavits from the water right holder. A portion of water was split from the original claim and transferred in change G1-300889CL(B). The remainder is transferred to City of Arlington in this decision.

The water split from the original claim and subsequently transferred to Water Right Claim 300889CL(B) was for development of 35 homes, stockwatering, and irrigation. Annual water allocation required by an applicant for year

round domestic purpose of use is calculated using the number of anticipated connections and water use per connection. Residential water use is based on historical and current data from similarly-sized water systems. Presently, these systems indicate average use per connection is approximately one-third (0.3) acre-foot per year. At this rate, the annual water quantity required by the holder of claim 300889(B) to serve 35 residential connections is 10.5 acre-feet per year. This year round use absorbs most of the available water for year round use in the Klein claim. The remainder (19.5) is for stockwatering and seasonal irrigation, transferred from the irrigation portion of the Klein claim. The total transferred to 300889CL(B) was 30 afy. The instantaneous withdrawal rate transferred was 50 gpm.

There remains 3.24 afy to transfer to City of Arlington for year round use (combining stockwatering, dairy activities, and domestic uses), and 68.94 afy are classified seasonal (irrigation).

Table 3. Destination of available water in Water Right Claim 300889 based on purposes of use.

Classification	Used by Klein	GPM	Transferred to 300889CL(B)	Transferred to 300889CL(A)
Instantaneous		185	50 gpm	135 gpm
Irrigation	88.44		19.50	68.94
Stock Water	10.78		10.5	0.28
Dairy Activities	1.46		0	1.46
Domestic	1.50		0	1.50
Total	102.18		50 gpm, 30 afy	135 gpm, 72.18 afy

Note:
1) Units are acre-feet per year (afy) unless otherwise indicated.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to Water Right Claim 300889CL(A) be approved in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial:

- 135 gpm
- 72.18 acre-feet per year: 68.94 seasonal (March 1 - September 30), 3.24 year-round.
- Municipal Supply

Point of Withdrawal

SE¼, NW¼, Section 2, Township 31 North, Range 05 E.W.M.

Place of Use

As described on Page 1 of this Report of Examination.

Report by: _____ Date 06/10/2009
Noel S. Philip, LG
Water Resources Program

References

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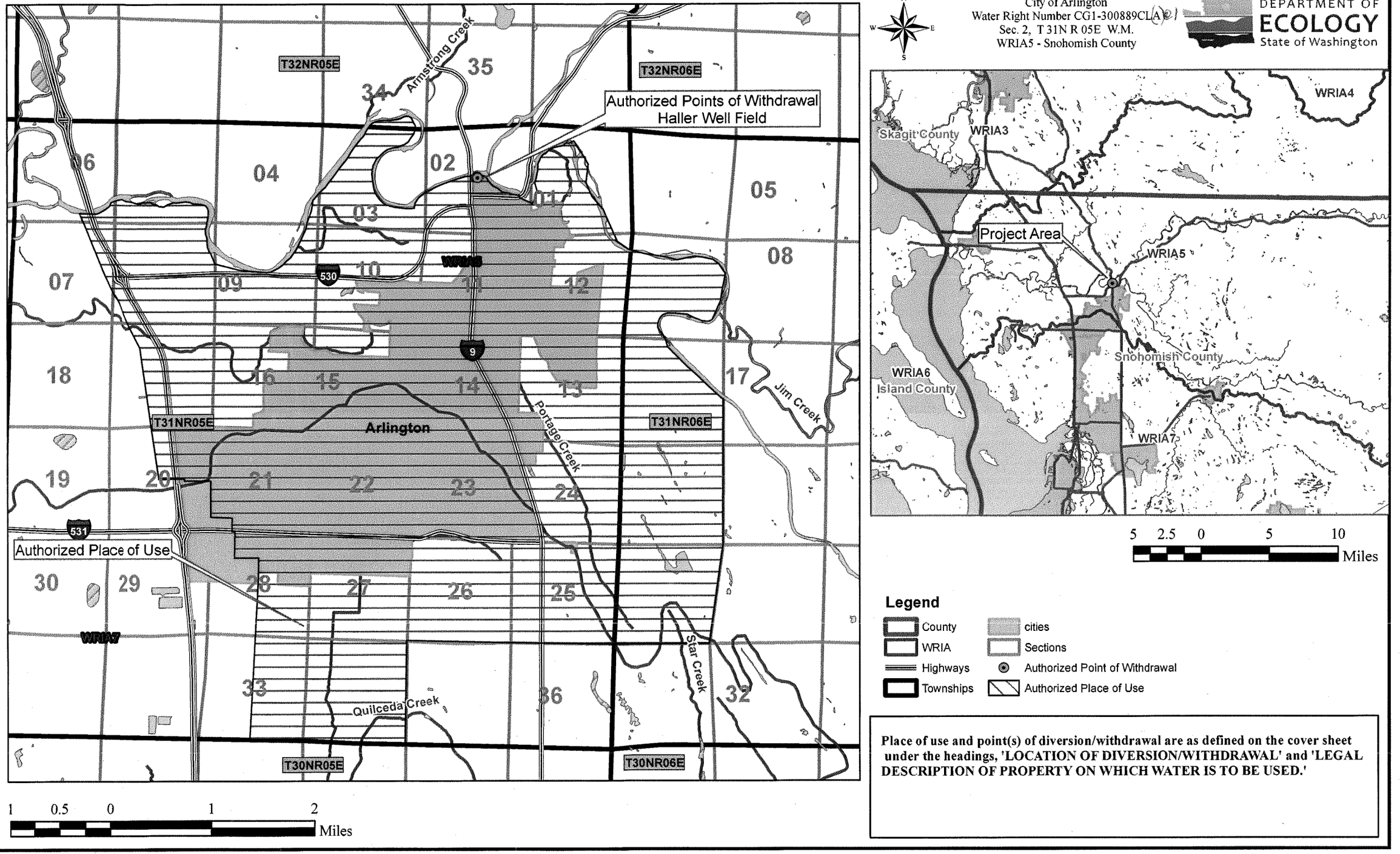
If you need this publication in an alternate format, please call Water Resources Program at (360) 407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.



Place of use and point(s) of diversion/withdrawal are as defined on the cover sheet under the headings, 'LOCATION OF DIVERSION/WITHDRAWAL' and 'LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED.'

Attachment 1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
*Change Application CG1-*02115C*
To Groundwater Certificate 1488

PRIORITY DATE	CLAIM NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
September 4, 1951			*1488-A*

NAME
City of Arlington

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
154 Cox Avenue	Arlington	WA	98223

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Three wells in the City of Arlington Haller Wellfield
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	90	40

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Water Supply
- *Continuously April 16 to September 30*
- *Interruptible October 1 to April 15 subject to meeting minimum instream flows established under WAC 173-505-040*

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Haller Wellfield: 2,900 feet north and 2,770 feet west from the SE Corner of Section 2, T.31N., R.5E., W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SE 1/4 NW 1/4	2	31N.	5E.	5	Snohomish

PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
31050300101000	48.2029 N	122.1284 W	NAD83

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Arlington as described within the most recently approved Water System Plan

DESCRIPTION OF PROPOSED WORKS

The City of Arlington's water system consists of three wells in the Haller Wellfield (Wells 1, 2, and 3), the Airport Well, water treatment and disinfection facilities, distribution system piping, pumps, and meters. The system has been constructed and is in use.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Completed (infrastructure in place)	*N/A*	*N/A*

PROVISIONS

This authorization for change is issued subject to all applicable State laws and regulations and to the following provisions:

1. The quantities transferrable through this change are an instantaneous quantity of 90 gpm and an annual quantity of 40 AF/yr, subject to minimum instream flows outside of the irrigation season for pasture/turf (October 1 through April 15), as established for the Mainstem of the Stillaguamish River as provided in Table 2 under WAC 173-505-050.

2. All wells constructed in the state shall meet the "Minimum Standards for the Construction and Maintenance of Wells" (WAC 173-160) and "Water Well Construction" (RCW 18.104). In general, wells shall be located at least 100 feet from sources of contamination and at least 1,000 feet of the boundary of a solid waste landfill. Any well which is unusable, abandoned, or is an environmental, safety, or public health hazard shall be decommissioned.

3. All wells shall be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

4. Required installation and maintenance of an access port as described in WAC 173-160- 291(3).

5. An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

   Water use data shall be recorded weekly. The maximum monthly instantaneous rate of diversion/withdrawal and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of monthly meter readings to collect seasonal information for water resource planning, management and compliance.

   The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

   Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

   Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

   Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

6. This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project. Phone: (360) 570-3265. The mailing address is: Department of Revenue, Real Estate Excise Tax, PO Box 47477, Olympia WA 98504-7477 Internet: http://dor.wa.gov/ E-mail: REETSP@DOR.WA.GOV.

7. If the criteria in RCW 90.03.386(2) are not met and a Water System Plan/Small Water System Management Program was approved after September 9, 2003, the place of use of this water right reverts to the service area described in that document. If the criteria in RCW 90.03.386(2) are not met and no Water System Plan/Small Water System Management Program has been approved after September 9, 2003, the place of use reverts to the last place of use described by The Department of Ecology in a water right authorization.

8. Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

9. The water right holder is required to maintain efficient water delivery systems and use of up-to-date water conservation practices consistent with RCW 90.03.005.

10. A superseding certificate shall be issued upon a showing that sufficient infrastructure is in place at the new point of withdrawal to accommodate the additional Qi and Qa that results from this decision.

FINDINGS OF FACT AND DECISION

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER the requested change under Ground Water Change Application No. CG1-*02115C be approved, subject to existing rights and the provisions specified above.

You have a right to appeal this decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov . To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser .

Signed at Bellevue, Washington, this 4th day of April, 2012.

Jacqueline Klug, Section Manager
Water Resources Program
Northwest Regional Office

BACKGROUND

The City of Arlington (City) submitted change application CG1-*02115C for Certificate 1488 on March 23, 2010. The City entered into a cost reimbursement agreement with the Department of Ecology to process this application for change along with two other applications for change. This report of examination was prepared by Golder Associates Inc. through Ecology's Cost-Reimbursement Program.

The City also submitted two applications for change along with this application for change:

- Application for change CS1-18929C (Certificate 10024) seeks to transfer 269 gpm (0.60 cfs) and 125 AF/year from an irrigation and stockwatering right to the City for the purpose of municipal water supply
- Application for change CS1-10680C (Certificate 5983) seeks to transfer 112 gpm (0.25 cfs) and 50 AF/year from an irrigation right to the City for the purpose of municipal water supply

These two change applications are being processed concurrently with this application.

Description and Purpose of Requested Change

The City purchased an irrigation water right and proposes to transfer the water to the City's existing points of withdrawal at the Haller Wellfield for the purpose of year round municipal water supply within the City's water service area.

Attributes of the Certificate and Proposed Change

Attributes of the Original Certificate

Owner name	Linda Neunzig
Name on Certificate:	P.V. Robertson
Priority Date:	September 4, 1951
Instantaneous Quantity:	90 gallons per minute (gpm)
Annual Quantity:	40 acre-feet per year (AF/yr)
Point of Withdrawal:	T31N R5E Sec 3, SE ¼ NE ¼
Purpose of Use:	Irrigation of 30 acres
Period of Use:	Not Specified
Place of Use:	Beginning at a point on east and West Quarter line 15 feet west of East of section; thence North 968 feet; thence West to Easterly bank of Stillaguamish River; thence Southerly along said Easterly bank to an intersection with said East and West quarter line; thence East to point of beginning, Sec. 3, Twp. 31 N., Rge. 5 E.W.M.

Proposed Change

Name of Applicant:	City of Arlington
Date of Application for Change:	March 23, 2010
Points of Withdrawal:	SE¼ NW¼ of Section 2, Township 31 North, Range 5 East (Haller Wellfield)
Purpose of Use:	Municipal Water Supply
Period of Use:	Continuously
Place of Use:	Area served by the City of Arlington as described within the most recently approved Water System Plan
Notice of Publication:	The Everett Herald, July 21, 2010 and July 28, 2010
Protests:	None

Legal Requirements for Proposed Change

- **Water Resources Statues and Case Law**

This application is subject to legal requirements in statute, administrative rules, and relevant case law which must be considered prior to issuance of the requested change(s). Among these legal requirements:

- The Washington State Supreme County has held that Ecology, when processing an application for a change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*
- RCW 90.03.380(1) allows for a water right that has been put to beneficial use to be changed. The point of diversion, place of use, and purpose of use may be changed if the change would not result in harm or injury to existing water rights.
- RCW 90.14.160 states that any person entitled to divert water through an appropriation authorized through a general adjudication, who abandons or voluntarily fails, without sufficient cause, to divert all or any part of said right for a period of five successive years after July 1, 1967, shall relinquish such right or portion thereof, to the state.
- RCW 90.44.100 allows Ecology to amend a ground water permit or certificate to (1) allow the user to construct a replacement or additional well at a new location outside of the location of the original well, or to (2) change the manner or place of use of the water, if:

  (a) The additional or replacement well taps the same body of public ground water as the original well. RCW 90.44.100(2)(a),

(b) Where a replacement well is approved, the user must discontinue use of the original well and properly decommission the original well. RCW 90.44.100(2)(b),
(c) Where an additional well is constructed, the user may continue to use the original well, but the combined total withdrawal from all wells shall not enlarge the right conveyed by the original permit or certificate. RCW 90.44.100(2)(c),
(d) Other existing rights shall not be impaired. RCW 90.44.100(2)(d).

- **Public Notice**

  Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

- **State Environmental Policy Act (SEPA)**

  This application is exempt from the provisions of the State Environmental Policy Act (SEPA), Chapter 43.21 RCW, due to the fact that the cumulative quantity of water constitutes a withdrawal of less than 2,250 gallons per minute (gpm) of groundwater (WAC 197-11-800(4)).

INVESTIGATION

In considering this application, the investigation included, but was not limited to, research and/or review of:

- Ecology's online Water Rights Tracking System (WRTS) database
- Records of water rights in the vicinity
- Ecology's online Well Log Database
- Topographic and local area maps
- Site visit
- LANDSAT photographs of the area for years 2001 through 2008, inclusive
- Available regional geologic and hydrogeological information including:
  - Golder Associates, 2007, Phase I Summary Technical Memorandum: City of Arlington Water Right Application G1-26641. Prepared for the Washington State Department of Ecology.
  - Golder Associates, 2011, Phase I Summary Technical Memorandum: City of Arlington Water Right Applications CS1-10681C, CS1-18929C, and CG1-02115C. Prepared for the Washington State Department of Ecology. February 1.
  - Pacific Groundwater Group, January 2007. City of Arlington Hydrogeologic Conceptual Model Summary Report, prepared for the City of Arlington.
  - Pacific Groundwater Group, February 2007. Hydrogeologic Analysis for Klein Water Right Transfer.
  - Newcomb, R.C., 1952, Ground-Water Resources of Snohomish County, Washington, U.S. Geological Survey Water-Supply Paper 1135.
  - RH2 Engineering Inc., 2010, City of Arlington Draft Comprehensive Water System Plan, November.
  - Thomas, B.E., J.M. Wilkinson and S.S. Embrey, 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington. USGS Water Resources Investigations Report 96-4312.
  - USDA-ARS Washington Irrigation Guide, Appendix B. 1992. Available online at http://www.wa.nrcs.usda.gov/technical/ENG/irrigation_guide/index.html.
  - WestWater Research LLC, 2010, Water Right Summary and Proof of Beneficial Use for Ninety Farms and Water Right Certificate No. 1488, prepared for the City of Arlington, February 24.

Tentative Evaluation of the Extent and Validity of the Water Right Proposed for Change

The original water right was issued to P.V. Robertson in 1951 for irrigation of 30 acres. A series of property ownership transfers occurred over the years since the original water right was issued. Linda Neunzig purchased the property December 2002 from Gerald Klein.

WestWater Research LLC (2010) completed a beneficial use evaluation for the existing water right. As part of their research, they undertook the following:

- Review of the property ownership and water right history
- Review of historic color and black and white aerial photographs over the period 1941 to 2006
- Site visit
- Estimates of water use
- Source assessment and impairment analysis
- Affidavit from Linda Neunzig, current owner of the property, concerning water use

The WestWater evaluation concluded that water had been put to beneficial use for irrigation of 30 acres from 1951 through 2008 based on the aerial photos and the affidavit of the current owner. They also concluded that of the 40 AF/yr allowable under the original certificate, 34.67 AF were available for transfer.

Review of the WestWater report and information from the site visit and discussions with the applicant indicate:

- The irrigation right was not used for a period starting in January 2009 because of damage to the pump and irrigation equipment from flooding in January 2009. According to the City of Arlington, the owner irrigated the property again in 2011.
- The pump used to supply water for the irrigation system after 2002 was gasoline powered. The flood-damaged pump was observed during the site visit. Because the pump was gasoline powered, there are no electrical records to confirm water use.
- WestWater used color and black and white aerial photographs to evaluate water use. The photos are from 1941, 1965, 1976 (color), 1980, 1987, 1996, 2001 (color), 2004 (color), 2005 (color), and 2006 (color). The month of the photos is not indicated but it is likely that they were taken during later spring, summer or early fall. Some of the photos appear to show evidence of irrigation use in the form of green vegetation (2004 and 2005) while others (2001 and 2006) appear to have patches of dry vegetation suggesting no irrigation. (An evaluation of water use was conducted by Golder Associates for the period 2001 through 2008 using Landsat photos and is discussed later in this report.)
- WestWater estimated water use using information on the pump and the distribution system and estimated the instantaneous pumping rate was about 114 gpm. This appears to be reasonable given the rated pump capacity of 116 gpm and the distribution system characteristics, and is higher than the instantaneous quantity for the certificate of 90 gpm, suggesting the system was capable of producing at least 90 gpm.
- The crop irrigation requirement for pasture is given as 11.12 inches/year for the Sedro Woolley area by WestWater; however, Everett is considered more representative of the Arlington area. The total crop irrigation requirement for pasture based is 14.89 inches/year (for the Everett area, based on the Washington Irrigation Guide, Appendix B (1992). The corresponding amount of water required for irrigation of 30 acres of pasture is 49.6 AF.
- WestWater estimated an annual consumption of 34.67 AF based on the period of use of 138 days between May 15 and October 1, pump operation over 12 hours per day, and the estimated pumping rate of 114 gpm, and this value was requested by the change application . Although the instantaneous pumping rate is limited to 90 gpm by the certificate, the annual consumption estimated by WestWater appears low based on the estimated withdrawal requirement of 49.6 AF yr using the crop irrigation requirements, irrigated acres, system efficiency, and period of use. Given this information, the certificated amount of 40 AF appears reasonable to transfer.

Landsat Evaluation

Review of aerial photographs between 2001 and 2008 suggested that there may have been a period of non-use of the water right. Landsat imagery was evaluated In order to identify if there was a five-year period of non-use between 2002 when the property was purchased through 2008 when the water right was reported to be last used by the owner.

Landsat satellites used for gathering data on land surface reflectance have been in place since 1972. The satellites are equipped with an array of sensors that scans the ground as the satellite passes over a point and records the amount of reflected energy in certain wavelength bands. These bands are then combined to make a color image. For example, one sensor only sees in the red wavelength, one sees only green, and another sees only blue. These are combined to make a color image that we interpret as "true color." The benefit is that the sensors can record both visible and infrared components of the spectrum. Each pixel in the Landsat imagery is a 30 by 30 meter square (approximately 100 by 100 feet). The Landsat bands are summarized in the following table:

Band	Wavelength (µm)	Portion of spectrum	Use
1	0.45-0.52	Blue	blue, suspended sediments
2	0.52-0.60	Green	green, vegetation
3	0.63-0.69	Red	red, chlorophyll absorption
4	0.76-0.90	Near Infrared	water/land interface, vegetation
5	1.55-1.75	Mid Infrared	vegetation, soil moisture
6^	10.40-12.50	Thermal Infrared	surface temperature, geology
7*	2.08-2.35	Mid infrared	vegetation moisture, soils, geology, burns

^ Band six is not included in the 6 layer .img Landsat file
*This is layer 6 is the .img Landsat files

Varying combinations of the bands provide information on photosynthesizing vegetation, variations in vegetation types and moisture content, and plant health.

Review of Landsat images over the period 2002 through 2008 suggests that irrigation use may have been limited in certain years (e.g. 2002 through 2004 and 2006) but there was good evidence of water use in 2005, 2007, and 2008, demonstrating recent use of the water right.

Proposed Use

The proposed use is municipal water supply for the City of Arlington.

- ***Beneficial Use***

  According to RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020, municipal water supply is considered a beneficial use.

- ***Water Demand***

  The City's average and peak day demands are forecast to increase (RH2 2010). The 2010 Water System Plan (RH2 2010) identified source capacity deficiencies at the Haller Wellfield. Transfer of this water right to the Haller Wellfield will help the City meet current and projected future demands and increase the reliability of their water supply.

- *Development Schedule*

  The City's water system is fully developed and undergoes periodic upgrades and maintenance as needed to maintain a safe, reliable supply of water.

Other Rights Appurtenant to the Place of Use

The City of Arlington holds four water right certificates and one water right claim for its sources of municipal supply. The City's existing rights are summarized in the following table:

Water Right Tracking #	Certificate #	Priority Date	Qi (cert)	Qi Additive	Qi Non-Additive	Qa (cert)	Qa Additive	Qa Non-Additive	Source
G1-*07495C	GWC 5170	2/12/1965	200	200		320	320		Airport Well
G1-*07494C	GWC 5169	2/12/1965	1,700		1,700	1,344		1,344	Haller Wellfield
S1-*01194C	SWC 194	10/10/1924	2,244.15	2,244.15		3,619.84	3,619.84		Haller Wellfield
G1-24900C		9/17/1986	380	380		386		376	Airport Well
G1-300889CLA		1931	135	135		72.18	72.18		Haller Wellfield
Totals			**4,659.15**	**2,959.15**	**1,700**	**5,742.02**	**4,012.02**	**1,720**	

Note: provided by Doug Wood, Ecology NWRO.

The Haller Wellfield includes three wells (Wells 1, 2, and 3). The instantaneous pumping capacity of each well is 570 gpm, for an instantaneous wellfield capacity of 1,710 gpm. The instantaneous capacity of the water treatment plant is also 1,710 gpm.

Site Visit

A site visit was made on January 11, 2011, to the existing points of withdrawal and diversion and the proposed points of withdrawal. The site visit was made by Michael Klisch (Golder), Doug Wood (Ecology), and Mike Wolanek (City of Arlington). The existing point of withdrawal for CG1-*02115C is a 36-inch diameter concrete-cased well. Based on information on the well log, the well was drilled in 1952 and is 25 feet deep. At the time of drilling (October 1952) the depth to water was 11 feet below top of casing. The well log noted a pumping rate of 94 gpm with two feet of drawdown using a 5 hp electric motor. The depth to water at the time of the site visit was estimated to be about 10 feet below the top of the casing.

At the time of the site visit, there was no electrical service to the well, and there was no pump installed. Evidence of irrigation equipment was observed near the well, including irrigation pipe, a cannon-type sprinkler, and couplings and connectors. Similar equipment was documented in the West Water Report (West Water Research 2010). The gasoline-powered centrifugal pump used for irrigation was located in another portion of the farm. The pump was damaged during flooding in January 2009. The pump information indicates the pump was a 5-hp centrifugal pump with a capacity of 6,960 gallons per hour (116 gpm). The pump was rated for a total head of 187 feet and a maximum suction head of 26 feet.

Hydrologic/Hydrogeologic Evaluation

The hydrogeology of the Arlington area has been described in Newcomb (1953), Thomas and others (1997), and Pacific Groundwater Group (2007). The City of Arlington is located at the confluence of the North and South Forks of the Stillaguamish River (WRIA 5). Thomas and others (2007) delineated the hydrogeologic units in the vicinity of Arlington. The geologic units are summarized in the following table:

Epoch	Hydrogeologic Unit	Typical Thickness (feet)	Maximum Thickness (feet)	Lithology	Hydrogeology
Holocene	Bog/Peat/Marsh Deposits	3	10	Peat, organic-rich mud	Thin and discontinuous, not an aquifer or aquitard
	Alluvium	40	120	Fluvial and beach deposits of fine to coarse sand with lenses of silt and gravel	Unconfined aquifer
Pleistocene	Recessional Outwash	40	250	Sand and gravel, grades to silt	Unconfined aquifer or perched groundwater
	Till	70	250	Compact unsorted sand and gravel in silt and clay matrix	Aquitard with occasional thin confined aquifers
	Advance Outwash	120	350	Fine sand, grades to gravel or silt	Unconfined to confined aquifer
	Transitional Beds	100	400	Sand to silty clay	Aquitard with occasional thin confined aquifers
	Undifferentiated Sediments	500	1,000	Glacial drift and interglacial deposits of sand and gravel with some silt	Confined aquifer and aquitards
Eocene	Bedrock	Unknown	Unknown	Varying sedimentary and volcanic lithologies	Small amounts of confined water in fractures, with some potential for porous flow in sandstone units

Note: Modified from Thomas and others (2007), Table 3.

The City's Haller Wellfield is located immediately downstream of the confluence of the North and South Forks of the Stillaguamish River, about 50 feet south of the main stem Stillaguamish River. The Haller Well Field includes three shallow wells completed in the unconfined alluvial aquifer adjacent to the main stem Stillaguamish River at depths ranging from 34 to 36 feet below ground surface. The unconfined alluvial aquifer is present in the valleys of the North and South Forks of the Stillaguamish and the main stem Stillaguamish River. The existing point of withdrawal well is also a shallow well completed to a depth of 25 feet below ground in unconfined alluvial materials adjacent to the main stem Stillaguamish River.

The Haller Well Field area is underlain by unconsolidated alluvial sand and gravel. The depth to the underlying Tertiary bedrock is uncertain. Bedrock was interpreted by Pacific Groundwater Group (2007) to be at a depth of about 40 feet below ground in the wellfield area. However, it is possible that alluvial materials include large boulders, such as glacial erratics, that due to the difficult drilling conditions, may have been misinterpreted as "bedrock" at the time of drilling as the wells were not advanced beyond the "bedrock" (Mike Wolanek, City of Arlington, personal communication 2011). The alluvial aquifer is moderately to highly permeable, with hydraulic conductivities ranging from about 3.6 to 3,200 ft/d, and a median hydraulic conductivity of 88 ft/d (Thomas and others 2007).

Pumping tests in the Haller Well Field show that the alluvial aquifer is in direct hydraulic continuity with the main stem and South Fork Stillaguamish River (WWR 2010), and the wellfield is considered to be groundwater under the direct influence of surface water by the Washington Department of Health.

Minimum instream flows for WRIA 5 were established in 2005 under WAC 173-505-050 for the main stem Stillaguamish River and tributaries. The following table summarizes instream flow requirements for the main stem Stillaguamish River from the mouth at Port Susan to the confluence of the North and South Forks. The control point for this reach of the river is Ecology gaging station #05A070 at River Mile 11.2 (near Silvana).

Month	Day	Instream flow (cfs)
January	1-31	2,200
February	1-29	2,000
March	1-15	2,000
	16-31	2,000
April	1-30	2,000
May	1-31	2,000
June	1-15	2,000
	15-30	2,000
July	1-15	2,000
	15-31	2,000
August	1-15	1,700
	15-31	1,700
September	1-15	1,700
	15-30	1,700
October	1-15	1,700
	15-31	1,700
November	1-15	2,200
	15-30	2,200
December	1-31	2,200

Under WAC 173-505-070, the main stem Stillaguamish River from the mouth to the confluence of the North and South Forks at River Mile 17.8 has water available above instream flow requirements over the period October 16 to June 30. Because the water right proposed for transfer has a priority date of September 4, 1951, it is senior to the instream flow regulations during the irrigation season (the prior approved period of use) and is therefore not subject to interruption during this time (April 16 to September 30). Outside of the irrigation season, during the additional period of use approved by this report, the water right is subject to interruption when instream flows are not met.

Impairment Considerations

The existing point of withdrawal and the wells in the Haller Wellfield are completed in a highly-permeable alluvial aquifer that is in direct hydraulic communication with the main stem Stillaguamish River. There will be no impairment to the main stem Stillaguamish River minimum instream flow by moving the point of withdrawal of a water right utilizing the same source that is senior to the minimum flow established in WAC 173-505-070, provided that the water right is subject to instream flows outside of the irrigation season. The Haller Wellfield wells have been in operation for many years indicting water is physically available. There have been no reports of interference to other wells or water right holders since the wells have been in operation. Testing completed by Pacific Groundwater Group in 2002 in Well 1R (referenced in the Report of Examination for CG1-300889CL(A)@1) showed there was about 6.5 feet of drawdown in Well 1R when the well was pumped at 570 gpm over a 4-hour period, with rapid recovery to pre-test levels following pump shutdown. Approximately 9 inches of drawdown were observed in Well 1, located about 25 feet from Well 1R, confirming little drawdown is expected outside the immediate wellfield area.

A search of the well log database indicted that there were 11 wells on file within about 0.5 miles of the Haller Wellfield. Other wells may be present that do not have logs filed with Ecology. With the exception of one well which is completed in bedrock (McMahan) all of the wells are completed in the alluvial aquifer. No impairment to these wells is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

Well Owner	Well Depth (feet bgs)	Date Completed	Completion Aquifer	Location
ASSOCIATED SAND & GRAVEL	64		Alluvial	T31/R5E-2NWNE
ASSOCIATED SAND AND GRAVEL	26	03/10/69	Alluvial	T31/R5E-2NWNE
C D HAMMER	19		Alluvial	T31/R5E-2NESW
CITY OF ARLINGTON	38	05/08/02	Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
DENNIS DEARINGER	74	08/12/98	Alluvial	T31/R5E-2NENW
HENRY MILLER	40	04/10/99	Alluvial	T31/R5E-2SENW
LEE FLATO	37	08/09/91	Alluvial	T31/R5E-2SWSW
LYNN GRANSTROM	50	09/16/02	Alluvial	T31/R5E-2NESE
MIKE HANLOCK	30	04/03/81	Alluvial	T31/R5E-2SWNE
PETE VECHL	38	07/12/00	Alluvial	T31/R5E-2SENW
TOM MC MAHAN	211	06/25/92	Bedrock	T31/R5E-2NWSE

The Water Rights Application Tracking System database was queried to located water rights and claims within a 0.5 mile radius of the Haller Wellfield. Twelve water right claims for groundwater, one surface water certificate, and two groundwater certificates are within 0.5 miles of the subject application for change (excluding rights held by the City of Arlington). At least one groundwater certificate and one groundwater claim can be tied to available well logs. Some of the well logs may be associated with water rights or claims filed under a different name or are exempt from the application process. No impairment to these rights is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

File Number	Certificate Number	Person	Document Type	Priority Date	Purpose of Use	Qi	Unit of Measure	Qa	Location	Source
G1-153724CL		MILLER HENRY C	Claim S		NR		GPM		T31N/R5E-	
G1-135771CL		VAN SLAGEREN TOM	Claim L		ST,DG		GPM		T31N/R5E-	WELL
G1-124942CL		LEWIS ORWILL P	Claim S		IR,DG		GPM		T31N/R5E-	
G1-123457CL		WILSON MARVIN W	Claim L		ST,IR		GPM		T31N/R5E-	WELL
G1-119434CL		VALLEY GEM FARMS	Claim L		ST,DG		GPM		T31N/R5E-	WELL
G1-111124CL		HAMMER CURTIS D	Claim S		ST,DG		GPM		T31N/R5E-	
G1-093046CL		GROENDYK JOHN	Claim S		IR,DG		GPM		T31N/R5E-	
G1-091257CL		RICKARD JOHN C	Claim S		IR,DG		GPM		T31N/R5E-	
G1-050157CL		KROEZE JOHN	Claim S		DG		GPM		T31N/R5E-	WELL
G1-035541CL		DESPRES CLARA M	Claim L		DG		GPM		T31N/R5E-	WELL
G1-035723CL		BREEKVELDT BERT	Claim S		DG		GPM		T31N/R5E-	
G1-025841CL		KLEIN PAUL	Claim L		DG		GPM		T31N/R5E-	
S1-008945CL		SOPER FRANCES M. M.	Claim L		DG		CFS		T31N/R5E-	
S1-*11473AWC	06447A	KROEZE J	Cert	6/23/1952	IR	0.32	CFS		T31N/R5E-	UNNAMED SLOUGH
S1-*01194C	194	Puget Sound Power & Light Co	Cert	10/10/1924	DM	5	CFS		T31N/R5E-SE/NW	STILLAGUAMISH RIVER
G1-*09495C	6379	Associated Sand & Gravel Co Inc	Cert	6/4/1968	CI	150	GPM	36	T31N/R5E-	WELL
G1-*07494C	5169	Arlington City	Cert	2/12/1965	MU	1700	GPM	1344	T31N/R5E-	WELL
G1-*02442C	2968	HAMMER C D	Cert	4/9/1952	IR	156	GPM	30	T31N/R5E-	WELL
CG1-*02115C	1488	Arlington City	ChgApp	3/23/2010	MU	90	GPM	34.67	T31N/R5E-SE/NW	WELL 1
CS1-*18929C	10024	Arlington City	ChgApp	4/7/2010	MU	0.6	GPM		T31N/R5E-SE/NW	Haller well field
CS1-*10680C	5983	Arlington City	ChgApp	4/7/2010	MU	0.25	GPM		T31N/R5E-SE/NW	Haller well field

Enlargement

No enlargement will result from approval of this change. The City of Arlington is receiving a transferred quantity based on a tentative determination of extent and validity. Only water that was previously put to beneficial use is transferred, and only that amount is authorized to be withdrawn (by this authorization) from the wells in the Haller Wellfield.

Public Interest Considerations

Factors considered for evaluating whether the proposed change is in the public interest included but were not limited to: potential impacts to exempt wells, existing water rights, permits, and claims holders, other water right change applications, potential impact to groundwater

and surface water resources, and beneficial use of the resource. No detriment to the public interest was identified during the investigation of the subject application. The available information shows other wells in the area are not expected to be impaired by the anticipated

CONCLUSIONS

In accordance with state law, the following considerations were addressed as part of the process of evaluating this change request:

- The potential for enlargement of the original right,
- The potential for impairment of other rights,
- Consideration of the public interest and welfare,
- Physical availability of water,
- Whether the new point of withdrawal would tap the same body of public groundwater as the original well, and
- Protests or Letters of Concern

Potential for Enlargement

The annual quantity and maximum instantaneous quantity will not be enlarged by this change.

Impairment of Other Rights

No impairment of other rights is expected because the alluvial aquifer is highly permeable with a direct hydraulic connection with the main stem and South Fork of the Stillaguamish River. Interference drawdown from pumping the Haller Wellfield in areas outside the immediate wellfield is expected to be negligible. There are no reports of impairment by other groundwater or surface water users since the wellfield has been in operation. The existing point of withdrawal and the Haller Wellfield are in the same body of groundwater in direct communication with the main stem Stillaguamish River. Because the water right proposed for transfer has a priority date of September 4, 1951, it is senior to the instream flow regulations during the irrigation season, and is therefore not subject to interruption when flows are not met. Outside of the irrigation season, the water right is subject to instream flows for the expanded period of use. No impairment to instream flows is expected from approval of this water right.

Public Interest

No detriment to the public interest was identified during the investigation of this application for change. Municipal water supply is a beneficial use under RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020.

Availability of Water

Availability of water from the source was determined when the original permit was issued. Physical availability of water from the Haller Wellfield has been established through operation of the field for more than 100 years with no reports during that time of decreased water availability.

Same Body of Groundwater

The existing and proposed points of withdrawals are both in the alluvial aquifer which is in direct continuity with the main stem of the Stillaguamish River.

Protests or Letters of Concern

Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to Certificate 1488-A (G1-02115C) be authorized, in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial.

90 gpm, 40 acre-ft/yr for municipal water supply.

Point of Withdrawal

SE¼, NW¼, Section 2, Township 31 North, Range 5 East W.M.

Place of Use

As described on Page 1 of this Report of Examination.

State of Washington
Hydrogeologist
1100
Licensed Geologist
Carl M. Einberger

exp. 10/22/12

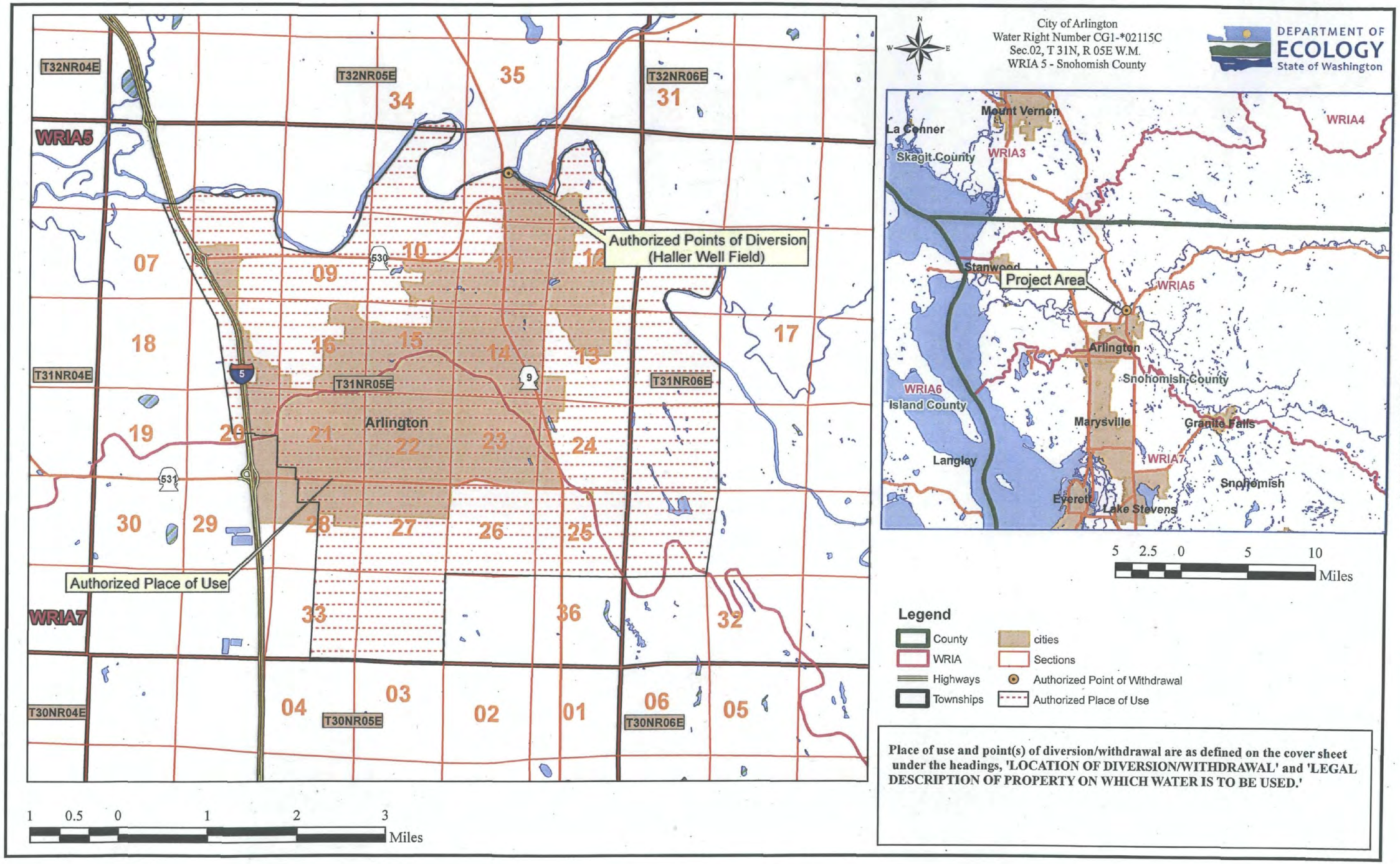
REPORT BY _____ DATE March 27, 2012

Carl Einberger, L.Hg.
Senior Consultant, Water Resources
Golder Associates Inc.

REVIEWED BY Douglas H. Wood DATE April 3, 2012

Douglas H. Wood, LHG
Water Resources
Department of Ecology





Attachment 1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
*Change Application CS1-*10680C*
To Surface Water Certificate 5983

PRIORITY DATE	CLAIM NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 30, 1951			*5983*

NAME
City of Arlington

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
154 Cox Avenue	Arlington	WA	98223

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Three wells in the City of Arlington Haller Wellfield
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	112	49.09

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Water Supply

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Haller Wellfield: 2,900 feet north and 2,770 feet west from the SE Corner of Section 2, T.31N., R.5E., W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SE 1/4 NW 1/4	2	31N.	5E.	5	Snohomish
PARCEL NUMBER	LATITUDE		LONGITUDE	DATUM	
31050300101000	48.2029 N		122.1284 W	NAD83	

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Arlington as described within the most recently approved Water System Plan

DESCRIPTION OF PROPOSED WORKS

The City of Arlington's water system consists of three wells in the Haller Wellfield (Wells 1, 2, and 3), the Airport Well, water treatment and disinfection facilities, distribution system piping, pumps, and meters. The system has been constructed and is in use.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Completed (infrastructure in place)	*N/A*	*N/A*

PROVISIONS

This change authorization is issued subject to all applicable State laws and regulations and to the following provisions:

1. The quantities transferrable through this change are an instantaneous quantity (Qi) of 112 gpm and an annual quantity (Qa) of 49.09 AF/yr, approved for continuous withdrawal without added restrictions.

2. All wells constructed in the state shall meet the "Minimum Standards for the Construction and Maintenance of Wells" (WAC 173-160) and "Water Well Construction" (RCW 18.104). In general, wells shall be located at least 100 feet from sources of contamination and at least 1,000 feet of the boundary of a solid waste landfill. Any well which is unusable, abandoned, or is an environmental, safety, or public health hazard shall be decommissioned.

3. All wells shall be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

4. Required installation and maintenance of an access port as described in WAC 173-160- 291(3).

5. An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

   Water use data shall be recorded weekly. The maximum monthly instantaneous rate of diversion/withdrawal and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of monthly meter readings to collect seasonal information for water resource planning, management and compliance.

   The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

   Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

   Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

6. This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project. Phone: (360) 570-3265. The mailing address is: Department of Revenue, Real Estate Excise Tax, PO Box 47477, Olympia WA 98504-7477 Internet: http://dor.wa.gov/ E-mail: REETSP@DOR.WA.GOV.

7. If the criteria in RCW 90.03.386(2) are not met and a Water System Plan/Small Water System Management Program was approved after September 9, 2003, the place of use of this water right reverts to the service area described in that document. If the criteria in RCW 90.03.386(2) are not met and no Water System Plan/Small Water System Management Program has been approved after September 9, 2003, the place of use reverts to the last place of use described by The Department of Ecology in a water right authorization.

8. Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

9. The water right holder is required to maintain efficient water delivery systems and use of up□to□date water conservation practices consistent with RCW 90.03.005.

10. A superseding certificate shall be issued upon a showing that sufficient infrastructure is in place at the new point of withdrawal to accommodate the additional Qi and Qa that results from this decision.

FINDINGS OF FACT AND DECISION

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER the requested change under Change Application No. CS1-*10680C be approved, subject to existing rights and the provisions specified above.

You have a right to appeal this decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov . To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser .

Signed at Bellevue, Washington, this 4th day of April, 2012.

Jacqueline King, Section Manager
Water Resources Program
Northwest Regional Office

BACKGROUND

The City of Arlington (City) submitted change application CS1-*10680C for Certificate 5983 on April 7, 2010. The City entered into a cost reimbursement agreement with the Department of Ecology to process this application for change along with two other applications for change. This report of examination was prepared by Golder Associates Inc. through Ecology's Cost-Reimbursement Program.

The City also submitted two applications for change along with this application for change:

- Application for change CS1-18929C (Certificate 10024) seeks to transfer 269 gpm (0.60 cfs) and 125 AF/year from an irrigation and stockwatering right to the City for the purpose of municipal water supply
- Application for change CG1-02115C (Certificate 1488) seeks to transfer 90 gpm and 34.67 AF/year from an irrigation right to the City for the purpose of municipal water supply

These two change applications are being processed concurrently with this application.

Description and Purpose of Requested Change

The City purchased an irrigation water right and proposes to transfer the water to the City's existing points of withdrawal at the Haller Wellfield for the purpose of year round municipal water supply within the City's water service area.

Attributes of the Certificate and Proposed Change

Attributes of the Original Certificate

Owner Name	City of Arlington
Name on Certificate:	J. Floyd Sill
Priority Date:	August 30, 1951
Instantaneous Quantity:	0.25 cubic feet per second (cfs)
Annual Quantity:	Not Specified
Point of Withdrawal:	Gov. Lots 5 and 10 within Section 2, Township 31 North, Range 5 East
Purpose of Use:	Irrigation of 25 acres
Period of Use:	Not Specified
Place of Use:	BEGINNING at a point 990 feet East of Southwest corner of Lot 5, then North to river bank; thence southerly along said bank to point West of point of beginning; thence east to Point of Beginning, Sec. 1, Twp. 31 N, Rge. 5 E.W.M. BEGINNING at Southwest corner of Sec. 1, Twp. 31 N, Rge. 5 E.W.M., thence north 2°51'10" east along West line of section 1337.37 feet to point of beginning; thence North 79°26' east 344.74 feet; thence north 58°32'East 227.8 feet; thence North 22°30' West 63.4 feet; thence North 59°33'30" East 392.2 feet; thence South 86°10'30" West 490 feet more or less to East Line of Lot 10; thence North to Northeast corner of said Lot 10; thence West to Stillaguamish River; thence Southerly along said river to West line of section; thence south to the point of beginning, less county road.

Proposed Change

Name of Applicant:	City of Arlington
Date of Application for Change:	April 7, 2010
Points of Withdrawal:	SE¼ NW¼ of Section 2, Township 31 North, Range 5 East (Haller Wellfield)
Proposed Instantaneous Quantity:	112 gallons per minute (gpm)
Proposed Annual Quantity:	50 AF/yr
Purpose of Use:	Municipal Water Supply
Period of Use:	Continuously
Place of Use:	Area served by the City of Arlington as described within the most recently approved Water System Plan
Notice of Publication:	The Everett Herald, July 21, 2010 and July 28, 2010
Protests:	None

Legal Requirements for Proposed Change

- **Water Resources Statues and Case Law**

This application is subject to legal requirements in statute, administrative rules, and relevant case law which must be considered prior to issuance of the requested change(s). Among these legal requirements:

- The Washington State Supreme County has held that Ecology, when processing an application for a change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*
- RCW 90.03.380(1) allows for a water right that has been put to beneficial use to be changed. The point of diversion, place of use, and purpose of use may be changed if the change would not result in harm or injury to existing water rights.
- RCW 90.14.160 states that any person entitled to divert water through an appropriation authorized through a general adjudication, who abandons or voluntarily fails, without sufficient cause, to divert all or any part of said

right for a period of five successive years after July 1, 1967, shall relinquish such right or portion thereof, to the state.

- A point of diversion for a surface water right may be changed to a groundwater point of withdrawal. The authority is derived from RCW 90.03.380, RCW 90.44.020-030, RCW 90.44.100 and RCW 90.54.020(9). RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed if it would not result in detriment or injury to other water rights. Additionally, moving the point of diversion to a groundwater withdrawal requires compliance with the groundwater code (RCW 90.44), including a finding that there be no detriment to the public welfare and that the source of the existing diversion and the proposed point of withdrawal be part of the same water body.

- **Public Notice**

  Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

- **State Environmental Policy Act (SEPA)**

  This application is exempt from the provisions of the State Environmental Policy Act (SEPA), Chapter 43.21 RCW, due to the fact that the cumulative quantity of water constitutes a withdrawal of less than 2,250 gallons per minute (gpm) of groundwater (WAC 197-11-800(4)).

INVESTIGATION

In considering this application, the investigation included, but was not limited to, research and/or review of:

- Ecology's online Water Rights Tracking System (WRTS) database
- Records of water rights in the vicinity
- Ecology's online Well Log Database
- Topographic and local area maps
- Site visit
- LANDSAT and aerial photographic images of the area for the month of July in years 2001 through 2009, inclusive
- Letter of February 1, 2010 from Lawrence A. Costich, of Schwabe, Williamson, and Wyatt to Henry and Betty Graafstra , regarding availability of water rights, file number 118547/158668
- Available regional geologic and hydrogeological information including:

  - Falk, Dean E., 2010, Fresh Water Needs for Dairy Farms, Idaho Association of Soil Conservation Districts. http://oneplan.org/Stock%5CDairyWater.asp

  - Golder Associates, 2007, Phase I Summary Technical Memorandum: City of Arlington Water Right Application G1-26641. Prepared for the Washington State Department of Ecology.

  - Golder Associates, 2011, Phase 1 Summary Technical Memorandum: City of Arlington Water Right Applications CS1-10681C, CS1-18929C, and CG1-02115C. Prepared for the Washington State Department of Ecology.. February 1.

  - Pacific Groundwater Group, January 2007. City of Arlington Hydrogeologic Conceptual Model Summary Report, prepared for the City of Arlington.

  - Newcomb, R.C., 1952, Ground-Water Resources of Snohomish County, Washington, U.S. Geological Survey Water-Supply Paper 1135.

  - RH2 Engineering Inc., 2010, City of Arlington Draft Comprehensive Water System Plan, November.

  - Thomas, B.E., J.M. Wilkinson and S.S. Embrey, 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington. USGS Water Resources Investigations Report 96-4312.

  - USDA-ARS Washington Irrigation Guide, Appendix B. 1992. Available online at http://www.wa.nrcs.usda.gov/technical/ENG/irrigation_guide/index.html.

Tentative Evaluation of Extent and Validity of the Water Right Proposed for Change

The perfected quantity of the right is the maximum amount that has historically been applied to beneficial use under the right.
The history of water use is documented in an affidavit included in the 2010 Schwabe, Williamson, and Wyatt (2010) letter. Certificate 5983 (the subject of this change application) and the land appurtenant to it were purchased by Henry Graafstra in 1959. Graafstra purchased Certificate 10024 (the subject of a concurrent change application) and the appurtenant land in the 1970's. The two certificates were used to operate a dairy farm from 1959 until 2006.

Review of materials provided by the City for these two water rights indicates that there have been several de facto changes to the point of diversion, place of use, and purpose of use since the water rights were certificated. The dairy owner indicates he implemented these changes through his farm plan in response to regulations requiring him to comply with the Clean Water Act (Schwabe, Williamson, and Wyatt 2010). The water rights continued to be associated with agricultural use while the dairy farm was operational. The de facto changes include:

- The original point of diversion for Certificate 5983 was within Government Lots 5 and 10, Section 1, T31N/R5E. The original point of diversion for Certificate 10024 was within Government Lot 7, Section 1, T31N/R5E. The point of

diversion was changed to a point of withdrawal (a well) in Government Lots 5 or 10, Section 1, T31N/R5E, sometime in the 1970s.

- The two water right certificates are appurtenant to 85 acres of land, 25 acres for Certificate 5983 and 60 acres for Certificate 10024. Water was also used for irrigation of adjacent leased lands.
- Certificate 5983 is for 0.25 cfs for irrigation of 25 acres. Certificate 10024 is for 0.58 cfs and 120 AF/yr for irrigation of 60 acres (over the irrigation season) and 0.02 cfs and 5 AF over the entire year for stock watering. The total Qa under both rights is 175 AF/yr, with 5 AF/yr for stock watering and 170 AF for irrigation.

  Information provided by the City (Schwabe, Williamson, and Wyatt 2010) indicates that the purpose of use has changed from that originally stated on the certificates at some time after 1985 when the manure lagoon was constructed:

  - Irrigation: 93.25 AF/yr for irrigation (81.25 AF/yr for grass silage and 12 AF/yr for corn) of 85 acres owned and 17.87 AF/yr for acres leased to grow row crops for cattle feed. The total irrigation diversion was estimated to be 111.12 AF/yr. The 17.87 AF/yr estimated for use on off-site leased land was used on leased lands an only a partial source of water to those acres, and actual quantities of use have not been well established. However, based on pumping records discussed below, this amount of estimated use appears to be reasonable.
  - Stock watering: 52.81 AF
  - Domestic Use, Dairy, and Animal Operations: 19.83 AF/yr including 1.09 AF for domestic use, 1.12 AF for animal operations, 17.62 AF for milk and ice cream production.
- The total water use claimed is 183.76 AF/yr, slightly more than the combined total of 175 AF/yr requested by this change application and the companion application for certificate 10024.

According to Graafstra's affidavit, the irrigated acreage included 65 acres of grass pasture land, and 18 acres of corn silage land. Using the Washington State Irrigation Guide for Everett, about 14.89 inches (1.25 feet) of water are needed annually for pasture/turf. Thus the water required for the irrigation of 65 acres of pasture is about 81.25 AF. The irrigation requirement for field corn is 0.67 feet of water. For 18 acres of corn, 12 AF are required for annual irrigation.

Graafstra estimated stockwatering use to be 100 gallons per day per milk cow and 16 gallons per day to water dry cows and heifers, for a total of 52.81 AF/yr. The 100 gallons per day was based on stockwatering in five Arizona dairies and likely overestimates water requirements for dairy cows in western Washington. Based on information for Idaho summarized by Falk (2010), approximately 50 gallons per milk cow and 16 gallons per day per dry cows and heifers may be more representative for the Arlington area. With consideration to both Graafstra's estimates and Falk (2010), an average value of 75 gallons per day has been used in this analysis for milk cows. Graafstra's affidavit indicates that 450 milk cows on average were tended, resulting in an estimated use of 37.81 AF/yr. An additional 45 dry cows, 30 springing heifers, and 95 yearly heifers were tended, with associated water use estimated to be 3.05 AF/yr. The estimate of 19.83 AF/yr of water use for milk and ice cream production, animal operation, and domestic use appear to be reasonable.

The Schwabe, Williamson, and Wyatt (2010) letter included attachments documenting electrical consumption and water use. The flow meter and electric meter on the pump were read weekly for about one month in the late spring of 2006. Over this period, approximately 1,077,992 gallons were pumped using 245 KWH of electricity. Thus, about 4,400 gallons are pumped per KWH:

Date	Flow Meter (gallons)	Gallons	Electric Meter Total (KWH)	KWH	Gallons/KWH
5/16/2006	3,367,666		29,466		
5/24/2006	3,762,550	394,884	29,544	78	5,063
6/1/2006	4,027,555	265,005	29,609	65	4,077
6/7/2006	4,217,917	190,362	29,656	47	4,050
6/13/2006	4,445,658	227,741	29,711	55	4,141
Total	-	**1,077,992**	-	**245**	**4,400**

The last five years of operation of the water right were 2001 to 2006. A new electric meter was installed on the power feed to the pump on May 3, 2004 to replace a faulty meter that appeared to under-record the electrical consumption at the well. Therefore, water use information is only available for part of 2004, all of 2005, and part of 2006. From May 3, 2004 through October 6, 2006, the meter recorded 30,897 KWH of electricity used based on meter readings made approximately every two months. Using the gallons/KWH factor calculated above of 4,400 gallons/KWH, this suggests about 136 million gallons were pumped over that period (886 days or 2.43 years). This is equivalent to approximately 175 AF/yr pumped under this right and Certificate 10024. Certificate 10024 is for 125 AF/yr, and this application requests 50 AF/yr which appears reasonable based on the pumping records.

The total estimate for all beneficial water use for water pumped under this right and Certificate 10024 based on Ecology's analysis is 171.81 AF/yr (111.12 AF/yr for irrigation, 40.86 AF/yr for stock watering, and 19.83 AF/yr for domestic use, dairy, and animal operations). Of this amount, 111.12 AF/yr is interruptible as the irrigation season portion of the transfer, and 60.69 AF/yr is not interruptible as the year-round portion of the transfer previously used for stock watering and other year-round farm operations. Proration of the amount of this water attributable to this change application (Certificate 5983) yields a transferable quantity to the City of Arlington of 49.09 AF/yr. All of this water will be transferred to the City as non-interruptible for this portion of the transfer. The remainder of the non-interruptible quantity, 11.6 AF/yr, along with all of the 111.12 AF/yr interruptible quantity, will be transferred under the Certificate 10024 change application Report of Examination.

Proposed Use

The proposed use is municipal water supply for the City of Arlington.

- ***Beneficial Use***

According to RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020, municipal water supply is considered a beneficial use.

- ***Water Demand***

  The City's average and peak day demands are forecast to increase (RH2 2010). The 2010 Water System Plan (RH2 2010) identified source capacity deficiencies at the Haller Wellfield. Transfer of this water right to the Haller Wellfield will help the City meet current and projected future demands and increase the reliability of their water supply.

- ***Development Schedule***

  The City's water system is fully developed and undergoes periodic upgrades and maintenance as needed to maintain a safe, reliable supply of water.

Other Rights Appurtenant to the Place of Use

The City of Arlington holds four water right certificates and one water right claim for its sources of municipal supply. The City's existing rights are summarized in the following table:

Water Right Tracking #	Certificate #	Priority Date	Qi (cert)	Qi Additive	Qi Non-Additive	Qa (cert)	Qa Additive	Qa Non-Additive	Ecology Source
G1-*07495C	GWC 5170	2/12/1965	200	200		320	320		Airport Well
G1-*07494C	GWC 5169	2/12/1965	1,700		1,700	1,344		1,344	Haller Wellfield
S1-*01194C	SWC 194	10/10/1924	2,244.15	2,244.15		3,619.84	3,619.84		Haller Wellfield
G1-24900C		9/17/1986	380	380		386		376	Airport Well
G1-300889CLA		1931	135	135		72.18	72.18		Haller Wellfield
Totals			**4,659.15**	**2,959.15**	**1,700**	**5,742.02**	**4,012.02**	**1,720**	

Note: provided by Doug Wood, Ecology NWRO

The Haller Wellfield includes three wells (Wells 1, 2, and 3). The instantaneous pumping capacity of each well is 570 gpm, for an instantaneous wellfield capacity of 1,710 gpm. The instantaneous capacity of the water treatment plant is also 1,710 gpm.

Site Visit

A site visit was made on January 11, 2011 to the existing points of withdrawal and diversion and the proposed points of withdrawal by Michael Klisch (Golder), Doug Wood (Ecology), and Mike Wolanek (City of Arlington). The original point of diversion associated with this right was the South Fork of the Stillaguamish River. Suction lines were placed into the river at the points of diversion to supply the wheel line irrigation system. Sometime in the 1970's, the property owner installed a well to replace this surface water diversion and the diversion associated with Certificate 18929C and discontinued use of the diversions. The original diversions were not visible. Both the original and current points of diversion and withdrawal, respectively, are upstream of the proposed point of withdrawal.

The well is a dug well that is completed with 60-inch-diameter concrete casing. The depth of the well is 22 feet below ground. There is no well log on file for the well. The well was previously equipped with two pumps which have been removed. One pump fed the early irrigation system which consisted of distribution pipe and hand lines across the floodplain. The second pump fed the uphill dairy system, from which some water subsequently drained to the manure lagoon. The lagoon doubled as an irrigation reservoir beginning with its construction in about 1983. There is electrical service to a pole near the well location.

There was no evidence of former irrigation equipment in the field except for the 6-inch line from the well, which was partially exposed adjacent to the well. In the former dairy area, a former water treatment building was partially standing. The building included several pressure tanks and other tanks for chlorination. Most of the piping for the system had been removed.

Hydrologic/Hydrogeologic Evaluation

The hydrogeology of the Arlington area has been described in Newcomb (1953), Thomas and others (1997), and Pacific Groundwater Group (2007). The City of Arlington is located at the confluence of the North and South Forks of the Stillaguamish River (WRIA 5). Thomas and others (2007) delineated the hydrogeologic units in the vicinity of Arlington. The geologic units are summarized in the following table:

Epoch	Hydrogeologic Unit	Typical Thickness (feet)	Maximum Thickness (feet)	Lithology	Hydrogeology
Holocene	Bog/Peat/Marsh Deposits	3	10	Peat, organic-rich mud	Thin and discontinuous, not an aquifer or aquitard
	Alluvium	40	120	Fluvial and beach deposits of fine to coarse sand with lenses of silt and gravel	Unconfined aquifer
Pleistocene	Recessional Outwash	40	250	Sand and gravel, grades to silt	Unconfined aquifer or perched groundwater
	Till	70	250	Compact unsorted sand and gravel in silt and clay matrix	Aquitard with occasional thin confined aquifers

Epoch	Hydrogeologic Unit	Typical Thickness (feet)	Maximum Thickness (feet)	Lithology	Hydrogeology
	Advance Outwash	120	350	Fine sand, grades to gravel or silt	Unconfined to confined aquifer
	Transitional Beds	100	400	Sand to silty clay	Aquitard with occasional thin confined aquifers
	Undifferentiated Sediments	500	1,000	Glacial drift and interglacial deposits of sand and gravel with some silt	Confined aquifer and aquitards
Eocene	Bedrock	Unknown	Unknown	Varying sedimentary and volcanic lithologies	Small amounts of confined water in fractures, with some potential for porous flow in sandstone units

Note:
Modified from Thomas and others (2007), Table 3.

The City's Haller Wellfield is located immediately downstream of the confluence of the North and South Forks of the Stillaguamish River, about 50 feet south of the main stem Stillaguamish River. The Haller Well Field includes shallow three wells completed in the unconfined alluvial aquifer adjacent to the main stem Stillaguamish River at depths ranging from 34 to 36 feet below ground surface. The unconfined alluvial aquifer is present in the valleys of the North and South Forks of the Stillaguamish and the main stem Stillaguamish River. The existing point of withdrawal well is also a shallow well completed to a depth of 22 feet below ground in unconfined alluvial materials adjacent to the South Fork Stillaguamish River.

The Haller Well Field area is underlain by unconsolidated alluvial sand and gravel. The depth to the underlying Tertiary bedrock is uncertain. Bedrock was interpreted by Pacific Groundwater Group (2007) to be at a depth of about 40 feet below ground in the wellfield area. However, it is possible that alluvial materials include large boulders that, such as glacial erratic, that due to the difficult drilling conditions, may have been misinterpreted as "bedrock" at the time of drilling as the wells were not advanced beyond the "bedrock" (Mike Wolanek, City of Arlington, personal communication 2011). The alluvial aquifer is moderately to highly permeable, with hydraulic conductivities ranging from about 3.6 to 3,200 ft/d, and a median hydraulic conductivity of 88 ft/d (Thomas and others 2007).

Pumping tests in the Haller Well Field show that the alluvial aquifer is in direct hydraulic continuity with the main stem and South Fork Stillaguamish River (WWR 2010), and the wellfield is considered to be groundwater under the direct influence of surface water by the Washington Department of Health.

Minimum instream flows for WRIA 5 were established in 2005 under WAC 173-505-050 for the main stem Stillaguamish River and tributaries. The following table summarizes instream flow requirements for the main stem Stillaguamish River from the mouth at Port Susan to the confluence of the North and South Forks. The control point for this reach of the river is Ecology gaging station #05A070 at River Mile 11.2 (near Silvana).

Month	Day	Instream flow (cfs)
January	1-31	2,200
February	1-29	2,000
March	1-15	2,000
	16-31	2,000
April	1-30	2,000
May	1-31	2,000
June	1-15	2,000
	15-30	2,000
July	1-15	2,000
	15-31	2,000
August	1-15	1,700
	15-31	1,700
September	1-15	1,700
	15-30	1,700
October	1-15	1,700
	15-31	1,700
November	1-15	2,200
	15-30	2,200
December	1-31	2,200

Under WAC 173-505-070, the main stem Stillaguamish River from the mouth to the confluence of the North and South Forks at River Mile 17.8 has water available above instream flow requirements over the period October 16 to June 30. Under WAC 1173-505-100, the total consumptive withdrawals from the existing and future water rights in the Stillaguamish River basin during open periods shall not exceed a total of 300 cubic feet per second (cfs) as measured at Ecology station #05A070 at river mile (RM) 11.2 (WAC 173-505-100(2)). Of that 300 cfs, the maximum allocation that may be taken from the South Fork of the Stillaguamish River from RM 17.9 (confluence with the North Fork) to RM 34.9 is 150 cfs during open period from November 1 to June 15 as measured at Ecology station #05B090. Ecology also reserved one cfs of water for future stockwatering (WAC 173-505-080) and five cfs at River Mile 11.2 for future permit-exempt groundwater use (WAC 173-505-090). The five cfs reservation includes a maximum of two cfs from the North Fork Stillaguamish River (River Mile 6.5) and 1.5 cfs from the South Fork Stillaguamish River (River Mile 6.5). Because the water right

proposed for transfer has a priority date of September 4, 1951, it is senior to the instream flow regulations and is therefore not subject to interruption.

Impairment Considerations

The wells in the Haller Wellfield are completed in a highly permeable unconfined alluvial aquifer that is in direct hydraulic communication with the main stem Stillaguamish River. There will be no impairment to the main stem Stillaguamish River minimum instream flow by moving the point of withdrawal of a water right utilizing the same source that is senior to the minimum flow established in WAC 173-505-070.

The Haller Wellfield wells have been in operation for many years indicating that water is physically available. There have been no reports of interference to other wells or water right holders since the wells have been in operation. Testing completed by Pacific Groundwater Group in 2002 in Well 1R (referenced in the Report of Examination for CG1-300889CL(A)@1) showed there was about 6.5 feet of drawdown in Well 1R when the well was pumped at 570 gpm over a 4-hour period, with rapid recovery to pre-test levels following pump shutdown. Approximately 9 inches of drawdown were observed at the end of the test in Well 1, located about 25 feet from Well 1R, confirming little drawdown is expected outside the immediate wellfield area.

A search of the well log database indicted that there were 11 wells on file within about 0.5 miles of the Haller Wellfield. Other wells may be present that do not have logs filed with Ecology. With the exception of one well which is completed in bedrock (McMahan) all of the wells are completed in the alluvial aquifer. No impairment to these wells is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

Well Owner	Well Depth (feet bgs)	Date Completed	Completion Aquifer	Location
ASSOCIATED SAND & GRAVEL	64		Alluvial	T31/R5E-2NWNE
ASSOCIATED SAND AND GRAVEL	26	03/10/69	Alluvial	T31/R5E-2NWNE
C D HAMMER	19		Alluvial	T31/R5E-2NESW
CITY OF ARLINGTON	38	05/08/02	Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
DENNIS DEARINGER	74	08/12/98	Alluvial	T31/R5E-2NENW
HENRY MILLER	40	04/10/99	Alluvial	T31/R5E-2SENW
LEE FLATO	37	08/09/91	Alluvial	T31/R5E-2SWSW
LYNN GRANSTROM	50	09/16/02	Alluvial	T31/R5E-2NESE
MIKE HANLOCK	30	04/03/81	Alluvial	T31/R5E-2SWNE
PETE VECHL	38	07/12/00	Alluvial	T31/R5E-2SENW
TOM MC MAHAN	211	06/25/92	Bedrock	T31/R5E-2NWSE

The Water Rights Application Tracking System database was queried to located water rights and claims within a 0.5 mile radius of the Haller Wellfield. Twelve water right claims for groundwater, one surface water certificate, and two groundwater certificates are within 0.5 miles of the subject application for change (excluding rights held by the City of Arlington). At least one groundwater certificate and one groundwater claim can be tied to available well logs. Some of the well logs may be associated with water rights or claims filed under a different name or are exempt from the application process. No impairment to these rights is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

File Number	Certificate Number	Person	Document Type	Priority Date	Purpose of Use	Qi	Unit of Measure	Qa	Location	Source
G1-153724CL		MILLER HENRY C	Claim S		NR		GPM		T31N/R5E-	
G1-135771CL		VAN SLAGEREN TOM	Claim L		ST,DG		GPM		T31N/R5E-	WELL
G1-124942CL		LEWIS ORWILL P	Claim S		IR,DG		GPM		T31N/R5E-	
G1-123457CL		WILSON MARVIN W	Claim L		ST,IR		GPM		T31N/R5E-	WELL
G1-119434CL		VALLEY GEM FARMS	Claim L		ST,DG		GPM		T31N/R5E-	WELL
G1-111124CL		HAMMER CURTIS D	Claim S		ST,DG		GPM		T31N/R5E-	
G1-093046CL		GROENDYK JOHN	Claim S		IR,DG		GPM		T31N/R5E-	
G1-091257CL		RICKARD JOHN C	Claim S		IR,DG		GPM		T31N/R5E-	
G1-050157CL		KROEZE JOHN	Claim S		DG		GPM		T31N/R5E-	WELL
G1-035541CL		DESPRES CLARA M	Claim L		DG		GPM		T31N/R5E-	WELL
G1-035723CL		BREEKVELDT BERT	Claim S		DG		GPM		T31N/R5E-	
G1-025841CL		KLEIN PAUL	Claim L		DG		GPM		T31N/R5E-	
S1-008945CL		SOPER FRANCES M. M.	Claim L		DG		CFS		T31N/R5E-	
S1-*11473AWC	06447A	KROEZE J	Cert	6/23/1952	IR	0.32	CFS		T31N/R5E-	UNNAMED SLOUGH
S1-*01194C	194	Puget Sound Power &	Cert	10/10/1924	DM	5	CFS		T31N/R5E-	STILLAGUA

File Number	Certificate Number	Person	Document Type	Priority Date	Purpose of Use	Qi	Unit of Measure	Qa	Location	Source
		Light Co							SE/NW	MISH RIVER
G1-*09495C	6379	Associated Sand & Gravel Co Inc	Cert	6/4/1968	CI	150	GPM	36	T31N/R5E-	WELL
G1-*07494C	5169	Arlington City	Cert	2/12/1965	MU	1700	GPM	1344	T31N/R5E-	WELL
G1-*02442C	2968	HAMMER C D	Cert	4/9/1952	IR	156	GPM	30	T31N/R5E-	WELL
CG1-*02115C	1488	Arlington City	ChgApp	3/23/2010	MU	90	GPM	34.67	T31N/R5E-SE/NW	WELL 1
CS1-*18929C	10024	Arlington City	ChgApp	4/7/2010	MU	0.6	GPM		T31N/R5E-SE/NW	Haller well field
CS1-*10680C	5983	Arlington City	ChgApp	4/7/2010	MU	0.25	GPM		T31N/R5E-SE/NW	Haller well field

Because the proposed change will move the point of withdrawal downstream, there is a net benefit to flows in the main stem and South Fork Stillaguamish River between the proposed and existing points of withdrawal.

Enlargement

No enlargement will result from approval of this change. The City of Arlington is receiving a transferred quantity based on a tentative determination of extent and validity. Only water that was previously put to beneficial use is transferred, and only that amount is authorized to be withdrawn (by this authorization) from the wells in the Haller Wellfield.

Public Interest Considerations

Factors considered for evaluating whether the proposed change is in the public interest included but were not limited to: potential impacts to exempt wells, existing water rights, permits, and claims holders, other water right change applications, potential impact to groundwater and surface water resources, and beneficial use of the resource. No detriment to the public interest was identified during the investigation of the subject application. The available information show other wells in the area are not expected to be impaired by the proposed change, and the proposed change will provide a net benefit to flows in the main stem and South Fork Stillaguamish River between the proposed and existing points of withdrawal.

CONCLUSIONS

In accordance with state law, the following considerations were addressed as part of the process of evaluating this change request:

- The potential for enlargement of the original right,
- The potential for impairment of other rights,
- Consideration of the public interest and welfare,
- Physical availability of water,
- Whether the new point of withdrawal would tap the same body of public groundwater as the original well, and
- Protests or Letters of Concern.

Potential for Enlargement

The annual quantity and maximum instantaneous quantity will not be enlarged by this change.

Impairment of Other Rights

No impairment of other rights is expected because the alluvial aquifer is highly permeable with a direct hydraulic connection with the main stem and South Fork of the Stillaguamish River. Interference drawdown from pumping the Haller Wellfield in areas outside the immediate wellfield is expected to be negligible. There are no reports of impairment by other groundwater or surface water users since the wellfield has been in operation. Review of materials provided by the City indicated that a de facto change to the original point of diversion was made by the dairy owner sometime in the 1970s to address requirements of the Clean Water Act. The dairy owner indicates he implemented these changes through his farm plan in response to regulations requiring him to comply with the Clean Water Act (Schwabe, Williamson, and Wyatt 2010). The point of diversion was changed to a nearby point of withdrawal (a well). The existing point of withdrawal and the Haller Wellfield are in the same body of groundwater in direct communication with the main stem and South Fork of the Stillaguamish River. Because the water right proposed for transfer has a priority date of August 30, 1951, it is senior to the instream flow regulations adopted in 2005 and is therefore not subject to interruption when flows are not met. No impairment to instream flows are expected from approval of this water right.

Public Interest

No detriment to the public interest was identified during the investigation of this application for change. Municipal water supply is a beneficial use under RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020.

Availability of Water

Availability of water from the source was determined when the original permit was issued. Physical availability of water from the Haller Wellfield has been established through operation of the field for over 100 years with no reports during that time of decreased water availability.

Same Body of Groundwater

The existing and proposed points of withdrawals are both in the alluvial aquifer which is in direct continuity with the main stem and South Fork Stillaguamish River.

Protests or Letters of Concern

Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to Certificate 5983 be authorized, in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial.

112 gpm, 49.09 acre-ft/yr for municipal water supply. The combined transferable quality for Certificates 5983 and 10024 shall not exceed 171.81 AF.

Point of Withdrawal

SE¼, NW¼, Section 2, Township 31 North, Range 5 East W.M.

Place of Use

As described on Page 1 of this Report of Examination.

REPORT BY _____ DATE March 27, 2012

Carl Einberger, L.Hg.
Senior Consultant, Water Resources
Golder Associates Inc.

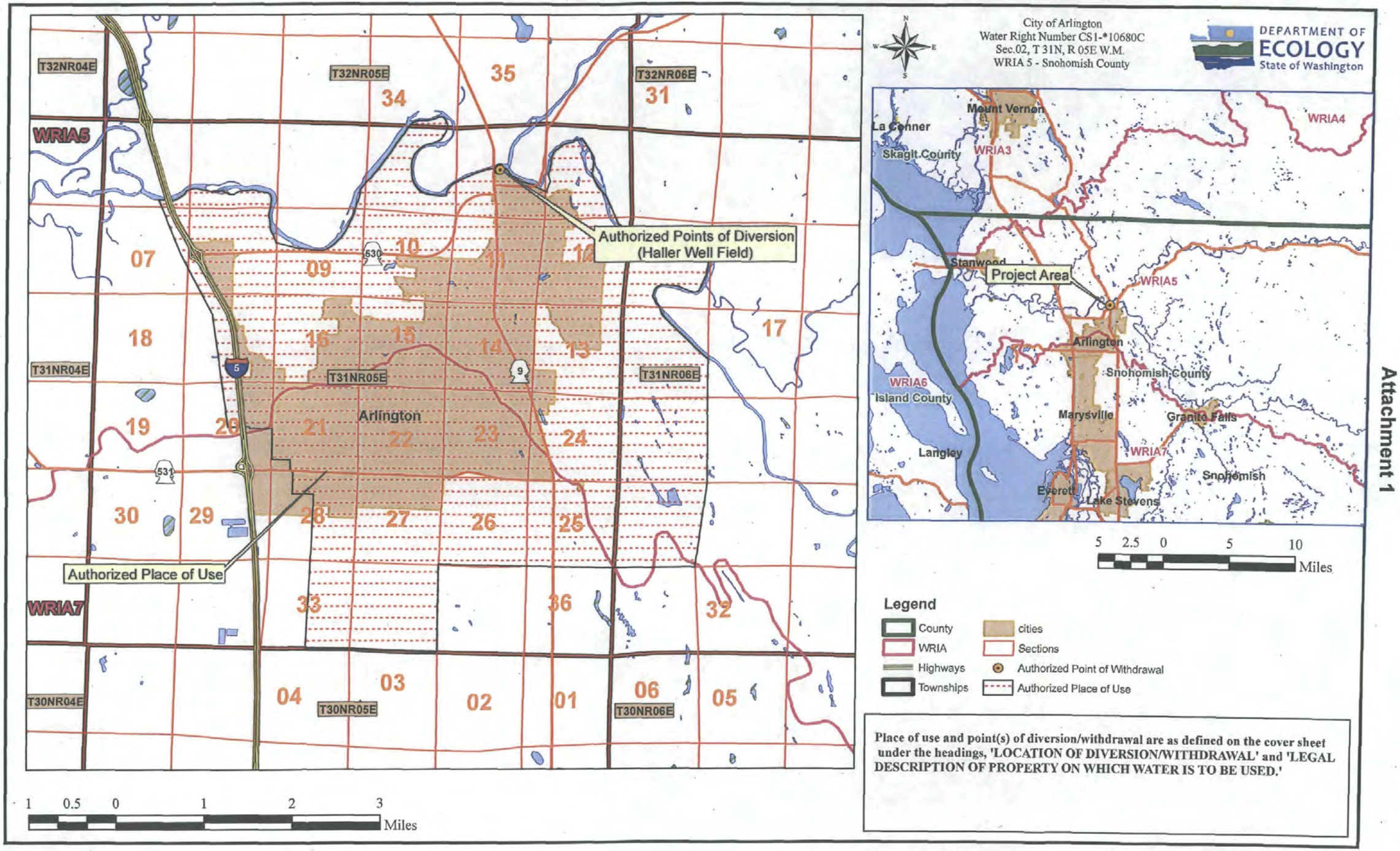
State of Washington
Hydrogeologist
1100
Licensed Geologist
Carl M. Einberger

exp. 10/22/12

REVIEWED BY _____ DATE April 3, 2012

Douglas H. Wood, LHG
Water Resources
Department of Ecology

State of Washington
Hydrogeologist
952
Licensed Geologist
DOUGLAS H. WOOD



Attachment 1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
*Change Application CS1-*18929C*
To Surface Water Certificate 10024

PRIORITY DATE	CLAIM NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
March 29, 1965			*10024*

NAME
City of Arlington

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
154 Cox Avenue	Arlington	WA	98223

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Three wells in the City of Arlington Haller Wellfield
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	*269**	122.72*

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Water Supply
** 244 gpm and 111.12 AF/yr*
- Continuously April 16 to September 30
- Interruptible October 1 to April 15 subject to meeting minimum instream flows established under WAC 173-505-040
** 25 gpm and 11.6 AF/yr*
- Continuously all year

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Haller Wellfield: 2,900 feet north and 2,770 feet west from the SE Corner of Section 2, T.31N., R.5E., W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SE 1/4 NW 1/4	2	31N.	5E.	5	Snohomish
PARCEL NUMBER	LATITUDE		LONGITUDE	DATUM	
31050300101000	48.2029 N		122.1284 W	NAD83	

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Arlington as described within the most recently approved Water System Plan

DESCRIPTION OF PROPOSED WORKS

The City of Arlington's water system consists of three wells in the Haller Wellfield (Wells 1, 2, and 3), the Airport Well, water treatment and disinfection facilities, distribution system piping, pumps, and meters. The system has been constructed and is in use.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Completed (infrastructure in place)	*N/A*	*N/A*

PROVISIONS

This change authorization is issued subject to all applicable State laws and regulations and to the following provisions:

1. The quantities transferrable through this change are an instantaneous quantity of 269 gpm and an annual quantity of 122.72 AF/yr.
   a. 100.95 AF/yr, which was perfected for irrigation use and limited to the irrigation season shall be subject to minimum instream flows during the non-irrigation season (October 1 to April 15), as established for the Mainstem of the Stillaguamish River as provided in Table 2 under WAC 173-505-050.
      i. This quantity shall be attached to a pumping capacity of 244 gpm
   b. 11.6 AF/yr which was perfected for other uses not restricted to the irrigation season are approved for continuous withdrawal without added restrictions
      i. This continuous quantity shall be attached to a pumping capacity of 25 gpm

2. All wells constructed in the state shall meet the "Minimum Standards for the Construction and Maintenance of Wells" (WAC 173-160) and "Water Well Construction" (RCW 18.104). In general, wells shall be located at least 100 feet from sources of contamination and at least 1,000 feet of the boundary of a solid waste landfill. Any well which is unusable, abandoned, or is an environmental, safety, or public health hazard shall be decommissioned.

3. All wells shall be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

4. Required installation and maintenance of an access port as described in WAC 173-160- 291(3).

5. An approved measuring device shall be installed and maintained for each diversion/withdrawal of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

   Water use data shall be recorded weekly. The maximum monthly instantaneous rate of diversion/withdrawal and the monthly total volume shall be submitted to Ecology by January 31st of the following year. Ecology is requiring submittal of monthly meter readings to collect seasonal information for water resource planning, management and compliance.

   The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, Permit/Certificate/Claim No., source name, volume including units, Department of Health WFI water system number and source number(s) (for public drinking water systems), and well tag number (for ground water withdrawals). In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

   Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

   Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

6. This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project. Phone: (360) 570-3265. The mailing address is: Department of Revenue, Real Estate Excise Tax, PO Box 47477, Olympia WA 98504-7477 Internet: http://dor.wa.gov/ E-mail: REETSP@DOR.WA.GOV.

7. If the criteria in RCW 90.03.386(2) are not met and a Water System Plan/Small Water System Management Program was approved after September 9, 2003, the place of use of this water right reverts to the service area described in that document. If the criteria in RCW 90.03.386(2) are not met and no Water System Plan/Small Water System Management Program has been approved after September 9, 2003, the place of use reverts to the last place of use described by The Department of Ecology in a water right authorization.

8. Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

9. The water right holder is required to maintain efficient water delivery systems and use of up to date water conservation practices consistent with RCW 90.03.005.

10. A superseding certificate shall be issued upon a showing that sufficient infrastructure is in place at the new point of withdrawal to accommodate the additional Qi and Qa that results from this decision.

FINDINGS OF FACT AND DECISION

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER the requested change under Change Application No. CS1-*10680C be approved, subject to existing rights and the provisions specified above.

You have a right to appeal this decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov . To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser .

Signed at Bellevue, Washington, this 4th day of April, 2012.

Jacqueline Klug, Section Manager
Water Resources Program
Northwest Regional Office

BACKGROUND

The City of Arlington (City) submitted change application CS1-*18929 for certificate 10024 on April 7, 2010. The City entered into a cost reimbursement agreement with the Department of Ecology to process this application for change along with two other applications for change. This report of examination was prepared by Golder Associates Inc. through Ecology's Cost-Reimbursement Program.

The City also submitted two applications for change along with this application for change:

- Application for change CS1-18929C (Certificate 5983) seeks to transfer 269 gpm (0.60 cfs) and 125 AF/year from an irrigation and stockwatering right to the City for the purpose of municipal water supply
- Application for change CG1-02115C (Certificate 1488) seeks to transfer 90 gpm and 34.67 AF/year from an irrigation right to the City for the purpose of municipal water supply

These two change applications are being processed concurrently with this application

Description and Purpose of Requested Change

The City purchased an irrigation water right and proposes to transfer the water to the City's existing points of withdrawal at the Haller Wellfield for the purpose of year round municipal water supply within the City's water service area.

Attributes of the Certificate and Proposed Change

Attributes of the Original Certificate

Owner Name	City of Arlington
Name on Certificate:	G. Foerester
Priority Date:	March 29, 1965
Instantaneous Quantity:	0.60 cubic feet per second (cfs), 0.58 cfs for irrigation, 0.02 cfs for stockwatering
Annual Quantity:	125 AF (120 AF for irrigation, 5 AF for stockwatering)
Point of Withdrawal:	T31N R5E Sec 1, SW ¼ NW ¼
Purpose of Use:	Irrigation of 60 acres
Period of Use:	Irrigation season for 120 AF, continuous year-round for stockwatering for 5AF
Place of Use:	In Section 1, T.31N. R. 5 E.W.M.: Parcel A: That part of SW ¼ NE ¼ lying westerly of the present course of the South Fork Stillaguamish River ; AND: Parcel B: That part of Government Lots 3 and 7 lying southerly and westerly of the present course of the South Fork Stillaguamish River ; AND: Parcel C: That part of Government Lot 6 lying easterly of a line parallel to, and 990 feet east of, the west line of Sec. 1; AND: Parcel D: That part of Government Lot 8 lying westerly of the present course of the South Fork of the Stillaguamish River; AND: Parcel E: Government Lot 9, EXCEPT tract conveyed to Victor and Clare Wrobleski by deed under Auditor's file N0. 924646. Vol. 437, Page 553, described as follows: Beginning at the intersection of center line of East 5th Street and the easterly line of Plat of Victor Heights, division No. 1 as recorded on page 188, Vol. 12 of Plats; thence north 52° 40' east 487.9 feet; thence south 37° 12' east 15 feet; thence north 80° 28' east 98.4 feet; more or less, to the east line of Government Lot 10, the true point of beginning; thence north 80° 28' east 40 feet; more or less; thence north 8°14' east 380 feet, thence north 79°51' west 32 feet; thence south 50° 00' west 62 feet, more or less, to the east line of Government Lot 10; thence southerly to the true point of beginning; AND EXCEPT tract conveyed to Dale G. and Elizabeth M. Huber by deed under Auditor's File No. 924647, Vol. 637, Page 554, described as follows: beginning at the intersection of center line of East 5th Street and the easterly line of Plat of Victor Heights Division No. 1 as recorded on page 188, Vol. 12 of Plats; thence north 52° 48' east 487.9 feet, thence south 37° 12' east 15 feet thence north 80° 28' east 138.4 feet to true point of beginning; thence north 8° 14' east 380 feet; thence south 79° 41' east to west margin of Sill Slough; thence southerly 805 feet more or less, along west margin of said Sill Slough to a point on a line bearing south 81°46' east from true point of beginning; thence north 81° 46' west to true point of beginning, AND: Parcel F: Accretion lands of that part of the bed of the North Fork Stillaguamish River as defined in the Surveyor General's Report of December 27, 1875 between a line parallel with east 990 feet easterly of the wets line of said Section 1 and the south line of said Government Lot 9.

Proposed Change

Name of Applicant:	City of Arlington
Date of Application for Change:	April 7, 2010
Points of Withdrawal:	SE¼ NW¼ of Section 2, Township 31 North, Range 5 East (Haller Wellfield)
Proposed Instantaneous Quantity:	269 gallons per minute (gpm)
Proposed Annual Quantity:	125 AF/yr
Purpose of Use:	Municipal Water Supply
Period of Use:	Continuously

Place of Use:	Area served by the City of Arlington as described within the most recently approved Water System Plan
Notice of Publication:	The Everett Herald, July 21, 2010 and July 28, 2010
Protests:	None

Legal Requirements for Proposed Change

- **Water Resources Statues and Case Law**

This application is subject to legal requirements in statute, administrative rules, and relevant case law which must be considered prior to issuance of the requested change(s). Among these legal requirements:

- The Washington State Supreme County has held that Ecology, when processing an application for a change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*
- RCW 90.03.380(1) allows for a water right that has been put to beneficial use to be changed. The point of diversion, place of use, and purpose of use may be changed if the change would not result in harm or injury to existing water rights.
- RCW 90.14.160 states that any person entitled to divert water through an appropriation authorized through a general adjudication, who abandons or voluntarily fails, without sufficient cause, to divert all or any part of said right for a period of five successive years after July 1, 1967, shall relinquish such right or portion thereof, to the state.
- A point of diversion for a surface water right may be changed to a groundwater point of withdrawal. The authority is derived from RCW 90.03.380, RCW 90.44.020-030, RCW 90.44.100 and RCW 90.54.020(9). RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed if it would not result in detriment or injury to other water rights. Additionally, moving the point of diversion to a groundwater withdrawal requires compliance with the groundwater code (RCW 90.44), including a finding that there be no detriment to the public welfare and that the source of the existing diversion and the proposed point of withdrawal be part of the same water body.

- **Public Notice**

Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

- **State Environmental Policy Act (SEPA)**

This application is exempt from the provisions of the State Environmental Policy Act (SEPA), Chapter 43.21 RCW, due to the fact that the cumulative quantity of water constitutes a withdrawal of less than 2,250 gallons per minute (gpm) of groundwater (WAC 197-11-800(4)).

INVESTIGATION

In considering this application, the investigation included, but was not limited to, research and/or review of:

- Ecology's online Water Rights Tracking System (WRTS) database
- Records of water rights in the vicinity
- Ecology's online Well Log Database
- Topographic and local area maps
- Site visit
- LANDSAT and aerial photographic images of the area for the month of July in years 2001 through 2009, inclusive
- Letter of February 1, 2010 from Lawrence A. Costich, of Schwabe, Williamson, and Wyatt to Henry and Betty Graafstra , regarding availability of water rights, file number 118547/158668
- Available regional geologic and hydrogeological information including:

    - Falk, Dean E., 2010, Fresh Water Needs for Dairy Farms, Idaho Association of Soil Conservation Districts. http://oneplan.org/Stock%5CDairyWater.asp

    - Golder Associates, 2007, Phase I Summary Technical Memorandum: City of Arlington Water Right Application G1-26641. Prepared for the Washington State Department of Ecology.

    - Golder Associates, 2011, Phase I Summary Technical Memorandum: City of Arlington Water Right Applications CS1-10681C, CS1-18929C, and CG1-02115C. Prepared for the Washington State Department of Ecology.. February 1.

    - Pacific Groundwater Group, January 2007. City of Arlington Hydrogeologic Conceptual Model Summary Report, prepared for the City of Arlington.

    - Newcomb, R.C., 1952, Ground-Water Resources of Snohomish County, Washington, U.S. Geological Survey Water-Supply Paper 1135.

    - RH2 Engineering Inc., 2010, City of Arlington Draft Comprehensive Water System Plan, November.

    - Thomas, B.E., J.M. Wilkinson and S.S. Embrey, 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington. USGS Water Resources Investigations Report 96-4312.

- USDA-ARS Washington Irrigation Guide, Appendix B. 1992. Available online at http://www.wa.nrcs.usda.gov/technical/ENG/irrigation_guide/index.html.

Tentative Evaluation of Extent and Validity of the Water Right Proposed for Change

The perfected quantity of the right is the maximum amount that has historically been applied to beneficial use under the right.
The history of water use is documented in an affidavit included in the 2010 Schwabe, Williamson, and Wyatt (2010) letter. Certificate 10024 (the subject of this change application) and the land appurtenant to it were purchased by Henry Graafstra in the 1970s. Graafstra purchased Certificate 5983 (the subject of a concurrent change application) and the appurtenant land in the 1959. The certificates were used to operate a dairy farm from 1959 until 2006.

Review of materials provided by the City for these two water rights indicates that there have been several de facto changes to the point of diversion, place of use, and purpose of use since the water rights were certificated. The dairy owner indicates he implemented these changes through his farm plan in response to regulations requiring him to comply with the Clean Water Act (Schwabe, Williamson, and Wyatt 2010). The water rights continued to be associated with agricultural use while the dairy farm was operational. The de facto changes include:

- The original point of diversion for Certificate 5983 was within Government Lots 5 and 10, Section 1, T31N/R5E. The original point of diversion for Certificate 10024 was within Government Lot 7, Section 1, T31N/R5E. The point of diversion was changed to a point of withdrawal (a well) in Government Lots 5 or 10, Section 1, T31N/R5E, sometime in the 1970s.
- The two water right certificates are appurtenant to 85 acres of land, 25 acres for Certificate 5983 and 60 acres for Certificate 10024. Water was also used for irrigation of adjacent leased lands.
- Certificate 5983 is for 0.25 cfs for irrigation of 25 acres. Certificate 10024 is for 0.58 cfs and 120 AF/yr for irrigation of 60 acres (over the irrigation season) and 0.02 cfs and 5 AF over the entire year for stock watering. The total Qa under both rights is 175 AF/yr, with 5 AF/yr for stock watering and 170 AF for irrigation

  Information provided by the City (Schwabe, Williamson, and Wyatt 2010) indicates that the purpose of use has changed from that originally stated on the certificates at some time after 1985 when the manure lagoon was constructed:

  - Irrigation: 93.25 AF/yr for irrigation (81.25 AF/yr for grass silage and 12 AF/yr for corn) of 85 acres owned and 17.87 AF/yr for acres leased to grow row crops for cattle feed. The total irrigation diversion was estimated to be 111.12 AF/yr. The 17.87 AF/yr estimated for use on off-site leased land was used on leased lands an only a partial source of water to those acres, and actual quantities of use have not been well established. However, based on pumping records discussed below, this amount of estimated use appears to be reasonable.
  - Stock watering: 52.81 AF
  - Domestic Use, Dairy, and Animal Operations: 19.83 AF/yr including 1.09 AF for domestic use, 1.12 AF for animal operations, 17.62 AF for milk and ice cream production.
- The total water use claimed is 183.76 AF/yr, slightly more than the combined total of 175 AF/yr requested by this change application and the companion application for certificate 5983.

According to Graafstra's affidavit, the irrigated acreage included 65 acres of grass pasture land, and 18 acres of corn silage land. Using the Washington State Irrigation Guide for Everett, about 14.89 inches (1.25 feet) of water are needed annually for pasture/turf. Thus the water required for the irrigation of 65 acres of pasture is about 81.25 AF. The irrigation requirement for field corn is 0.67 feet of water. For 18 acres of corn, 12 AF are required for annual irrigation.

Graafstra estimated stockwatering use to be 100 gallons per day per milk cow and 16 gallons per day to water dry cows and heifers, for a total of 52.81 AF/yr. The 100 gallons per day was based on stockwatering in five Arizona dairies and likely overestimates water requirements for dairy cows in western Washington. Based on information for Idaho summarized by Falk (2010), approximately 50 gallons per milk cow and 16 gallons per day per dry cows and heifers may be more representative for the Arlington area. With consideration to both Graafstra's estimates and Falk (2010), an average value of 75 gallons per day has been used in this analysis for milk cows. Graafstra's affidavit indicates that 450 milk cows on average were tended, resulting in an estimated use of 37.81 AF/yr. An additional 45 dry cows, 30 springing heifers, and 95 yearly heifers were tended, with associated water use estimated to be 3.05 AF/yr. The estimate of 19.83 AF/yr of water use for milk and ice cream production, animal operation, and domestic use appear to be reasonable.

The Schwabe, Williamson, and Wyatt (2010) letter included attachments documenting electrical consumption and water use. The flowmeter and electric meter on the pump were read weekly for about one month in the late spring of 2006. Over this period, approximately 1,077,992 gallons were pumped using 245 KWH of electricity. Thus, about 4,400 gallons are pumped per KWH:

Date	Flow Meter (gallons)	Gallons	Electric Meter Total (KWH)	KWH	Gallons/KWH
5/16/2006	3,367,666		29,466		
5/24/2006	3,762,550	394,884	29,544	78	5,063
6/1/2006	4,027,555	265,005	29,609	65	4,077
6/7/2006	4,217,917	190,362	29,656	47	4,050
6/13/2006	4,445,658	227,741	29,711	55	4,141
Total	-	**1,077,992**	-	**245**	**4,400**

The last five years of operation of the water right were 2001 to 2006. A new electric meter was installed on the power feed to the pump on May 3, 2004 to replace a faulty meter that appeared to under-record the electrical consumption at the well. Therefore, water use information is

only available for part of 2004, all of 2005, and part of 2006. From May 3, 2004 through October 6, 2006, the meter recorded 30,897 KWH of electricity used based on meter readings made approximately every two months. Using the gallons/KWH factor calculated above of 4,400 gallons/KWH, this suggests about 136 million gallons were pumped over that period (886 days or 2.43 years). This is equivalent to approximately 175 AF/yr pumped under this right and Certificate 10024. Certificate 10024 is for 125 AF/yr, and this application requests 50 AF/yr which appears reasonable based on the pumping records.

The total estimate for all beneficial water use for water pumped under this right and Certificate 5983 based on Ecology's analysis is 171.81 AF/yr (111.12 AF/yr for irrigation, 40.86 AF/yr for stock watering, and 19.83 AF/yr for domestic use, dairy, and animal operations). Of this amount, 111.12 AF/yr is interruptible as the irrigation season portion of the transfer, and 60.69 AF/yr is not interruptible as the year-round portion of the transfer previously used for stock watering and other year-round farm operations. Proration of the amount of this water attributable to this change application (Certificate 10024) yields a transferable quantity to the City of Arlington of 122.72 AF/yr. All of the interruptible portion of the combined transfers (111.12 AF/yr) will be applied to this transfer under Certificate 10024, along with 11.6 AF/yr of the non-interruptible quantity for the combined transfers. The remainder of the non-interruptible quantity, 49.09 AF/yr, will be transferred under the Certificate 5983 change application Report of Examination.

Proposed Use

The proposed use is municipal water supply for the City of Arlington.

- ***Beneficial Use***

  According to RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020, municipal water supply is considered a beneficial use.

- ***Water Demand***

  The City's average and peak day demands are forecast to increase (RH2 2010). The 2010 Water System Plan (RH2 2010) identified source capacity deficiencies at the Haller Wellfield. Transfer of this water right to the Haller Wellfield will help the City meet current and projected future demands and increase the reliability of their water supply.

- ***Development Schedule***

  The City's water system is fully developed and undergoes periodic upgrades and maintenance as needed to maintain a safe, reliable supply of water.

Other Rights Appurtenant to the Place of Use

The City of Arlington holds four water right certificates and one water right claim for its sources of municipal supply. The City's existing rights are summarized in the following table:

Water Right Tracking #	Certificate #	Priority Date	Qi (cert)	Qi Additive	Qi Non-Additive	Qa (cert)	Qa Additive	Qa Non-Additive	Ecology Source
G1-*07495C	GWC 5170	2/12/1965	200	200		320	320		Airport Well
G1-*07494C	GWC 5169	2/12/1965	1,700		1,700	1,344		1,344	Haller Wellfield
S1-*01194C	SWC 194	10/10/1924	2,244.15	2,244.15		3,619.84	3,619.84		Haller Wellfield
G1-24900C		9/17/1986	380	380		386		376	Airport Well
G1-300889CLA		1931	135	135		72.18	72.18		Haller Wellfield
Totals			**4,659.15**	**2,959.15**	**1,700**	**5,742.02**	**4,012.02**	**1,720**	

Note: provided by Doug Wood, Ecology NWRO.

The Haller Wellfield includes three wells (Wells 1, 2, and 3). The instantaneous pumping capacity of each well is 570 gpm, for an instantaneous wellfield capacity of 1,710 gpm. The instantaneous capacity of the water treatment plant is also 1,710 gpm.

Site Visit

A site visit was made on January 11, 2011 to the existing points of withdrawal and diversion and the proposed points of withdrawal by Michael Klisch (Golder), Doug Wood (Ecology), and Mike Wolanek (City of Arlington). The original point of diversion associated with this right was the South Fork of the Stillaguamish River. Suction lines were placed into the river at the points of diversion to supply the wheel line irrigation system. Sometime in the 1970's, the property owner installed a well to replace this surface water diversion and the diversion associated with Certificate 18929C and discontinued use of the diversions. The original diversions were not visible. Both the original and current points of diversion and withdrawal, respectively, are upstream of the proposed point of withdrawal.

The well is a dug well that is completed with 60-inch-diameter concrete casing. The depth of the well is 22 feet below ground. There is no well log on file for the well. The well was previously equipped with two pumps which have been removed. One pump fed the early irrigation system which consisted of distribution pipe and hand lines across the floodplain. The second pump fed the uphill dairy system, from which some water subsequently drained to the manure lagoon. The lagoon doubled as an irrigation reservoir beginning with its construction in about 1983. There is electrical service to a pole near the well location.

There was no evidence of former irrigation equipment in the field except for the 6-inch line from the well, which was partially exposed adjacent to the well. In the former dairy area, a former water treatment building was partially standing. The building included several pressure tanks and other tanks for chlorination. Most of the piping for the system had been removed.

Hydrologic/Hydrogeologic Evaluation

The hydrogeology of the Arlington area has been described in Newcomb (1953), Thomas and others (1997), and Pacific Groundwater Group (2007). The City of Arlington is located at the confluence of the North and South Forks of the Stillaguamish River (WRIA 5). Thomas and others (2007) delineated the hydrogeologic units in the vicinity of Arlington. The geologic units are summarized in the following table:

Epoch	Hydrogeologic Unit	Typical Thickness (feet)	Maximum Thickness (feet)	Lithology	Hydrogeology
Holocene	Bog/Peat/Marsh Deposits	3	10	Peat, organic-rich mud	Thin and discontinuous, not an aquifer or aquitard
	Alluvium	40	120	Fluvial and beach deposits of fine to coarse sand with lenses of silt and gravel	Unconfined aquifer
Pleistocene	Recessional Outwash	40	250	Sand and gravel, grades to silt	Unconfined aquifer or perched groundwater
	Till	70	250	Compact unsorted sand and gravel in silt and clay matrix	Aquitard with occasional thin confined aquifers
	Advance Outwash	120	350	Fine sand, grades to gravel or silt	Unconfined to confined aquifer
	Transitional Beds	100	400	Sand to silty clay	Aquitard with occasional thin confined aquifers
	Undifferentiated Sediments	500	1,000	Glacial drift and interglacial deposits of sand and gravel with some silt	Confined aquifer and aquitards
Eocene	Bedrock	Unknown	Unknown	Varying sedimentary and volcanic lithologies	Small amounts of confined water in fractures, with some potential for porous flow in sandstone units

Note:
Modified from Thomas and others (2007), Table 3.

The City's Haller Wellfield is located immediately downstream of the confluence of the North and South Forks of the Stillaguamish River, about 50 feet south of the main stem Stillaguamish River. The Haller Well Field includes shallow three wells completed in the unconfined alluvial aquifer adjacent to the main stem Stillaguamish River at depths ranging from 34 to 36 feet below ground surface. The unconfined alluvial aquifer is present in the valleys of the North and South Forks of the Stillaguamish and the main stem Stillaguamish River. The existing point of withdrawal well is also a shallow well completed to a depth of 22 feet below ground in unconfined alluvial materials adjacent to the South Fork Stillaguamish River.

The Haller Well Field area is underlain by unconsolidated alluvial sand and gravel. The depth to the underlying Tertiary bedrock is uncertain. Bedrock was interpreted by Pacific Groundwater Group (2007) to be at a depth of about 40 feet below ground in the wellfield area. However, it is possible that alluvial materials include large boulders, such as glacial erratic, that due to the difficult drilling conditions, may have been misinterpreted as "bedrock" at the time of drilling as the wells were not advanced beyond the "bedrock" (Mike Wolanek, City of Arlington, personal communication 2011). The alluvial aquifer is moderately to highly permeable, with hydraulic conductivities ranging from about 3.6 to 3,200 ft/d, and a median hydraulic conductivity of 88 ft/d (Thomas and others 2007).

Pumping tests in the Haller Well Field show that the alluvial aquifer is in direct hydraulic continuity with the main stem and South Fork Stillaguamish River (WWR 2010), and the wellfield is considered to be groundwater under the direct influence of surface water by the Washington Department of Health.

Minimum instream flows for WRIA 5 were established in 2005 under WAC 173-505-050 for the main stem Stillaguamish River and tributaries. The following table summarizes instream flow requirements for the main stem Stillaguamish River from the mouth at Port Susan to the confluence of the North and South Forks. The control point for this reach of the river is Ecology gaging station #05A070 at River Mile 11.2 (near Silvana).

Month	Day	Instream flow (cfs)
January	1-31	2,200
February	1-29	2,000
March	1-15	2,000
	16-31	2,000
April	1-30	2,000
May	1-31	2,000
June	1-15	2,000
	15-30	2,000
July	1-15	2,000
	15-31	2,000
August	1-15	1,700
	15-31	1,700
September	1-15	1,700

Month	Day	Instream flow (cfs)
	15-30	1,700
October	1-15	1,700
	15-31	1,700
November	1-15	2,200
	15-30	2,200
December	1-31	2,200

Under WAC 173-505-070, the main stem Stillaguamish River from the mouth to the confluence of the North and South Forks at River Mile 17.8 has water available above instream flow requirements over the period October 16 to June 30. Under WAC 1173-505-100, the total consumptive withdrawals from the existing and future water rights in the Stillaguamish River basin during open periods shall not exceed a total of 300 cubic feet per second (cfs) as measured at Ecology station #05A070 at river mile (RM) 11.2 (WAC 173-505-100(2)). Of that 300 cfs, the maximum allocation that may be taken from the South Fork of the Stillaguamish River from RM 17.9 (confluence with the North Fork) to RM 34.9 is 150 cfs during open period from November 1 to June 15 as measured at Ecology station #05B090. Ecology also reserved one cfs of water for future stockwatering (WAC 173-505-080) and five cfs at River Mile 11.2 for future permit-exempt groundwater use (WAC 173-505-090). The five cfs reservation includes a maximum of two cfs from the North Fork Stillaguamish River (River Mile 6.5) and 1.5 cfs from the South Fork Stillaguamish River (River Mile 6.5). Because the water right proposed for transfer has a priority date of September 4, 1951, it is senior to the instream flow regulations and is therefore not subject to interruption.

Impairment Considerations

The wells in the Haller Wellfield are completed in a highly permeable unconfined alluvial aquifer that is in direct hydraulic communication with the main stem Stillaguamish River. There will be no impairment to the main stem Stillaguamish River minimum instream flow by moving the point of withdrawal of a water right utilizing the same source that is senior to the minimum flow established in WAC 173-505-070.

The Haller Wellfield wells have been in operation for many years indicating that water is physically available. There have been no reports of interference to other wells or water right holders since the wells have been in operation. Testing completed by Pacific Groundwater Group in 2002 in Well 1R (referenced in the Report of Examination for CG1-300889CL(A)@1) showed there was about 6.5 feet of drawdown in Well 1R when the well was pumped at 570 gpm over a 4-hour period, with rapid recovery to pre-test levels following pump shutdown. Approximately 9 inches of drawdown were observed at the end of the test in Well 1, located about 25 feet from Well 1R, confirming little drawdown is expected outside the immediate wellfield area.

A search of the well log database indicted that there were 11 wells on file within about 0.5 miles of the Haller Wellfield. Other wells may be present that do not have logs filed with Ecology. With the exception of one well which is completed in bedrock (McMahan) all of the wells are completed in the alluvial aquifer. No impairment to these wells is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

Well Owner	Well Depth (feet bgs)	Date Completed	Completion Aquifer	Location
ASSOCIATED SAND & GRAVEL	64		Alluvial	T31/R5E-2NWNE
ASSOCIATED SAND AND GRAVEL	26	03/10/69	Alluvial	T31/R5E-2NWNE
C D HAMMER	19		Alluvial	T31/R5E-2NESW
CITY OF ARLINGTON	38	05/08/02	Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
CITY OF ARLINGTON	36		Alluvial	T31/R5E-2SENW
DENNIS DEARINGER	74	08/12/98	Alluvial	T31/R5E-2NENW
HENRY MILLER	40	04/10/99	Alluvial	T31/R5E-2SENW
LEE FLATO	37	08/09/91	Alluvial	T31/R5E-2SWSW
LYNN GRANSTROM	50	09/16/02	Alluvial	T31/R5E-2NESE
MIKE HANLOCK	30	04/03/81	Alluvial	T31/R5E-2SWNE
PETE VECHL	38	07/12/00	Alluvial	T31/R5E-2SENW
TOM MC MAHAN	211	06/25/92	Bedrock	T31/R5E-2NWSE

The Water Rights Application Tracking System database was queried to located water rights and claims within a 0.5 mile radius of the Haller Wellfield. Twelve water right claims for groundwater, one surface water certificate, and two groundwater certificates are within 0.5 miles of the subject application for change (excluding rights held by the City of Arlington). At least one groundwater certificate and one groundwater claim can be tied to available well logs. Some of the well logs may be associated with water rights or claims filed under a different name or are exempt from the application process. No impairment to these rights is expected based on the observed drawdown during the 2002 testing, the high aquifer transmissivity, and the good hydraulic connection to the river.

File Number	Certificate Number	Person	Document Type	Priority Date	Purpose of Use	Qi	Unit of Measure	Qa	Location	Source
G1-153724CL		MILLER HENRY C	Claim S		NR		GPM		T31N/R5E-	
G1-135771CL		VAN SLAGEREN TOM	Claim L		ST,DG		GPM		T31N/R5E-	WELL

File Number	Certificate Number	Person	Document Type	Priority Date	Purpose of Use	Qi	Unit of Measure	Qa	Location	Source
G1-124942CL		LEWIS ORWILL P	Claim S		IR,DG		GPM		T31N/R5E-	
G1-123457CL		WILSON MARVIN W	Claim L		ST,IR		GPM		T31N/R5E-	WELL
G1-119434CL		VALLEY GEM FARMS	Claim L		ST,DG		GPM		T31N/R5E-	WELL
G1-111124CL		HAMMER CURTIS D	Claim S		ST,DG		GPM		T31N/R5E-	
G1-093046CL		GROENDYK JOHN	Claim S		IR,DG		GPM		T31N/R5E-	
G1-091257CL		RICKARD JOHN C	Claim S		IR,DG		GPM		T31N/R5E-	
G1-050157CL		KROEZE JOHN	Claim S		DG		GPM		T31N/R5E-	WELL
G1-035541CL		DESPRES CLARA M	Claim L		DG		GPM		T31N/R5E-	WELL
G1-035723CL		BREEKVELDT BERT	Claim S		DG		GPM		T31N/R5E-	
G1-025841CL		KLEIN PAUL	Claim L		DG		GPM		T31N/R5E-	
S1-008945CL		SOPER FRANCES M. M.	Claim L		DG		CFS		T31N/R5E-	
S1-*11473AWC	06447A	KROEZE J	Cert	6/23/1952	IR	0.32	CFS		T31N/R5E-	UNNAMED SLOUGH
S1-*01194C	194	Puget Sound Power & Light Co	Cert	10/10/1924	DM	5	CFS		T31N/R5E-SE/NW	STILLAGUAMISH RIVER
G1-*09495C	6379	Associated Sand & Gravel Co Inc	Cert	6/4/1968	CI	150	GPM	36	T31N/R5E-	WELL
G1-*07494C	5169	Arlington City	Cert	2/12/1965	MU	1700	GPM	1344	T31N/R5E-	WELL
G1-*02442C	2968	HAMMER C D	Cert	4/9/1952	IR	156	GPM	30	T31N/R5E-	WELL
CG1-*02115C	1488	Arlington City	ChgApp	3/23/2010	MU	90	GPM	34.67	T31N/R5E-SE/NW	WELL 1
CS1-*18929C	10024	Arlington City	ChgApp	4/7/2010	MU	0.6	GPM		T31N/R5E-SE/NW	Haller well field
CS1-*10680C	5983	Arlington City	ChgApp	4/7/2010	MU	0.25	GPM		T31N/R5E-SE/NW	Haller well field

Because the proposed change will move the point of withdrawal downstream, there is a net benefit to flows in the main stem and South Fork Stillaguamish River between the proposed and existing points of withdrawal.

Enlargement

No enlargement will result from approval of this change. The City of Arlington is receiving a transferred quantity based on a tentative determination of extent and validity. Only water that was previously put to beneficial use is transferred, and only that amount is authorized to be withdrawn (by this authorization) from the wells in the Haller Wellfield.

Public Interest Considerations

Factors considered for evaluating whether the proposed change is in the public interest included but were not limited to: potential impacts to exempt wells, existing water rights, permits, and claims holders, other water right change applications, potential impact to groundwater and surface water resources, and beneficial use of the resource. No detriment to the public interest was identified during the investigation of the subject application. The available information show other wells in the area are not expected to be impaired by the proposed change, and the proposed change will provide a net benefit to flows in the main stem and South Fork Stillaguamish River between the proposed and existing points of withdrawal.

CONCLUSIONS

In accordance with state law, the following considerations were addressed as part of the process of evaluating this change request:

- The potential for enlargement of the original right,
- The potential for impairment of other rights,
- Consideration of the public interest and welfare,
- Physical availability of water,
- Whether the new point of withdrawal would tap the same body of public groundwater as the original well, and
- Protests or Letters of Concern.

Potential for Enlargement

The annual quantity and maximum instantaneous quantity will not be enlarged by this change.

Impairment of Other Rights

No impairment of other rights is expected because the alluvial aquifer is highly permeable with a direct hydraulic connection with the main stem and South Fork of the Stillaguamish River. Interference drawdown from pumping the Haller Wellfield in areas outside the immediate wellfield is expected to be negligible. There are no reports of impairment by other groundwater or surface water users since the wellfield has been in operation. Review of materials provided by the City indicated that a de facto change to the original point of diversion was made by the dairy owner sometime in the 1970s to address requirements of the Clean Water Act. The dairy owner indicates he implemented these changes through his farm plan in response to regulations requiring him to comply with the Clean Water Act (Schwabe, Williamson, and Wyatt 2010). The point of diversion was changed to a nearby point of withdrawal (a well). The existing point of withdrawal and the Haller Wellfield are in the same body of groundwater in direct communication with the main stem and South Fork of the Stillaguamish River.

Certificate 10024 limits the beneficial use of quantities allocated for irrigation purposes to the irrigation season (typically from May through October). The proposed change to continuous use could impair minimum instream flows established under WAC 173-505-050 for the mainstem of the Stillaguamish River. In order to prevent impairment of instream flows, the portion of the transfer perfected for irrigation (100.95 AF/yr) cannot be used if instream flows are not met. The quantities perfected for non-irrigation purposes (4.21 AF/yr) can be transferred without further limitations since these quantities are senior and therefore not subject to the minimum instream flow. No impairment to instream flows are expected from approval of this water right if the irrigation portion is made subject to instream flows.

Public Interest

No detriment to the public interest was identified during the investigation of this application for change. Municipal water supply is a beneficial use under RCW 43.27A.020, RCW 90.14.031, and RCW 90.54.020.

Availability of Water

Availability of water from the source was determined when the original permit was issued. Physical availability of water from the Haller Wellfield has been established through operation of the field for over 70 years with no reports during that time of decreased water availability.

Same Body of Groundwater

The existing and proposed points of withdrawals are both in the alluvial aquifer which is in direct continuity with the main stem and South Fork Stillaguamish River.

Protests or Letters of Concern

Public notice of the proposed application for change was published on July 21, 2010 and July 28, 2010 in the Everett Herald. No protests were received.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to Certificate 10024 be authorized, in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial.

244 gpm and 111.12 AF/yr
- Continuously April 16 to September 30
- Interruptible October 1 to April 15 subject to meeting minimum instream flows established under WAC 173-505-040

25 gpm and 11.6 AF/yr
- Continuously all year

The combined transferable quality for Certificates 5983 and 10024 shall not exceed 171.81 AF.

Point of Withdrawal

SE¼, NW¼, Section 2, Township 31 North, Range 5 East W.M.

Place of Use

As described on Page 1 of this Report of Examination.

REPORT BY Carl M. Einberger DATE March 27, 2012

Carl Einberger, L.Hg.
Senior Consultant, Water Resources
Golder Associates Inc.

State of Washington Hydrogeologist 1100 Licensed Geologist

Carl M. Einberger

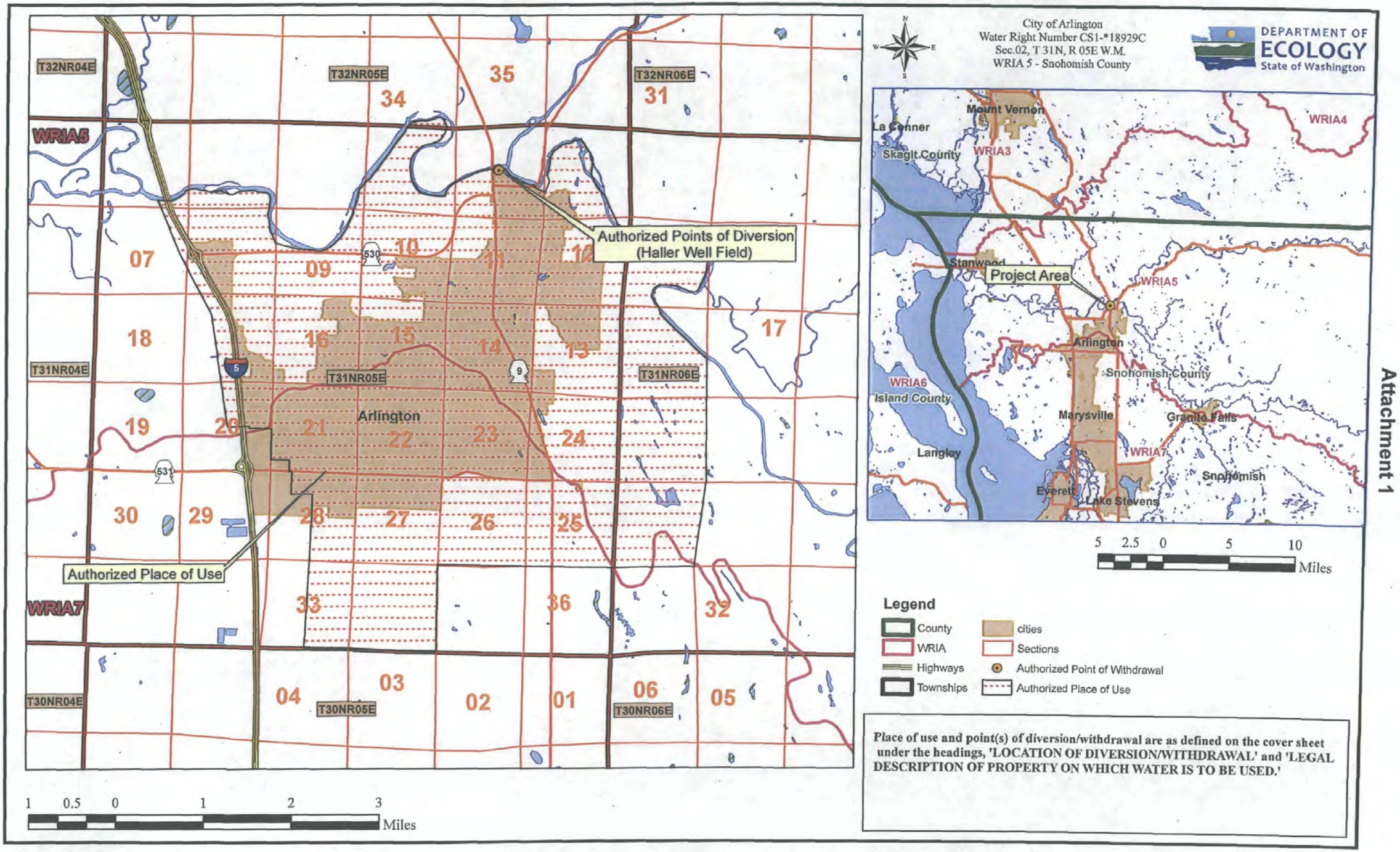
exp. 10/22/12

REVIEWED BY Douglas H. Wood DATE April 3, 2012

Douglas H. Wood, LHG
Water Resources
Department of Ecology

State of Washington Hydrogeologist 952 Licensed Geologist

DOUGLAS H



Attachment 1

L RETAIL WATER SERVICE AREA AGREEMENTS

L.1 CWSP 2015 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE AND AGREEMENT

L.2 CWSP 2015 BOUNDARY ADJUSTMENT (MARYSVILLE) MAP

L.3 CWSP WATER PURVEYORS MAP 2015

L.4 NORTH SNOHOMISH COUNTY COORDINATED WATER SYSTEM PLAN (CWSP) SIGNED AGREEMENT—1990

L.5 CWSP 2017 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE, AGREEMENT, AND MAP

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WATER SERVICE AREA CHANGE AGREEMENT

between

CITY OF ARLINGTON and

CITY OF MARYSVILLE

An Agreement between the City of Arlington (Arlington) and the City of Marysville (Marysville), individually a "Party" and collectively the "Parties":

WHEREAS, the above Parties each provide retail water service to a Water Service Area agreed to and established in the North Snohomish County Coordinated Water System Plan and identified on the Coordinated Water Service Plan (CWSP); and

WHEREAS, Arlington and Marysville each previously signed an "Agreement for Establishing Water Utility Service Area Boundaries," on file with Snohomish County Planning and Development Services (PDS), an example of which can be found in Appendix D of the 2010 update to the North Snohomish County Coordinated Water System Plan; and

WHEREAS, the current respective water service areas of the Parties to this Agreement are indicated in Figure 1-1 of the CWSP (December 2010 edition); and

WHEREAS, Section Ill 2.D. of the CWSP allows service area boundaries to be revised at any time with the execution of revised service area agreements by authorized representatives of each affected purveyor; and

WHEREAS, this Agreement shall serve as an amendment to the agreements on file with PDS;

NOW, THEREFORE, the Parties hereby agree to adjust their respective water service areas to match the Proposed Boundaries on Exhibit A attached hereto and included herein by reference.

THIS AGREEMENT SHALL BE EFFECTIVE with respect to each Party when that Party's authorized representative executes the agreement. The original signature pages shall be delivered to the attention of Gary ldleburg at PDS, which maintains the file of water service area agreements under the CWSP. Copies of the signature pages shall be delivered to each Party to this Agreement. This Agreement may be executed in counterparts.

IN AGREEMENT WHEREOF, the undersigned parties execute this Agreement

City of Arlington Water Utility

Barbara Tolbert
City of Arlington

2/4/16
Date

City of Marysville Water Utility

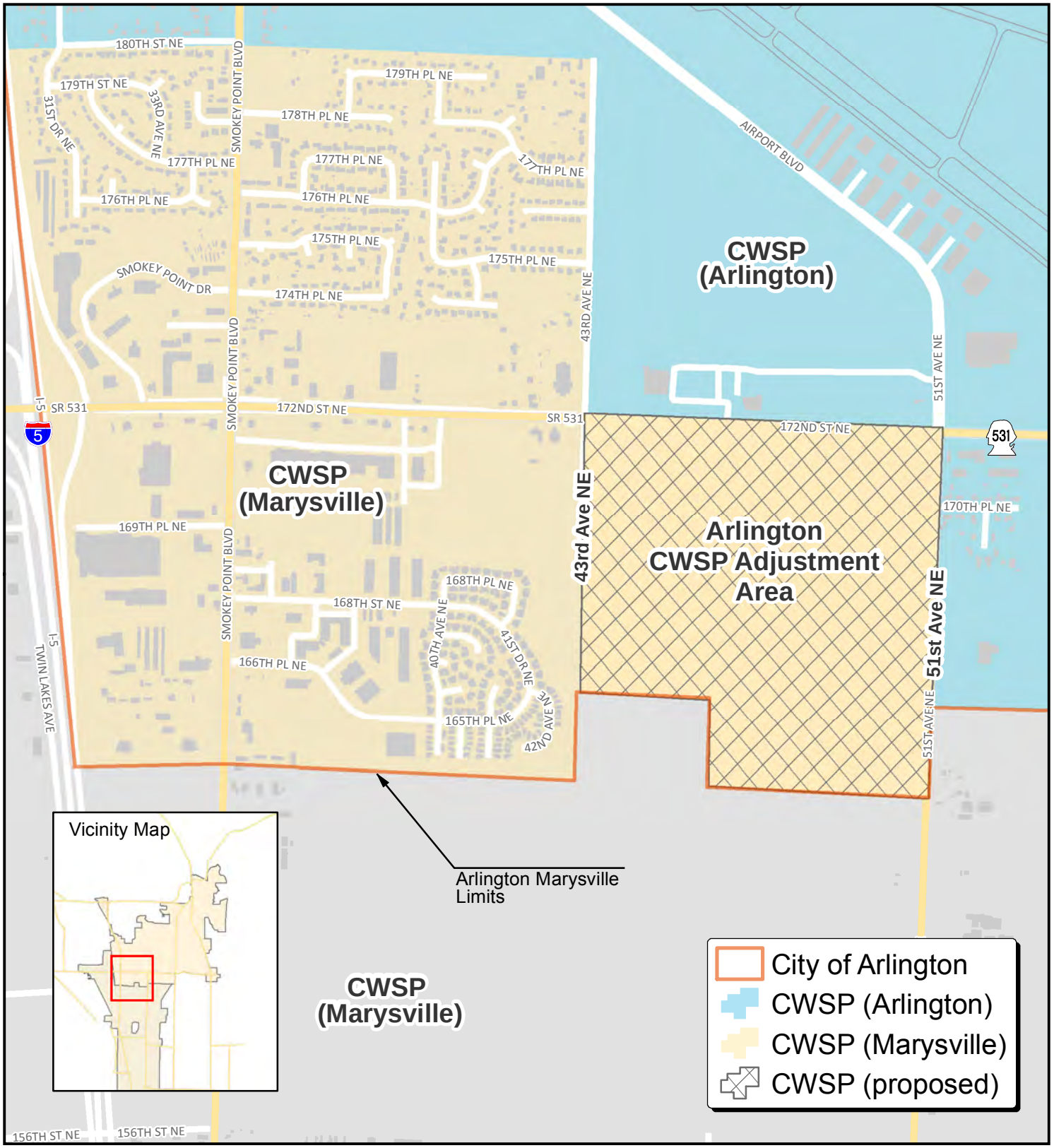
John Nehring
City of Marysville

2/5/16
Date

Receipt Acknowledged

Gary Idleburg
Senior Planner
PDS-Snohomish County

3/2/16
Date



Legend

State Routes
Roads
Buildings

N

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City of Arlington

South Arlington CWSP Adjustment Exhibit A

Scale:	File:
1 inch = 1,000 feet	SArlMarUtilExp8.5x11portrait_15
Date:	**Cartographer:**
3/10/2016	akc

May 14, 2015

Gary Idleburg
Senior Planner
Snohomish County Planning & Development
3000 Rockefeller Ave. M/S #604
Everett, WA 98201

Re: CWSP Boundary Adjustment

Mr. Idleburg,

The City of Arlington and the City of Marysville met on March 10, 2015 to discuss adjustment of our mutual water service area boundary as defined in the North Snohomish County Coordinated Water System Plan (CWSP). Specifically, the area in question is bounded on the east/west by 51st Ave./43rd Ave. and from 172nd St. south to Arlington city limits, please see attached map.

This area is currently undeveloped land within Arlington city limits. Arlington and Marysville are working on the creation of a Manufacturing Industrial Center (MIC) and we have all agreed that future development would be better served if this water service area was consistent with the city limits.

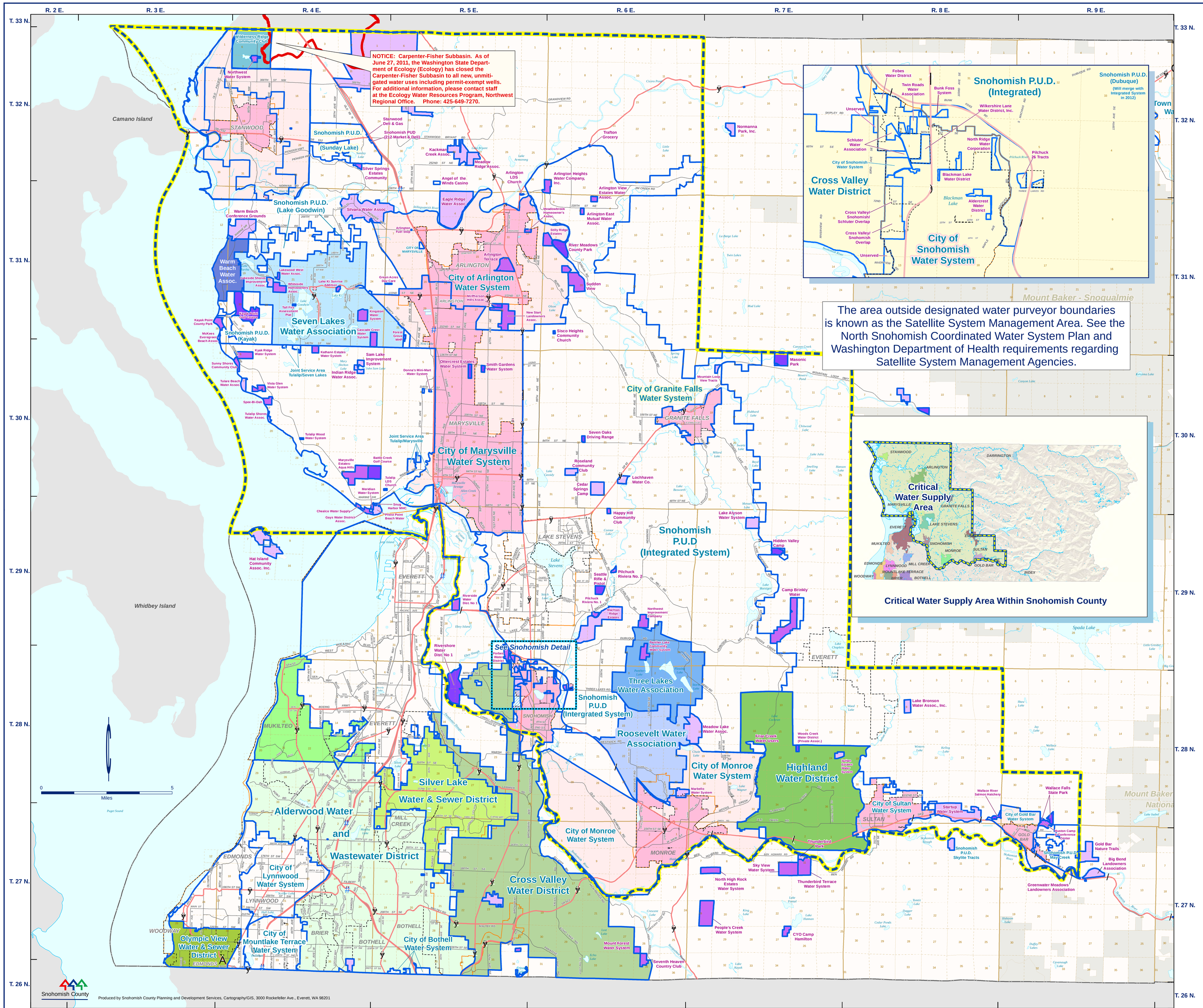
The City of Arlington is finalizing the 2015 update to its Comprehensive Water Plan and would like to include the revised CWSP in the final draft that is submitted to Department of Health. Please call me at 360.403.3505 if you need any additional information or if we can assist with the processing of this request for a CWSP Boundary Adjustment.

Sincerely,

James X. Kelly,
Public Works Director

cc: Kevin Nielsen

attach (1)



Snohomish County Water Purveyors

North Snohomish County Coordinated Water System Plan

Plan Adopted By Washington State Department of Health: January 5, 2011
(Map Revision Dates: 4/4/2016)

LEGEND

- Critical Water Supply Service Area Boundary**
- Expanding Water System Boundary
- Carpenter-Fisher Subbasin Boundary
- Service Overlaps Between Water Purveyors
- Service Gaps Between Water Purveyors

EXPANDING MUNICIPAL WATER SYSTEMS (WITH MORE THAN 50 RESIDENTIAL CONNECTIONS)

- Municipal Water System, Incorporated Portion
- Municipal Water System, Unincorporated Portion

EXPANDING SPECIAL PURPOSE WATER SYSTEMS (WITH MORE THAN 50 RESIDENTIAL CONNECTIONS)

- Alderwood Water and Wastewater District
- Cross Valley Water District
- Highland Water District
- Mukilteo Water and Wastewater District
- Olympic View Water and Sewer District
- Silver Lake Water and Sewer District
- Snohomish County Public Utility District No. 1 (P.U.D.)

EXPANDING PRIVATE WATER SYSTEMS (WITH MORE THAN 50 RESIDENTIAL CONNECTIONS)

- Roosevelt Water Association
- Seven Lakes Water Association
- Three Lakes Water Association
- Warm Beach Water Association
- Wilderness Ridge Community Club Water System

EXPANDING TRIBAL WATER SYSTEMS (WITH MORE THAN 50 RESIDENTIAL CONNECTIONS)

- Tulalip Water System

NONEXPANDING WATER SYSTEMS

- 50 Or More Connections
- 15-49 Connections
- 1- 14 Connections
- Stillaguamish Tribe of Indians
- Nonexpanding System Absorbed by Highland

GENERAL MAP SYMBOLS

- Incorporated City Boundary
- Urban Growth Area Boundary
- Public Land Survey Section Boundary
- Public Land Survey Township Boundary
- Mount Baker - Snoqualmie National Forest

This map is intended to provide general information only. No regular data sharing program exists between water purveyors and the county; therefore it is important to always contact the individual purveyors for the most current and accurate information for both district boundaries and water line locations.

New water hookups are dependant upon proximity to existing water lines. It should not be assumed that new hookups are possible at locations within a water service and/or planning area where water lines do not already exist.

Water systems labeled as "nonexpanding" do not offer water extensions outside of their water service boundary. The number of water hookups within a nonexpanding water system are determined by the Washington State Department of Health.

*Group A water systems come under the jurisdiction of the Washington State Department of Health. Rules, regulations, and definitions for Group A water districts may be found in the Washington Administrative Code (WAC), Chapter 246-290. All Group A water systems (both expanding and nonexpanding) are shown on this map. Group B water systems have not been mapped.

**The Critical Water Supply Service Area is that portion of the county where water supply problems related to uncoordinated planning, inadequate water supply, or unreliable service may exist. No new public water system may be approved within the area unless an existing water purveyor is unable to provide water service. Refer to State RCW 70.116 for more information.

Boundary data for special purpose water districts (those which elect commissioners via public elections) is maintained by the Snohomish County Auditor's Office. All other district boundary data was initially collected by the consulting firm of Economic and Engineering Services in the early 1990's. Over the years, PDS has relied upon annexation notices, comprehensive water plans, and website postings by the individual districts to keep our boundary data sets current. No regular data sharing program exists between the districts and the County.

Data:
Expanding Water System Boundary, updated 1-2014
Expanding Municipal Water Systems Boundary, updated 1-2014
Snohomish County PUD No. 1, updated 1-2014
Urban Growth Area Boundaries, PDS 11-2013
City Boundaries, Assessor 1-2014
All other data derived from the Snohomish County Group A Water Purveyors, January 2012 map

Disclaimer: All maps, data and information set forth herein ("Data") are for illustrative purposes only and are not to be considered an official citation to, or representation of, the Snohomish County Code. Amendments and updates to the Data, together with other applicable County Code provisions, may apply which are not depicted herein. Snohomish County makes no representation or warranty concerning the content, accuracy, currency, completeness or quality of the Data contained herein and expressly disclaims any warranty of merchantability or fitness for any particular purpose. All persons accessing or otherwise using the Data assume all responsibility for use thereof and agree to hold Snohomish County harmless from and against any damages, loss, claim or liability arising out of any error, defect or omission contained within said data. Washington State Law,Ch. 42.56 RCW, prohibits state and local agencies from providing access to lists of individuals intended for use of commercial purposes and, thus, no commercial use may be made of any Data comprising lists of individuals contained herein.

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AGREEMENT FOR ESTABLISHING WATER UTILITY SERVICE AREA BOUNDARIES

PREAMBLE

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

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

1. Snohomish County Critical Water Supply Service Area Map shall mean the map incorporated into this Agreement as Attachment A for the retail service area, except as amended in accordance with the CWSP procedures and with the concurrence of the affected water purveyors.

2. Retail Service Area shall mean the designated geographical area in which a purveyor shall supply water either by direct connection, 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 the Snohomish County Planning Department, unless otherwise established by amendment to the CWSP.

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

TERMS OF AGREEMENT

WHEREAS, Such an Agreement is required in WAC 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 Snohomish County as growth occurs; and

WHEREAS, Responsibility for providing water service through ownership and/or management of water systems in a designated service area is vested in the designated utility; and

WHEREAS, Definite retail and wholesale service areas will help assure that water reserved for public water supply purposes within Snohomish 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 Snohomish 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 Attachment A. Such common service areas, if they exist, are described in Attachment B to this agreement. Also included in Attachment B are copies of, or a list of, all resolutions, ordinances, or agreements permitting these uncontested overlays. The undersigned party agrees that any water line for retail service extending outside of the retail service area boundary, as set forth in Attachment A, shall be phased out and service transferred to the designated adjacent utility on an economic basis or by mutual agreement.

Economic basis considerations may include, but are not limited to:

(a) A determination by the present owner of service lines that maintenance, repair, and/or replacement costs exceed attributable income.

(b) Planned or imminent major street improvements or major improvements to either or both water systems which include an opportunity to transfer service.

The terms of the transfer of service area described in this Section shall be established in a separate agreement among the adjacent 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 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 deemed appropriate by 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 legislative authority(ies) having jurisdiction. These written modifications must be noted and filed with the designated Snohomish 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. This provision does not apply where boundary adjustments are made as a result of municipal annexations or incorporations, nor is it intended to modify the provisions of state law.

Section 5. Service Extension Policies. The undersigned party agrees that prior to expanding 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 Snohomish County Minimum Design Standards.

Municipalities further agree that if an individual municipality identifies a service area outside of their existing municipal corporate boundaries, said 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.

Section 6. Systems Placed in Receivership. Legislation passed in the 1990 Regular Session of the Washington State Legislature (Substitute Senate Bill 6447) provides that whenever an action is brought in superior court to place a public water system in receivership, the petition to the court shall name candidates for receiver who have consented to assume operation of the water system. The undersigned party agrees to be named as receiver in such actions initiated for systems within its designated service area. By this consent, the undersigned does not waive its rights to appear and participate in the court proceedings to determine acceptable conditions of receivership.

This agreement by reference includes the following attachments:

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

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

IN WITNESS WHEREOF, the undersigned party has executed this Agreement as of October 15, 1990.

City of Arlington
Water Utility

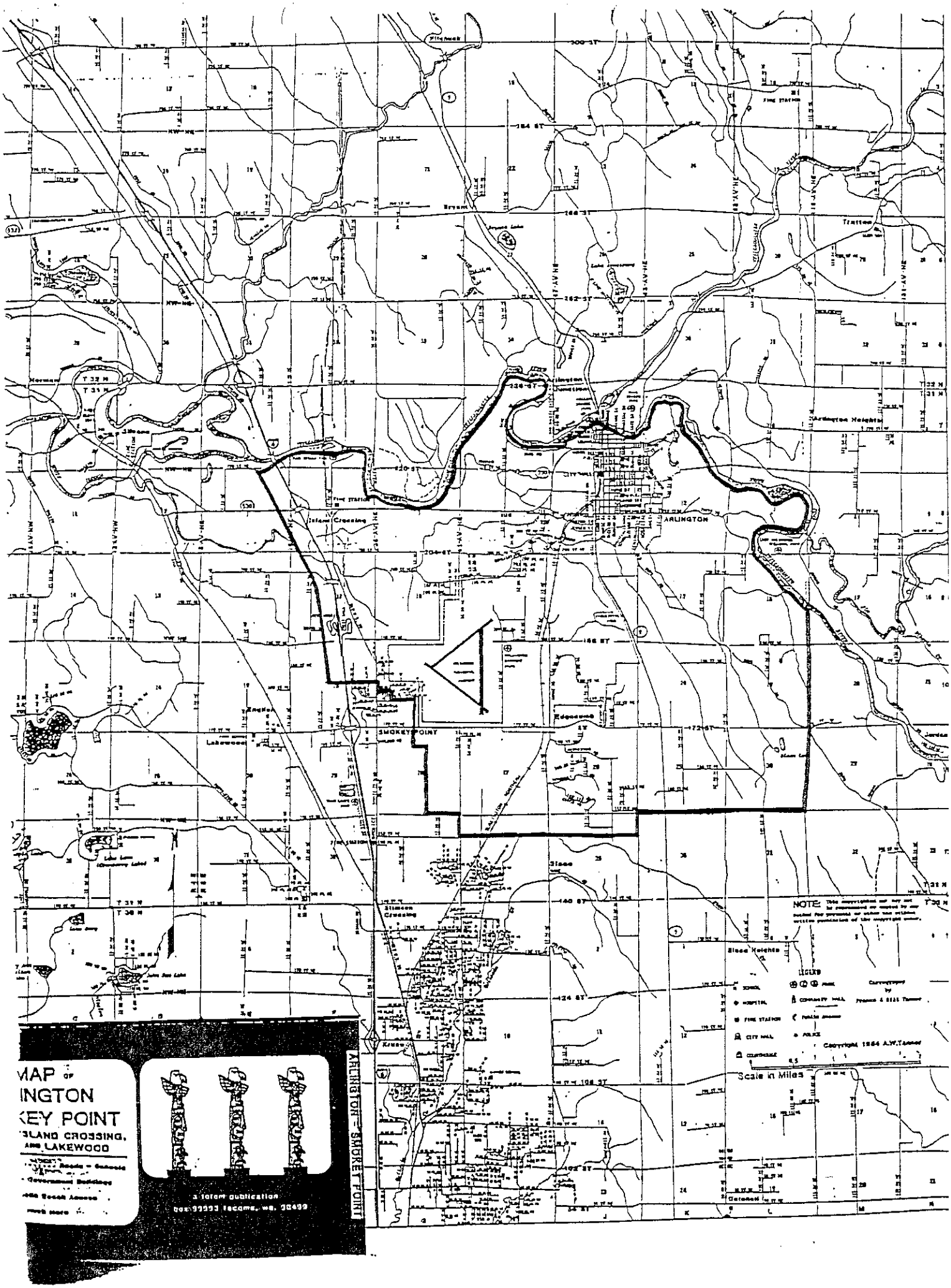
X
Representative

Mayor
Title

Receipt Acknowledged:

Snohomish County
Planning Department

Date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SMOKEY POINT
Arlington Heights
Trafton
Bryant
Silvana
Lakewood
Edgecomb
Stanwood
Kruse
Oakshott
Fire Station
Scale in Miles
NOTE:
LEGEND
Copyright 1984 A.W.Tanner

L.5 [NEW TO 2019 AMENDMENT]

CWSP 2017 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE, AGREEMENT, AND MAP

Snohomish County
Planning and Development Services

Barb Mock
PDS Director

(425) 388-3311
FAX (425) 388-3870

M/S #604
3000 Rockefeller Avenue
Everett, WA 98201-4046

September 15, 2017

James X. Kelly
Public Works Director
City of Arlington
154 W. Cox Avenue
Arlington, WA 98223

Re: CWSP Boundary Adjustment
Cities of Arlington and Marysville

Dear Mr. Kelly,

Thank you for notifying Snohomish County of the negotiated adjustment to the water provider service area boundary between the Cities of Arlington and Marysville. Attached are the signed Water Service Area Change Agreement documents acknowledging receipt by the county. The county will coordinate changes to the service area map in the Coordinated Water System Plan (CWSP).

If you have not already done so, this revision to your mutual service area should be evaluated for possible requirements administered by the Boundary Review Board as per Section III.4.B of the CWSP which states:

> *…the Boundary Review Board should be notified of those utilities that have signed Service Area Agreements, of the service area boundary of each such utility, and be requested to recognize these boundaries in the conduct of the Boundary Review Board responsibilities.*

Because this service area adjustment is within the city limits of Arlington, it is assumed that franchise agreements with the county are not applicable in this case. Please let me know if this assumption is incorrect so that I can alert the county's Public Works Department. I can be reached by phone at 425-262-2359 or email at terri.strandberg@snoco.org.

Thank you again for your efforts to coordinate with the county.

Sincerely,

Terri Strandberg, Principal Planner
Snohomish County Planning and Development Services

City of Arlington
Public Works

September 8, 2017

Terri Strandberg
Principal Planner
Snohomish County Planning & Development
3000 Rockefeller Ave. M/S #604
Everett, WA 98201

Re: CWSP Boundary Adjustment
Cities of Arlington and Marysville

Ms. Strandberg,

The City of Arlington and the City of Marysville have negotiated an adjustment of our mutual water service area boundary in accordance with the North Snohomish County Coordinated Water System Plan (CWSP). The boundary adjustment is shown on Exhibit A of the attached Water Service Area Change Agreement.

Two original copies of the agreement, signed by the mayors of both cities, are enclosed with this letter. Please coordinate changes to the CWSP water service area map, sign both copies of the agreement and return them to my attention. Please call me at 360.403.3505 if you have any questions about this water service area boundary adjustment or if I can assist with the processing of this request.

Sincerely,

James X. Kelly,
Public Works Director

cc: Kevin Nielsen

enc (1)

154 W. Cox Avenue - Arlington, WA 98223 - 360-403-3526 - fax 360-435-7944 - www.arlingtonwa.gov

WATER SERVICE AREA CHANGE AGREEMENT

between

CITY OF ARLINGTON and

CITY OF MARYSVILLE

An Agreement between the City of Arlington (Arlington) and the City of Marysville (Marysville), individually a "Party" and collectively the "Parties":

WHEREAS, the above Parties each provide retail water service to a Water Service Area agreed to and established in the North Snohomish County Coordinated Water System Plan and identified on the Coordinated Water Service Plan (CWSP); and

WHEREAS, Arlington and Marysville each previously signed an "Agreement for Establishing Water Utility Service Area Boundaries," on file with Snohomish County Planning and Development Services (PDS), an example of which can be found in Appendix D of the 2010 update to the North Snohomish County Coordinated Water System Plan; and

WHEREAS, the current respective water service areas of the Parties to this Agreement are indicated in Figure 1-1 of the CWSP (December 2010 edition); and

WHEREAS, Section Ill 2.D. of the CWSP allows service area boundaries to be revised at any time with the execution of revised service area agreements by authorized representatives of each affected purveyor; and

WHEREAS, this Agreement shall serve as an amendment to the agreements on file with PDS;

NOW, THEREFORE, the Parties hereby agree to adjust their respective water service areas to match the Proposed Boundaries on Exhibit A attached hereto and included herein by reference.

THIS AGREEMENT SHALL BE EFFECTIVE with respect to each Party when that Party's authorized representative executes the agreement. The original signature pages shall be delivered to the attention of Terri Strandberg at PDS, which maintains the file of water service area agreements under the CWSP. Copies of the signature pages shall be delivered to each Party to this Agreement. This Agreement may be executed in counterparts.

IN AGREEMENT WHEREOF, the undersigned parties execute this Agreement

City of Arlington Water Utility

Barbara Tolbert
City of Arlington

9-7-17
Date

City of Marysville Water Utility

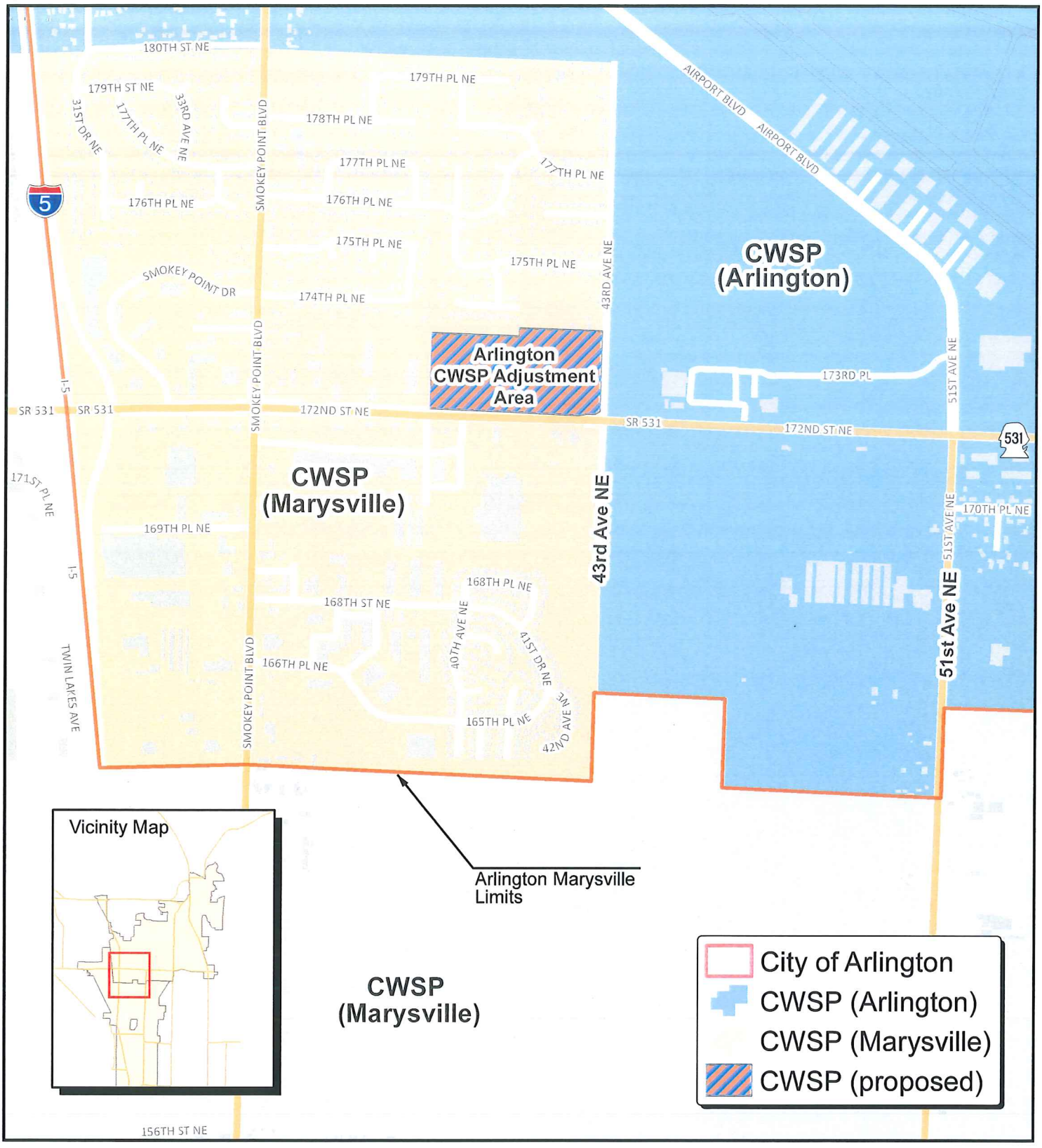
John Nehring
City of Marysville

8/30/17
Date

Receipt Acknowledged

Terri Strandberg
Principal Planner
PDS-Snohomish County

9-15-17
Date



Legend

State Routes
Roads
Buildings

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City of Arlington

South Arlington CWSP Adjustment Exhibit A

Scale:	File:
1 inch = 1,000 feet	SArlMarUtilExp8.5x11portrait_17
Date:	**Cartographer:**
9/8/2017	akc

M SNOHOMISH COUNTY PUD NO. 1 WHOLESALE WATER AGREEMENT

M.1 AGREEMENT NOT REVISED FOR THE 2015 WSP UPDATE

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RESOLUTION NO. 4770

A RESOLUTION Authorizing the General Manager to Execute a Wholesale Water Agreement Providing for the Sale of Water by the District to the City of Arlington.

WHEREAS, the City of Arlington requires a high quality, dependable supply of water in order to serve its current and future retail water service customers; and

WHEREAS, the availability of such a water supply to the City of Arlington is a component of the long-term comprehensive water plans of both the City of Arlington and Public Utility District No. 1 of Snohomish County; and

WHEREAS, the North Snohomish County Coordinated Water System Plan prepared jointly by the State of Washington, Snohomish County, and public water purveyors identifies a common service area boundary between the City of Arlington and the District in the Burn Road area; and

WHEREAS, the District's 1995 Comprehensive Water System Plan identifies a possible intertie between the City of Arlington and the District at Burn Road; and

WHEREAS, the staffs of Arlington and the District have discussed Arlington's purchase of 1,000 gallons per minute of water supply to be obtained in five equal annual increments of 200 gallons per minute each; and

WHEREAS, the District is constructing a Burn Road pipeline in 1998 which can be increased in size to accommodate 1,000 gallons per minute of flow to the City of Arlington; and

WHEREAS, the City of Arlington wishes to purchase water on a wholesale basis from the District for resale by the city to its water utility customers; and

WHEREAS, District staff members have negotiated with representatives of the City of Arlington and recommend that the District enter into a Wholesale Water Agreement substantially in the form attached as Exhibit A hereto providing for the sale of water by the District to the City of Arlington on a wholesale basis until the year 2018; and

WHEREAS, the Board of Commissioners, based upon the information and evaluation provided by staff, believes that it is in the best interests of the District and its ratepayers for the District to sell water to Arlington subject to the terms and conditions set forth in the attached Agreement.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Public Utility District No. 1 of Snohomish County hereby approves the sale of water by the District to the City of Arlington on a wholesale basis, subject to the terms and conditions set forth in Exhibit A – "Wholesale Water Agreement," and hereby authorizes and directs the General Manager to execute on behalf of the District a Wholesale Water Agreement substantially in the form set forth in Exhibit A.

PASSED AND APPROVED this 28th day of July, 1998.

Charles Moon
President

Vice President

Kathleen R Vaughan
Secretary

Exhibit X

5.03.16 SCHEDULE 48---CITY OF ARLINGTON WHOLESALE WATER SERVICE

(1) **AVAILABILITY.** This schedule is available to the City of Arlington only for wholesale water service for resale by the City to its retail water customers. The water will be supplied directly from the District's mains through one master meter located at the boundary between the Arlington Water Service Area and the District's Water Service Area on Burn Road, at the intersection of Burn Road and 172nd Street N.E.

(2) **MONTHLY RATE (COMMODITY CHARGE).**

$0.753 per 100 cubic feet of water*

(3) **TERMS OF SERVICE.** Service under this schedule is subject to terms as defined in the Wholesale Water Agreement between the District and the City of Arlington, and the District's Water Service Regulations.

(4) **TAX ADDITIONS.** The above rates are subject to proportional increases to compensate for any gross revenue tax imposed by any municipal body upon the District.

*The actual monthly rate for each year will be based on the average costs of the preceding year for each of the wholesale cost components as described in Exhibit 2 of the Wholesale Water Agreement between the District and the City of Arlington.

The terms and conditions of the Wholesale Water Agreement by and between Public Utility District No. 1 of Snohomish County (District) and the City of Arlington, as amended from time to time, including but not limited to the provisions of Section 3 thereof, are hereby incorporated into and made a part of this schedule by this reference as though fully set forth herein.

Effective Date: July 14, 1998

[Reso No. (1998)]

Resolution No. 4770

CITY OF ARLINGTON

Public Works

238 N. Olympic, Arlington, WA 98223

☐ Water ☐ Sewer ☐ Streets ☐ Development Services

Phone (360) 435-3811 FAX (360) 435-7944

LETTER OF TRANSMITTAL

DATE 7-21-98	JOB NO.
ATTENTION Mark Spaar	
RE: Bird Road Transmission line agreement.	

TO Snohomish County PUD

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2			signed originals

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☒ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

Please return one fully executed contract to us.

Thank-you

COPY TO file

SIGNED: Cresty L Brubaker

RECYCLED PAPER:
Contents: 40% Pre-Consumer • 10% Post-Consumer

If enclosures are not as noted, kindly notify us at once

WHOLESALE WATER AGREEMENT

THIS AGREEMENT is made and entered into this 28th day of July , 1998 by and between the Public Utility District No. 1 of Snohomish County, herein referred to as "the District," and the City of Arlington, herein referred to as "the City."

WHEREAS, high quality, dependable water supply is important to serve the City's water utility customers and to accomplish goals of the long-term comprehensive plans of the City, District, and Snohomish County; and

WHEREAS, the City currently has multiple water sources to supply its existing water utility customers, but as the number of customers grows, additional water supply will be needed to provide service; and

WHEREAS, the District prepared a comprehensive water system plan in 1995 which identified future District mains extending to the boundary between the City's and District's water utility service areas, including a possible intertie with the City in the vicinity of the Burn Road; and

WHEREAS, the City desires to purchase wholesale water from the District for resale by the City to its water utility customers and the District is willing to sell water wholesale to the City, for resale under the terms of this Agreement; and

WHEREAS, the capacity for wholesale water the City intends to obtain from the District totals 1,000 gpm to be obtained in five equal annual increments of 200 gpm each.

THE PARTIES AGREE AS FOLLOWS:

Section 1. Definition of Terms.

As used in this Agreement, the following words and phrases shall have the meanings indicated below unless the context shall clearly indicate that another meaning is intended.

a) Cubic Foot shall mean a unit of measurement of water equal to 7.48 gallons.

b) Equivalent Residential Unit ("ERU") shall mean the volume of water demand and use deemed and agreed by the District and the City to be characteristic of a single family residential unit in 1998, and shall equal 0.55 gallons per minute (gpm) measured on the basis of a maximum instantaneous rate of flow.

c) General Facilities Charge ("GFC") shall represent the proportionate share of the District's cost of source, storage and transmission facilities necessary to supply an ERU.

The 1998 GFC amount shall be $1,865 per ERU, and is subject to annual adjustment on January 1, based on the annual rate of inflation in the Engineering News Record's (ENR) Seattle Construction Price Index. Additional adjustments to the GFC may be necessitated by changes to the District's Water System Plan. Prior to initiating any such additional adjustments, the District will consult with the City.

d) Arlington Water Service Area shall mean that area identified in the 1991 North Snohomish County Coordinated Water System Plan ("CWSP") as the City's water service area, plus any real property which is added to the City's water service area through subsequent amendments to the CWSP.

e) May shall mean permissive.

f) Master Meter shall mean the water volume measuring device and appurtenances, including a rate of flow control valve placed in the District's water main at the point of connection with the City's water system. The master meter shall be located at the boundary between the Arlington Water Service Area and the District's Water Service Area on Burn Road, at the intersection of Burn Road and 172nd Street NE, as shown on Exhibit 1. The master meter site marks the location of delivery between the District's water system and the City's water system.

g) Shall shall mean mandatory.

h) Average Daily Demand shall mean the total annual amount of water received by the City from the District (in cubic feet), divided by the number of days in that year.

i) Peak Day Demand shall mean the amount of water purchased by the City from the District (in cubic feet) on the day of each year on which the City receives the greatest amount of water from the District.

j) Peaking Factor shall mean Peak Day Demand divided by Average Daily Demand.

Section 2. Delivery and Use of Water.

The PUD shall make the first increment of 200 gpm available at the Master Meter on or before November 1, 1998, and each additional 200 gpm increment shall be made available on or before November 1 of each subsequent year until the last increment is made available on or before November 1, 2002.

The City agrees to consume water from the District in a manner that minimizes the City's Peaking Factor. This shall be accomplished through, a) a rate of flow control valve included with the master meter that shall be adjusted to provide increments of supply in accordance with this agreement, and b) through the City's use of the intertie as its base source of water supply, with demands in excess of water provided hereunder being supplied from the City's other water sources.

Section 3. Wholesale Water Rate and Billing.

a) The wholesale water rate to be paid by the City to the District shall be per 100 cubic feet ("CCF") of water, delivered to the City at the master meter, and shall be subject to adjustment from time to time as provided herein. The rate shall be based upon the City of Everett's wholesale water rates to the District, plus the District's pumping, conveyance, administration and system depreciation costs as shown on Exhibit 2.

b) Except as otherwise provided herein, the wholesale water rate to be paid by the City to the District per CCF shall be adjusted annually, with a new rate coming into effect on April 1 of each year and remaining in effect through the last day of March of each succeeding year. The new rate each year shall be based upon actual costs incurred during the previous calendar year for the cost components listed in Exhibit 2.

c) Notwithstanding anything else to the contrary herein, should the purchase cost to the District's Water Utility of water and/or electricity be increased or decreased at any time between annual rate adjustments, such change in cost per CCF of water shall be calculated pursuant to the cost component formula set forth in Exhibit 2, and the resulting rate increase shall take effect upon the date such change becomes applicable to the District's Water Utility.

d) The period of billing for water supplied under this Agreement shall be monthly, beginning with the month during which the City first uses water via the master meter. The master meter shall be read by the District and the results recorded near the last workday of each month. Billing to the City will be issued on or before the 10th day of each month following reading of the master meter. Payment to the District shall become due within 30 days of issuance of the billing invoice. A payment shall be deemed delinquent if more than 10 days past due. Delinquent wholesale water charge amounts

shall accrue interest on the unpaid balance, from the date of delinquency until paid, at the rate of 1% per month, or 12% per year.

e) Review of Components in Wholesale Rate. The City and the District agree that not less than once every three years during the term of this Agreement, and more frequently if requested in writing by either party, the rate components of the Wholesale Water Rate may be reviewed by the District and the City. This review shall determine if the components are appropriate or if components should be dropped, altered or added. The City and the District shall agree in writing by Amendment to this Agreement for any changes in the Wholesale Water Rate components as shown in Exhibit 2.

f) Review of Rate Changes. The District shall provide to the City documentation to support any proposed change in the Wholesale Water Rate. The City shall have the opportunity to comment on any proposed change. The District shall endeavor to provide the City a minimum of 45 days notice prior to implementation of any proposed change to the Wholesale Water Rates; however, failure to provide such period of prior notice shall not prevent a change to wholesale water rates under paragraph 2(c) above when the District has not received at least 45 days notice of change in its purchase cost of water and/or electricity.

Section 4. General Facilities Charge

a) The GFC for the City shall be $1,865 per ERU in 1998.

b) The "Total GFC" the City shall owe to the District for attachment to the District's water system and acquisition of capacity to supply 1,000 gpm shall be equal to the applicable GFC amount multiplied by 1,820 ERUs (1,000 gpm divided by 0.55 gpm per ERU), plus the cost of the master meter, as described in Section 5 below.

Section 5. Payment of Total GFC

The City shall pay to the District an initial payment of $678,182 plus the cost of the master meter, which represents partial payment, at no interest, for 364 ERUs (200 gpm/0.55 gpm/ERU) at the 1998 GFC rate of $1,865/ERU. The City shall make the initial payment to the District within 10 days following written notification by the District that the Master Meter is installed and water service is available to the City, which shall be no sooner than sixty (60) days following the date of execution of this agreement. The City's unpaid balance of the GFC due the District hereunder shall be payable as

subsequent 200 gpm increments of supply are available to the City in accordance with the schedule as described in Section 2. The GFC for all subsequent increments shall be 364 ERUs times the District's GFC applicable at the time that the increment is provided to City.

Notwithstanding anything else to the contrary above, the City may determine to delay the water delivery schedule, and payment of the GFC amount due, for increments deliverable subsequent to the initial delivery and payment date. In such event the City shall provide to the District, in advance, a written proposal for modification of the delivery and payment schedule. Provided, however, that any payment made more than sixty (60) days after the scheduled payment date established in Section 2 shall accrue interest at the rate of six percent (6%) per annum until paid; and Provided further, that in no event shall the water delivery and payment schedule be modified to extend more than four years beyond that established in Section 2 without prior written amendment of this Agreement.

Section 6. Master Meter

All water supply delivered by the District to the City shall be delivered and measured through the Master Meter to be installed by the District. The cost of the Master Meter and appurtenances, including a rate of flow control valve shall be its actual construction cost as established by public bid and public works contract, which cost shall include installation and appurtenances as shown in Exhibit 3; such cost shall be in addition to the Total GFC. The line of demarcation and "point of delivery" between the District's and the City's distribution systems shall be as shown on Exhibit 3 and as described in Section 1(f). The City shall be responsible for constructing all connections between the City's water system and the "point of delivery" to its water system.

Access to the master meter and appurtenances, including flow recorders shall be made available to the City at all reasonable times. The master meter and rate of flow control valve shall be checked for accuracy on a frequency recommended by the meter manufacturer, as part of normal maintenance, and master meter test data shall be available to the City at all reasonable times, upon request.

Section 7. Water Quality

The water supplied by the District to the City under this agreement shall meet all state and federal drinking water standards at the point of delivery to the City and shall be of the same standard and quality as that normally delivered by the District to its retail customers. Provided, that the City, to the extent allowed by law, shall be responsible for maintaining water quality beyond the point of delivery and assurance of compatibility of delivered water with that supplied by the City; and the City shall hold the District harmless from and against any claims, losses, or damages arising from or relating to the introduction into its system of water or other substances beyond the point of delivery.

Section 8. Quantity, Pressure and Reliability.

a) The District shall provide water to the City at hydraulic grade line elevations between 650 and 726 feet above mean sea level at the master meter connection. The District's system will have sufficient storage and hydraulic capacity to supply water in accordance with the rate and schedule contained in Section 2.

b) It shall be the responsibility of the City to install and maintain such control valves and appurtenances as may be needed to regulate the pressure to conform to the needs of the City's distribution system and its water service customers.

c) The District's System will be designed, maintained and operated by the District in a manner consistent with municipal water system standards and applicable rules and regulations in order to provide maximum reliability of service to the City. However, it is understood and agreed that the District can make no guarantee as to pressure, quantity, or continuity of service because of the possibility of accidents or unforeseen failures to the District's, or City of Everett's water systems. Therefore, the District shall not be held liable for losses or damage from a deficiency or failure to supply water due to accidents, acts of God, and any conditions beyond the reasonable control of the District. In the event of an emergency or other necessity that may disrupt service to the City, the District shall immediately notify the City through verbal or telephone contact, and shall restore service and make water available as soon as it can reasonably do so.

In the event of scheduled maintenance, alterations, extensions, or connections, the District shall provide written notification to the City, and schedule such work to minimize the potential disruption of service to the City.

Section 9. Use of City's Existing Water Sources

It is understood that the City intends to retain and utilize its existing sources and water rights in addition to water purchased from the Project, and to support reasonably uniform daily and seasonal demand for water from the District.

Section 10. Resolution of Disputes

The parties may elect to submit any disputes to binding arbitration or other alternative dispute resolution measures agreeable to both parties. Disputes between the parties not submitted by mutual agreement to such an alternative process shall be resolved by application to the Superior Court of the State of Washington, with venue in Snohomish County. This contract shall be enforced and interpreted in accordance with the laws of the United States and the State of Washington. The prevailing party in any dispute which proceeds to judgment in superior court shall be entitled to reasonable attorney fees and costs.

Section 11. Term

This Agreement shall be effective from the date of execution by authorized representatives of both parties hereto and shall continue in effect through 2018 and thereafter unless terminated by mutual agreement or upon 5-year written notice by either party.

This Agreement may be amended at any time upon mutual written agreement of the parties, approved by their respective governing board or council. Notice shall be given by certified mail to the official mailing address of each party.

Section 12. Exhibits

Exhibits 1 through 3, referred to throughout this Agreement, are attached hereto and incorporated herein as though fully setforth at each reference.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed this 28th day of July, 1998.

APPROVED AS TO CONTENT:

Public Utility District #1

of Snohomish County

By: _____
Mark A. Schinman
General Manager

By: _____

CITY OF ARLINGTON

By: _____
Mayor

By: _____
Deputy City Clerk

APPROVED AS TO FORM:

By: _____
Assoc. Gen. Counsel

By: _____
City Attorney

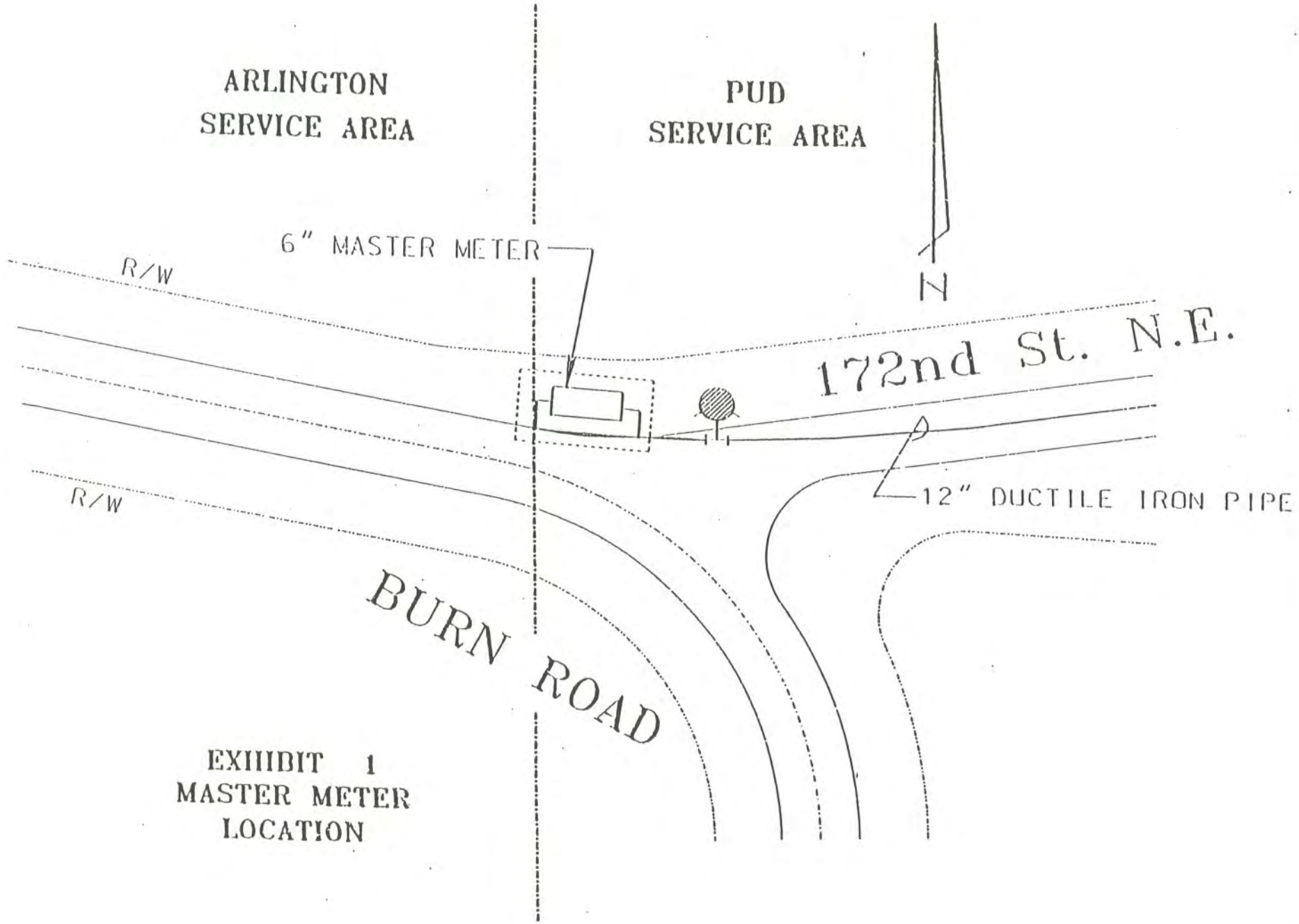


EXHIBIT 1
MASTER METER
LOCATION

EXHIBIT 2

DISTRICT WHOLESALE RATE FORMULA FOR ARLINGTON

		COST BASED ON 12/31/97 FINANCIAL STATEMENT
WHOLESALE WATER RATE COMPONENTS	SUPPLY (1)	$0.485
	PUMPING (2)	$0.113
	CONVEYANCE (3)	$0.043
	ADMINISTRATIVE (4)	$0.058
	DEPRECIATION (5)	$0.054
	TOTAL	**$0.753**

The costs for 1-5 are based on the District's 12-month average costs ending 12/31/97. The actual rate for each year will be based on the average costs of the preceding year for each of the wholesale cost components as described in items 1 through 5 below.

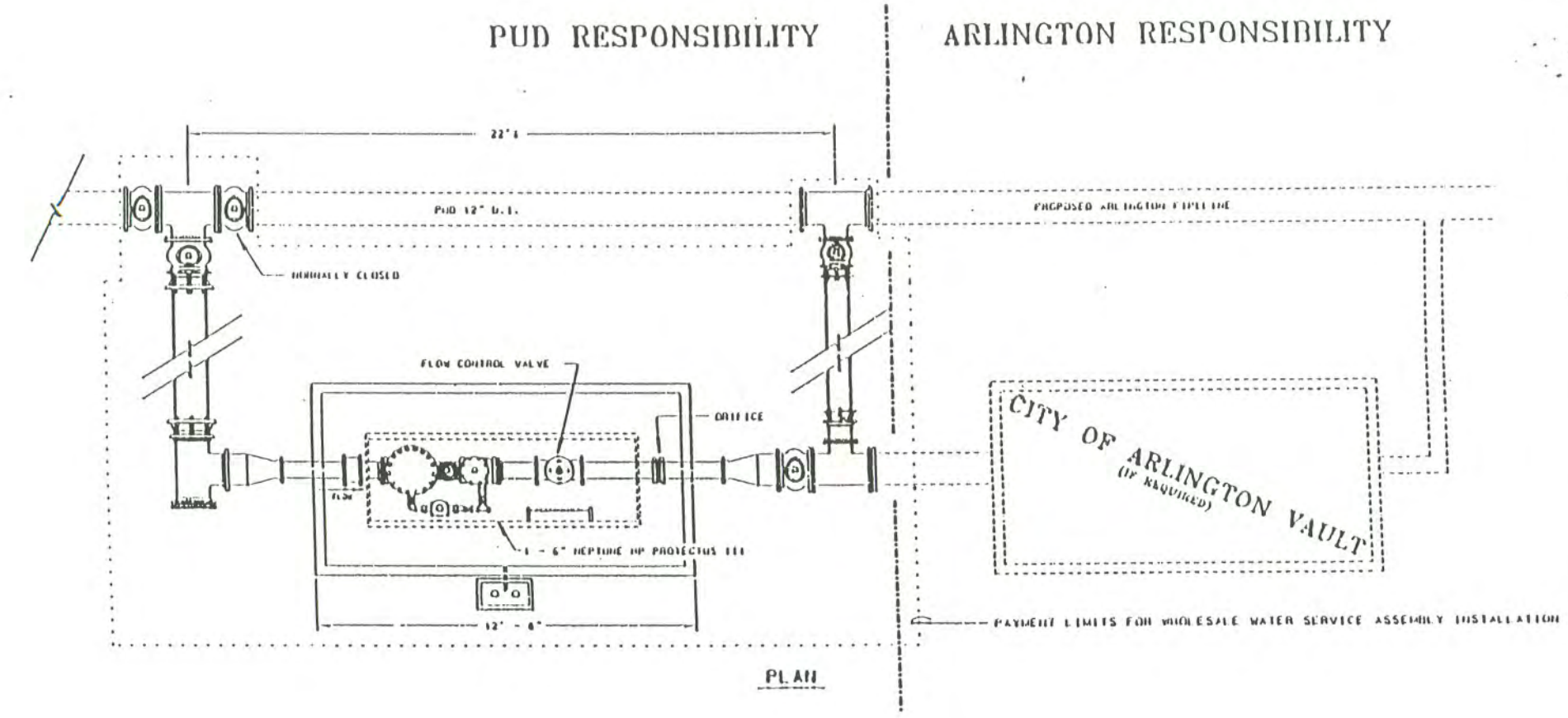
1. Average cost of all water purchased from Everett for the preceding year and adjusted for any rate increase from Everett when they occur.

2. Total pumping costs for the preceding year, times two, divided by the total cubic feet pumped. Costs adjusted for electric rate increases when they occur.

3. Total transmission and distribution costs for the preceding year times 0.162659 (the length of pipe used to transport and distribute water to the City divided by the total length of 6" or larger pipe in the PUD's system) times the amount of water delivered to the City divided by the total water purchased from Everett.

4. Nine percent of supply, pumping and conveyance costs.

5. Total District water system depreciation for the preceding year times 0.162659 (the length of pipe used to transport water to the City divided by the total length of 6" or larger pipe in the PUD's system) divided by the total water purchased from Everett (in 100 cf).



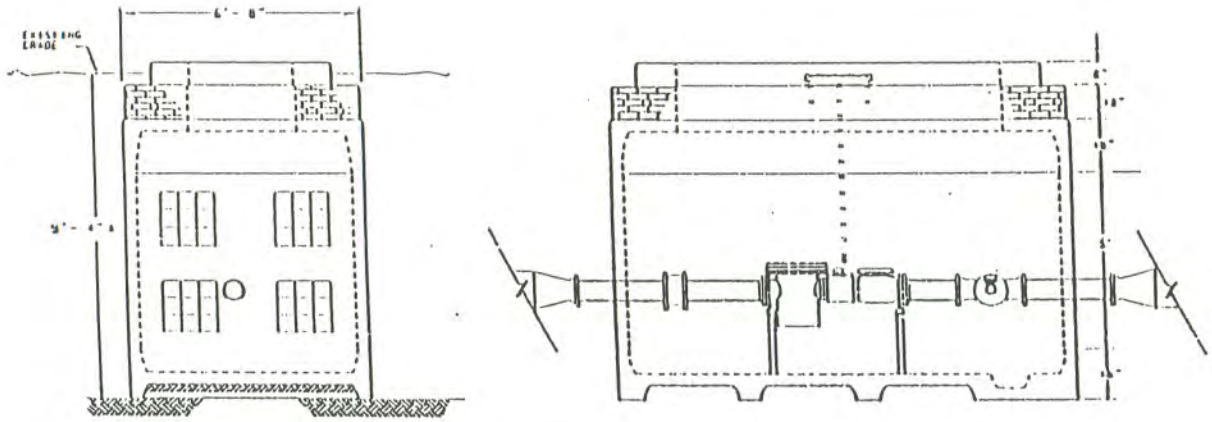


EXHIBIT 3
MASTER METER

N CONSISTENCY REVIEW CHECKLISTS

N.1 CITY OF ARLINGTON COMMUNITY AND ECONOMIC DEVELOPMENT, JULY 7, 2017

N.2 CITY OF ARLINGTON COMMUNITY AND ECONOMIC DEVELOPMENT, OCTOBER 9, 2015

N.3 SNOHOMISH COUNTY PLANNING AND DEVELOPMENT SERVICES, AUGUST 29, 2017

N.4 SNOHOMISH COUNTY PLANNING AND DEVELOPMENT SERVICES, MARCH 15, 2016

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Washington State Department of Health
Office of Drinking Water

Local Government Consistency Review Checklist

Water System Name: Arlington Water Department PWS ID: 02950K

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: July 2017 Amendment to October 2015 WSP

Local Government with Jurisdiction: City of Arlington

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Fig. 2-2 & Fig. 3-1	YES
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 3, esp. pg. 3-7ff	YES
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Chapter 5, Appendices D, O & P	YES
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Pages 5-5 to 5-8; Appendix L	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Chapters 5, 6, 7 & 9 Appendices L, I & F	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.

Marc Hayes
Signature

July 7, 2017
Date

Marc Hayes Community & Economic Development Director City of Arlington
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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

For **water system plans (WSP)**, a consistency review is required for the retail 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 non-community 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 per WAC 246-290-110(4)(b)(ii).

A) Documenting Consistency: Municipal water suppliers must document all of the elements in a consistency review per WAC 246-290-108.

1 a) Provide 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 are related to water supply planning.

1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

1c) 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.

1 d) Include all **service area policies** for how new water service will be provided to new customers.

1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). 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 provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: 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 their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

The Department of Health is an equal opportunity agency. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

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

Local Government Consistency Review Checklist

Water System Name: Arlington Water Department PWS ID: 02950K

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: October 2015

Local Government with Jurisdiction: City of Arlington

WAC 246-290-108 Consistency with local plans and regulations:
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1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Fig. 2-2 & Fig. 3-1	YES
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 3, esp. pg. 3-7ff	YES
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Chapter 5, Appendices D, O & P	YES
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Pages 5-5 to 5-8; Appendix L	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Chapters 5, 6, 7 & 9 Appendices L, I & F	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 10-9-15
Date

TROY DAVIS, SENIOR PLANNER, ARLINGTON
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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

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1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

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1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). 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 provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: 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 their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

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Mike Wolanek

From: Bowley, Samantha <Samantha.Bowley@co.snohomish.wa.us>
Sent: Wednesday, August 30, 2017 3:42 PM
To: Mike Wolanek
Cc: Sleight, Randy; Strandberg, Terri; Zelinski, Michael
Subject: Stamped Statement of Consistency - City of Arlington
Attachments: Arlington Water Consistency Determination.pdf

Mr. Wolanek,

The attached consistency statement is provided subsequent to the recent edits and clarification provided to Snohomish County's addressing comment dated 7/31/17 from Michael Zelinski, Senior Planner. Thank you for making these edits and we look forward to receipt of the final plan when it is published. A stamped original has been mailed to the City of Arlington today.

Sincerely,

Randolph R. Sleight, PE, PLS
Chief Engineering Officer
Snohomish County Planning and Development Services
3000 Rockefeller Avenue M/S 604
Everett, WA 98201

Samantha Bowley | *Administrative Assistant, on behalf of Randolph R. Sleight*
Snohomish County Planning and Development Services
3000 Rockefeller Avenue M/S 604 | Everett, WA 98201
425-262-2195| samantha.bowley@snoco.org

NOTICE: All emails, and attachments, sent to and from Snohomish County are public records and may be subject to disclosure pursuant to the Public Records Act (RCW 42.56)

July 12, 2017

Randy Sleight
Planning and Development Services
Snohomish County
3000 Rockefeller Avenue M/S 604
Everett, WA 98201

SUBMITTED BY EMAIL ONLY

RE: City of Arlington 2017 Amendment to its 2015 Comprehensive Water System Plan—Consistency Review

Dear Randy:

Herewith we provide an Agency Review Draft of the City's 2017 WSP Amendment. Please review the WSP and indicate County consistency with the requirements on the attached Local Consistency Form for our submittal to the Department of Health.

To access the Agency Review Draft of the 2017 Amendment to the 2015 WSP, please download and view the document and the separate map files from the City's web site at the link below.
http://arlingtonwa.gov/index.aspx?page=244

To begin your review, I recommend that you first: read the Revision Note on page xxvii; scan the expanded Table of Contents to identify amended sections of the WSP; and read Chapter 3, Land Use, beginning with its separate introductory note. I anticipate that you will be able to do this easily on your computer monitor. However, if you would like a hardcopy to facilitate your review, please call me and I will ship one to you immediately.

If you or any County staff have any questions regarding our WSP, please do not hesitate to contact me at 360-403-3541, or Jim Kelly, Public Works Director, at 360-403-3505. Thank you in advance for your prompt review.

Sincerely,

Mike Wolanek

Michael D. Wolanek
Water Resources Planner
Utilities Division, Public Works Department

Attachments:

- Partially completed Local Consistency Form (as a PDF file)
- WSP files are available at the link above and are not attached

Consistency Review Request Letter SnoCoPDS V2 20170712.doc

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

Local Government Consistency Review Checklist

Water System Name: Arlington Water Department PWS ID: 02950K

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: July 2017 Amendment to October 2015 WSP

Local Government with Jurisdiction: City of Arlington

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Fig. 2-2 & Fig. 3-1	Yes
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 3, esp. pp. 3-5 to 3-7	Yes
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Chapter 5, Appendices H & O	Yes
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Pages 5-3 to 5-6; Appendix A	Yes
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Chapters 3, 5, 6, 7 & 9 Appendices A, J & L	Yes

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

Signature Date 8/29/2017

Randolph R. Sleight Chief Engineering Officer
Printed Name, Title, & Jurisdiction Snohomish County Planning and Development Services

RANDOLPH R. SLEIGHT STATE OF WASHINGTON 17683 REGISTERED PROFESSIONAL ENGINEER

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 retail 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 non-community 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 per WAC 246-290-110(4)(b)(ii).

A) Documenting Consistency: Municipal water suppliers must document all of the elements in a consistency review per WAC 246-290-108.

1 a) Provide 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 are related to water supply planning.

1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

1c) 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.

1 d) Include all **service area policies** for how new water service will be provided to new customers.

1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). 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 provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: 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 their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

The Department of Health is an equal opportunity agency. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

Snohomish County
Planning and Development Services

RECEIVED
MAR 21 2016
PW Utilities

Dave Somers
County Executive

Barb Mock, Interim Director
3000 Rockefeller Avenue M/S #604
Everett, WA 98201-4046
(425) 388-3311 FAX (425) 388-3832+

March 15, 2016

City of Arlington
Public Works Administrative Office
Arlington, WA 98233

Attn: James Kelly, City of Arlington-Public Works Director

Dear Mr. Kelly:

Planning and Development Services (PDS) staff has carefully reviewed your comprehensive water plan and evaluated it relative to the criteria of the "Local Government Consistency Review Checklist" (consistency statement) pursuant to WAC 246-290-106, WAC 246-290-107, and WAC 246-290-110(4)(b)(ii).

We unfortunately, cannot sign a consistency statement at this time, to verify that your comprehensive water plan is consistent with Snohomish County's comprehensive plan.

Our primary concerns are the following:

1. The water service area maps and underlying land use and zoning assumptions (e.g. Figure 3-1 Land Use) are not consistent with the Future Land Use Map (FLUM) of our comprehensive plan.

2. The comprehensive plan for the City of Arlington is currently being appealed to the Puget Sound Growth Management Hearing Board (GMHB) and a signed consistency statement from us for this particular water comprehensive plan would be premature.

If you are able to revise the pertinent maps in your plan PDS would be willing to reconsider signing a consistency statement. We would also be willing to have a discussion about these issues with you and Washington State Department of Health staff if it would be helpful.

PDS would like to acknowledge yours and Mike Wolenek's work during this process in resolving various technical issues and securing a new service area agreement with the City of Marysville.

Enclosed is an unsigned consistency statement checklist with our comments.

If you have any questions, please contact Gary Idleburg, Sr. Planner, at 425-388-3311, ext. 2333 or Randy Sleight, Chief Engineering Officer, at 425.388.3311 ext. 2014. Thank you for your time and efforts.

Sincerely,

Barbara Mock

Barbara Mock, Interim Director
Snohomish County Planning & Development Services

Attach: Local Government Consistency Review Checklist

cc: Joshua Dugan, PDS Manager
Jacqueline Reid, PDS Supervisor
Randolph Sleight, PDS Chief Engineering Officer
Gary Idleburg, PDS Senior Planner
Michael Wolanek, City of Arlington-Water Resources Planner

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

Local Government Consistency Review Checklist

Water System Name: Arlington Water Department PWS ID: 02950K

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: October 2015

Local Government with Jurisdiction: City of Arlington

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Fig. 2-2 & Fig. 3-1	No
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 3, esp. pg. 3-7ff	No
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Chapter 5, Appendices D, O & P	YES
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Pages 5-5 to 5-8; Appendix L	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Chapters 5, 6, 7 & 9 Appendices L, I & F	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 3/15/2016 Date

Randolph R. Sleight Chief Engr. Snohomish County Planning & Development Services
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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

For **water system plans (WSP)**, a consistency review is required for the retail 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 non-community 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 per WAC 246-290-110(4)(b)(ii).

A) Documenting Consistency: Municipal water suppliers must document all of the elements in a consistency review per WAC 246-290-108.

1 a) Provide 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 are related to water supply planning.

1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

1c) 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.

1 d) Include all **service area policies** for how new water service will be provided to new customers.

1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). 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 provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: 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 their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

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O CITY OF ARLINGTON COUNCIL DECISIONS AND GUIDANCE

O.1 RECENT WATER-RELATED ORDINANCES

O.2 RECENT WATER-RELATED RESOLUTIONS

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ORDINANCE NO. 2017-012

AN ORDINANCE OF THE CITY OF ARLINGTON, WASHINGTON, MAKING CERTAIN FINDINGS AND ADOPTING BY REFERENCE AMENDMENTS TO THE COMPREHENSIVE WATER SYSTEM PLAN FOR THE CITY OF ARLINGTON

WHEREAS the City of Arlington operates a water system governed in part by Washington Administrative Code (WAC) Chapter 246-290; and

WHEREAS, the City of Arlington is required to periodically take legislative action to review and, if needed, revise its comprehensive water system plan, including capital improvement plans, service levels, and operational and maintenance plans to ensure compliance with city policies, state and federal regulations, to identify any deficiencies which present threats to public health and safety, and to develop and identify funding sources and requirements; and

WHEREAS, the City of Arlington's comprehensive water system plan was last amended in 2016, but subsequent revisions to the City's Comprehensive Plan required updates to the comprehensive water plan; and

WHEREAS, the City of Arlington contracted with RH2 and FCS Group to conduct a thorough review of the City's water comprehensive plan and prepare with the assistance of city staff amendments to the plan for consistency with the City Comprehensive Plan; and

WHEREAS, on August 1, 2017, the City Planning Commission first considered the amendments to the comprehensive water plan for the City of Arlington; and

WHEREAS, based on its review of the requirements of WAC Chapter 173-240 and other requirements of state law, the Planning Commission conducted a public hearing and took public testimony on August 15, 2017; and

WHEREAS, the City Council considered the recommendation of the Planning Commission at its workshop on September 25, 2017 and thereafter took the matter under consideration at its October 2, 2017 public meeting; and

WHEREAS, based on its review of the requirements of state law, the analysis and proposed revisions prepared by the Planning Commission and staff, and the public comments received, the City Council finds and declares that the review and needed revisions have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Washington Administrative Code Chapter 246-290, RCW Chapter 43.21C RCW, and the approved public participation and adoption process; and

WHEREAS, based on its review of the requirements of state law, the analysis and proposed revisions prepared by the Planning Commission and staff, the recommended findings

on review and proposed revisions forwarded by the Planning Commission, and the public comments received, the City Council hereby finds and declares that Arlington's comprehensive water system plan as revised by this ordinance complies with the requirements of state law;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF ARLINGTON, WASHINGTON, DOES MAKE THE FOLLOWING FINDINGS:

1. Findings. The Arlington City Council finds that:

a. The City has established and followed a public participation program in accordance with RCW 36.70A.130(2)(a), which program was formally adopted and followed by the City via City of Arlington Resolution #2014-022.

b. The City Council believes that the SEPA Determination of Non-Significance (DNS) issued by the City's Responsible Official for the Water System Plan update adequately evaluated all known environmental issues associated with the adoption of the updates to the comprehensive plan.

c. The comprehensive water system plan identifies operational and capital improvement projects and has been updated to address changes established in the Arlington General Comprehensive Plan, amended on September 18, 2017.

d. Notice of all amendments to the comprehensive plan adopted to fulfill the state law was sent to the Washington State Department of Health and the Snohomish County Planning Department.

e. The City Council finds that the review and needed revisions to the Water Comprehensive Plan have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Chapter 43.21C RCW, WAC Chapter 246-290, and the approved public participation and adoption process and, taken collectively, are in the best interests of all its citizens.

NOW, THEREFORE, the City Council of the City of Arlington does hereby ordain as follows:

Section 1. Adoption of Water Comprehensive Plan. The City Council approves that certain Comprehensive Water System Plan prepared by the City of Arlington staff with assistance from RH2 Engineers and the FCS Group dated January 2016, and amended July, 2017, a true copy of which is attached to the original of this ordinance as Exhibit "A" hereto.

Section 2. Severability. If any provision, section, or part of this ordinance shall be adjudged to be invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision or part thereof not adjudged invalid or unconstitutional.

Section 3. Effective Date. This ordinance or a summary thereof consisting of the title shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after publication.

PASSED BY the City Council and APPROVED by the Mayor this 2nd day of October, 2017.

CITY OF ARLINGTON

Barbara Tolbert, Mayor

Attest:

Kristin Banfield, City Clerk

Approved as to form:

Steven J. Peiffle
City Attorney

ORDINANCE NO. 2016-002

AN ORDINANCE OF THE CITY OF ARLINGTON, WASHINGTON, MAKING CERTAIN FINDINGS AND ADOPTING BY REFERENCE AMENDMENTS TO THE COMPREHENSIVE WATER SYSTEM PLAN FOR THE CITY OF ARLINGTON

WHEREAS the City of Arlington operates a water system governed in part by Washington Administrative Code (WAC) Chapter 246-290; and

WHEREAS, the City of Arlington is required to periodically take legislative action to review and, if needed, revise its comprehensive water system plan, including capital improvement plans, service levels, and operational and maintenance plans to ensure compliance with city policies, state and federal regulations, to identify any deficiencies which present threats to public health and safety, and to develop and identify funding sources and requirements; and

WHEREAS, the City of Arlington's comprehensive water system plan was amended in 2004 and again in 2011; and

WHEREAS, the City of Arlington contracted with RH2 and FCS Group to conduct a thorough review of the City's water comprehensive plan and prepare with the assistance of city staff analyses of that portion of the water comprehensive plan currently in effect in the City of Arlington for consistency with the requirements of state law; and

WHEREAS, the City Council adopted of Ordinance No. 2015-014 on July 6, 2015, noting that portions of the comprehensive water system plan were still in process though the plan was substantially complete; and

WHEREAS, based on its review of the requirements of WAC Chapter 246-290 and other requirements of state law, the Planning Commission conducted a public hearing and took public testimony on December 21, 2015; and

WHEREAS, the City Council considered the recommendation of the Planning Commission at its workshop on January 11, 2016 and thereafter took the matter under consideration at its January 19, 2016 public meeting; and

WHEREAS, based on its review of the requirements of state law, the analysis and proposed revisions prepared by the Planning Commission and staff, and the public comments received, the City Council finds and declares that the review and needed revisions have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Washington Administrative Code Chapter 246-290, RCW Chapter 43.21C RCW, and the approved public participation and adoption process; and

WHEREAS, based on its review of the requirements of state law, the analysis and

proposed revisions prepared by the Planning Commission and staff, the recommended findings on review and proposed revisions forwarded by the Planning Commission, and the public comments received, the City Council hereby finds and declares that Arlington's comprehensive water system plan as revised by this ordinance complies with the requirements of state law;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF ARLINGTON, WASHINGTON, DOES MAKE THE FOLLOWING FINDINGS:

1. Findings. The Arlington City Council finds that:

a. The City has established and followed a public participation program in accordance with RCW 36.70A.130(2)(a), which program was formally adopted and followed by the City via City of Arlington Resolution #2014-022.

b. The City Council believes that the SEPA Determination of Non-Significance (DNS) issued by the City's Responsible Official for the Water System Plan update adequately evaluated all known environmental issues associated with the adoption of the updates to the comprehensive plan.

c. The comprehensive water system plan identifies operational and capital improvement projects to meet growth projections established in the Arlington General Comprehensive Plan, adopted July 6, 2015.

d. Notice of all amendments to the comprehensive plan adopted to fulfill the state law was sent to the Washington State Department of Health and the Snohomish County Planning Department.

e. The City Council finds that the review and needed revisions to the Water Comprehensive Plan have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Chapter 43.21C RCW, WAC Chapter 246-290, and the approved public participation and adoption process and, taken collectively, are in the best interests of all its citizens.

NOW, THEREFORE, the City Council of the City of Arlington does hereby ordain as follows:

Section 1. Adoption of Water Comprehensive Plan. The City Council approves that certain Comprehensive Water System Plan prepared by the City of Arlington staff with assistance from RH2 Engineers and the FCS Group dated January 2016, as amended, a true copy of which is attached to the original of this ordinance as Exhibit "A" hereto.

Section 2. Adoption of Water Use Efficiency Goals. The City Council approves the Water Use Efficiency Goals prepared for adoption and attached hereto as Exhibit "B" hereto.

Section 3. Severability. If any provision, section, or part of this ordinance shall be adjudged to be invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision or part thereof not adjudged invalid or unconstitutional.

Section 4. Effective Date. This ordinance or a summary thereof consisting of the title shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after publication.

PASSED BY the City Council and APPROVED by the Mayor this 19th day of January, 2016.

CITY OF ARLINGTON

Barbara Tolbert

Barbara Tolbert, Mayor

Attest:

Kristin Banfield

Kristin Banfield, City Clerk

Approved as to form:

Steven J. Peiffle
City Attorney

RESOLUTION NO. 2014-008

A RESOLUTION OF THE CITY OF ARLINGTON DECLARING CERTAIN UTILITY PROPERTY AS SURPLUS AND AUTHORIZING ITS SALE

WHEREAS, the City has purchased the vehicles, equipment and improvements to real property listed on the attached Exhibit "A"; and

WHEREAS, the items identified on Exhibit "A" are surplus to the needs of the City; and

WHEREAS, the City conducted a public hearing on April 21, 2014 and thereafter determined approval of this resolution was in the best interests of the City and citizens;

NOW, THEREFORE, the City of Arlington, acting by and through its City Council, does hereby resolve as follows:

1. The equipment/property described on the attached Exhibit "A" is declared surplus to the needs of the City.

2. Staff is instructed to trade in all items for the best available price, sell all items for the best available price or properly dispose of items that it is unable to sell. Staff is further authorized to dispose of the property via an intergovernmental transfer pursuant to RCW 39.33.010.

Passed by the City Council of the City of Arlington at a regular meeting on this 5th day of May, 2014.

Barbara Tolbert
Mayor

ATTEST:

Kristin Banfield, City Clerk

APPROVED AS TO FORM:

Steven J. Peiffle, City Attorney

EXHIBIT A

Year	Item	VIN	ID #
1994	Ford F-150	1FTEX14H1RKB44956	#W-83
1997	Chevrolet S-10	1GCCS19X5V8179562	#W-25
1890	House	Property Parcel ID	00461804000100
1962	Steel Reservoir	20521 Burn Road	Burn Rd Reservoir
	Generator	135 kw Kohler	135ROZJ

RESOLUTION NO. 2013-004

A RESOLUTION OF THE CITY OF ARLINGTON TO WAIVE BID REQUIREMENTS FOR THE PURCHASE OF NEW AND REPLACEMENT WATER METERS FOR USE BY THE CITY OF ARLINGTON WATER DEPARTMENT

WHEREAS, the City of Arlington Water Department provides its customers with potable water through metered water services; and

WHEREAS, to maintain a consistent infrastructure of the water system and to reduce costs associated with the retro-fitting existing water services in order to handle multiple types of water meters, a single meter manufacturer is required; and

WHEREAS, Sensus Meters (formerly Rockwell Meters) has provided the City of Arlington with approximately 99% of its existing water meters and Ferguson Waterworks is the sole representative authorized to sell Sensus Meters; and

WHEREAS, RCW 35.23.352(9) permits the waiving of bidding requirements for the purchase of materials which are clearly and legitimately limited to a single source of supply or services which are subject to special market conditions;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Arlington, as follows:

Section 1: The City Council of the City of Arlington hereby waives the bidding requirements for the purchase of new and replacement water meters for use by the City of Arlington Water Department.

Section 2: This resolution will be effective for three (3) years from the date of adoption.

APPROVED by the Mayor and City Council of the City of Arlington this 19th day of February 2013.

CITY OF ARLINGTON

Barb Tolbert

Barb Tolbert, Mayor

ATTEST:

Kristin Banfield

Kristin Banfield, City Clerk

APPROVED AS TO FORM:

Steven J. Peiffle, City Attorney

CITY OF ARLINGTON
ORDINANCE NO. 2013-001

AN ORDINANCE OF THE CITY OF ARLINGTON, WASHINGTON DEFERRING CERTAIN INCREASES TO CITY WATER AND SEWER RATES AND CHARGES

WHEREAS, the City of Arlington, Washington has the authority to enact laws to promote the health, safety and welfare of its citizens; and

WHEREAS, the City of Arlington continues to examine equitable rates for water and sewer service; and

WHEREAS, the City's water rate contains a CPI adjustment factor which the City Council wishes to defer for 2013; and

WHEREAS, the City wishes to reduce the planned sewer rate increase for 2013;

NOW, THEREFORE, be it ordained by the City Council of the City of Arlington as follows:

Section 1. The two prefatory subparagraphs of Arlington Municipal Code section 13.12.040 shall be and hereby are amended to read as follows:

13.12.040 Water rates and charges. State and city utility taxes are included in the following rates and charges for water service. The water charges shall include a base charge by meter size, and a consumption rate, as set forth below.

Beginning on January 15, 2011, the rates set forth for the year 2010 shall be increased annually by the October reported percentage increase of the Consumer Price Index (CPI) for the Seattle-Tacoma-Bremerton area for All Urban Consumers, or other measure commonly used by the city should it change; provided, however, that no CPI adjustment shall be made for the period from January 15, 2012 to January 14, 2014; and provided further, however, that notwithstanding any reduction in the CPI, rates shall not decrease.

Section 2. Arlington Municipal Code section 13.12.040(4)(B) shall be and hereby is amended to read as follows:

(B) The usage rates set forth for temporary water service shall be increased annually by the October reported percentage increase of the Consumer Price Index (CPI) for the Seattle-Tacoma-Bremerton area for All Urban Consumers, or other measure commonly used by the city should it change; provided, however, that no CPI adjustment shall be made for the period from January 15, 2012 to January 14, 2014, and provided further, however, that notwithstanding any reduction in the CPI, rates shall not decrease.

Section 3. Arlington Municipal Code section 13.12.130 shall be and hereby is amended to read as follows:

13.12.130 - Residential and other sewer rates and charges.

State and city utility taxes are included in the following rates and charges for sewer service. The effective dates for the following four-year plan will be based on the city's billing cycle for use beginning on June 1, 2010, and January 15th of each year thereafter:

Sewer Charges(Monthly)	2010 RATE	2011 RATE	2012 RATE	2013 RATE
Base rate per residential unit	$ 57.45	$ 62.80	$ 68.15	$ 70.15

Beginning on January 15, 2014, the rates set forth for the year 2013 shall be increased annually by the October reported percentage increase of the Consumer Price Index (CPI) for the Seattle-Tacoma-Bremerton area for All Urban Consumers, or other measure commonly used by the city should it change; provided, however, that notwithstanding any reduction in the CPI, rates shall not decrease.

Section 4. Arlington Municipal Code section 13.12.140(a) shall be and hereby is amended to read as follows:

(a) All sanitary sewerage users consisting of any public or private premises not classified under Section 13.12.110 or classified as an industrial user under Section 13.12.150 shall be classified as commercial and charged upon the basis of water consumption. State and city utility taxes are included in the following rates and charges for sewer service. The effective dates for the following four-year plan will be based on the city's billing cycle for use beginning on June 1, 2010 and January 15th of each year thereafter. Each user shall pay a minimum monthly charge of one base rate plus a volume rate for all consumption over three hundred cubic feet per month.

Sewer Charges (Monthly)	2010 RATE	2011 RATE	2012 RATE	2013 RATE
Base rate (includes 300 cubic feet per month)	$57.45	$62.80	$68.15	$70.15
Volume rate (per 100 cubic feet per month)	$5.95	$6.50	$7.05	$7.25

Section 5. Arlington Municipal Code section 13.12.150(2)(A) shall be and hereby is amended to read as follows:

(A) For an industrial user with waste strength less than two hundred fifty mg/l, measured as five-day BOD and TSS, and other parameters within limits established in Sections 13.08.240,

13.28.050, and Chapter 13.36 of this title, and whose discharge does not require regular monitoring other than flow, the minimum monthly charge is as set forth below:

Sewer Charges (Monthly)	2010 RATE	2011 RATE	2012 RATE	2013 RATE
waste strength <250 mg/l	$352.00	$384.00	$417.00	$429.00

Section 6. Arlington Municipal Code section 13.12.150(2)(B) shall be and hereby is amended to read as follows:

(B) For an industrial user with waste strength in excess of two hundred fifty mg/l for two months or more per year, the minimum monthly charge is as set forth below:

Sewer Charges (Monthly)	2010 RATE	2011 RATE	2012 RATE	2013 RATE
waste strength >250 mg/l	$1,406.00	$1,536.00	$1,666.00	$1,715.00

Section 7. Arlington Municipal Code section 13.12.150(3) shall be and hereby is amended to read as follows:

Until such time as a sewer user charge analysis can be conducted to establish equitable charges under a negotiated discharge permit between the city and the industrial user, the following shall be used as the basis for industrial user charges:

(A) Flow based charge per cubic foot of wastewater discharged;

(B) BOD charge per pound of BOD discharged;

(C) TSS charge per pound of TSS discharged;

Sewer Charges (Monthly)	2010 RATE	2011 RATE	2012 RATE	2013 RATE
Flow-based charge (per cubic foot)	$0.01681	$0.01837	$0.01993	$0.02051
BOD charge (per pound BOD)	$0.529	$0.578	$0.627	$0.645
TSS charge (per pound TSS)	$0.354	$0.386	$0.419	$0.431

Section 8. 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 preempted by state

or federal law or regulation, such decision or preemption shall not affect the validity of the remaining portions of this ordinance or its application to other persons or circumstances.

Section 9. Effective Date. The title of this ordinance, which summarizes the contents of this ordinance, shall be published in the official newspaper of the City. The ordinance shall take effect and be in full force five (5) days after the date of publication, provided, however, that the amended rates shall be effective retroactive to January 15, 2013.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 22nd DAY OF January, 2013.

CITY OF ARLINGTON

By Barbara Tolbert
Barbara Tolbert, Mayor

Attest:

Kristin Banfield
Kristin Banfield, City Clerk

Approved as to form:

Steven J. Peiffle, City Attorney

SUMMARY OF ORDINANCE ADOPTION

You are hereby notified that on January 22, 2013, the City Council of the City of Arlington, Washington, did adopt Ordinance No. 2013-001 entitled,

"AN ORDINANCE OF THE CITY OF ARLINGTON, WASHINGTON DEFERRING CERTAIN INCREASES TO CITY WATER AND SEWER RATES AND CHARGES"

This ordinance is effective five days from its passage and publication.

The full text of the ordinance is available to interested persons and will be mailed upon request.

Kristin Banfield
City Clerk
City of Arlington

CERTIFICATION OF ORDINANCE

I, Kristin Banfield, being the duly appointed and acting Clerk of the City of Arlington, Washington, a municipal corporation, do hereby certify that the following Ordinance #2013-001 was approved at the January 22, 2013 City Council meeting.

ORDINANCE #2013-001

"AN ORDINANCE OF THE CITY OF ARLINGTON, WASHINGTON DEFERRING CERTAIN INCREASES TO CITY WATER AND SEWER RATES AND CHARGES"

A true and correct copy of the original ordinance is attached.

Dated this 24th day of January, 2013.

Kristin Banfield
City Clerk for the City of Arlington

ORDINANCE NO. 2011-025

AN ORDINANCE ADOPTING UPDATES AND REVISIONS
TO THE CITY OF ARLINGTON
WATER COMPREHENSIVE PLAN

WHEREAS, the City of Arlington engaged the services of RH2 Engineering to prepare an update to the City of Arlington's Water Comprehensive Plan (Plan); and

WHEREAS, City staff participated in the preparation of the Plan along with members of the public, and state and federal agencies; and

WHEREAS, the draft comprehensive plan dated November 2010, has been amended after review by the Washington Department of Health, Snohomish County Planning and Development Services, City of Marysville Public Works Department, and the Snohomish County Public Utilities District; and

WHEREAS, the Plan does contain in Appendix F, Water Use Efficiency Program, the following goals for efficient water use:

- Achieve system-wide average water use reduction of two percent by 2014, and five percent by 2018, from 2008 levels;
- While meeting the DSL standard of 10 percent or less based on a three-year rolling average, maintain 5 to 7 percent or lower DSL in the water system on an annual basis; and
- 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.

WHEREAS, the City Council finds that the plan should be adopted as the City of Arlington's water comprehensive plan;

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

Section 1. Adoption. The City of Arlington hereby adopts the Final Water Comprehensive Plan, and its water use efficiency goals, dated July 2011. A copy of said plan shall be on file in the City Clerk's office.

Section 2. Severability. If any section, sentence, clause, or phrase of this ordinance should 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 ordinance.

Section 3. Effective Date. This ordinance shall take effect five (5) days after its publication as provided by law.

PASSED BY THE CITY COUNCIL and approved by the mayor at a regular meeting thereof on the 15th day of August, 2011.

CITY OF ARLINGTON:

Steve Baker, Mayor Pro Tem

ATTEST:

Kristin Banfield, City Clerk

APPROVED AS TO FORM:

Steve Peiffle, City Attorney

CERTIFICATION OF ORDINANCE

I, Kristin Banfield, being the duly appointed and acting Clerk of the City of Arlington, Washington, a municipal corporation, do hereby certify that the following Ordinance #2011-025 was approved at the August 15, 2011 City Council meeting.

ORDINANCE #2011-025
"AN ORDINANCE ADOPTING UPDATES AND REVISIONS TO THE CITY OF ARLINGTON WATER COMPREHENSIVE PLAN"

A true and correct copy of the original ordinance is attached.

Dated this 18th day of August 2011.

Kristin Banfield
City Clerk for the City of Arlington

P WATER AND SEWER MUTUAL AID AGREEMENT

P.1 REGIONAL AGREEMENT, 2006

P.2 UPDATED CONTACT INFORMATION, 2013

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WATER AND SEWER MUTUAL AID AGREEMENT - 2006

THIS MUTUAL AID AGREEMENT is by and between all water and sewer utilities (Purveyors) in Snohomish County that have approved this Agreement, who are authorized to provide the benefits and undertake the obligations contained in this Agreement, and have executed this Agreement.

RECITAL

Subject to the terms and conditions below, each of the Purveyors agrees to provide personnel, materials and equipment to other Purveyors who are parties to this Agreement and who request assistance to handle a disaster or emergency.

AGREEMENT

It is agreed by the Purveyors as follows:

1. Request for Assistance. A Purveyor, through its Designated Official, may request another Purveyor to send personnel, materials and equipment to deal with a disaster or emergency. A request for assistance may be oral or written. If the request is oral, it shall be confirmed in writing by the requesting Purveyor's Designated Official as soon as practicable after the request. A written request or confirmation shall be in a form sufficient to demonstrate that it was made by a Designated Official. Each request or confirmation shall describe the equipment, personnel, materials, and other resources that are needed to address the disaster or emergency.

2. Definition of Disaster or Emergency. A disaster or emergency is an event or situation which (1) demands immediate action to preserve public health or protect life or property or (2) reaches a dimension or degree of destructiveness as to warrant the Governor of the State of Washington declaring a state of emergency.

3. Response to Request. The responding Purveyor, through its Designated Official, should, as soon as reasonably possible determine whether personnel, materials and equipment are available to respond to the request for disaster or emergency assistance. Following that determination, the responding Purveyor's Designated Official should, as soon as reasonably possible advise the requesting Purveyor of the availability of personnel, materials and equipment; and, if any or all of such items are available, the approximate time when such will be provided. The judgment of the responding Purveyor's Designated Official shall be final as to the availability of personnel, materials and equipment. A responding Purveyor shall not be liable to the requesting Purveyor or any person or entity for failing to respond to a request for assistance or provide personnel, materials and equipment. By signing this Agreement, any party who requests assistance pursuant to this Agreement waives and releases all claims for damages of any kind against any other party who fails to respond to a request for, or does not provide assistance, personnel, materials or equipment.

4. Control of Personnel and Equipment. Personnel and equipment of the responding Purveyor that are made available to the requesting Purveyor shall, to the fullest extent possible, remain under the control and direction of the responding Purveyor; the responding Purveyor shall be and remain at all times an independent contractor. The responding Purveyor's employees shall remain solely the employees of the responding Purveyor. The requesting

Purveyor shall coordinate the activities of personnel and equipment of the responding Purveyor, provided however, employees of the responding Purveyor remain employees of the responding Purveyor while performing functions and duties on behalf of the requesting Purveyor. The responding Purveyor shall retain the right to withdraw at any time some or all of its personnel, materials and equipment for any reason. Notice of intention to withdraw shall be communicated to the requesting Purveyor's Designated Official, as soon as possible; however, it need not be in writing. A responding Purveyor shall not be liable to the requesting Purveyor or any person or entity for first providing personnel, materials or equipment and later withdrawing some or all of the same personnel, materials or equipment, according to the provisions of this Agreement. By signing this Agreement, any party who requests assistance pursuant to this Agreement waives and releases all claims for damages of any kind against the responding Purveyor for withdrawing some or all of its personnel, materials or equipment that were provided pursuant to this Agreement.

5. Status of Personnel. All privileges, immunities, rights, duties and benefits of officers and employees of the responding Purveyor shall apply while those officers and employees are performing functions and duties on behalf of the requesting Purveyor, unless otherwise provided by law.

6. Indemnification. To the extent permitted by law, the requesting Purveyor shall protect, defend, hold harmless and indemnify all other responding signatory Purveyors, and their officers and employees from any and all claims, suits, costs, damages of any nature, or causes of action, including the cost of defense and attorneys fees, by reason of the acts or omissions, whether negligent, willful, or reckless, of the requesting Purveyor's officers, employees, and

Job Title of Designated Official for the purposes of initiating this Agreement:

Mayor
[Printed JOB TITLE]

City of Arlington
[Printed NAME of PURVEYOR]

By (Signature) Margaret Larson

Margaret Larson, Mayor
[Printed NAME, TITLE]

Dated: 11-7-06

ATTEST:

By (Signature) Kathy Peterson

Kathy Peterson, Finance Director/City Clerk

Dated: 11-7-06

APPROVED AS TO FORM:

By (Signature)

Steve Peiffle, City Attorney

Dated: 11-9-06

RESOLUTION NO. 734

A RESOLUTION OF THE CITY OF ARLINGTON, SNOHOMISH COUNTY, WASHINGTON, TO AUTHORIZE THE MAYOR TO SIGN THE WATER AND SEWER MUTUAL AID AGREEMENT – 2006 FOR THE PROVISION OF PERSONNEL, MATERIALS AND EQUIPMENT TO OTHER WATER AND SEWER UTILITIES (PURVEYORS) IN SNOHOMISH COUNTY WHO ARE PARTIES TO THIS AGREEMENT AND WHO REQUEST ASSISTANCE TO HANDLE A DISASTER OR EMERGENCY.

WHEREAS, the City of Arlington has authority to enter into interlocal agreements with other municipal entities; and

WHEREAS, signatories to the Sewer and Water Mutual Aid Agreement (developed in 1995) have jointly proposed language revisions to clarify the terms and conditions for their existing Sewer and Water Mutual Aid Agreement, to which the City wishes to become a party, and

WHEREAS, the City of Arlington has the power and authority to approve the signing of Water and Sewer Mutual Aid Agreement – 2006, for the purpose of providing personnel, materials and equipment to other water and sewer utilities (Purveyors) of Snohomish County who are parties to this Agreement and who request assistance to handle a disaster or emergency, and

WHEREAS, the City of Arlington has reviewed the Water and Sewer Mutual Aid Agreement – 2006, attached hereto as Exhibit A (which document is made a part hereof by this reference and are available for public inspection in the office of the City Clerk), and

WHEREAS, the City of Arlington , finds that it is in the best interest of Arlington and its water and sewer system customers to secure participation in mutual aid with other Purveyors of Snohomish County for responding to disasters and emergencies;

NOW, THEREFORE, BE IT RESOLVED by the City of Arlington, as follows:

1. The City of Arlington approves and the Mayor is authorized to sign the Water and Sewer Mutual Aid Agreement – 2006 attached to this resolution.

2. The Mayor is directed and authorized to send a certified copy of this resolution to the Everett Utilities Director.

PASSED by the City Council and APPROVED by the Mayor this 6th day of ~~October~~ November, 2006.

CITY OF ARLINGTON

Margaret Larson, Mayor

ATTEST:

Kathy Peterson, City Clerk

APPROVED AS TO FORM:

Steve Peiffle, City Attorney

DESIGNATED OFFICIAL title and contact information for Water and Sewer Mutual Aid Agreement - 2006

(As of Aug. 22, 2013)

Agreement Signatory	**Agreement Designated Official** (Title)	**Current Designated Official Title holder (**Name)	**Designee of the Designated Official** (Name)	**Purveyor 24/7 Emergency Phone #**
City of Everett	Public Works Director	**Dave Davis** Desk..... 425-257-8913 Main Office ..... 425-257-8800 Cell Phone ..... 425-220-4173 Pager..... N/A_____ Home ..... 425-220-4173 Email..... ddavis@everettwa.gov	**Mark Sadler** Desk..... 425-257-8967 Main Office ..... 425-257-8800 Cell Phone ..... 425-210-0103 Pager..... N/A_____ Home ..... 425-337-4703 Email .... msadler@everettwa.gov	425-257-8821 (staffed 24/7)
Snohomish County PUD	Assistant General Manager, Water Generation and Corporate Services	**Kim Moore** Desk..... 425-783-8606 Main Office ..... 425-397-3000 Cell Phone ..... 425-530-6936 Pager..... N/A_____ Home ..... 425-530-6936 Email.....kdmoore@snopud.com	**Brant Wood** Desk..... 425-397-3003 Main Office ..... 425-397-3000 Cell Phone ..... 425-231-5643 Pager..... N/A_____ Home ..... 360-652-4083 Email ..... bewood@snopud.com	425-783-1000 (staffed 24/7)
Olympic View Water District	General Manager	**Lynne Danielson** Desk..... 425-774-7769 Main Office ..... 425-774-7769 Cell Phone ..... 360-710-2396 Pager N/A_____ Home ..... 360-697-1270 Email.....lynned@ovwater.com	**Steve Dunphy** Desk..... 425-774-7769 Main Office ..... 425-774-7769 Cell Phone ..... 425-508-7736 Pager..... N/A_____ Home ..... 425-355-6232 Email ..... steved@ovwater.com	425-774-7769 (linked to 24/7 answering service)
Mukilteo Water Wastewater District	General Manager	**Jim Voetberg** Desk..... 425-355-3355 Main Office ..... 425-355-3355 Cell Phone ..... 425-551-8306 Pager..... N/A_____ Home ..... 425-551-8306 Email.....jimv@mukilteowwd.org	**Kevin English** Desk..... 425-355-3355 Main Office ..... 425-355-3355 Cell Phone ..... 425-356-9084 Pager..... N/A_____ Home ..... 360-653-2879 Email kevine@mukilteowwd.org	425-355-3355 (answering service to on-call person)

Agreement Signatory	**Agreement Designated Official** (Title)	**Current Designated Official Title holder (**Name)	**Designee of the Designated Official** (Name)	**Purveyor 24/7 Emergency Phone #**
Highland Water District	General Manager	**Ray Phelps** Desk.....360-794-6900 Main Office .....360-794-6900 Cell Phone .....425-770-1889 Pager.....425-303-2866 Fax.....360-805-0616 Email ..... rayphelps@frontier.com	**Pete Neese** Desk.....360-794-6900 Main Office .....360-794-6900 Cell Phone .....425-239-6783 Pager.....425-303-2866 Home ..... _____ Email ..... N/A_____	425-303-2866 (pager)
City of Lynnwood	Public Works Director	**Bill Franz** Desk.....425-670-5204 Main Office .....425-670-5000 Cell Phone .....425-754-5951 Pager..... N/A_____ Home ..... _____ Email wfranz@ci.lynnwood.wa.us	**Lester Rubstello** Desk.....425-670-5231 Main Office .....425-670-5000 Cell Phone .....425-754-7194 Fax.....425-778-5632 Home ..... _____ Email lrubstello@ci.lynnwood.wa.us	425-248-9060 (Nextel, wastewater utility on-call person)
City of Arlington	Public Works Director	**James Kelly** Desk.....360-403-3505 Main Office .....360-403-3526 Cell Phone .....425-754-7431 Pager..... N/A_____ Home .....360-341-3140 Email ..... jkelly@arlingtonwa.gov	**Don Smith** Desk.....360-403-3507 Main Office .....360-403-3526 Cell Phone .....425-754-7432 Pager..... N/A_____ Home .....360-403-0373 Email . dsmith@arlingtonwa.gov	**Water On-Call Phone** 360-386-5926 **Sewer On-Call Cell Phone** 425-754-7445

Agreement Signatory	**Agreement Designated Official** (Title)	**Current Designated Official Title holder (**Name)	**Designee of the Designated Official** (Name)	**Purveyor 24/7 Emergency Phone #**
Silver Lake Water and Sewer District	General Manager	**Patrick Curran** Desk.....425-337-3647 Main Office .....425-337-3647 Cell Phone .....425-750-0940 Pager..... N/A_____ Home .....206-720-7862 Email ..... pmcurran@slwsd.com	**Walt Robison** Desk.....425-337-3647 Main Office .....425-337-3647 Cell Phone .....425-750-0939 Pager..... N/A_____ Home .....425-337-2199 Email: wrobison@slwsd.com	425-337-3647 (Answering & call out service)
City of Snohomish	Public Works Director	**Steve Schuller** Desk.....360-282-3194 Main Office .....360-568-3115 Cell Phone .....425-328-6520 Pager..... N/A_____ Home ..... Email .....schuller@ci.snohomish.wa.us	**Tim Jackson** Desk.....360-568-3229 Main Office ...360-568-7070x237 Cell Phone .....425-328-0072 Pager..... N/A_____ Home ..... Email jackson@ci.snohomish.wa.us	360-563-2012 (24 hour answering service)
Alderwood Water and Wastewater District	General Manager	**Jeff Clarke** Desk.....425-741-7911 Main Office .....425-743-4605 Cell Phone .....425-280-9231 Fax 425-742-4562 Home .....425-280-9231 Email: JClarke@awwd.com	**Joe Bolam** Desk.....425-743-8911 Main Office .....425-787-0250 Cell Phone .....425-218-7647 Pager..... N/A_____ Home .....253-770-4184 Email: jbolam@awwd.com	425-422-0379 (AWWD's on-call cell ph. #)
Cross Valley Water District	General Manager	**Gary Hajek** Desk.....360-668-6766, x102 Main Office .....360-668-6766 Cell Phone .....425-239-9843 Pager..... N/A_____ Home .....360-794-3664 Email .....gary@crossvalleywater.net	**Dave Calvo** Desk.....360-668-6766, x104 Main Office .....360-668-6766 Cell Phone .....425-339-7742 Pager..... N/A_____ Home .....425-210-9509 Email ..... davec@crossvalleywater.net	360-668-6766 (Linked to answering service)

Agreement Signatory	**Agreement Designated Official** (Title)	**Current Designated Official Title holder (**Name)	**Designee of the Designated Official** (Name)	**Purveyor 24/7 Emergency Phone #**
City of Edmonds	Public Works Director	**Phil Williams** Desk.....425-771-0234 Main Office .....425-771-0235 Cell Phone .....425-582-3058 Pager..... N/A_____ Home .....360-621-4223 Email ... phil.williams@ci.edmonds.wa.us	**Jim Waite** Desk.....425-771-0235, x1649 Main Office .....425-771-0235 Cell Phone .....425-870-0617 Pager.....425-303-3584 Home .....360-794-5671 Email .. waite@ci.edmonds.wa.us	Pager: 425-303-3575 Cell:425-308-9867
City of Marysville	Public Works Director	**Kevin Nielsen** Desk.....360-363-8121 Main Office .....360-363-8100 Cell Phone .....425-754-4703 Pager..... N/A_____ Home .....425-754-4703 Email ..... knielsen@marysvillewa.gov	**Doug Byde** Desk.....360-363-8125 Main Office .....360-363-8100 Cell Phone .....425-754-1854 Pager..... N/A_____ Home .....425-754-1854 Email: dbyde@marysvillewa.gov	360-913-2560 (Cell)
City of Monroe	Public Works Director	**Brad Feilberg** Desk.....360-863-4540 Main Office .....360-794-7400 Cell Phone .....425-754-3833 Pager N/A Home ..... _____ Email: ..... bfeilberg@monroewa.gov	**Jakeh Roberts** Desk.....360-863-4502 Main Office .....360-794-6100 Cell Phone .....425-754-3752 Pager..... N/A_____ Home ..... _____ Email: ..... jroberts@monroewa.gov	425-239-0189 (Pager Phone)
Roosevelt Water Association, Inc.	Manager	Name **Janelle MacDicken** Desk..... _____ Main Office ..... _____ Cell Phone .....360-568-3450 Pager..... _____ Home .....360-794-5011 Email .....Rooseveltwater@frontier.com	Name **On-call Alternate** Desk..... _____ Main Office ..... _____ Cell Phone .....360-568-3450 Pager..... _____ Home ..... _____ Email .....Rooseveltwater@frontier.com	360-568-3450

Agreement Signatory	**Agreement Designated Official** (Title)	**Current Designated Official Title holder (**Name)	**Designee of the Designated Official** (Name)	**Purveyor 24/7 Emergency Phone #**
_____	_____	Name Desk..... _____ Main Office ..... _____ Cell Phone ..... _____ Pager..... _____ Home ..... _____ Email .. _____	Name Desk..... _____ Main Office ..... _____ Cell Phone ..... _____ Pager..... _____ Home ..... _____ Email ... _____	_____ (staffed, dialer, etc.?)

Q SEPA

Q.1 2017 ADDENDUM TO THE DNS

Q.2 DETERMINATION OF NON-SIGNIFICANCE (DNS)

Q.3 SEPA CHECKLIST FOR A NON-PROJECT ACTION

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ADDENDUM
DETERMINATION OF NON-SIGNIFICANCE
CITY OF ARLINGTON

FILE NAME: 2015 Comprehensive Water System Plan, 2017 Amendment

FILE NUMBER: PLN#170

ADDENDUM: The City of Arlington 2015 Comprehensive Water Plan serves, by adoption, as a critical element to the City of Arlington's GMA Comprehensive Plan. Changes to planned City expansion and redistribution of population, as documented in the City of Arlington's GMA Comprehensive Plan as amended in 2017, has required this 2015 Comprehensive Water Plan, 2017 Amendment to assure compliance with state and federal regulations and laws, to assure adequate water infrastructure, to assure a high level of service to existing customers, and to facilitate the growth of new customers.

ORIGINAL DESCRIPTION OF PROPOSAL: Planned update of the City's Comprehensive Water Plan. Noteworthy changes in this update include identification of six focus areas to accommodate residential growth and commercial/industrial expansion, including expansion of the City's UGA and Water Service Area west of I-5 (dependent on Snohomish County Council approval of its 2016 docket). Capital projects are identified for 10 and 20 year horizons.

PROPONENT: City of Arlington Public Works Department

LOCATION OF PROPOSAL: The Comprehensive Water System Plan, 2017 Amendment applies within its water system boundary, including the city limits, the UGA, and area within Snohomish County that is outside of Arlington's UGA.

LEAD AGENCY: City of Arlington department of Community and Economic Development

DETERMINATION: The lead agency for this proposal has determined that the addendum does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This determination assumes compliance with State law and City of Arlington ordinances related to general environmental protection. This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

Responsible Official:	Marc Hayes
Title:	Director, Community & Economic Development
Address:	City of Arlington 238 N Olympic Ave Arlington, WA 98223
Phone:	(360) 403-3457
Issue Date:	June 26, 2017

Signature: Marc Hayes **Date:** 6/20/2017

There is no comment period or agency appeal associated with this addendum.

COMMUNITY & ECONOMIC DEVELOPMENT
PLANNING & LAND USE DIVISION

★

ARLINGTON AIRPORT OFFICE
18204 59TH AVE NE
ARLINGTON, WA 98223
8am – 5pm M-F
Closed Holidays

T: 360.403.3551

TO LEARN MORE

You may email the planner assigned to the project or review the project file at the address listed above.

TO COMMENT

Send written comments to the listed Staff Contact within the specified comment period.

SEPA THRESHOLD DETERMINATION

Determination of Non-Significance (DNS)

FILE NAME: 2015 Water System Plan SEPA

FILE NUMBER: PLN#170 (SEPA Only)

LEAD AGENCY: City of Arlington, Community & Economic Development Department

DESCRIPTION: Planned update of the City's Comprehensive Water System Plan. Noteworthy changes in this update include identification of six focus areas to accommodate residential growth and commercial/industrial expansion, including expansion of the City's UGA and Water Service Area west of I-5 (dependent on Snohomish County Council approval of its 2016 docket). Capital projects are identified for 10 and 20 year horizons.

LOCATION: City of Arlington

APPLICANT: City of Arlington Department of Public Works

STAFF CONTACT: Troy Davis, Senior Planner, tdavis@arlingtonwa.gov

DATE CHECKLIST PREPARED: July 15, 2015

APPROVALS REQUIRED: City of Arlington, Washington State Department of Ecology

SEPA THRESHOLD DETERMINATION: The City has determined that this proposal does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request. Impacts of the project will be mitigated by the requirement that the development must comply with all City of Arlington zoning and development regulations.

DISCLAIMER: The determination that an environmental impact statement does not have to be filed does not mean there will be no adverse environmental impacts. The City of Arlington codes governing noise control, land use performance standards, construction and improvements of roads, off site road improvement obligations, drainage control, traffic, school, park, stormwater, and utility mitigations, fire protection; and building practices will provide substantial mitigation of the aforementioned impacts.

The issuance of this DNS should not be interpreted as acceptance or approval of this proposal as presented. The City of Arlington reserves the right to deny or

approve said proposal subject to conditions if it is determined to be in the best interest of the city and/or necessary for the general health, safety, and welfare of the public to do so.

STUDIES REQUIRED: None

DATE OF MITIGATED DETERMINATION OF NON-SIGNIFICANCE: 10/08/2015

COMMENT PERIOD: There is a 14-day comment period for this DNS. If you would like to comment on this Threshold Determination, written comments must be received prior to 5:00 p.m. on October 22, 2015. The Responsible Official may incorporate any substantial comments into the DNS. If the DNS is substantially modified, it will be reissued for further public review.

SEPA RESPONSIBLE OFFICIAL: Chris Young, Director of Community & Economic Development

10/8/15 | Christopher Young

DATE | SIGNATURE OF SEPA RESPONSIBLE OFFICIAL

TO APPEAL A DECISION: An agency or person may appeal the City's procedural compliance with WAC Chapter 197-11 (SEPA) for issuance of this DNS. Appeal of the final DNS must be made to the Hearing Examiner within 10 days of the date the DNS is final (see WAC 197-11-390 (2)(a)). The DNS is a final DNS when the City issues the land use permit. Appeal of the land use permit must be made to the Hearing Examiner within 14 days of the date the permit is issued.

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

1. Name of proposed project, if applicable:

City of Arlington 2015 Comprehensive Water System Plan

2. Name of applicant:

City of Arlington

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

Jim Kelly
Public Works Director
City of Arlington
238 N Olympic Avenue
Arlington, WA 98223
360.403.3505
jkelly@arlingtonwa.gov

4. Date checklist prepared:

July 15, 2015

5. Agency requesting checklist:

City of Arlington

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

The City of Arlington's *2015 Comprehensive Water System Plan* (WSP) is an update of the October 2011 version. It is designed to meet the State of Washington regulatory requirements for potable water purveyors in WAC 246-290-100. It also identifies Capital Improvement Projects necessary to facilitate and extend water services to a customer base envisioned to grow as described in the City's 2015 Update to its General Comprehensive Plan. The implementation of the proposed plan would be phased. This non-project action is within the 2015 City of Arlington Comprehensive Plan Update docket cycle.

It is anticipated that a public hearing on the WSP will be held at City Council in fall 2015. Adoption of the Plan by City Council is anticipated to be completed by year-end 2015.

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

Arlington Public Works would continue to focus on programs that address water capital and O&M needs. The City would periodically review and update the *2015 Comprehensive Water System Plan*, as needed. Washington State Department of Health (WDOH) requires and update of the Plan every six years. In addition, the City is concurrently producing updates to

its Comprehensive Wastewater Plan and Comprehensive Transportation Plan. It just completed and adopted its General Comprehensive Plan. Any future updates of this proposed plan and the related plans would undergo environmental review under SEPA.

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

None.

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.

Other than the plans specified under 7 above, there are no other applications pending for governmental approvals. However, individual projects related to the proposed plan may require additional approvals, and such approvals would be sought for the individual projects prior to construction or development.

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

City Council approved the 2015 Comprehensive Plan Amendments, which include the Comprehensive Water System Plan. WDOH reviews and approves Water System Plans such as this one, as required by Section 246-290-100 WAC.

More specific information on approvals or permits for projects anticipated under the proposed plan would be determined during project-level environmental review. Future programs and projects that would result from the *2015 Comprehensive Water System Plan* must comply with applicable federal, state, and local regulations. Future projects to implement the proposed plan could require certain federal, state, and local government approvals and permits, including SEPA review, and potentially NEPA review if a project involves federal funding or agency approval.

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.)

Planned update of the City's Comprehensive Water System Plan. Noteworthy changes in this update include identification of six focus areas to accommodate residential growth and commercial/industrial expansion, including expansion of the City's UGA and Water Service Area west of I-5 (dependent on Snohomish County Council approval of its 2016 docket). Capital projects are identified for 10 and 20 year horizons.

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.

This SEPA checklist evaluates an update of the City's Comprehensive Water System Plan which applies within its water system boundry, including the city limits, the UGA, and area within Snohomish County that is outside of Arlington's UGA. See the attached map.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

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

N/A for this nonproject action.

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

N/A

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.

N/A

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

N/A

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.

N/A

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

N/A

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

N/A

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

N/A

2. Air

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.

N/A for this nonproject action.

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

N/A

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

N/A

3. Water

a. Surface Water:

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

There is surface water in the form of the Stillaguamish River and numerous streams and creeks throughout the City of Arlington. The City is authorized to withdrawal water from wells on the south bank of the river for filtration and disinfection in its water treatment plant (WTP) at a rate of 1,700 gpm. It subsequently distributes potable water to its customers, and would continue to do so. A City-owned constructed wetland lies adjacent to the WTP. The WTP is currently permitted to discharge dechlorinated, sediment-free effluent to the wetland and would continue to do so. This non-project action could allow specific projects that would affect the water treatment and distribution process.

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.

N/A for this nonproject action.

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.

N/A

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

N/A

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

N/A

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.

N/A

b. Ground Water:

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

In addition to the water withdrawn from wells near the Stillaguamish River, the City is authorized to withdrawal water from a single well on the Arlington Airport at a rate of up to 580 gpm, and typically draws approximately 220 gpm. It subsequently disinfects and distributes the potable water to its customers, and would continue to do so. This non-project action could allow specific projects that would affect the water treatment and distribution process.

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, thenumber 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.

As described previously, a City-owned constructed wetland lies adjacent to the WTP. The WTP is currently permitted to discharge dechlorinated, sediment-free effluent to the wetland surface and would continue to do so. This non-project action could allow specific projects that would affect the waste stream generated by the backwashing of the filters used in the water treatment process.

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.

N/A for this nonproject action.

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

N/A

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

N/A

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

N/A

4. Plants

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

N/A for this nonproject action.

____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?

N/A

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

N/A

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

N/A

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

N/A

5. Animals

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.

N/A for this nonproject action.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

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

N/A for this non-project action, although salmon and bullhead trout likely exist in the Stillaguamish River.

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

N/A

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

N/A

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

N/A

6. Energy and Natural Resources

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.

N/A for this nonproject action.

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

N/A

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:

N/A

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, riskof fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

N/A for this nonproject action.

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

N/A

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.

N/A

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.

N/A

4) Describe special emergency services that might be required.

N/A

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

N/A

b. Noise

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

N/A for this nonproject action.

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.

N/A

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

N/A

8. Land and Shoreline Use

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.

N/A for this nonproject action.

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?

N/A for this nonproject action.

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:

N/A for this nonproject action.

c. Describe any structures on the site.

N/A for this nonproject action.

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

N/A for this nonproject action.

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

This nonproject action covers all City zoning classifications.

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

This nonproject action covers all City comprehensive plan designations.

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

N/A

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

N/A

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

N/A

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

N/A

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

N/A

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

N/A

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

N/A

9. Housing

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

N/A for this nonproject action.

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

N/A

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

N/A

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

N/A for this nonproject action.

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

N/A

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

N/A

11. Light and Glare

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

N/A for this nonproject action.

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

N/A

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

N/A

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

N/A

12. Recreation

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

N/A for this nonproject action.

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

N/A

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

N/A

13. Historic and cultural preservation

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 located on or near the site? If so, specifically describe.

N/A for this nonproject action.

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.

N/A

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.

N/A

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.

N/A

14. Transportation

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.

N/A for this nonproject action.

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?

N/A

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

N/A

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). ____

N/A

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

N/A

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?

N/A

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.

N/A

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

N/A

15. Public Services

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.

N/A for this nonproject action.

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

N/A

16. Utilities

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

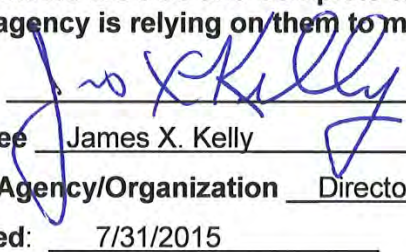
N/A for this nonproject action.

c. Describe the utilities that are proposed for the project, the utility providing the service,and the general construction activities on the site or in the immediate vicinity which mightbe needed.

N/A

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 James X. Kelly

Position and Agency/Organization Director, City of Arlington Pubic Works

Date Submitted: 7/31/2015

D. supplemental sheet for nonproject actions

(**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?

This non-project action references separate, preliminary, capital improvement projects which could individually facilitate increases in water withdrawals from rivers and groundwater, discharges to receiving waters, and which could affect the quality of the effluent and the loading of contaminants to those receiving waters. These changes in quantity and quality would be within (or restricted by) limits specified by permit under state and federal law. This non-project action itself is not likely to increase: emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise. Any projects that may occur as listed within the WSP would likely be reviewed under SEPA and require environmental analysis and review.

Proposed measures to avoid or reduce such increases are:

The return of water supply as wastewater flows to the wetland and the river are addressed under this WSP and the Water Utility's NPDES discharge permit. The Department of Ecology monitors compliance with permit conditions intended to avoid or mitigate impacts from these discharges.

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

This nonproject action itself is not likely to affect plants, animals, fish, or marine life.

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

Permit conditions require specific monitoring and reporting of residual chlorine, settleable solids, pH, and turbidity to Ecology. Also, protections are afforded through SEPA review and compliance with the City's Environmentally Critical Areas regulations and the requirements of the Endangered Species Act.

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

This non-project action itself is not likely to deplete energy or natural resources

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

None proposed.

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 non-project action itself is not likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection.

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

See D.2 above.

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 nonproject action would continue without modification the operation of the Haller well field on the south bank of the Stillaguamish River, a facility which has been previously approved under the Shorelines review process. It is not likely to affect land and shoreline use nor is it likely to allow or encourage land or shoreline uses incompatible with existing plans.

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

This non-project would not allow uses that are incompatible with existing plans.

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

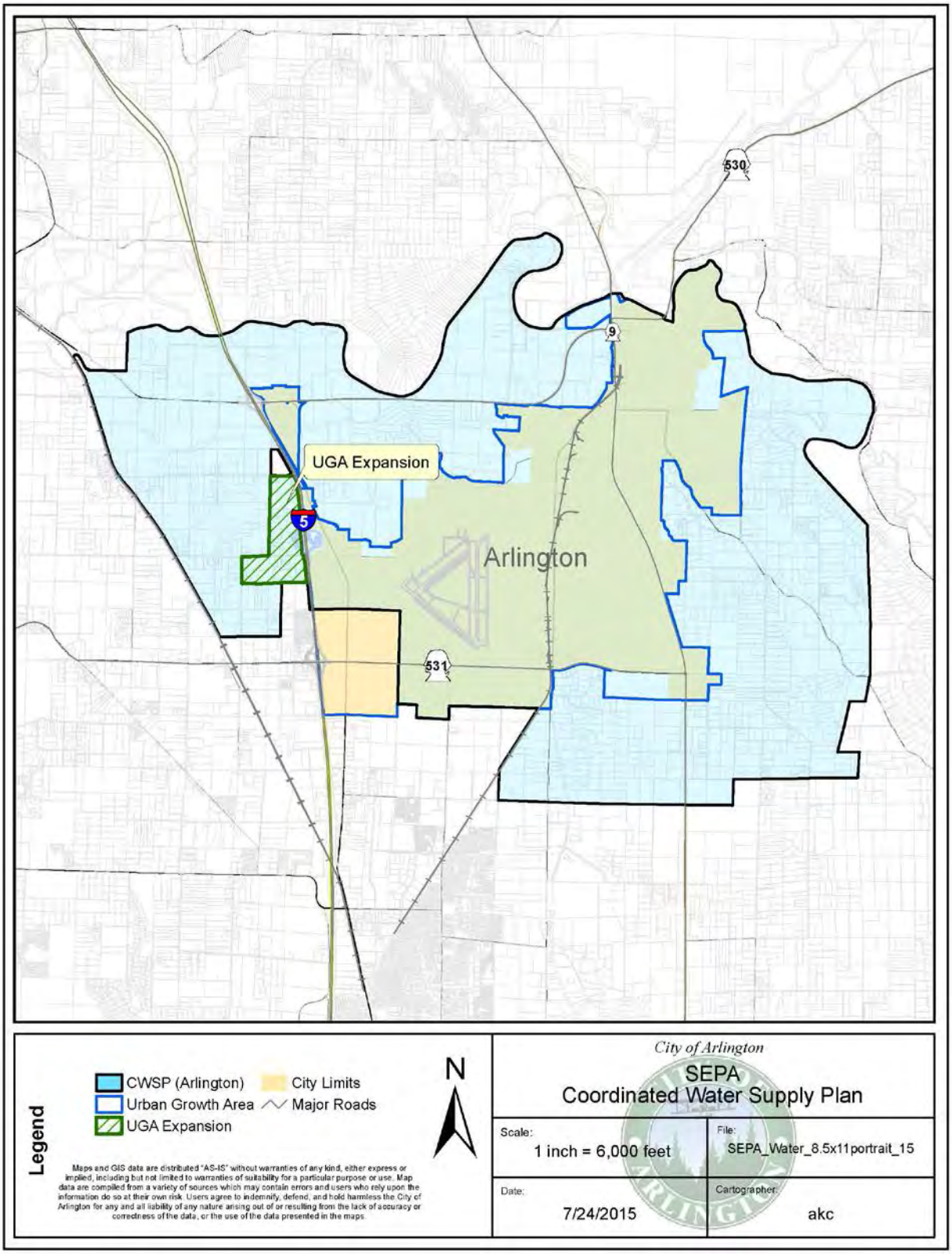
This non-project action itself is not likely to increase demands on transportation or public services and utilities.

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

None proposed since no increase is anticipated.

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

This non-project action itself is not known to be in conflict with local, state, or federal laws or requirements for the protection of the environment.


530
9
UGA Expansion
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Arlington
531
Legend
CWSP (Arlington)
Urban Growth Area
UGA Expansion
City Limits
Major Roads
N
Maps and GIS data are distributed "AS-IS" without warranties of any kind, either express or implied, including but not limited to warranties of suitability for a particular purpose or use. Map data are compiled from a variety of sources which may contain errors and users who rely upon the information do so at their own risk. Users agree to indemnify, defend, and hold harmless the City of Arlington for any and all liability of any nature arising out of or resulting from the lack of accuracy or correctness of the data, or the use of the data presented in the maps.
City of Arlington
SEPA
Coordinated Water Supply Plan
Scale:
1 inch = 6,000 feet
File:
SEPA_Water_8.5x11portrait_15
Date:
7/24/2015
Cartographer:
akc

R NPDES PERMIT FOR DISCHARGING FILTER BACKWASH WATER

R.1 NPDES GENERAL PERMIT NO. WAG647003, FOR DISCHARGING WATER TREATMENT PLANT FILTER BACKWASH WATER

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

July 16, 2014

Mr. Allen Johnson
Administrator
City of Arlington
238 N. Olympic Avenue
Arlington, WA 98223

RE: Coverage under the Water Treatment Plant General Permit

Permit number: WAG647003
Facility Name: Arlington WTP

Dear Mr. Johnson:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Water Treatment Plant General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on September 1, 2014. **Please retain this permit coverage letter with your permit (enclosed) and any other documents required on site (e.g., operation and maintenance manual, solid waste control plan, stormwater pollution prevention plan, spill contingency plan, and monitoring reports).** These materials are part of the official record of permit coverage for your facility.

Please take time to read the entire permit, and contact Ecology if you have any questions.

Appeal Process

You or a third party have a right to appeal coverage under this general permit to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information:

Street Addresses:	Mailing Addresses:
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board (PCHB) 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WQWebDMR)

This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you already have a SAW account, simply go to: https://secureaccess.wa.gov/ecy/wqwebportal.

If you have questions, contact Tonya Wolfe at (360) 407-7097 (Olympia area), (800) 633-6193/option 3, or email: WQWebPortal@ecy.wa.gov.

Questions or Additional Information

Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/wtp/index.html. If you have questions about the water treatment plant general permit, please contact Tonya Lane, tlan461@ecy.wa.gov, 425-649-7050.

Sincerely,

FOR Kevin C. Fitzpatrick
Water Quality Section Manager
Water Quality Program
Northwest Regional Office

Enclosure

Issuance Date: July 16, 2014
Effective Date: September 1, 2014
Expiration Date: August 31, 2019

WATER TREATMENT PLANT GENERAL PERMIT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE GENERAL PERMIT
for
Water Treatment Plants

State of Washington
Department of Ecology
Olympia, Washington 98504-7600

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Until this permit expires, is modified, or revoked, Permittees that have properly obtained coverage under this permit are hereby authorized to discharge in accordance with the Special and General Conditions contained herein.

Heather R. Bartlett, Manager
Water Quality Program
Washington State Department of Ecology

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SUMMARY OF REQUIRED SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal		Frequency	First Submittal Date
S-6.3.3	Discharge Monitoring Report	(a)	Monthly	October 15, 2014
S-3.1	Operations and Maintenance Manual	(a)	Once	January 1, 2015
S-3.2	Solid Waste Control Plan	(a)	Once	January 1, 2015
S-3.3	Stormwater Pollution Prevention Plan	(a) (b)	Once	January 1, 2015
S-3.4	Spill Contingency Plan	(a)	Once	January 1, 2015
G-2.6	Application for Permit Renewal	(a)	Once per permit cycle	March 1, 2019
S-3.1	Operations and Maintenance Manual Update	(a)	As necessary	
S-3.2	Solid Waste Control Plan Update	(a)	As necessary	
S-3.3	Stormwater Pollution Prevention Plan Update	(a)	As necessary	
S-3.4	Spill Contingency Plan Update	(a)	As necessary	
S-6.2.1	Notification of Non-Compliance		As necessary	
S-4.2.1 S-6.2.2	Notification of Planned Bypass		As necessary	
S-6.2.3 G-4.7	Permit Application Supplement or Notification of Significant Change in Process or Discharge		As necessary	
S-6.3.1	Additional Monitoring Results		As necessary	
G-2.7	Notification of Spills or Other Discharges		As necessary	
G-2.10	Other Information		As necessary	
G-4.2	Signature Authorization		As necessary	
G-4.11	Notice of Permit Transfer		As necessary	

(a) Electronic submittal is required via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

(b) Submission of a Stormwater Pollution Prevention Plan is required by only those Permittees that discharge stormwater associated with industrial activity at their sites to surface water or to a separate stormwater sewer system.

SPECIAL CONDITIONS

S-1 PERMIT COVERAGE

S-1.1 Activities, Discharges, and Facilities that require this Permit

This general permit covers all water treatment plants (WTPs) that discharge backwash effluent to surface water and that meet all of the following criteria:

1. Produce potable water or "industrial" water (primary treatment/settled water) where the treatment and distribution of water is the primary function of the facility.

2. Have an actual production rate equal to or greater than 35,000 gallons per day of treated product water (finished water) as determined on an average monthly basis. "Actual production rate" is the amount of finished water that a treatment facility actually produces on any given day. To calculate the value of the actual production rate on an average monthly basis, add the value of each daily production rate during a calendar month, and divide the sum by the total number of days in the month. The Washington State Department of Ecology (Ecology) reserves the right to determine that permit coverage is needed for facilities with actual production rates less than 35,000 gallons per day in order to protect water quality.

3. The wastewater discharge is from water treatment filtration processes (filter backwash, sedimentation/pre-sedimentation basin washdown, sedimentation/clarification, or filter-to-waste).

4. The water treatment works are not part of a larger, permitted facility, such as a pulp and paper mill.

S-1.2 Discharges Authorized under this Permit

S-1.2.1 Process Wastewater

Beginning on the effective date of this permit, all WTP facilities covered under the WTP general permit effective in September 2009 and that reapplied by March 1, 2014, are authorized to discharge filter backwash water associated with finished water production to surface waters of the State subject to the limits identified in this permit.

S-1.2.2 Non-Routine and Unanticipated Wastewater

Non-routine and unanticipated wastewater consists of process wastewater not identified in Special Condition S-1.2.1 (Process Wastewater), not routinely discharged, and not anticipated at the time of permit application, such as waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

This reissued general permit authorizes non-routine and unanticipated discharges under certain conditions. The Permittee must characterize the non-routine wastewater for pollutants and examine the opportunities for reuse. Prior to discharging the non-routine wastewater, the Permittee must obtain approval from Ecology on a case-by-case basis.

Any discharges not specified in Special Condition S-1.2.1 (Process Wastewater) must be addressed in accordance with the terms and conditions of this section.

1. Beginning on the effective date of this permit, prior to any discharge of non-routine and unanticipated wastewater, the Permittee must contact Ecology and provide the following information at a minimum:

   (a) The proposed discharge location.
   (b) The nature of the activity that will generate the discharge.
   (c) Any alternatives to the discharge, such as reuse, storage, or recycling of the water.
   (d) The total volume of water it expects to discharge.
   (e) The results of the chemical analysis of the water.
   (f) The date of the proposed discharge.
   (g) The expected rate of discharge, in gallons per minute.

2. The Permittee must analyze the wastewater for all parameters with effluent limits in this permit and must report the results as required by Special Condition S-5 (Monitoring Requirements), along with any other parameter deemed necessary by Ecology, using the methods and quantitation levels specified by Ecology.

3. Depending on the nature and extent of pollutants in the wastewater and any opportunities for reuse, Ecology may:

   - Authorize the facility to discharge the wastewater.
   - Require the facility to treat the wastewater.
   - Require the facility to reuse the wastewater.

   All discharges must comply with the effluent limits established in Special Condition S-2 (Limits and Standards); water quality standards; and any other limits imposed by Ecology.

4. The discharge may not proceed until Ecology has reviewed the Permittee's request and has authorized the discharge by Administrative Order. Once approved and if the proposed discharge is to a municipal storm drain, the Permittee must obtain prior approval from the municipality and notify it when it plans to discharge.

S-1.3 Covered Geographic Area

The geographic area covered by this general permit is the entire State of Washington.

S-1.4 Activities, Discharges, and Facilities Excluded from Coverage under this Permit

Discharges to surface water of wastewaters produced from ion exchange, reverse osmosis, or slow sand filtration water treatment processes are excluded from coverage under this permit and may be required to apply for an individual permit.

Discharges of wastewater from water treatment filtration processes to publicly-owned treatment works are excluded from coverage under this permit.

Discharges of wastewater from water treatment filtration processes to the land are excluded from coverage under this permit only if that discharged wastewater has no potential, during all weather conditions, to runoff or overflow into surface water. The operator of a facility that discharges such wastewater to the land must inform the appropriate Ecology Regional Office, identified in Special Condition S-6.2.1 (Notification of Non-Compliance) so that Ecology may determine whether that facility must apply for coverage under an individual State waste discharge permit to ensure that waters of the State (both underground and surface) are protected from degradation.

Ecology may require facilities that meet the requirements of Special Condition S-1.1 (Activities, Discharges, and Facilities that Require this Permit) but cannot meet the water quality requirements of Special Condition S-2.2 (Discharge Limits) to apply for an individual permit. Such facilities with coverage under this general permit will retain permit coverage until the effective date of the individual permit.

S-2 LIMITS AND STANDARDS

S-2.1 Compliance with Standards

The Permittee must comply with the technology- and water quality-based effluent limits and standards described in this Condition. Ecology has based these limits, as described in the accompanying Fact Sheet, on either:

- Technology-based limits, after considering the monitoring data reported by the WTP Permittees from 2009 through 2013, and the expected implementation of all known, available, and reasonable methods of prevention, control, and treatment (AKART); or

- Surface water quality criteria for the protection of human health and aquatic biota, after accounting for a mixing zone consistent with Chapter 173-201A WAC. The resultant fresh water mixing zones were:

  Acute exposure: 30 feet downstream from the point of discharge with an effluent unit volume no greater than 2.5 percent of the receiving water unit volume.

  Chronic exposure: 300 feet downstream from the point of discharge with an effluent unit volume no greater than 25 percent of the receiving water unit volume.

S-2.2 Discharge Limits

The Permittee must comply with effluent limits for settleable solids, pH, and total residual chlorine. While the discharge limits for settleable solids and pH will remain constant for the entire 5-year term of this permit, the discharge limits for total residual chlorine will decrease for existing Permittees after the first year (September 2014 through August 2015). Existing Permittees will thereby have sufficient time to adjust their treatment processes, if necessary, to achieve the smaller daily limit during the remaining 4 years of the term of this permit (September 2015 through August 2019).

EFFLUENT LIMITS			
Parameter	**Effective Term**	**Average Monthly Discharge Limit (a)**	**Maximum Daily Discharge Limit (b)**
Settleable Solids	Sept 2014 – Aug 2019	0.1 mL/L	0.2 mL/L
Total Residual Chlorine	Sept 2014 – Aug 2015	0.07 mg/L	0.15 mg/L
Total Residual Chlorine	Sept 2015 – Aug 2019	Not applicable	0.07 mg/L
Parameter	**Effective Term**	**Daily Minimum**	**Daily Maximum**
pH (c)	Sept 2014 – Aug 2019	6.0 S.U.	9.0 S.U.

(a) The average monthly discharge limit is defined as the greatest average of daily discharges allowed for a calendar month, calculated as the sum of all the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. Where only one sample is measured in a month, its value may not exceed the monthly average.

(b) The maximum daily discharge limit is defined as the greatest daily discharge allowed during a calendar day. Except for pH, if a parameter is measured more than once within a single calendar day, the daily discharge is the arithmetic average of the values from that single day.

(c) The averaging of pH values is not allowed.

S-2.3 Impaired Water Bodies and TMDL Requirements

The Permittee must comply with any applicable total maximum daily load (TMDL) determination that is completed and accepted by the U.S. Environmental Protection Agency (EPA) as of either the effective date of this permit or the effective date of facility coverage under this permit, whichever is later.

If the Permittee discharges to a water body listed as impaired per the 303(d) list approved by the U.S. EPA on December 21, 2012, the Permittee must monitor for the listed pollutant(s) unless it demonstrates that the listed pollutant(s) is not present in its discharge. The applicable listing of impairment is the listing that is final as of the effective date of this permit or the effective date of facility coverage under this permit, whichever is later. Ecology will set the monitoring schedule by administrative order.

1. A new facility may not cause or contribute to an exceedance of the listed pollutant(s).

2. An existing facility that has the potential to cause or contribute to impairment of a listed water body must demonstrate that its discharge will cause no increase in the pollutant(s) of concern, identify steps that it can take to reduce the discharge of those pollutant(s), and incrementally implement those steps. Ecology will either set the schedule for meeting this requirement with an administrative order or require an individual permit for the facility.

S-3 PLANNING REQUIREMENTS

S-3.1 Operations and Maintenance Manual

The Permittee must prepare an operations and maintenance (O&M) manual in accordance with WAC 173-240-150. New facilities must submit their O&M manual within 30 days of receiving coverage under this permit. Existing facilities must consider any necessary updates and submit their updated O&M manual no later than **January 1, 2015**. The Permittee must submit its O&M manual to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

The O&M manual must identify the main water treatment processes employed by the facility and document the procedures for operating and maintaining the wastewater treatment and discharge systems (e.g., the filter backflush systems). At a minimum the O&M manual must include:

1. Maintenance schedule and procedures for treatment and discharge systems.

2. Monitoring necessary to assure proper functioning of treatment and discharge systems.

3. Emergency shut down and containment procedures in the event of uncontrolled discharge due to plant maintenance activities, severe stormwater events, start ups or shut downs, or other causes.

The Permittee must update the O&M manual as necessary to reflect changes in the water treatment processes and procedures and must keep the manual on site and available for inspection by Ecology.

S-3.2 Solid Waste Control Plan

The Permittee must maintain a solid waste control plan. New facilities must submit their solid waste control plan within 30 days of receiving coverage under this permit. Existing facilities must submit their updated solid waste control plan by **January 1, 2015**. The Permittee must submit its solid waste control plan to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

The plan must include, at a minimum, a description of the solid waste, identification of the source of the solid waste, the generation rate of the solid waste, and identification of the disposal methods of the solid waste. The plan must comply with any applicable requirements of the jurisdictional health department and any local requirements for a solid waste permit. The Permittee must update the plan as necessary to reflect changes in solid waste handling and disposal and keep the plan on site and available for inspection by Ecology.

S-3.3 Stormwater Pollution Prevention Plan

Permittees that discharge stormwater associated with industrial activity from their sites to surface water or to a separate stormwater sewer system must prepare a stormwater pollution prevention plan (SWPPP). New facilities must submit their SWPPP before receiving coverage under this permit and complete or implement all best management practices (BMPs) prior to producing the authorized discharge. Existing facilities must update their SWPPP and submit it to Ecology by **January 1, 2015**. The Permittee must submit its SWPPP to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

Existing facilities must implement operational or source control BMPs within the first 6 months following the effective date of this permit and complete treatment BMPs, if required, within the first year following the effective date of this permit.

1. The SWPPP must include the following:

   (a) Assessment and description of existing and potential pollutant sources.
   (b) Description of the operational BMPs.
   (c) Description of selected source-control BMPs.
   (d) When necessary, a description of the erosion and sediment control BMPs.
   (e) When necessary, a description of the treatment BMPs.
   (f) Implementation schedule.

2. The descriptions of BMPs must include the following:

   (a) Operational Source Control BMPs: Operational BMPs are common to all facilities and include at the minimum:

      i. Responsible Party: Identification by name or position the person responsible for stormwater management.

      ii. Good Housekeeping: Listing of ongoing maintenance and cleanup activities, as appropriate, of areas that may contribute pollutants to stormwater discharges.

      iii. Preventive Maintenance: Schedule for inspection and maintenance of the stormwater drainage and treatment systems (if any) and plant equipment and systems that could fail and result in contamination of stormwater.

(b) Structural Source Control BMPs: Source control BMPs eliminate or minimize the exposure of stormwater to pollutants.

(c) Treatment BMPs: Treatment BMPs reduce the amount of pollutants in stormwater and maintain compliance with water quality standards.

(d) Erosion and Sediment Control BMPs: Erosion and sediment control BMPs prevent soil erosion. The SWPPP must identify the locations on site with the potential for soil erosion that could contaminate stormwater.

The Permittee must update the SWPPP as necessary to reflect changes in potential pollutant sources and BMPs and must keep the plan on site and available for inspection by Ecology.

S-3.4 Other Spill Contingency Plan

The Permittee must have, maintain, and implement a spill plan for preventing the accidental release of pollutants to State waters and for minimizing damages if such a spill occurs. New facilities must submit their spill plan within 30 days of receiving coverage under this permit. Existing facilities must submit their updated spill plan by **January 1, 2015**. The Permittee must submit its updated spill plan to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

At a minimum, the plan must include the following:

1. Documentation of the procedures the Permittee will employ for the prevention, containment, and control of spills or unplanned discharges of the following:

   (a) Oil and petroleum products.

   (b) Materials which, when spilled or otherwise released into the environment, are designated dangerous waste or extremely hazardous waste by the procedures set forth in WAC 173-303-070.

   (c) Other materials that may become pollutants or cause pollution upon reaching waters of the State, such as untreated hyper-chlorinated water.

2. A description of the reporting system that will alert responsible managers and legal authorities in the event of a spill.

3. A description of the preventive measures and facilities that prevent, contain, or treat spills (including an overall facility plot showing drainage patterns).

4. A list of all oil and chemicals used, processed, or stored at the facility that may be spilled into State waters.

For the purpose of meeting this requirement, plans and manuals, or portions thereof, required by 33 CFR 154; 40 CFR 109; 40 CFR 110; 40 CFR Part 112; the Federal Oil Pollution Act of 1990, Chapter 173-181; and contingency plans required by Chapter 173-303 WAC may be included by reference as long as they are available on site.

The Permittee must review the plan at least annually and update it as necessary. The reviewer must initial and date the plan and note any updates to the plan to keep it current. This plan must be kept on site and be available for inspection by Ecology.

S-4 OPERATIONAL REQUIREMENTS

S-4.1 Operation and Maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed to achieve compliance with this permit. Where design criteria have been established, the Permittee may not allow flows or waste loadings to exceed approved design criteria or approved revisions thereto.

Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that the Permittee installs only when their operation is necessary to achieve compliance with this permit.

S-4.2 Operational Restrictions

S-4.2.1 Bypass Prohibition and Procedures

Bypass, which is the intentional diversion of a wastestream from any portion of a treatment facility, is prohibited, and Ecology may take enforcement action against a Permittee for bypass unless one of the following three circumstances is applicable.

1. Bypass for Essential Maintenance without the Potential to Cause Violation of Permit Limits or Conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limits or other Conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee shall submit prior notice, if possible, at least 10 days before the date of the bypass.

2. Bypass which is Unavoidable, Unanticipated, and Results in Non-Compliance with this Permit. This bypass is permitted only if:

   Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and

permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass; and

There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility; and

Ecology is properly notified of the bypass as required in General Condition G-2.7 (Notification of Non-Compliance).

3. Bypass which is Anticipated and has the Potential to Result in Non-Compliance with this Permit.

   For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. Analyses of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing, and of the cost-effectiveness of alternatives, including comparative resource damage assessment, must be considered during preparation of the engineering report or facilities plan and plans and specifications and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following factors prior to issuing an administrative order for this type bypass:

   (a) Whether the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   (b) Whether feasible alternatives to the bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   (c) Whether the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

   After consideration of the above factors, the anticipated adverse effects of the proposed bypass, and any other relevant factors, Ecology will approve or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under Chapter 90.48 RCW.

S-4.2.2 Application of Products

Any addition of chemicals to treat the wastewater (discharge) must comply with manufacturers' recommendations and be administered only at a rate appropriate for treatment. The addition of excessive quantities of treatment chemicals to the wastewater is prohibited. The use of treatment chemicals that will result in a water quality violation in the receiving water is prohibited.

S-4.2.3 Solid Waste Management

The Permittee must handle and dispose of all solid waste in such a manner as to prevent its entry into waters of the State, either ground water or surface water.

S-4.2.4 Spill Prevention and Control

The Permittee must prevent or control pollutant discharges from site runoff, spillage and leaks, sludge and waste disposal, and materials handling and storage.

S-5 MONITORING REQUIREMENTS

S-5.1 Monitoring Objectives

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored discharge or pollutant, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality. Monitoring must occur at intervals sufficiently frequent to yield data that reasonably characterize the nature of the monitored discharge or pollutant.

Ecology may require by administrative order monitoring of intake water, influent to treatment facilities, internal waste streams, and/or receiving waters to verify compliance with net discharge limits or removal requirements, to verify the maintenance of proper waste treatment or control practices, or to determine the effects of the discharge on the waters and sediments of the State.

S-5.2 Sampling Procedures

S-5.2.1 Event Criteria, Frequency, and Timing

Permittees must monitor the wastewater (discharge) in accordance with the testing schedule appropriate for their facilities, based on the design maximum production capacity of product water (drinking and industrial water) and the source of the raw source water (surface water or ground water). The "design maximum production capacity" is the amount of finished water that a treatment facility is designed to produce at peak output and 24-hour production. For the purpose of determining whether the source of raw water is surface water or ground water, Ecology will use the same classification method as the Washington State Department of Health (DoH), which additionally specifies a third source of raw water: "ground water under the direct

influence of surface water" (GWI). Potential GWI sources are defined as all infiltration galleries, Ranney wells, springs, and wells less than 50 feet deep located within 200 feet of surface water. Ecology will consider these sources the same as surface water unless the DoH designates a specific source at a particular WTP as ground water.

WTP facilities are divided into two monitoring groups as follows:

- **Group 1:** Facilities designed to produce less than 4 million gallons per day (gpd) or use only ground water for their source water. Group 1 facilities must follow testing schedule A below.

- **Group 2:** Facilities designed to produce 4 million gallons per day or more and treat surface water or GWI. Group 2 facilities must follow testing schedule B below.

	< 4 Million gpd	**≥ 4 Million gpd**
Surface Water / GWI	Group 1	Group 2
Ground Water	Group 1	Group 1

Testing Schedule A: Monitoring Methods and Frequency for Group 1 WTP Facilities

Parameter	**Analytical Method (Accuracy)**	**Detection Limit**	**Quantitation Level**	**Sampling Frequency**	**Sample Type**
Settleable Solids	SM 2540F – Imhoff Cone (±0.1 mL/L or ±1.0%)	0.1 mL/L	0.1 mL/L	Monthly	Grab
pH	SM 4500-H^+ B – Meter (±0.02 standard units)	NA	NA	Monthly	Grab
Total Residual Chlorine	SM 4500 Cl G – Photometer (±0.01 mg/L)	0.01 mg/L	0.02 mg/L	Monthly	Grab
Turbidity	EPA 180.1 – Nephelometric (±0.5 NTU ±1.0%)	0.1 NTU	0.5 NTU	Monthly	Grab
Total Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Dissolved Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Total Daily Volume of Discharge	Meter or Estimate (±30 gallons)	10 gallons per event	10 gallons per event	Daily Year 1: If available Years 2-5: Required	NA
Total Daily Number of Discharge Events	Count	Count	Count	Daily Year 1: If available Years 2-5: Required	NA

Testing Schedule B: Monitoring Methods and Frequency for Group 2 WTP Facilities

Parameter	Analytical Method (Accuracy)	Detection Limit	Quantitation Level	Sampling Frequency	Sample Type
Settleable Solids	SM 2540F – Imhoff Cone (±0.1 mL/L or ±1.0%)	0.1 mL/L	0.1 mL/L	Weekly	Grab
pH	SM 4500-H^+ B – Meter (±0.02 standard units)	NA	NA	Weekly	Grab
Total Residual Chlorine	SM 4500 Cl G – Photometer (±0.01 mg/L)	0.01 mg/L	0.02 mg/L	Weekly	Grab
Turbidity	EPA 180.1 – Nephelometric (±0.5 NTU ±1.0%)	0.1 NTU	0.5 NTU	Weekly	Grab
Total Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Dissolved Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Total Daily Volume of Discharge	Meter or Estimate (±30 gallons)	10 gallons per event	10 gallons per event	Daily Year 1: If available Years 2-5: Required	NA
Total Daily Number of Discharge Events	Count	Count	Count	Daily Year 1: If available Years 2-5: Required	NA

Analytical methods are from "Methods for Chemical Analysis of Water and Wastes," U.S. EPA, Environmental Monitoring Systems Laboratory – Cincinnati, EPA-600/4-020, Revised March 1983 and 1979; and "Precision and Recovery Statements for Methods for Measuring Metals," Appendix D of 40 CFR Part 136.

(a) Detection Limit:
The minimum concentration of an analyte that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR Part 136, Appendix B.

(b) Quantitation Level: (also known as minimum level of quantitation)
(1) The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the laboratory has used all method-specified sample weights, volumes, and cleanup procedures. The quantitation level is calculated by multiplying the method detection limit by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer. (64 FR 30417)
(2) The smallest detectable concentration of analyte greater than the method detection limit where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs, Submitted to the U.S. EPA December 2007.)

The first monitoring period begins on the effective date of this permit.

During the first year of this permit term, i.e., from September 2014 through August 2015, Permittees must report the total daily volume of their discharge and the total daily number of discharge events only if that information is readily available. Beginning in the second year of this permit term, i.e., beginning in September 2015, all Permittees must monitor for and report these two flow parameters.

Monitoring for total and dissolved arsenic is required for only the 12 monitoring periods of the third year of this permit term, i.e., from September 2016 through August 2017 for existing and covered Permittees, or for the first 12 months of coverage for new Permittees whose coverage begins after September 2016.

Based on the results of arsenic monitoring, Ecology may modify this permit by extending the term when monitoring for arsenic is required; adding one or more effluent limits for arsenic or other parameters; adding monitoring requirements for other parameters; adding monitoring requirements for other environmental matrices, such as raw water sources and receiving waters; or changing the activities, discharges, and facilities that require this permit or are excluded from coverage under this permit.

S-5.2.2 Field Documentation

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all measurements and analyses.

S-5.2.3 Location

The Permittee must conduct all monitoring as close to the point of discharge to surface water (end of pipe) as is reasonably possible.

S-5.2.4 Sampling Methods

Sampling methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the "Guidelines Establishing Test Procedures for the Analysis of Pollutants" contained in 40 CFR Part 136, (or as applicable in 40 CFR subchapters N [Parts 400-471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may specify alternative methods only for parameters without limits or without a U.S. EPA-approved test method in 40 CFR Part 136. Sampling must yield samples representative of the wastewater discharged by the Permittee.

S-5.3 Analytical Procedures

S-5.3.1 Laboratory Accreditation

All monitoring data required by Ecology must be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, "Accreditation of Environmental Laboratories." Flow, temperature, settleable solids, specific conductance, pH, turbidity, and internal process control parameters are exempt from this requirement, except that specific

conductance, pH, and turbidity must be accredited if the laboratory must otherwise be registered or accredited. An accredited laboratory must provide arsenic and chlorine data.

S-5.3.2 Laboratory Documentation

All laboratory reports providing monitoring data must include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory reporting limit or practical quantitation level (PQL), reporting units, and concentration detected. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for each parameter.

S-5.3.3 Laboratory Methods

The Permittee must analyze all wastewater samples for the parameters and using the methods, MDLs, and PQLs specified in Special Conditions S-5.2.1 (Event Criteria, Frequency, and Timing) and S-5.2.4 (Sampling Methods) unless:

- Another permit condition specifies other methods, MDLs, or PQLs; or
- The method used produces measureable results in the sample, and the U.S. EPA has listed it as an EPA-approved method in 40 CFR Part 136.

The analyses must also include any other parameter deemed necessary by Ecology. If the Permittee uses an alternative method, not specified in the permit and allowed as above, it must report the test method, MDL, and PQL on the discharge monitoring report or other required report. If the Permittee is unable to obtain the required MDL or PQL in its effluent due to matrix effects, the Permittee must submit a matrix-specific MDL and PQL to Ecology along with appropriate laboratory documentation.

S-5.4 Supporting Documentation

The Permittee must maintain supporting documentation for all field and laboratory measurements and any calculations used to determine the total daily volume of discharges and total daily number of discharge events.

S-6 REPORTING AND RECORDKEEPING REQUIREMENTS

S-6.1 Permit-Required Submittals

Unless otherwise specified in this permit, the Permittee must use the on-line "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html to submit all permit-required reports by the specified due dates. Where another condition of this permit requires submission of hardcopy paper documentation, the Permittee must ensure that the submission is postmarked or received by Ecology no later than the specified due date. The

Permittee must submit hardcopy paper documentation to the water quality permit coordinator at the appropriate address provided in Special Condition S-6.2.1 (Notification of Non-Compliance).

S-6.2 Notification and Posting Requirements

S-6.2.1 Notification of Non-Compliance

In the event that the Permittee fails to comply with any of the terms and conditions of this permit, or in the event of a spill or other discharge not authorized by this permit, such that the resulting non-compliance may threaten human health or the environment, the Permittee must:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges and otherwise stop the non-compliance, correct the problem, and minimize any adverse impacts to waters of the State.

2. Immediately notify Ecology of a spill by calling the appropriate regional Emergency Response Tracking System (ERTS) phone number and the regional permit administrator. The phone numbers are provided below:

Ecology Central Regional Office Water Quality Program 15 West Yakima Avenue, Suite 200 Yakima, WA 98902-33887 509-575-2490 TDY: 711 or 1-800-833-6341	**Counties** Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima
Ecology Eastern Regional Office Water Quality Program North 4601 Monroe Spokane, WA 99205-1295 509-329-3400 TDY: 711 or 1-800-833-6341	**Counties** Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman
Ecology Northwest Regional Office Water Quality Program 3190 - 160th Avenue SE Bellevue, WA 98008-5452 (425) 649-7000 TDY: 711 or 1-800-833-6341	**Counties** Island, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom
Ecology Southwest Regional Office Water Quality Program P.O. Box 47775 Olympia, WA 98504-7775 360-407-6300 TDY: 711 or 1-800-833-6341	**Counties** Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, and Wahkiakum

3. Notify the Ecology regional permit administrator of any other non-compliance, including any unanticipated bypass and/or upset that exceeds any effluent limit in the permit, orally within 24 hours from the time the Permittee becomes aware of the non-compliance.

4. If applicable, repeat the sampling and analysis that identified the non-compliance, and submit the results to Ecology within 5 days of becoming aware of the non-compliance.

5. Submit a detailed written report to Ecology at the appropriate address provided in Step 2 above within 5 days of the time the Permittee becomes aware of the non-compliance. The report must include all of the following information, at a minimum:

   (a) A description of the nature and cause of the non-compliance, including the quantity and quality of any unauthorized discharges.

   (b) The period of non-compliance, including the beginning and ending dates and times of the non-compliance, or if the Permittee has not yet corrected the non-compliance, the anticipated date and time when the Permittee will return to compliance.

   (c) The results of any additional sampling and analyses.

   (d) A description of the corrective action taken or planned by the Permittee.

   (e) Steps the Permittee has taken or plans to take to reduce, eliminate, and prevent a recurrence of the non-compliance.

   (f) Any other pertinent information.

6. Ecology may temporarily waive the written report required in Step 5, above, on a case-by-case basis upon written request if it has received a timely oral report, but in no case for more than 30 days after the Permittee becomes aware of the non-compliance.

Reportable failures of compliance include, but are not limited to:

1. Any bypass that exceeds any effluent limit in this permit.

2. Any upset that exceeds any effluent limit in this permit.

3. Any exceedance of a maximum daily discharge limit for any of the pollutants listed in Special Condition S-2 (Limits and Standards).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with any of the terms and conditions of this permit or from any resulting liability for failure to comply.

S-6.2.2 Notification of an Anticipated Bypass

The Permittee must notify Ecology at least 30 days before the planned date of any bypass which is anticipated and has the potential to result in non-compliance with this permit. The notice must contain: (1) A description of the bypass and its cause; (2) An analysis of all known alternatives that would eliminate, reduce, or mitigate the need for bypassing; (3) A cost-effectiveness analysis of alternatives including comparative resource damage assessment; (4) The minimum and maximum duration of the bypass under each alternative; (5) A recommendation for the preferred alternative for conducting the bypass; (6) The projected date of bypass initiation; (7) A statement of compliance with SEPA; (8) A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated; and (9) Steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

S-6.2.3 Notification of a Change in Covered Activities

The Permittee must report to Ecology any facility expansion, production increase, or significant process modification that may cause a new or increased discharge of pollutants that may cause either an exceedance of an effluent limit or a discharge beyond that reported in the original application for coverage. This report must be in the form of a new application or a supplement to the original application.

Significant process changes include a substantially increased discharge of pollutants or a change in the nature of the discharge of pollutants, including:

- A wastewater discharge increase of 25% more than the previous permit covered;
- A new source of raw water that requires different treatment processes, consequently altering the characteristics of the discharged wastewater; or
- A change or addition of treatment to remove a substance not previously removed, consequently altering the characteristics of the discharged wastewater.

S-6.3 Required Reports

S-6.3.1 Additional Monitoring by Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S-5 (Monitoring Requirements) of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's discharge monitoring report.

S-6.3.2 Bypasses

The Permittee must report bypasses to Ecology as described in Special Condition S-4.2.1 (Bypass Prohibition and Procedures).

S-6.3.3 Discharge Monitoring Report (DMR)

The Permittee must submit a DMR each calendar month, whether or not a discharge occurred. If the facility did not discharge during a given monitoring period, the Permittee must submit a completed DMR with "No Discharge" entered as the DMR Reporting Code. Submission of DMRs must be completed by no later than the 15th day of the month following the completed monitoring period.

Permittees must sign up for and submit monitoring data through the Ecology WebDMR program via the Permittee's SecureAccess Washington account, which is accessible at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html and at "About WQWebDMR" at http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html.

Permittees unable to submit electronically (e.g., those who do not have an Internet connection) must contact the Ecology water treatment plant permit administrator at the locations provided in General Condition G-2.7 (Notification of Non-Compliance) to request a waiver and obtain instructions on how to obtain a hardcopy paper DMR. Permittees with waivers must submit hardcopy paper DMRs to be received by Ecology no later than the 15th day of the month following the completed monitoring period.

All DMRs must contain the following information:

1. Include data for each of the parameters for which monitoring is required by Special Condition S-5 (Monitoring Requirements) and as required by the DMR entry screen or hardcopy paper form. Report a value for each day sampling occurred and for the monthly values.

2. If the Permittee did not discharge wastewater during a given monitoring period, enter the "no discharge" reporting code.

3. Record onto the DMR those analytical values reported as "less than the detection limit" by entering "<" followed by the numeric value of the detection limit (e.g., < 2.0). If the method used did not achieve the detection limit or quantitation level identified in Special Condition S-5.2.1 (Event Criteria, Frequency, and Timing), report the actual detection limit and quantitation level in the DMR comments section or other location provided.

4. Report the analytical test method actually used in the DMR comments section or other location provided if the laboratory used an alternative method not specified in the permit and as allowed in Special Condition S-5.2.1 (Event Criteria, Frequency, and Timing).

5. Calculate average and total values (unless otherwise specified in the permit) using:

   (a) For all quantitative results measured at levels equal to or greater than the agency-required detection limit value: The reported numeric value.

(b) For results reported at less than the detection limit numerically (e.g., <0.01 mg/L or not detected with a specified detection limit value): One-half the reported detection limit value.

(c) For results reported as less than the detection limit non-numerically (e.g., ND or not detected) and without a specified detection limit value,

i. If the same parameter was detected in another sample from the same monitoring point for the reporting period: One-half the detection limit value reported for the other sample.

ii. If the same parameter was not detected in another sample from the same monitoring point for the reporting period: Zero.

6. Submit an electronic copy of the laboratory report as an attachment using the link for "About WQWebDMR" or as a paper copy along with the hardcopy paper DMR form. Laboratory reports must include a record of the chain of custody, QA/QC results, and documentation of accreditation for each parameter.

S-6.4 Record Retention

The Permittee must retain records of all monitoring information resulting from any monitoring activity required as a condition of the application for or as a condition of coverage under this permit for a minimum of 5 years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S-7 PERMIT ADMINISTRATION

S-7.1 Application for Coverage

S-7.1.1 Who May Apply for Coverage

New facilities or facilities currently operating without permit coverage that qualify under Special Condition S-1 (Permit Coverage) must apply for coverage under this general permit.

S-7.1.2 How to Obtain Coverage

An applicant must submit to Ecology a completed and signed application for coverage (an electronic notice of intent, or eNOI) specifically prescribed by Ecology for this general permit.

All such applications for coverage must be submitted within 180 days prior to commencement of the activity which may result in the discharge of any pollutant to waters of the State.

All applications for coverage under this permit must:

1. Contain sufficient information necessary for adequate program implementation;

2. Contain the legal name and address of the owner or operator, the facility name and address, type of facility and discharges, and the receiving water bodies;

3. Bear a certification of correctness;

4. Be signed by a responsible person, as identified in General Condition G-4.2 (Certification and Signature Requirements); and

5. Include any other information that Ecology deems relevant.

S-7.1.3 Public Notice

All new applicants for this permit and any existing Permittee that plans a significant process change, as described in Special Condition S-6.3.2 (Notification of a Change in Covered Activities), must cause notice to be circulated within the geographical area of the proposed discharge and certify this fact to Ecology. Such notice must:

1. Be published twice, with at least a 1-week interval between, in the newspaper of greatest general circulation within the county in which the discharge is proposed to occur;

2. Be circulated by any other method as Ecology may direct; and

3. Contain, at a minimum, the following:

   (a) The name, address, and location of the facility requesting coverage under this permit;

   (b) The applicant's activities or operations that result in a discharge;

   (c) The name of the general permit under which coverage is requested; and

   (d) The following statement: "Any person desiring to present their views to Ecology regarding this application may do so in writing, within 30 days of the last date of publication of this notice. Comments should be submitted to Ecology. Any person interested in Ecology's action on this application may notify Ecology of their interest within 30 days of the last date of publication of this notice."

S-7.1.4 Proof of Compliance with SEPA

All new applicants must submit to Ecology, along with an application for coverage, proof and certification that their facility has met all applicable requirements of the State Environmental Policy Act (SEPA) under Chapter 197-11 WAC.

GENERAL CONDITIONS

G-1 OPERATION AND MAINTENANCE

G-1.1 Activities and Discharges Authorized by this Permit

All activities and discharges authorized by this permit must be consistent with the terms and conditions of this permit. The Permittee is at all times responsible for continuous compliance with the terms and conditions of this permit. The discharge of any pollutant more frequently than or at a concentration or amount in excess of that authorized by this permit constitutes a violation of the terms and conditions of this permit.

G-1.2 Discharges from Activities Not Covered by this Permit

The discharge of pollutants resulting from activities not covered under this permit for which the discharger has requested coverage is a violation of this permit.

G-1.3 Maintaining Compliance if Treatment System Fails

The Permittee, in order to maintain compliance with this permit, must control production and all discharges such that, in the event of reduction, loss, failure, or bypass of any portion of the treatment system, the Permittee maintains compliance with this permit until the treatment system is fully restored or an alternate method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment system is reduced, lost, or fails.

G-1.4 Removed Substances

The Permittee must not allow collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment or control of the wastewater and/or stormwater covered by this permit to be resuspended or reintroduced to the storm sewer system or to waters of the State.

G-1.5 Upset

An upset is an exceptional incident in which an unintentional and temporary non-compliance with technology-based permit effluent limits occurs due to factors beyond the reasonable control of the Permittee. An upset does not include non-compliance to the extent caused by operational error, improperly designed treatment facilities, inadequate storage or treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limits if the requirements of this paragraph are met. No determination made during administrative review of claims that non-compliance was caused by upset, and before an action for non-compliance, is a final administrative action, subject to judicial review. A Permittee who wishes to establish the affirmative defense of upset must

demonstrate, through properly signed contemporaneous operating logs or other relevant evidence, that:

1. An upset occurred, and that the Permittee can identify the cause(s) of the upset;

2. The permitted facility was being properly operated at the time of the upset;

3. The Permittee submitted notice of the upset as required in Special Condition S-6 (Reporting and Recordkeeping Requirements) of this permit; and

4. The Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G-2 OTHER DUTIES AND RESPONSIBILITIES

G-2.1 Additional Monitoring Requirements

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G-2.2 Compliance with Other Laws and Regulations

Nothing in this permit excuses the Permittee from any requirement for compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

The Permittee must comply with effluent standards and prohibitions for toxic pollutants established under Section 307(a) of the Clean Water Act, the Resource Conservation and Recovery Act (Public Law 95.190), the Hazardous Waste Management Act (Chapter 70.105 RCW), the Solid Waste Management–Reduction and Recycling Act (Chapter 70.95 RCW), and all other applicable requirements of 40 CFR 122.41 and 122.42 within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G-2.3 Duty to Comply with this Permit

The Permittee must comply with all Conditions of this permit. Any permit non-compliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G-2.4 Duty to Mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge, use, or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

G-2.5 Duty to Provide Information

The Permittee must provide to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also provide to Ecology, upon request, copies of records required to be kept by this permit.

G-2.6 Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must reapply for coverage under this permit (or under an individual permit) at least 180 days prior to the specified expiration date of this permit. An expired general permit and coverage under the general permit continue in force and effect until Ecology issues a new general permit (or a new individual permit) or until Ecology cancels the general permit. Coverage under this permit continues for only those Permittees who reapply for coverage.

G-2.7 Notification of Spills and Other Discharges

If the Permittee has knowledge of a discharge or spill that could constitute a threat to human health, welfare, or the environment, the Permittee must:

1. Take appropriate action to correct or minimize the threat to human health, welfare, and the environment.

2. Notify the Ecology regional office and other appropriate spill response authorities immediately, but in no case later than within 24 hours of obtaining that knowledge.

3. Immediately report spills or other discharges which might cause bacterial contamination of marine waters to the Ecology regional office and to the Department of Health, Shellfish Program.

4. Immediately report spills or discharges of oils or hazardous substances to the Ecology regional office and to the Washington Emergency Management Division.

The relevant 24-hour phone numbers are:

- Department of Ecology Northwest Regional Office (425) 649-7000
- Department of Ecology Southwest Regional Office (360) 407-6300
- Department of Ecology Central Regional Office (509) 575-2490
- Department of Ecology Eastern Regional Office (509) 329-3400

- Washington Emergency Management Division (800) 258-5990
- Department of Health Shellfish Program (360) 789-8962

G-2.8 Plan Review Required

Prior to constructing or modifying any wastewater control facilities, the Permittee must provide all engineering reports and detailed plans and specifications to Ecology for approval in accordance with Chapter 173-240 WAC. Submission of engineering reports, plans, and specifications must occur in accordance with a compliance schedule issued by Ecology or at least 30 days before the time approval is desired. Construction and operation of the facilities must occur in accordance with the approved plans.

G-2.9 Prohibited Discharges

Discharge of pollutants by the Permittee to waters of the State are prohibited except as authorized through coverage under this permit.

This permit does not authorize any person to discharge any of the following:

1. Any radiological, chemical, or biological warfare agent or high-level radioactive waste into waters of the State.

2. Any pollutants that the Secretary of the Army acting through the Chief, Corps of Engineers, finds would substantially impair anchorage and navigation.

3. Any pollutant that the U.S. EPA, not having waived its right to object pursuant to Section 402(e) of the Clean Water Act, has objected to in writing pursuant to Section 402(d) of the Clean Water Act.

4. Any pollutant in conflict with plans or amendment thereto approved pursuant to Section 208(b) of the Clean Water Act.

5. Any pollutant subject to a toxic pollutant discharge prohibition under Section 307 of the Clean Water Act.

6. Any dangerous waste, as defined in the dangerous waste regulations, Chapter 173-303 WAC, into a subsurface disposal system, such as a well or drainfield.

G-2.10 Reporting Other Information

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to Ecology, the Permittee must promptly submit such facts or information.

G-3 ENFORCEMENT AND PENALTIES

G-3.1 Enforcement

Ecology, with the assistance of the attorney general, may sue in courts of competent jurisdiction to enjoin any threatened or continuing violation of this permit or the Conditions thereof without the necessity of a prior revocation of coverage under this permit. Any violation of the terms and conditions of this permit, the state Water Pollution Control Act, or the federal Clean Water Act are subject to the enforcement sanctions, direct and indirect, as provided for in WAC 173-226-250.

G-3.2 Penalties for Tampering

Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, by imprisonment for not more than 2 years per violation, or by both fine and imprisonment. If a conviction of a person is for a violation committed after a first conviction of such person under this Condition, punishment shall be a fine of not more than $20,000 per day of violation, by imprisonment of not more than 4 years, or by both fine and imprisonment.

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, by imprisonment for not more than 6 months per violation, or by both fine and imprisonment.

G-3.3 Penalties for Violating Permit Conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is guilty of a crime and, upon conviction thereof, may be punished by a fine of up to $10,000 and costs of prosecution, by imprisonment, or by both fine and imprisonment, in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of this permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to $10,000 for every such violation. Each and every such violation is a separate and distinct offense, and in the case of a continuing violation, every day's continuance may be deemed a separate and distinct violation.

G-3.4 Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

G-3.5 Right of Inspection and Entry

The Permittee must allow Ecology or its authorized representative, upon the presentation of credentials and such other documents as may be required by law, at reasonable times, for the purpose of inspecting and investigating (a) Conditions relating to the pollution or the possible pollution of any waters of the State, or (b) Actual or suspected violations of water quality standards, effluent standards or limits, or the terms and conditions of this permit:

1. To enter upon the premises, public or private, in which an effluent source or discharge is located or where any records must be kept under the terms and conditions of this permit.

2. To have access to and to copy at reasonable cost any records that must be kept under the terms and conditions of this permit.

3. To investigate, inspect, or monitor any facility, operation, or practice regulated by or required under this permit, including:

   (a) Postings.
   (b) Collection, control, treatment, pollution management, and discharge facilities.
   (c) Monitoring equipment or methods.

4. To sample or monitor any discharge, internal waste stream, substances, or parameters at any location, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

"Reasonable times" includes regular business hours and any other times when Ecology suspects the occurrence or evidence of a violation requiring immediate inspection.

G-4 PERMIT MANAGEMENT AND COORDINATION

G-4.1 Appeal

Any person may appeal the terms and conditions of this general permit, as they apply to the appropriate class of dischargers, within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

Any person may appeal the terms and conditions of this general permit, as they apply to an individual discharger, within 30 days of the effective date of coverage of that discharger, in accordance with Chapter 43.21B RCW. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or inapplicability to that individual discharger.

The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit

are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G-4.2 Certification and Signature Requirements

The Permittee must sign and certify as correct all applications, reports, or information that it provides to Ecology. The person who provides such signature and certification must be any of the following:

1. In the case of corporations, a responsible corporate officer who may be:

   (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy- or decision-making functions for the corporation; or

   (b) The manager of one or more manufacturing, production, or operating facilities, provided:

      i. The manager is authorized to make management decisions which govern the operation of the permitted facility or activity, including having the explicit or implicit duties of making major capital investment recommendations and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations;

      ii. The manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

      iii. Where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. In the case of a partnership, a general partner.

3. In the case of a sole proprietorship, the proprietor.

4. In the case of a municipal, state, or other public facility or activity, either a principal executive officer or ranking elected official.

5. A duly authorized representative of a person identified among items 1 through 4 of this Condition. A person is a duly authorized representative only if:

   (a) A person identified among items 1 through 4 of this Condition makes the authorization in writing and submits it to Ecology; and

   (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or a position having overall

responsibility for environmental matters for the Permittee. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

If an authorization under item 5 of this Condition is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or activity, the Permittee must provide to Ecology a new authorization satisfying the requirements of this Condition prior to or together with any applications, reports, or information to be signed by an authorized representative.

Any person signing a document under this Condition must make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G-4.3 Dates of Coverage under this Permit

Unless Ecology responds in writing to a Notice of Intent application for coverage under this general permit, coverage of a discharger under this general permit will automatically commence on the latter of the following:

1. The effective date of this general permit.

2. The 31st day following the end of the 30-day comment period following the issuance of the final general permit, as required in WAC 173-226-130(4).

3. The 31st day following receipt by Ecology of that discharger's completed Notice of Intent application for coverage under this general permit.

4. The coverage date specified in this general permit.

When a Permittee has made a timely and sufficient application for the renewal of coverage under this permit prior to its expiration, this permit remains in effect and enforceable until Ecology:

1. Denies the application;
2. Issues a replacement permit; or
3. Cancels the expired permit.

Coverage under an expired general permit for Permittees who fail to submit a timely and sufficient application expires on the expiration date of the general permit.

G-4.4 Severability

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit are not affected thereby.

G-4.5 Payment of Fees

The Permittee must provide payment of fees associated with this permit as assessed by Ecology pursuant to Chapter 173-224 WAC until the permit is either terminated or revoked.

G-4.6 Termination of Coverage upon Issuance of an Individual Permit

When an NPDES waste discharge individual permit is issued to a discharger otherwise subject to this general permit, the applicability of this general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G-4.7 Reporting a Cause for Modification or Revocation

The Permittee must provide a new application or information supplemental to the previous application whenever:

1. The Permittee anticipates a significant change to the permitted activity or in the quantity or type of discharge authorized by this permit; or

2. The Permittee knows, or has reason to believe, that any activity has occurred or will occur which would constitute cause for modification or revocation pursuant to 40 CFR 122.62.

A significant change includes, but is not limited to, any facility expansion, production increase, or process modification that would change the nature or increase the quantity of pollutants discharged such as to cause either non-compliance with effluent limits or discharges beyond those reported in the previous application for coverage. The Permittee must provide its plans, supplemental information, or new application for coverage to Ecology at least 60 days prior to any proposed changes. This reporting to Ecology does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G-4.8 Request to be Excluded from Coverage under this Permit

Any discharger authorized by this general permit may request to be excluded from coverage under this general permit by applying for an individual permit. Such discharger must provide to Ecology an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request for exclusion from coverage under this permit. These reasons must fully document how an individual permit will apply to the applicant in a way that this general permit cannot.

Ecology may require the applicant to provide information to support the request for exclusion from coverage under this general permit. Ecology will either issue an individual permit or deny the request with a statement explaining the reason for the denial.

G-4.9 Modification, Revocation, and Termination of this General Permit

Ecology may modify, revoke and reissue, or terminate this permit during its term for cause in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, any of the following:

1. A change in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

2. Promulgation of effluent limit standards or guidelines pursuant to the Clean Water Act or Chapter 90.48 RCW for the category of dischargers covered under this permit.

3. Approval by Ecology of a water quality management plan containing requirements applicable to the category of dischargers covered under this permit.

4. Receipt of information that indicates that cumulative effects on the environment from dischargers covered under this permit are unacceptable.

5. Establishment by the U.S. Environmental Protection Agency of a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) under Section 307(a) of the Clean Water Act for a toxic pollutant which is more stringent than any limit upon such pollutant in this permit.

In the event that a material change occurs in the condition of the waters of the State, Ecology may, by appropriate order, modify permit Conditions or specify additional Conditions in permits previously issued.

The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated non-compliance does not stay any permit Condition.

G-4.10 Termination of Coverage under this Permit

Ecology may revoke coverage for any discharger under this permit for cause in accordance with Chapter 173-226 WAC. The discharger has 30 days during which to respond to any notification from Ecology of termination of coverage under this permit before coverage under this permit is automatically revoked. Cases where coverage may be terminated include, but are not limited to, any of the following:

1. Violation of any term or condition of this permit.

2. Failure or refusal of the Permittee to comply with an interim or final requirement contained in this permit or submitted as part of its application for coverage under this permit.

3. Misrepresentation or failure to disclose fully all relevant facts when applying for and obtaining coverage under this permit.

4. A material change in the quantity or type of waste disposed or in any other condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

5. A determination that the permitted activity endangers human health or the environment or contributes to a water quality standard violation.

6. Incorporation of an approved local pretreatment program into a municipality's permit.

7. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5) when applicable.

8. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090 and General Condition G-3.5 (Right of Inspection and Entry).

9. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

Ecology may require any discharger, whether or not already covered under this general permit, to apply for and obtain coverage under an individual permit or another more appropriate general permit.

Permittees whose coverage has been revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided that the request is made within 90 days from the time of revocation and is submitted along with a complete individual permit application.

G-4.11 Transfer of Permit Coverage

Coverage under this permit is not transferable to any person except after notice to Ecology.

In the event of any change in control or ownership of the facility or activity from which the authorized discharge emanates, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, and provide a copy of that letter to Ecology.

A Permittee may transfer coverage under this permit to a succeeding owner or operator of the facility or activity producing the discharge, including owners or operators of lots or parcels within a common plan of development or sale, by:

1. Preparing a written agreement, signed by both the current Permittee and the new discharger, that specifies the proposed date of the transfer of coverage, responsibility, and liability for this permit; and

2. Submitting to Ecology a copy of that written and signed agreement at least 30 days prior to the proposed transfer date; and

Provided that:

Ecology does not notify the current Permittee and the new discharger by the proposed transfer date of its intent to modify, to revoke and reissue, or to terminate permit coverage. If Ecology does not notify the current Permittee and the new discharger, the transfer of permit coverage is effective on the date specified in the written agreement between the current Permittee and the new discharger.

When a current Permittee of a construction stormwater discharge site transfers control or ownership of a portion of that permitted site to another person, the current Permittee must also submit an updated application for coverage to Ecology indicating the acreage remaining after the transfer.

Upon consent of the Permittee, Ecology may transfer coverage under this permit to a succeeding Permittee by a minor modification in accordance with 40 CFR 122.63(d) to identify the new Permittee and incorporate such other requirements as Ecology may deem necessary.

Appendix A. Acronyms and Units of Measure

Acronym	Meaning
AKART	All known, available, and reasonable methods of prevention, control, and treatment
BMP	Best management practice
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
CWA	Clean Water Act
DoH	Washington State Department of Health
DMR	Discharge monitoring report
Ecology	Washington State Department of Ecology
eNOI	Electronic notice of intent
EPA	Environmental Protection Agency
ERTS	Emergency Response Tracking System
GWI	Ground water under the direct influence of surface water
MDL	Method detection limit
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
pdf	Portable document format
PQL	Practical quantitation level
QA/QC	Quality assurance and quality control
RCW	Revised Code of Washington State
SEPA	State Environmental Policy Act, RCW 43.21C
SWPPP	Stormwater pollution prevention plan
TMDL	Total maximum daily load
U.S.	United States
USC	United States Code
WAC	Washington Administrative Code
WTP	Water treatment plant

Unit of Measure	Meaning
gpd	Gallons per day
µg/L	Micrograms per liter
mg/L	Milligrams per liter
mL/L	Milliliters per liter
NTU	Nephelometric turbidity units
S.U.	Standard units

Appendix B. Definitions

303(d) List
The list of water bodies in Washington State that do not meet the water quality standards specified in Chapter 173-201A WAC. The Washington State Department of Ecology (Ecology) prepares and the U.S. Environmental Protection Agency approves this list periodically (every 2 years). The list is posted on the Ecology web site at http://www.ecy.wa.gov/programs/wq/303d/2008/index.html.

Action
Any human project or activity.

Activity
A discernible set of related actions or processes conducted within a facility, operation, or site that may cause a discharge of pollutants. Examples include, but are not limited to, construction; manufacturing; production or use of raw materials, products, or wastes; transportation; and cleanup or treatment of machinery, structures, land, or water.

Acute Toxicity
The adverse effects of a substance or a combination of substances on an organism that result either from a single exposure or from multiple exposures in a short period of time (usually from 48 to 96 hours).

All known, available, and reasonable methods of prevention, control, and treatment (AKART)
A technology-based approach of decision making for limiting pollutants from discharges. AKART represents the most current methodology for preventing, controlling, and abating pollution that can be installed or used at a reasonable cost.

Application for coverage
A formal request for coverage under this general permit using the paper or electronic form developed by the Washington State Department of Ecology for that purpose.

Average monthly discharge limit (same as Average monthly effluent limit)
The greatest average of daily discharges allowed for a calendar month. To calculate the value of the actual average monthly discharge for comparison with the limit, add the value of each daily discharge measured during a calendar month, and divide this sum by the total number of daily discharges measured.

Average monthly effluent limit (same as Average monthly discharge limit)
The greatest average of daily discharges allowed for a calendar month. To calculate the value of the actual average monthly discharge for comparison with the limit, add the value of each daily discharge measured during a calendar month, and divide this sum by the total number of daily discharges measured.

Background
The biological, chemical, physical, and radiological conditions that exist in the absence of any influences from outside an area potentially influenced by a specific activity.

Best management practice (BMP)
Activity, prohibition, maintenance procedure, or other physical, structural, and/or managerial practice to prevent or reduce pollution of and other adverse impacts to the waters of Washington State. BMPs include treatment systems, operating schedules and procedures, and practices used singularly or in combination to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

Bypass
The diversion of stormwater or a wastestream from any portion of a treatment facility. A bypass may be intentional or unintentional.

Calendar Day
A period of 24 consecutive hours starting at 12:01 A.M. and ending at the following 12:00 P.M. (midnight).

Carcinogen
Any substance or agent that produces or tends to produce cancer in humans. The term carcinogen applies to substances on the U.S. Environmental Protection Agency lists of A (known human) and B (probable human) carcinogens, and any substance which causes a significant increased incidence of benign or malignant tumors in a single, well conducted animal bioassay, consistent with the weight of evidence approach specified in the U.S. Environmental Protection Agency Guidelines for Carcinogenic Risk Assessment.

Chlorine
A chemical used to disinfect wastewaters of pathogens harmful to human health. Chlorine is extremely toxic to aquatic life.

Chronic toxicity
The adverse effects of a substance or combination of substances on an organism that result from exposure over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity may affect survival, reproduction or growth rates, or other health-related conditions.

Clean Water Act (CWA)
The primary federal law in the United States governing water pollution and that includes goals for eliminating releases of large amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters will meet standards necessary for human sports and recreation by 1983. (Federal Water Pollution Control Act, Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117, and 100-4; USC 1251, et seq.)

Color
The optical density at the visual wavelength of maximum absorption, relative to distilled water. One hundred percent transmittance is equivalent to zero optical density. The analytical procedure for measuring this parameter is typically Standard Methods for the Examination of Water and Wastewater, Method 204.

Compliance schedule
A schedule of remedial measures that includes an enforceable sequence of actions or operations leading to compliance with an effluent or other limit, prohibition, or standard.

Contaminant
Any biological, chemical, physical, or radiological substance that does not occur naturally in a given environmental medium or that occurs at concentrations greater than those in the natural or background conditions.

Control
1. To direct, oversee, supervise, manage, perform, or give instruction about any decision, action, or operation of the specific facility, site, field, wastestream, or other object "under control."
2. The partial removal or complete eradication of native plants, non-native non-noxious plants, algae, noxious or quarantine-list weeds, or other nonnative invasive organisms from a water body. The purpose of control activities may be to protect some of the beneficial uses of a water body, such as swimming, boating, water skiing, fishing access, etc. The goal may be to maintain some native aquatic vegetation for habitat, while accomplishing some removal for beneficial use protection. Control activities may include the application of chemical(s) to all or part of a water body.

Conveyance
A mechanism for transporting water, wastewater, or stormwater from one location to another location, including, but not limited to, gutters, ditches, pipes, and/or channels.

Criteria
The numeric values and the narrative standards that represent contaminant concentrations which are not to be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.

Daily discharge
The amount of a pollutant discharged during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limits expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limits expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant throughout the day.

Dangerous waste
Any discarded, useless, unwanted, or abandoned nonradioactive substances, including but not limited to certain pesticides, or any residues or containers of such substances which are disposed of in such quantity or concentration as to pose a substantial present or potential hazard to human

health, wildlife, or the environment because such wastes or constituents or combinations of such wastes: (1) Have short-lived, toxic properties that may cause death, injury, or illness or have mutagenic, teratogenic, or carcinogenic properties; or (2) Are corrosive, explosive, flammable, or may generate pressure through decomposition or other means. The exact definition of dangerous waste is provided at WAC 173-303-040.

Detection limit
The minimum observed result such that the lower 100(1- α) percent confidence limit of the result is greater than the mean of the method blanks.

Detention
The temporary collection of water into a storage device or pond, with the subsequent release of that water either at a rate slower than the collection rate or after a specified time period has passed since the time of collection. The purposes of detention include, but are not limited to, improving the quality of the water released and reducing or smoothing the mass flow rate of its discharge over time.

Detention pond
Man-made structure constructed specifically to collect and manage stormwater. Detention ponds are generally dry until a significant storm event and subsequently gradually release the accumulated stormwater through an outlet.

Dilution factor (DF)
A measure of the amount of mixing of effluent and receiving water that occurs at the mixing zone boundary, expressed as the inverse of the effluent fraction. For example, a dilution factor of 16 means that, assuming complete mixing at the mixing zone boundary, the effluent comprises 6.25 percent by volume, and the receiving water comprises 93.75 percent by volume of the mixture of effluent and receiving water [DF = 1/(6.25/100) = 16].

Discharge (the noun form is the same as Effluent)
To release or add material to waters of the State, including via surface runoff.

Discharge limit (same as Effluent limit)
Any restriction, including schedules of compliance, established by the local government, the Washington State Department of Ecology, or the U.S. Environmental Protection Agency on quantities, rates, and/or concentrations of biological, chemical, physical, radiological, and/or other characteristics of material discharged into any site including, but not limited to, waters of the State of Washington.

Discharge monitoring report (DMR)
A report submitted periodically (usually monthly or quarterly) by a Permittee to the Washington State Department of Ecology that provides the results of effluent monitoring tests conducted by or on the behalf of the Permittee.

Discharger
An owner or operator of any facility, operation, or activity subject to regulation under Chapter 90.48 of the Revised Code of Washington State or the federal Clean Water Act.

Domestic wastewater
Waste and wastewater containing human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground-water infiltration or surface waters as may be present.

Effluent (same as the noun form of Discharge)
Material (usually an aqueous liquid) released to waters of the State, including via surface runoff.

Effluent limit (same as Discharge limit)
Any restriction, including schedules of compliance, established by the local government, the Washington State Department of Ecology, or the U.S. Environmental Protection Agency on quantities, rates, and/or concentrations of biological, chemical, physical, radiological, and/or other characteristics of material discharged into any site including, but not limited to, waters of the State of Washington.

Entity (same as Party)
Any person or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

Erosion
The detachment and movement of soil or rock fragments and the wearing away of the land surface by precipitation, running water, ice, wind, or other geological agents, including processes such as gravitational creep.

Erosion and sediment control best management practices (ESC BMPs)
Best management practices (BMPs) intended to prevent erosion, sedimentation, or the release of sediment-laden water from the site. Examples include preserving natural vegetation, seeding, mulching and matting, and installation of plastic covering, filter fences, sediment traps, or ponds. (synonymous with stabilization and structural BMPs)

Facility (same as Operation)
The physical premises (including the land and appurtenances thereto) owned or operated by a Permittee from which wastewater or stormwater is discharged subject to regulation under the National Pollutant Discharge Elimination System program.

Fact Sheet
A document prepared by the Washington State Department of Ecology and issued with every permit which summarizes the general activities of the Permittee, explains the reasoning behind the Conditions of the permit, and tells how the public may comment.

Federal Water Pollution Control Act (FWPCA) (same as Clean Water Act)
The primary federal law in the United States governing water pollution and that includes goals for eliminating releases of large amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters will meet standards necessary for human sports and recreation by 1983. (Clean Water Act, Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117, and 100-4; USC 1251, et seq.)

General permit
A single permit that covers multiple characteristically similar dischargers of a point source category within a designated geographical area, in lieu of many individual permits that are specifically tailored and issued separately to each discharger.

Ground water (same as Underground water)
The water located in a saturated zone or stratum beneath the surface of the land or below a surface water body. Ground water is a water of the State and includes interflow, which is a type of perched water, and water in all other saturated soil pore spaces and rock interstices, whether perched, seasonal, or artificial. Although underground water within the vadose zone (unsaturated zone) also is a type of ground water, the Washington State ground water quality standards do not specifically protect soil pore water or soil moisture located in the vadose zone.

Hardness
The amount of calcium and magnesium salts present in water, typically expressed as milligrams of calcium carbonate per liter. The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 314.

Hazardous waste
That waste designated by 40 CFR Part 261, and regulated by the U.S. Environmental Protection Agency.

Individual permit
A permit that covers only a single point source, discharger, or facility.

Interflow
Underground water derived directly from rainfall or snowmelt that percolates into the shallow soil, travels a relatively short distance laterally through the soil near the land surface, and subsequently seeps either: (1) Back onto the land surface where it may evaporate, mix with runoff, or discharge to a surface water body, or (2) Below the surface into a surface water body. The presence and amount of interflow is a function of the soil system depth, permeability, and water-holding capacity.

Jurisdiction

1. The practical authority granted to a formally constituted legal body to deal with and make pronouncements on legal matters and, by implication, to administer justice within a defined area of responsibility.
2. The geographical area or subject-matter to which such practical authority applies.

Load allocation (LA)

Within the context of a total maximum daily load, that portion of the loading capacity of a pollutant entering a water body attributed to: (1) Existing or future nonpoint sources of pollution (i.e., all sources not covered by a National Pollutant Discharge Elimination System permit); and (2) Natural background sources. Wherever possible, nonpoint source loads and natural loads should be distinguished. LA does not include reserves for future growth or a margin of safety.

Loading capacity

The greatest amount of pollutant that a water body can receive and still meet water quality standards.

Method detection limit (MDL)

Minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, and is determined from analysis of a sample in a given matrix containing the analyte. The MDL (or simply "detection limit") is the smallest measured amount or concentration of analyte in a sample that gives rise to a Type I error tolerance of alpha under the null hypothesis that the true amount or concentration of analyte in the sample is equal to that of a blank. (The alternative hypothesis is that the true amount or concentration of analyte is greater than that of a blank).

Mixing zone (same as Dilution zone)

That portion of a water body adjacent to an effluent discharge point where mixing dilutes the effluent with the receiving water. The water within this zone need not meet numeric water quality criteria, but must allow passage of aquatic organisms and not upset the ecological balance of the receiving water. The permit specifies the mixing area or volume fraction of the receiving water surrounding the discharge point.

Monthly average

The sum of all daily measurements obtained during a calendar month divided by the number of days measured during that month (arithmetic mean).

Municipality

A political unit incorporated for local self-government, such as a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or pursuant to state law; an authorized Indian tribe or tribal organization; or a designated and approved management agency under Section 208 of the Clean Water Act. Municipalities include special districts created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity.

National Pollutant Discharge Elimination System (NPDES)
The federal wastewater permitting system for discharges of pollutants from point sources to the navigable waters of the United States authorized under Section 402 of the Clean Water Act. The U.S. Environmental Protection Agency has authorized the State of Washington to issue and administer NPDES permits for non-federal point sources within the State.

Nonpoint source
A source from which pollutants may enter waters of the State that is not readily discernible, such as any dispersed land-based or water-based activities including, but not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas, or forest lands; subsurface or underground sources; or discharges from boats or marine vessels not otherwise regulated under the National Pollutant Discharge Elimination System program.

Operation (same as Facility)
The physical premises (including the land and appurtenances thereto) owned or operated by a Permittee from which wastewater or stormwater is discharged subject to regulation under the National Pollutant Discharge Elimination System program.

Operational source control best management practice (Operational source control BMP)
The schedule of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial best management practices to prevent or reduce the pollution of waters of the State.

Organism
Any individual life form: an animal, plant, fungus, protistan, or moneran.

Outfall
The location of a point source where a discharge leaves a facility, site, or municipal separate storm sewer system and flows into waters of the State. Outfalls do not include open conveyances connecting two municipal separate storm sewers; or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State (e.g., culverts).

Party (same as Entity)
Any person or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

Permeable
Porous; capable of allowing liquids or gases to pass through.

Permit
An authorization, license, or equivalent control document issued by a formally constituted legal body, such as the Washington State Department of Ecology, to a facility, activity, or entity to treat, store, dispose, or discharge materials or wastes, specifying the waste treatment and control requirements and waste discharge conditions. Unless the context requires differently, "permit" refers to individual and general permits authorized under the National Pollutant Discharge Elimination System program.

Permittee
The entity who receives notice of coverage under this general permit.

Person
Any individual or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

pH
A measure of the acidity or alkalinity of water. A pH of 7.0 is defined as neutral. Large variations above or below 7.0 are harmful to most aquatic life. Mathematically, pH is the negative logarithm of the activity of the hydronium ion (often expressed as the negative logarithm of the molar concentration of the hydrogen ion). The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 423.

Point source
Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters of the State, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft. Point source does not include agricultural stormwater discharges and return flows from irrigated agriculture. See 40 CFR 122.3 for exclusions.

Pollutant (in water)
Any discharged substance or pathogenic organism that would: (1) Alter the biological, chemical, physical, radiological, or thermal properties of any water of the State, or (2) Would be likely to create a nuisance or render such water harmful, detrimental, or injurious (a) to the public health, safety, or welfare, (b) to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or (c) to any animal or plant life, either terrestrial or aquatic, either directly from the environment or indirectly by ingestion through the food chain.

Pollutants may include, but are not limited to, the following: solid waste, incinerator residue, garbage, sewage, sewage sludge, filter backwash, munitions, chemical wastes, biological

materials, radioactive materials, heat, wrecked or discarded equipment, dredged spoil, rock, sand, cellar dirt, and other industrial, municipal, and agricultural wastes.

Pollutant does not mean: (1) Sewage from marine vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces, within the meaning of Section 312 of the Clean Water Act (CWA); (2) Dredged or fill material discharged in accordance with a permit issued under Section 404 of the CWA; or (3) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal is approved by authority of the Washington State Department of Ecology (Ecology), and if Ecology determines that such injection or disposal will not result in the degradation of ground-water or surface water resources.

Pollution (of water)
The man-made or man-induced contamination or other alteration of the biological, chemical, physical, or radiological properties of any water of the State, including change in temperature, taste, odor, color, or turbidity of the water; or such discharge of any solid, liquid, gaseous, or other substance into any water of the State that will, or is likely to, create a nuisance or render such water harmful, detrimental, or injurious to: (1) The public health, safety, or welfare; (2) Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or (3) Any animal or plant life, either terrestrial or aquatic, either directly from the environment or indirectly by ingestion through the food chain.

Pretreatment
The reduction of the amount or concentration of pollutants, elimination of pollutants, or alteration of the nature of pollutant properties to a less harmful state prior to or in lieu of discharging wastewater to a treatment plant. This reduction or alteration may be obtained by biological, chemical, or physical processes, by process changes, or by other means, except by diluting the pollutants.

Publicly-owned treatment works (POTW)
1. A sewage treatment plant and its collection system that is owned by a municipality, the State of Washington, or the federal government. A POTW includes the sewers, pipes and other conveyances that convey wastewater to the treatment plant, and any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature.
2. The municipality or other entity that has jurisdiction over the indirect discharges to and the discharges from the treatment works.

Putrescible waste
Solid waste that contains material capable of being decomposed by micro-organisms.

Quantitation level (QL)
The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. The QL is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and

cleanup procedures have been employed. The QL may be calculated by multiplying the method detection limit (MDL) by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10n, where n is an integer.

Receiving water
The water body at the point of discharge, whether that discharge is through a point source or via sheet flow. If the discharge is to a stormwater conveyance system, either surface or subsurface, the receiving water is the water body to which the stormwater conveyance system discharges. Systems designed for ground-water drainage, redirecting stream natural flows, or conveyance of irrigation water/return flows that coincidentally convey stormwater, are considered the receiving water. Receiving waters may also be ground water to which surface runoff is directed by infiltration.

Representative (sample)
A sample that yields data that accurately characterizes the nature of a discharge or other sampled matrix for the parameters of concern. A representative sample should account for the factors that contribute to the variability of the parameters, such as the quantity of the discharge, the date and time of the sampling event, and whether the particular sampling location or associated physical events may affect the material sampled. Combining grab samples collected from multiple outfalls from a designated area of the facility during a certain time range to create a flow-weighted composite sample may be required to obtain a representative sample.

A random sample may not be a representative sample. Representative sampling schemes should vary based on the population distribution and variability. For a relatively constant discharge, a grab sample is representative. For a discharge that varies greatly over time or space, a grab sample would likely not be representative.

Runoff
Water derived directly from rainfall or snowmelt that travels across the land surface and discharges: (1) To water bodies either directly or through a constructed collection and conveyance system, or (2) To the subsurface through a constructed collection and conveyance system.

Sanitary sewer
A sewer designed to convey domestic wastewater.

Saturated zone
The subsurficial zone in which all soil pore spaces and rock interstices are completely filled with ground water. Saturated zones include aquifers, whether or not they produce a significant yield, areas of perched ground water, and interflow.

Sediment
The fragmented material that originates from the weathering and erosion of rocks, unconsolidated deposits, or unpaved yards; and is suspended in, transported by, or deposited by water.

Sedimentation
The deposition or formation of sediment.

Settleable solids
The material that settles out of suspension within a certain timespan measured volumetrically. The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 209E.

Site
1. The land or water area where any facility, operation, or activity is physically located or conducted, including any adjacent land or buffer areas used in connection with such facility, operation, or activity.
2. The land or water area receiving any effluent discharged from any facility, operation, or activity.

Solid waste
All putrescible, nonputrescible, solid, and semisolid waste. Examples of solid waste are: garbage, rubbish, ashes, industrial wastes, swill, demolition and construction wastes, abandoned vehicles or parts thereof, discarded commodities, sludge from wastewater treatment plants and septic tanks, woodwaste, contaminated soils, contaminated dredged material, dangerous waste, and problem wastes.

Source control best management practice (Source control BMP)
Best management practice intended to prevent or reduce the release of pollutants. Two types of source control BMPs exist: (1) Structural, which include physical, structural, or mechanical devices or facilities (e.g., roofs covering storage and working areas); and (2) Operational, which include management of activities that are sources of pollutants (e.g., directing wash water and similar discharges to the sanitary sewer or a dead-end sump).

State
The State of Washington.

State Environmental Policy Act (SEPA)
The Washington State law intended to prevent or eliminate damage to the environment that requires State and local agencies to consider the likely environmental consequences of development proposals prior to their approval (Chapter 43.21C RCW, as implemented through Chapter 197-11 WAC).

Stormwater
Water derived directly from rainfall or snowmelt that either: (1) Travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system; or (2) Percolates into the shallow soil, travels laterally through the soil near the land surface, and subsequently seeps back onto the land surface where it mixes with runoff or discharges to a surface water body. (Same as Runoff plus Interflow)

Stormwater Management Manual (SWMM)
The two technical manuals published by the Washington State Department of Ecology (Ecology) for use by local governments that describe stormwater management techniques and contain descriptions of and design criteria for best management practices to prevent, control, or treat pollutants in stormwater. One of the manuals applies to sites in eastern Washington (SWMMEW), and the other to sites in western Washington (SWMMWW). Ecology periodically updates the two manuals.

Stormwater pollution prevention plan (SWPPP)
The written plan that describes the measures to be employed at a facility to identify, prevent, and control the contamination of point source discharges of stormwater.

Substantial
Of considerable size, quality, value, degree, amount, extent, or importance.

Surface water
Lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, and all other fresh or brackish waters and water courses, plus drainages to those water bodies. Surface waters do not include hatchery ponds, raceways, pollution abatement ponds, and wetlands constructed solely for wastewater treatment.

Surface waters of the State of Washington
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.2, and all waters defined as "waters of the state" in RCW 90.48.020 excluding underground waters. These include lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, and all other fresh or brackish waters and water courses, within the jurisdiction of the State of Washington, plus drainages to those water bodies. Surface waters of the State do not include hatchery ponds, raceways, pollution abatement ponds, and wetlands constructed solely for wastewater treatment.

Technology-based discharge limit (same as Technology-based effluent limit)
A permit limit that is based on the ability of a treatment method to reduce the amount (e.g., concentration) of a pollutant.

Technology-based effluent limit (same as Technology-based discharge limit)
A permit limit that is based on the ability of a treatment method to reduce the amount (e.g., concentration) of a pollutant.

Total maximum daily load (TMDL)
1. An estimate of the maximum amount of a pollutant that a specific impaired water body or water-body segment can receive in a day and still be protective of its designated beneficial uses, i.e., meet water quality standards. The TMDL must incorporate seasonal variation, include a margin of safety, and account for all of the point and nonpoint sources that contributed to the impairment of the specific water body.
2. A water cleanup plan and a mechanism for establishing water quality-based controls on all point and nonpoint sources of pollutants within a watershed basin, sub-basin, or hydrographic

segment associated with a specific impaired water body. Percentages of the TMDL of a single pollutant are allocated to the various pollutant sources as waste load allocations for point sources and load allocations for nonpoint sources and background. A TMDL becomes effective after the U.S. Environmental Protection Agency has reviewed and approved it.

Total residual chlorine
The amount of chlorine remaining in water or wastewater, which is equivalent to the sum of the combined residual chlorine (non-reactive) and the free residual chlorine (reactive). The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 408.

Toxic
Causing death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in any organism or its offspring upon exposure, ingestion, inhalation, or assimilation.

Treat
1. To apply an algaecide, herbicide, or other control product to the water, vegetation, or soil to control or kill algae, vegetation, insects, or some other pest or target species, or to remove or inactivate bioavailable phosphorus.
2. To remove a pollutant from wastewater or to perform some other manipulation of wastewater to reduce or control the adverse effects of a pollutant therein.

Treatment
1. The application of an algaecide, herbicide, or other control product to the water, vegetation, or soil to control or kill algae, vegetation, insects, or some other pest or target species, or to remove or inactivate bioavailable phosphorus.
2. The removal of a pollutant from wastewater or some other manipulation of wastewater to reduce or control the adverse effects of a pollutant therein.

Treatment best management practice (Treatment BMP)
Best management practice intended to remove pollutants from wastewater, such as detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Turbidity
The optical property of water that causes light to be scattered and absorbed rather than transmitted in a straight line. Turbidity in water is caused by suspended matter, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms. Turbidity is a measure of water clarity using a calibrated turbidimeter according to the analytical procedure described typically by Standard Methods for the Examination of Water and Wastewater, Method 214A.

Upset
An exceptional incident in which an unintentional and temporary non-compliance with technology-based, permit effluent limits occurs due to factors beyond the reasonable control of the permittee. An upset does not include non-compliance to the extent caused by operational

error, improperly designed treatment facilities, inadequate storage or treatment facilities, lack of preventive maintenance, or careless or improper operation.

Vadose zone
The subsurficial zone where soil pore spaces and rock interstices are typically occupied at least partially by air. The vadose zone may extend from the surface of the ground down to the top of the water table, i.e., the top of the saturated zone, whether perched or not.

Waste
Any discarded, abandoned, unwanted, or unrecovered material, except the following are not waste materials for the purposes of this permit: (1) Discharges into the ground or ground water of return flow, unaltered except for temperature, from a ground-water heat pump used for space heating or cooling, provided that such discharges do not have significant potential, either individually, or collectively, to affect ground-water quality or uses; and (2) Discharges of stormwater that are not contaminated or potentially contaminated by industrial or commercial sources.

Water quality (WQ)
The biological, chemical, physical, and radiological characteristics of water, usually with respect to its suitability for a particular purpose.

Water quality-based discharge limit (same as Water quality-based effluent limit)
A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water. The limit may include a dilution factor if all known, available, and reasonable methods of prevention, control, and treatment have been accomplished and other restrictions are met.

Water quality-based effluent limit (same as Water quality-based discharge limit)
A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water. The limit may include a dilution factor if all known, available, and reasonable methods of prevention, control, and treatment have been accomplished and other restrictions are met.

Waters of the State of Washington
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.2, and all waters defined as "waters of the state" in RCW 90.48.020. These waters of the State include lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, underground waters, and all other fresh or brackish waters and water courses within the jurisdiction of the State of Washington, plus drainages to those waters.

Waters of the United States
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.

Well
A bored, drilled, or driven shaft, or dug hole whose depth is greater than the largest surface dimension.

Wetland
Any area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Jurisdictional wetlands are wetlands that have been identified as such by local, state, or federal agencies. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

S BREKHUS-BEACH PLANNING INFORMATION

S.1 INTRODUCTION

S.2 TWO LETTERS: FROM PAUL ELLIS, ADMINISTRATOR, CITY OF ARLINGTON, TO CLAY WHITE, DIRECTOR, SNOHOMISH COUNTY PDS, 9/24/2014; FROM BARB TOLBERT, MAYOR, TO BREKHUS-BEACH RESIDENTS, 9/5/2014

S.3 BREKHUS-BEACH CONCEPTUAL ROAD LAYOUT

S.4 BREKHUS-BEACH CONCEPTUAL WATER DISTRIBUTION SYSTEM

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S BREKHUS-BEACH PLANNING INFORMATION

S.1 INTRODUCTION

This 2015 WSP Appendix S contains conceptual, planning level information which demonstrates the City of Arlington's (City) due diligence in providing water service to the Brekhus-Beach neighborhood.

Upon annexation into the City, the City's General Comprehensive Plan update zoned the area as a high-density residential, master-planned neighborhood to be sold and developed using density credits obtained through a formal Transfer of Development Rights (TDR) program with Snohomish County. Under TDR, development rights which were obtained (bought) from the "sending areas" on the Stillaguamish floodplain, could be used (sold) to develop parcels in the Brekhus-Beach "receiving area" at higher densities. Public Works' Utilities staff were an integral part of the early planning, and the 2011 WSP identified water main, pressure zone, and water supply improvements necessary to serve water to the area.

Despite planning efforts between the City, the owners, and one or more developers interested in developing a master-planned community, final development proposals have never been received. In addition, no development credits from the TDR sending area have been sold. Because of the slow start of both the TDR program in the Stillaguamish basin and the development of a master planned community in Brekhus-Beach, City land use planners are now anticipating growth will be accommodated in areas that are likely to develop before Brekhus-Beach, including areas in western Arlington near I-5.

In order to keep planning efforts for Brekhus-Beach moving forward, the City and Brekhus-Beach landowners met and mapped what development within their neighborhood could look like. Mapped features included conceptual-level road layout, water and sewer main alignments, and connections with water and sewer infrastructure at one or more existing locations. The results of this exercise include the road network in Figure S-1, and water distribution system in Figure S-2. These maps are useful tools for communicating utility infrastructure needs with developers interested in Brekhus-Beach.

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September 24th , 2014

Clay White, Director
Department of Planning and Development Services
3000 Rockefeller Avenue MS 604
Everett, WA 98201-4046

Dear Mr. White,

This letter responds to yours of August 28th and your e-mail message to me on September 18th. The City does feel that another meeting would be appropriate to discuss the various items related both to ARL3 Docket XVII request and to the Comprehensive Plan Draft EIS currently out for public comment. Elements of both are related to one another and it will help the process if the City and County have a mutual understanding of the issues.

The City views the issues as follows:

UGA Expansion (ARL3): The City's Docket request was initiated for two primary reasons. First and foremost, it is needed to ensure that sufficient lands area available for future growth. It is serviceable with utilities. It is located directly adjacent to I-5 and Island Crossing. Second, the area would share a common boundary with the Marysville UGA to the south. It is a logical extension of the UGA boundary assuming there is a need to do so.

Brekhus/Beach: The Brekhus/Beach area was annexed to Arlington as part of a failed experiment at TDR and agricultural preservation, best summarized as follows in the City's 2005 Comprehensive Plan (Page 1-2):

> " *To the West and North of our city limits lies the Stillaguamish Valley. It is fertile farmland within the flood plain of the Stillaguamish River. As an awe inspiring entrance to our City it is unequalled. It is there that a major policy shift in our Comprehensive plan takes place as we adopt a pilot-program that will transfer development rights from the Valley to a designated area east of us. Owners of property in the Valley will gain by selling rights and purchasers in the receiving area will be allowed to come into the UGA and develop to urban densities.*

We will be tested at times during the next twenty years as we fit more citizens into less space. But the rewards will be great as we look westward at a preserved Stillaguamish Valley and to a master planned community."

In fact, the TDR program did not produce the TDR credits to farmers or developers; and the master planned community, which is Brekhus/Beach, was found to be incompatible with urban service provision and urban densities. Its annexation represented a commitment by the City to cooperate with the County on its agricultural preservation program, but it does not want to suffer the penalties of having the land essentially deleted from its buildable lands inventory.

De-annexation: It is important to emphasize at the outset that the Arlington did not propose de-annexation as part of its Docket XVII request, although it is willing to consider it. The issue grew out of the PDS review of the ARL3 request. There was a concern expressed about oversizing if the West UGA expansion occurred and, given that an urban level of development could not occur in the Brekhus/Beach annexation area, the City agreed to consider de-annexation to "right-size" the ultimate boundaries. This was not a proposal originating with the City; rather it was an attempt to address a County concern. The overriding issue for the City was to find buildable land that was serviceable and that would help the City to achieve its growth targets.

Your September 18th e-mail suggests that "deannexation is no longer being considered by the city" and that we "are considering other methods to justify the need for a UGA expansion". The City is a bit frustrated as our apparent inability to explain our purpose for asking for the West expansion or our willingness to discuss alternatives with the County. Again, we did not originally ask for a "swap" of UGAs, it was offered in response to the County's concern. Second, we are offering alternatives, such as downzoning, because of County indications that it might resist or oppose our de-annexation efforts.

To re-state, the City is willing to discuss any option that will allay concerns of the County about oversizing the UGA. The Draft EIS for the Comprehensive Plan Update at Page 3-96 supports the notion that expansion combined with contraction will produce something close to a zero-sum solution to the Brekhus/Beach dilemma.

"The (ARL3 Docket) proposal is evaluated in accordance with CPPs regarding land capacity, ability to provide services, and other topics (see Table 3.2-10). The proposal meets the criteria of CPP Policy DP-3 since there is no net increase in growth capacity and the area removed is not characterized by urban growth."

If de-annexation is not the desired course, then a low-density zoning on the property can be discussed. Your e-mail states that I "ultimately understood that probably wouldn't get you where you are looking to go." Respectfully, I had no such understanding and assume that we are still in discussions of what will right-size the UGA boundary and preserve the City's compliance with GMA, short of a "reassessment" process which the City is unwilling to accept.

Again, a meeting to discuss these items makes good sense.

If you will offer a few dates convenient to you and your staff, we will find a time to sit and discuss.

Sincerely,

Paul Ellis
City Administrator

cc: Mayor Barbara Tolbert
Christopher Young, Community and Economic Development Director
Barb Mock, Manager, PDS
Jacqueline Reid, Supervisor, PDS
Terri Strandberg, Principal Planner, PDS
Steve Skorney, Senior Planner, PDS
Councilmember Sommers
Councilmember Klein
Reid H. Shockey, AICP, Shockey Planning Group

City of Arlington
Executive

September 5, 2014

Dear Resident:

Recently, you may have received a post card notice from Snohomish County stating that the City had requested removal of your property from its Urban Growth Area (UGA). I am writing to correct this misinformation. The City has **not** made any such request. The City has, in fact, requested an expansion of its UGA on the west side of I-5 at Island Crossing and this is the item being discussed on September 9th by the Snohomish County Planning Commission. At that meeting the City will be requesting a one-year delay of that item.

The reason for our requested delay is that the expansion west of I-5 has become confused by the County with a completely separate process, the 10-year update of the City's Comprehensive Plan. As part of that required process, we are exploring the future of the Brekhus/Beach area, just as we are looking at every other part of the community. This review is required by the State Growth Management Act.

It is true that providing utilities to the Brekhus/Beach area could be a very expensive proposition for property owners and rate payers. Utilities are required in any area inside Arlington's UGA. No doubt there will be tough choices on the area's future, which could include keeping housing densities low, without utilities (an exception to the rules); extending utilities at property owner expense; or removing the area from the UGA. But much discussion and analysis of these issues must occur by June of next year when the updated Plan must be adopted; and you will be a part of that discussion.

Again, we have not requested removal of the Brekhus/Beach area from the UGA and most certainly will **not** be discussing the matter on September 9th. I am sorry you have been inconvenienced by the County's notice. Please contact our Community Development Director, Paul Ellis if you have any further questions at 360-403-4603 or pellis@arlingtonwa.gov)

Sincerely,

Barbara Tolbert

Barbara Tolbert
Mayor

238 North Olympic Avenue - Arlington, WA 98223 - 360-403-3441 - fax 360-403-4605 - www.arlingtonwa.gov

E MAPLE ST
S HAMLIN DR
215TH PL NE
87TH AVE NE
MEDICAL CENTER DR
89TH AVE NE
92ND AVE NE
E HIGHLAND DR
TVEIT RD
PORTAGE ST
207TH ST NE
BURN RD
OLD BURN RD
97TH AVE NE
200TH ST NE
196TH PL NE
95TH AVE NE
196TH ST NE
195TH ST NE
CROWN RIDGE BLVD

Critical Areas

- Wetlands (NWI)
- Moderate slopes (>15%)
- Steep slopes (>33%)

DRAFT

Maps and GIS data are distributed "AS-IS" without warranties of any kind, either express or implied, including but not limited to warranties of suitability for a particular purpose or use. Map data are compiled from a variety of sources which may contain errors and users who rely upon the information do so at their own risk. Users agree to indemnify, defend, and hold harmless the City of Arlington for any and all liability of any nature arising out of or resulting from the lack of accuracy or correctness of the data, or the use of the data presented in the maps.

CITY OF ARLINGTON

N

Legend

- Connections to existing roads
- Power lines
- Roads
- County mapped streams
- City Limits
- ROW (Proposed)
- Developable land

0 0.05 0.1 0.2
Miles

City of Arlington

Brekhus Beach Critical Areas, Developable Lands and Road Areas

Scale:	File:
1 inch = 500 feet	BBCriticalAreas11x17_15
Date:	**Cartographer:**
April 22, 2015	kdh / akc

Proposed

- Mainline Connector
- Water (Proposed)
- ROW (Proposed)

DRAFT

Maps and GIS data are distributed "AS-IS" without warranties of any kind, either express or implied, including but not limited to warranties of suitability for a particular purpose or use. Map data are compiled from a variety of sources which may contain errors and users who rely upon the information do so at their own risk. Users agree to indemnify, defend, and hold harmless the City of Arlington for any and all liability of any nature arising out of or resulting from the lack of accuracy or correctness of the data, or the use of the data presented in the maps.

CITY OF ARLINGTON

N

Legend

- Power lines
- Gas Line
- City Limits
- County mapped streams
- Public ROW
- Private ROW*
- Rail ROW
- Trail
- Assessor parcels
- Water Mains

0 0.05 0.1 0.2
Miles

City of Arlington

Brekhus Beach Proposed Water Infrastructure

Scale:	File:
1 inch = 500 feet	BBProposedWater11x17_15
Date:	**Cartographer:**
April 22, 2015	kdh / akc

T AGENCY REVIEW COMMENTS AND RESPONSES (AMENDED)

T.1 WASHINGTON DEPARTMENT OF HEALTH WSP AMENDMENT ACCEPTANCE LETTER ISSUED FEBRUARY 9, 2018

T.2 SUMMARY MATRIX OF COMMENTS ON THE AGENCY REVIEW DRAFT AND CITY OF ARLINGTON RESPONSES AS TO HOW EACH COMMENT WAS ADDRESSED IN THE FINAL WSP

T.3 WASHINGTON DEPARTMENT OF ECOLOGY COMMENT LETTER

T.4 WASHINGTON DEPARTMENT OF HEALTH COMMENT LETTER

T.5 SNOHOMISH COUNTY PUBLIC UTILITY DISTRICT (PUD) NO. 1 COMMENT EMAIL

T.6 SNOHOMISH COUNTY PLANNING AND DEVELOPMENT SERVICES EMAIL WITH DRAFT COMMENTS

T.7 SNOHOMISH COUNTY PLANNING AND DEVELOPMENT SERVICES EMAIL WITH FINAL COMMENTS

T.8 SNOHOMISH COUNTY PLANNING AND DEVELOPMENT SERVICES NON-COMPLIANCE LETTER

T.9 CITY OF ARLINGTON COMMUNITY AND ECONOMIC DEVELOPMENT DEPARTMENT RESPONSE TO SNOHOMISH COUNTY DRAFT COMMENTS

T.10 CITY OF ARLINGTON PLANNING COMMISSION PUBLIC HEARING COMMENTS AND PUBLIC NOTICE INFORMATION

* Note: In 2015, The City of Marysville Public Works Department and the Seven Lakes Water Association were both mailed a CD and a link to an online copy of the Agency Review Draft of the WSP with a request for review and comment. Neither responded. The seven closest non-expanding Group A water systems identified in Section 2.6.2 were each contacted by email with a

link to an online copy of the 2015 Agency Review Draft of the WSP with a request for review and comment. None responded. All commenters, their comments, and City responses are addressed in this appendix.

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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

February 9, 2018

DONALD SMITH
ARLINGTON WATER DEPARTMENT
154 W COX AVE
ARLINGTON WA 98223

RE: Arlington Water Department, ID# 02950
Snohomish County
Water System Plan – Amendment
Submittal #17-0707

Dear Mr. Smith:

The City of Arlington (the City) Water System Plan Amendment received in this office on July 24, 2017, with a subsequent submittal on February 7, 2018, have been reviewed and in accordance with the provisions of WAC 246-290-100, is hereby **APPROVED**.

Approval of this WSP is valid as it relates to current standards outlined in Washington Administrative Code (WAC) 246-290 revised January 2017, and is subject to the qualifications herein. Future revisions in the rules and statutes may be more stringent and require facility modification or corrective action. An approved update of this WSP is required on or before **April 20, 2026**, unless ODW requests an update or plan amendment pursuant to WAC 246-290-100(9).

APPROVED NUMBER OF CONNECTIONS

The analysis provided in this WSP shows the water system has sufficient capacity to meet the growth projections during this planning period. The City's water system can support an **"unspecified"** designation for its approved number of connections. A specific number of approved connections will not be applied at this time. Development may occur in compliance with the schedule and information provided in this WSP. This designation may be rescinded (and replaced with a specified number of approved connections) if ODW determines that the WSP is no longer representative of system activities.

LOCAL GOVERNMENT CONSISTENCY

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

SERVICE AREA AND DUTY TO SERVE

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

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

CONSTRUCTION WAIVERS

Standard Construction Specifications for distribution main extensions in this WSP are approved. Consistent with WAC 246-290-125(2), this system may proceed with the installation of distribution main extensions provided this system completes and keeps on file the enclosed construction completion report form in accordance with WAC 246-290-125(2) and WAC 246-290-120(5) and makes it available for review upon request by ODW.

WATER RESOURCES

Below is the general regulatory language that applies to all water system approvals:

This approval does not provide any guarantee and should not be considered to provide any guarantee concerning legal use of water or subsequent water rights decisions by the Department of Ecology. Questions concerning water rights should be directed to the Department of Ecology.

Thank you for your cooperation. Snohomish County is being notified of the terms and requirements of this approval and the determination of the approved number of connections. If you have any questions or wish to check our records, you may contact either of us at the numbers listed below.

Sincerely,

Richard Rodriguez
WSDOH Regional Planner

cc: Erika Lindsey, DOH
Snohomish County Planning and Development Services
Snohomish County Health District
Michael Wolanek, City of Arlington
Michelle Campbell, P.E., RH2

City of Arlington 2017 Amendment to the 2015 Comprehensive Water System Plan

Agency Comments and City Responses

Review Phase:	**WSP Agency Review Draft Issued July 2017 [to be revised to Final based on these responses to agency comments]**			**Health (RR) Comment Date:**	**8/28/2017**
Contact:	**James Kelly and Mike Wolanek (City)**			**Ecology Comment Date:**	**N/A**
	Dan Burwell (RH2 Engineering)			**Snohomish Co PDS Comment Date:**	**8/7/2017**
Date:	**8/8/2017**			**Snohomish Co PUD Comment Date:**	**N/A**

No.	Page No.	Section Paragraph No.	Agency Comment	Commenter Name	City Response (specific ext revisions in bright red font)	For PDS comments only, PDS reply to City response	City Responder Name	City Reviewer Name	Implementation Date	Implementation Initials
Responses to comments from Department of Ecology										
1	N/A	N/A	7/19/2017 email: M Wolanek, City: I am assuming that since water demands and water rights are not changing, that Ecology's original (2015) review of the WSP remains adequate for this amendment.		7/19/2017 email response: R Rodriguez, DOH: Thank you Mike. I agree, I see no need to share the Amendment with DOE.		MW	JK	10/30/17	MW
Responses to comments from Snohomish County Planning and Development Services, email received 8/3/2017										
1			I took a look at the City of Arlington's 2017 Water System Plan Amendment. Although it is intended primarily to reflect the elimination of the UGA expansion proposed by the City in 2014-15, I found some sections of the amended plan that continue to include or reflect that expansion proposal. I suspect this is advertent, but I think corrections should be made before we provide the consistency determination. Specifically the following sections need attention:	Michael Zelinsky	Concur that withdrawl of the City's petition to expand its UGA west of I-5 was a significant driver behind the WSP amendment. Yes, the references to continued UGA expansion west of I-5 were indeed oversights and have been corrected.		MW	JK	10/30/17	MW
2		ES 2.2	1. The Executive Summary mentions the city's 2015 Comprehensive Plan update and its application to expand its UGA, but does not mention the city's withdrawal of that application in 2016 and its 2017 comp plan amendment eliminating the UGA expansion (see Section ES 2.2). While this change is clearly explained in Chapter 3, it should also be noted in Section 2.2 of the Executive Summary.	Michael Zelinsky	The Executive Summary section 2.2 has been revised to be consistent with Chapter 3.		MW	JK	10/30/17	MW
3		3.2.2 and 3.2.3	2. The description of the "Urban Growth Area" in Sections 3.2.2 and 3.3.2 suggests that the city's original petition to expand the UGA is still being processed. The text in these sections should be updated to describe the city's subsequent withdrawal of the petition in 2016.	Michael Zelinsky	Concur. The text has been revised		MW	JK	10/30/17	MW
4		Table 3-1	3. Table 3-1 should be modified to remove the "Expanded UGA" column.	Michael Zelinsky	Consistent with our approach throughout this Amendment, we attempt to demonstrate the changes made throughout the document through notes to the reader, font changes including strikeout and underline, and maintenance of table structure. The Expanded UGA column in Table 3-1 remains, but each row and the total reflect no land use west of I-5 (i.e., all zeroes).		MW	JK	10/30/17	MW
5	3-10	3.5.1	4. The text in Section 3.5.1 at the bottom of p. 3-10 states that one third of the city's projected population growth will be accommodated in the proposed UGA expansion area. This section needs to be revised to reflect the elimination of the UGA expansion and a re-distribution of the projected population growth to existing city/UGA areas.	Michael Zelinsky	Text has been revised to indicate the population originally planned for UGA expansion west of I-5 will be dispersed as infill within existing city limits.		MW	JK	10/30/17	MW
6		3.5.2, Table 3-4, Table3-5	5. The text of Section 3.5.2 and the data in Tables 3-4 and 3-5 continue to include the UGA expansion - they should be revised to reflect its elimination.	Michael Zelinsky	Text has been revised. Tables continue to reflect zeroes.		MW	JK	10/30/17	MW
7		General, Appendix N	...please review and revise or edit the portions noted below by Michael Zelinski on the City of Arlington's 2017 Water System Plan Amendment, before I can give a final statement of consistency.	Randy Sleight	These are addressed above. Thank you for the signed consistency statement, which is provided in Appendix N.		MW	JK	10/30/17	MW
8		General	I did not have any further comments on the engineering side of the plan, as it was well done.	Randy Sleight	Thank you.		MW	JK	10/30/17	MW

City of Arlington 2017 Amendment to the 2015 Comprehensive Water System Plan

Agency Comments and City Responses

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Contact:	**James Kelly and Mike Wolanek (City)**	**Ecology Comment Date:**	**N/A**
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			Responses to final comments from Department of Health (Richard Rodriguez) received 2017							
1		General	We have reviewed the plan and offer the following comments. These comments must be adequately addressed prior to approval of this WSP Amendment.	Rodriguez, Richard	All of your comments have been addressed per the responses below.		MW	JK	10/30/17	MW
2	N-1	Ch 3, Appendix N	Provide a statement of local government consistency from your Planning Department and Snohomish County Planning and Development.	Rodriguez, Richard	Consistency statements from the City and Snohomish County PDS are included in Appendix N in the Final WSP Amendment. Snohomish County PDS, which had found the 2015 WSP to be *NOT CONSISTENT*, has issued a statement finding the 2017 Amendment to be *CONSISTENT*.		MW	JK	10/30/17	MW
3	iii, v, vii	Preliminary pages	Please provide replacement pages with the appropriate PE stamps.	Rodriguez, Richard	The signatures and stamps of PE's approving the Final WSP Amendment are included behind the cover page. The signatures of selected other reviewers providing approval are also presented. These signed, stamped pages will be included in the final hardcopy, and/or distributed separately for easy insertion into the hardcopy document provided.		MW	JK	10/30/17	MW
4	O-1, T-1	Appendices O, T	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.	Rodriguez, Richard	A public workshop on the WSP Amendment was held before Arlington Planning Commission on 8/1/2017. A public hearing was held before the same commission on 8/15/2017. Comments and responses for each session are documented in Appendix T.		MW	JK	10/30/17	MW
5	O-1	Appendix O	Prior to DOH approval, the City's governing body must approve and adopt the WSP Amendment.	Rodriguez, Richard	The Arlington City Council is scheduled to vote to adopt the Final WSP, per the Planning Commission's recommendation, on 10/2/2017. Planning Commission minutes are in Appendix T. The City Council Ordinance documenting Council adoption will also be added to Appendix O.		MW	JK	10/30/17	MW
6	T-1	Appendix T	Please provide copies of any comments made by adjacent purveyors, along with your response to those comments.	Rodriguez, Richard	No comments on the 2017 Amendment were solicited from adjacent purveyors because, with one exception, no comments were received on the 2015 WSP Update. Snohomish PUD did comment on the 2015 WSP, but none of its comments were germane to any of the land use or other revisions made in the 2017 Amendment. Areas of interest in their 2015 comments made by Karen Heneghan included: flows through the PUD Master Meter; Section 2.5.7; water service area boundaries in Section 3.3 and Appendix L; and ERU calculations"		MW	JK	10/30/17	MW
			Responses to comments from Snohomish County PUD No. 1							
1	N/A	N/A	N/A	N/A	City Note (August 4, 2017): PUD was not requested to review the 2017 amendment. Areas of interest in their 2015 comments made by Karen Heneghan were not affected by the amendment, including: flows through the PUD Master Meter; Section 2.5.7; water service area boundaries in Section 3.3 and Appendix L; and ERU calculations.		MW	JK	10/30/17	MW

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			Responses to City of Arlington Planning Commission Comments made during a Workshop on 8/1/2017							
1		General	My notes from last night's meeting showed only two comments from the Planning Commission: ... Please let me know if there is any additions or correction to the comments.	James Kelly, PW Director, email to Bruce Angell, Chair	We understand Planning Commission comments at the workshop were limited to the two requests listed below.		MW	JK	10/30/17	MW
2		General	1. Please edit narrative text in Land Use sections of Water, Sewer and Transportation plan to make sure it is consistent with what is stated in City's Comprehensive Plan.	Bruce Angell, Chair	A determination of consistency between planning documents that are in preparation is an iterative process. The GMA Comprehensive Plan appears to have received more comprehensive agency comments than did the WSP (e.g., PSRC), so we are waiting for final revisions to the GMA comp plan before beginning a final review and making any necessary corrections. Also, although it is not as true for Land Use as other technical subject matter, plans adopted by reference within the GMA comp plan often contain more detail that is only summarized in the GMA plan, so the absence of some information in the GMA comp plan should not be construed as inconsistent with its adopted, referenced plans.		MW	JK	10/30/17	MW
3		General	2. After MU Overlay zoning is adopted, please revisit Water, Sewer, and Transportation modeling to make sure area population projections are consistent.	Bruce Angell, Chair	We will revisit your concern after final revisions to the GMA comp plan are completed. However, we are fairly certain that the water modeling results and their implications are within the precision and limits of a wide and reasonable range of population projections. For example, removing UGA expansion west of I-5 from consideration and reallocating more than 2,200 persons across the 342 pressure zone (generally Old Town plus city limits west of 67th Avenue), did not result in any new capital improvement projects, and only removed the projects situated west of the freeway.		MW	JK	10/30/17	MW
			Responses to Comments made in Langabeer & Traxler, P.S., letter dated 7/21/2017							
1		General	I am writing on behalf of my clients Mr. and Mrs. Robert Phillips, Mr. Mike Pitman, and Ms. Jody Heigert, with regard to the City of Arlington's (City) 2017 Comprehensive Plan Update (Comp Plan Update) and the City 's proposed changes (Draft Plan) related to the Brekhus/Beach Subarea. This letter follows two prior submissions to the City's Planning Commission and the City Council which related to the 2015 Comp Plan Update.	Dannon Traxler	Responses here will focus on letters received after publication of the 2017 update of the GMA Comprehensive Plan and the Transportation 2035 Plan, and the 2017 Amendments of the Water (WSP) and Sewer (GSP) plans, and not the two 2015 letters.		MW	JK	10/30/17	MW
2			As you may know, my clients have a pending appeal before the Growth Management Hearings Board of the 2015 Comprehensive Plan. We filed that Petition for Review in September 2015, and it has essentially been on hold since that time, pending the outcome of the revisions to the Draft Plan that the Planning Commission is reviewing now. The issues in our appeal, to summarize, pertained to the City's plan to accommodate projected growth by expanding the UGA into the King-Thompson area, the unworkable TDR overlay on Brekhus/Beach which has prevented the accommodation of higher density development in that area, and the failure of the City to plan for and identify financing components of capital facilities infrastructure to Brekhus/Beach, including the provision of roads and water and sewer infrastructure to serve development there.	Dannon Traxler	We acknowledge your appeal of the 2015 GMA Comprehensive Plan (and the plans it adopts by reference) has been "on hold" pending the completion of the 2017 Update and Amendments. We understand the first two of your three issues--UGA expansion west of I-5 and the TDR overlay on the Brekhus/Beach neighborhood are satisfactorily addressed in the revised (2017) documents. We further understand that your third issue--lack of development of municipal infrastructure to facilitate development at Brekhus/Beach--remains unsettled as the revised documents move toward adoption by City Council.		MW	JK	10/30/17	MW

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3			We placed the appeal on hold with the hope that the Draft Plan would address (and moot out) the big issues in our appeal, and it has, to a certain extent. We fully agree with the City's plan to remove ARL3 from the Snohomish County docket so that the King-Thompson area is not included in the UGA. We also agree with the City's decision to remove the TOR overlay from Brekhus/Beach. We recognize that the removal will give the property owners more options. We thank you for your efforts in these respects, as it will allow us to dismiss some of the issues in our appeal.	Dannon Traxler	Concur. See the response immediately above.		MW	JK	10/30/17	MW
4			There are issues that remain, however. First, we do not agree with the City's decision to make up for the density capacity it won't be getting as part of the King-Thompson expansion by cramming a large part of the planned growth over the 20 year planning period into multi-family developments, which it seems from reviewing public comments over the course of this process, many of the people in this community oppose. The City should be placing at least some of that density in the available land at Brekhus/Beach and ensuring that adequate infrastructure can be installed within the 20-year planning period to support that kind of development in the area. We are deeply troubled by the fact that the reconciliation process with Snohomish County yielded an agreement of 606 units for the Brekhus/Beach area based on a development density of 5.5 dwellings per acre. This seems to be at least part of the resolution for accommodating the population projection. We do not understand how this density can be used when there's no assurance that such a density can be achieved within the planning period without adequate infrastructure. This is not GMA-compliant.	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW
5			The City concedes that the Draft Plan does not allow Brekhus/Beach to develop up to its OMA-required potential. On page 4-18 of the Draft Plan, the City states that the area is assumed to be a part of the buildable lands inventory. The City also states: "The City faces a paradox where the GMA requires that lands within Urban Growth Areas be developed at urban densities (4+ houses per acre), but there is no market or infrastructure financing available to achieve that level of development. Only a density of 20,000 square feet per acre is permissible without sewer or other facilities." Thus, in its own Comp Plan, the City is stating that it is not complying with GMA requirements in its treatment of Brekhus/Beach as far as density goes, while at the same time agreeing to use an unrealistic 5.5 acre density for growth capacity at Brekhus/Beach to satisfy population projections. This creates an internal inconsistency within the plan, which is also noncompliant with the GMA.	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW

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6			We are also concerned that the revised plan does not do any actual capital facilities planning for Brekhus/Beach, nor does it identify current or future funding mechanisms for such infrastructure, leaving an area that is within the City limits, to be fully funded by private property owners. While the "high-level master plan" includes some big picture mapping and discussion of roads, and water and sewer service, and a 2009 arterial study identifies potential transportation improvements, this does not constitute actual capital facilities planning and does nothing to ensure that this property which is de facto "urban" in nature will be developed to OMA-required densities within the planning period. For example, we see nothing in the section on Future Transportation Needs identifying any road projects that will aid in ensuring the build-out of Brekhus/Beach within the planning period even at only 5.5 units per acre. We also do not understand why the City isn't seeking any alternative funding mechanisms for such infrastructure, such as government grants and EDI funds.	Dannon Traxler	The water, sewer, and transportation plans use the population densities provided in the City's GMA Comprehensive Plan to develop a capital facilities improvement and financing plan. Based on the provided population densities and the conceptual Brekhaus/Beach development plan, the existing and planned facilites will be adequate to meet the needs of the future population.		JK	MW	10/30/17	MW
7			The heart of the GMA is the requirement for coordinated and comprehensive planning. Infrastructure must match and support urbanization. The costs of supplying urban services are to be taken into account at the time the urban growth boundary is extended or capacity is increased. GMA guidelines explain: The obligation to provide urban areas with adequate public facilities is not limited to new urban areas. Counties and cities must include in their capital facilities element a plan to provide adequate public facilities to all urban areas, including those existing areas that are developed, but do not currently have a full range of urban governmental services or services necessary to support urban densities. WAC 365-196-320(1)(e).	Dannon Traxler	The water, sewer, and transportation plan meet the requirements of WAC 365-196-320(1).		JK	MW	10/30/17	MW
8			The City's excuse is that "the topography and geology of the area make the installation of infrastructure such as roads and sewers very costly." The revised plan also identifies "numerous planning issues" with the Brekhus/Beach Subarea. The fact is, Brekhus/Beach is within the City limits, and per GMA requirements, the City is required to plan for growth. Capital facilities planning and financing are part and parcel of that.	Dannon Traxler	The water, sewer, and transportation plans use the population densities provided in the City's GMA Comprehensive Plan to develop a capital facilities improvement and financing plan. Based on the provided population densities and the conceptual Brekhaus/Beach development plan, the existing and planned facilites will be adequate to meet the needs of the future population.		JK	MW	10/30/17	MW
9			Finally, we are also troubled by the City's imposition of a high-level master plan over Brekhus/Beach which would seem to hold hostage those folks with smaller parcels who may want to develop to higher level densities before one wealthy developer can come in and buy up the whole area. We would like some assurance from the City that property owners within Brekhus/Beach can come up with smaller-scale development plans consistent with the high-level plan and still be allowed to develop at higher densities. That only makes sense. Capital facilities planning by both the City and the property owners would of course need to be a necessary component of that.	Dannon Traxler	The City is open to work with Brekhaus/Beach as a whole comprehensive development or as individual parcel developments. The development layout included in the water, sewer, and transportation plans was developed as a joint exercise with the City and a representative from Brekhaus/Beach.		JK	MW	10/30/17	MW
10			We look forward to working with you cooperatively on these issues and to help draft revisions that are agreeable to all parties and that are GMA-compliant. Please include me on your email list for all notifications related to your 2017 Comp Plan Update.	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW

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			Responses to Comments made in Langabeer & Traxler, P.S., letter dated 7/31/2017							
1		General	I am writing on behalf of my clients Mr. and Mrs. Robert Phillips, Mr. Mike Pitman, and Ms. Jody Heigert, with regard to the City of Arlington's (City) 2017 Updates to its Comprehensive Water and Sewer, and Transportation Plans as they relate to the Brekhus/Beach Subarea. This letter follows our prior submission to the Planning Commission on July 21, 2017 related to the 201 7 Comprehensive Plan Update and our attendance at your July 18, 201 7 Planning Commission meeting.	Dannon Traxler	Noted. Thank you.		MW	JXK	10/30/17	MW
2			We testified at the public hearing about our pending appeal before the Growth Management Hearings Board of the City's 2015 Comprehensive Plan and explained that we placed the appeal on hold with the hope that the updates to your current Plan would address the big issues in our appeal. We agreed that this update will resolve many of the appeal issues. However, we expressed concern about remaining issues related to the City's failure to properly plan for growth at Brekhus/Beach. Specifically, this iteration of the Comprehensive Plan does not ensure that adequate infrastructure (including water, sewer, and roads) can be installed to Brekhus/Beach within the 20-year planning period to support densities required by the OMA and the City's own Plan. The City does not appear to be doing any actual capital facilities planning for Brekhus/Beach, and it does not identify current or future funding mechanisms for such infrastructure, leaving an area within the City limits to be fully funded by private property owners.	Dannon Traxler	We disagree with this statement. The City has been planning for Brekhaus/Beach since 2008, this early work focused on with expansion of the waste water treatment plant and obtaining additional water rights. The City is currently expanding Lift Station #2 that will eventually handle sanitary sewer flows from the Brekhaus/Beach development. All of these past efforts and the current effort is fully funded by the City of Arlington. Based on the population densities projected in the City's GMS Comprehensive Plan and the conceptual Brekhaus/Beach development plan, the existing and planned facilities will be adequate to meet the needs of the future population.		MW	JXK	10/30/17	MW
3			At that same meeting, we and the Planning Commission were told by City staff that new information was available from Public Works related to infrastructure planning for Brekhus/Beach in the updates for the Water, Sewer, and Transportation Plans and that it was posted online. Staff stated that Public Works was also working on a financing analysis related to that infrastructure which would be available at the Planning Commission' s work session on August 1, 2017. In response, the Planning Commission explicitly directed staff to request that Public Works work on the financing component for the next meeting. We were encouraged by this development.	Dannon Traxler	Noted. Thank you.		MW	JXK	10/30/17	MW
4			The following day, I reviewed the City's website and the online draft updates to the Water and Sewer Plans. I did not see any new information (about infrastructure or otherwise) related to Brekhus/Beach. I first emailed Kristin Foster on July 20, 2017 and asked if she could point me toward the new information on the City's website. She referred me to James Kelly with Public Works.	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW

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5			On July 21, 2017, I emailed Mr. Kelly and asked about Brekhus/Beach planning information and a financing analysis. He responded that same day, stating: ' The 2017 updated Water and Sewer comprehensive plans do not include any Brekhus/Beach infrastructure planning work other than what was included in the 2015 documents." This took me completely by surprise, given what staff stated at the July 18th Planning Commission meeting, so I then emailed Amy Rusko and Marc Hayes and asked for clarification on their statements to the Commission. When I did not receive a response from either one of them, I called and spoke directly with Amy Rusko. She verified staff's statements at the Planning Commission meeting that staff believed new information related to Brekhus/Beach infrastructure and future financing either existed in the new Water and Sewer Plans or was forthcoming, and that staff believed it would also be part of the Transportation Plan update. She said that she did not know why Public Works had not provided it.	Dannon Traxler	Based on the population densities projected in the City's GMA Comprehensive Plan and the conceptual Brekhaus/Beach development plan, the existing and planned facilities that were included in the 2015 planning documents (water, sewer, and transportation) are adequate to meet the needs of the Brekhaus/Beach population in the planning horizon.		JK	MW	10/30/17	MW
6			This is very troubling. It means that the information the Planning Commission received from staff at its July 18th public hearing was inaccurate, and the Planning Commission voted to send the draft Comprehensive Plan to Council after receiving this information. There is no new information on Brekhus/Beach infrastructure planning in the Water, Sewer and Transportation Plans (and apparently, none is planned), and there is no financing analysis forthcoming. We do not understand this disconnect between Planning and Public Works staff. Misinformation of this sort should not *be* presented to the public during meetings, and it certainly should not be presented to the Planning Commission who is tasked with vetting crucial planning documents for the City Council.	Dannon Traxler	The water, sewer, and transportation plans include infrastructure improvement and financing plans for any needed infrastructure improvements to meet the population projections contained in the City's GMA Comprehensive Plan and at the service points as identified in the preliminary Brekhaus/Beach development plan.		JK	MW	10/30/17	MW
7			As we stated in our testimony to you, infrastructure planning and the identification of mechanisms for funding infrastructure are crucial components in ensuring a OMA-compliant Comprehensive Plan in accordance with RCW 36.70A.1 15 and WAC 365-196-320(1)(e). This is particularly true, since the City's reconciliation process with Snohomish County yielded an agreement of 606 units for the Brekhus/Beach area based on a development density of 5.5 dwellings per acre. There is no infrastructure currently in place to accommodate that level of growth within the planning period, and the City is obligated to correct that deficiency with this Comprehensive Plan update.	Dannon Traxler	The water, sewer, and transportation plans include infrastructure improvement and financing plans for any needed infrastructure improvements to meet the population projections contained in the City's GMA Comprehensive Plan and at the service points as identified in the preliminary Brekhaus/Beach development plan.		JK	MW	10/30/17	MW
8			Since infrastructure and funding information about areas within the City's urban growth area is necessary for the City's Comprehensive Plan to pass GMA muster, we request that at its August 2nd work session, the Planning Commission direct Public Works to come forward with new Brekhus/Beach planning information before any vote is taken on the Water, Sewer, and Transportation Plans. Since such information was promised to the Planning Commission by Planning staff, we also believe it is appropriate for the Commission to address the discrepancies between City departments to ensure that this process charts a smoother course in the future.	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW

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1		General	My notes from last night's meeting showed only two comments from the Planning Commission: ... Please let me know if there is any additions or correction to the comments.	James Kelly, PW Director, email to Bruce Angell, Chair	We understand Planning Commission comments at the workshop were limited to the two requests listed below.		MW	JK	10/30/17	MW
2		General	1. Please edit narrative text in Land Use sections of Water, Sewer and Transportation plan to make sure it is consistent with what is stated in City's Comprehensive Plan.	Bruce Angell, Chair	A determination of consistency between planning documents that are in preparation is an iterative process. The GMA Comprehensive Plan appears to have received more comprehensive agency comments than did the WSP (e.g., PSRC), so we are waiting for final revisions to the GMA comp plan before beginning a final review and making any necessary corrections. Also, although it is not as true for Land Use as other technical subject matter, plans adopted by reference within the GMA comp plan often contain more detail that is only summarized in the GMA plan, so the absence of some information in the GMA comp plan should not be construed as inconsistent with its adopted, referenced plans.		MW	JK	10/30/17	MW
3		General	2. After MU Overlay zoning is adopted, please revisit Water, Sewer, and Transportation modeling to make sure area population projections are consistent.	Bruce Angell, Chair	We will revisit your concern after final revisions to the GMA comp plan are completed. However, we are fairly certain that the water modeling results and their implications are within the precision and limits of a wide and reasonable range of population projections. For example, removing UGA expansion west of I-5 from consideration and reallocating more than 2,200 persons across the 342 pressure zone (generally Old Town plus city limits west of 67th Avenue), did not result in any new capital improvement projects, and only removed the projects situated west of the freeway.		MW	JK	10/30/17	MW
			Responses to Comments made in Langabeer & Traxler, P.S., letter dated 8/4/2017							
1		General	I am writing on behalf of my clients Mr. and Mrs. Robert Phillips, Mr. Mike Pitman, and Ms. Jody Heigert, with regard to the City of Arlington's (City) 2017 Updates to its Comprehensive Water and Sewer, and Transportation Plans as they relate to the Brekhus/Beach Subarea. At the request of Planning staff, I am providing the following legal citations/analysis of the Growth Management Act (GMA) and associated Growth Management Hearings Board decisions related to the GMA requirement that the City plan for infrastructure to serve Brekhus/Beach within the 20-year planning period. This information has previously been submitted to both the Planning Commission and the City Council. The full text of the GMA citations is included on Exhibit A, attached.	Dannon Traxler	Noted. Thank you.		MW	JK	10/30/17	MW
2a			The City's most crucial "miss" related to Brekhus/Beach is the OMA requirement that the City include a capital facilities plan element, which requires the City to forecast future needs for capital facilities (these facilities are necessary to allow Brekhus/Beach to develop to its potential) and requires the City to develop a six-year plan to finance the capital facilities. RCW 36.70A.070(3) requires that each Comp Plan include a plan, scheme or design for:	Dannon Traxler	The City did complete a capital facilities plan for water, sewer, and transportation that assed current infrastructure capacities and projected future infrastructure needs based of population projections from the City's GMA Comprehensive Plan. There is a financial section if or each capital facilities plan (water, sewer, and transportation).		MW	JK	10/30/17	MW

City of Arlington 2017 Amendment to the 2015 Comprehensive Water System Plan

Agency Comments and City Responses

Review Phase:	**WSP Agency Review Draft Issued July 2017 [to be revised to Final based on these responses to agency comments]**			**Health (RR) Comment Date:**	**8/28/2017**
Contact:	**James Kelly and Mike Wolanek (City)**			**Ecology Comment Date:**	**N/A**
	Dan Burwell (RH2 Engineering)			**Snohomish Co PDS Comment Date:**	**8/7/2017**
Date:	**8/8/2017**			**Snohomish Co PUD Comment Date:**	**N/A**

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	Page No.	Paragraph No.							Date	Initials
2b			"(a) An inventory of existing capital facilities owned by public entities, showing the locations and capacities of the capital facilities; (b) a forecast of the future needs for such capital facilities: (c) the proposed locations and capacities of expanded or new capital facilities: (d) at least a six-year plan that will finance such capital facilities within projected funding capacities and clearly identifies sources of public money for such purposes: and (e) a requirement to reassess the land use element if probable funding falls short of meeting existing needs and to ensure that the land use element, capital facilities plan element. and financing plan within the capital facilities plan element are coordinated and consistent ". (emphases added).	Dannon Traxler	See replay above		MW	JK	10/30/17	MW
3			As far as we can tell, the City has never done any real capital facilities planning for Brekhus/Beach, as required by the GMA. The City has not forecast the future needs for Brekhus/Beach, has shown only very general proposed locations and capacities of infrastructure necessary to serve Brekhus/Beach, and has not included proposed infrastructure for Brekhus/Beach in its six-year financing plan, all despite the fact that Brekhus/Beach is an urban area within the City limits. Instead, the City ignores the capital facilities needs of the area by choosing simply not to recognize or plan for such needs and by calling the area "too difficult" to serve. The GMA doesn't allow for such choices.	Dannon Traxler	The City has completed capital planning (engineering, design and financing) for the Brekhaus/Beach area. In 2007/2008 then planned populations for Brekhaus/Beach were used to size the wastewater treatment plant upgrade and the amount of water rights that needed to be procured. The same ultimate build-out populations were used in sizing the current (2016/2017) improvements to Lift Station #2.		JXK	MW	10/30/17	MW
4			In addition, the City does not ensure that public facilities were available to serve Brekhus/Beach when it was annexed. The requirement of RCW 36.70A.020(12) is compelling and requires the City to "(e)ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards." (emphasis added). The current version of the Comp Plan is under appeal for the City's failure to plan and finance public facilities for the Brekhus/Beach area, and the City cannot perpetuate this same violation in this next round. Brekhus/Beach is "available for occupancy" because it is within the City limits. Thus, under RCW 36.70A.020(12) the City is bound to plan and finance the infrastructure to serve it, and the City must do so during this planning period.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW

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5			In addition, RCW 36.70A.070(6) requires that the City include a transportation element that identifies "..state and local system needs to meet current and future demands." The transportation element also requires financing which must include "(a)n analysis of funding capability to judge needs against probable funding resources." Brekhus/Beach certainly has a "local system need" for roads to serve property that is within the City limits. We cannot see that the City has identified that need in any of its planning documents or done any analysis as to the funding capability of serving the area with roads. Instead, the City dismisses Brekhus/Beach as being too difficult and "too expensive" to serve, despite the fact that the City chose to annex the area. This approach violates RCW 36.70A.070(6). See Bothell. et al v Snohomish County. CPSGMHB Case No. 07-3-0026c, 21, Final Decision and Order (Sep. 17, 2007). GMA Guidelines explain: The obligation to provide urban areas with adequate public facilities is not limited to new urban areas. Counties and cities must include in their capital facilities element a plan to provide adequate public facilities to ***all*** *urban areas*, including those existing areas that are developed. but do not currently have a full range of urban governmental services or services necessary to support urban densities. WAC 365-196-320(1)(e). (emphases added).	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
6			It is clear from the Draft Plan that the City has no current or future plans to make good on its annexation of Brekhus/Beach and to properly and responsibly plan for public facility needs (which should have been done years ago). This is unacceptable, since the City is on a GMA- mandated deadline to serve Brekhus/Beach: "(A)reas included in the UGA expansion areas must have adequate urban services available within 20 years of the area's inclusion in the UGA." KCRP VI, 06-3-0007, 11/5/07, at 9. (emphasis added). The City has not even begun to plan for the placement of growth within this urban area within the City limits. The City failed to properly plan for infrastructure when it annexed Brekhus/Beach, and it perpetuates this failure with its most recent Comp Plan review and update. The City's approach is a blatant violation of the GMA.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
7			The onus of properly planning for growth falls on the City and not on individual property owners, and the City's failure to properly shoulder the burden cannot be perpetuated in the current Comp Plan Update without violating the GMA. This is supported by relevant GMHB decisions. For example, in Fallgatter IX v. City of Sultan, CPSGMHB 07-3-0017, FDO (Jun. 29, 2006) at 8- 9, the Board found that "(A jurisdiction's) solely relying on future development to provide major infrastructure, such as sewer, and not planning to have the capacity to provide service to existing development, fails to meet the requirements of the GMA." In addition, the Board came to the conclusion that "...a jurisdiction must ensure that within urban areas there will be adequate and available sewer capacity to serve the existing, un-sewered urban population within the 20-year planning period." Id. Because Brekhus/Beach is within the City limits and the UGA, the City must permit urban densities in the area, and the area is de facto "urban" in nature. Since Brekhus/Beach is urban, the fact that the City has failed to serve the area (and continues to fail to properly plan for it) violates the GMA.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW

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8			In Fallgatter IX, the Board found that the city did not comply with RCW 36.70A.020(12)'s and 36.70A.070(3)'s mandate to provide adequate and necessary facilities to support existing and new development within the 20-year planning period. CPSGMHB 07-3-0017, FDO (Jun. 29, 2006) at 8-9. The city's Capital Facilities Plan in that case failed to provide an adequate needs assessment (i.e. current needs, future needs, and expected levels of service) so as to properly document the needed funding to supply these services, both in regard to the funds required as well as the source of the needed funds. Id. at 9. Arlington is similarly guilty: the City's Capital Facilities Plan does not identify the needed funding to develop the infrastructure and services necessary to serve Brekhus/Beach which is an urban area within the City.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
9			Similarly, in City of Shoreline, et al v. Snohomish County, Coordinated Case Nos. 09-3- 0013c and 10-3-001 l c, Final Decision and Order (Apr. 25, 2011), the GMHB found that the development regulations enacted by Snohomish County for the Point Wells Urban Center did not adopt a sufficient plan for infrastructure and services. Instead, the regulations established process for developing urban services commitments concurrently with approving project pennit applications. Spokane County tested the same 'wait and see' approach to infrastructure mitigation in Fenske v. Spokane County, arguing that "traffic impacts will be subsequently reviewed and mitigated during the site-specific land use approval process and will be required to meet traffic concurrency at that later point in time."EWGMHB Case No. 10-1-0010, Final Decision and Order (Sep. 3, 2010), at 7-8.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
10			But the Board in Fenske found that such an approach was unacceptable: "By its very nature, capital facilities planning must be done at the PLAN approval stage as opposed to the PROJECT approval stage in order to effectively provide for the necessary lead time and identification of probable funding sources, and also to inform decision makers and the public as they consider the public infrastructure impacts of proposed comprehensive plan amendments." Id. (emphasis in original). What this means is that the City can't just wait for a developer to make the development of Brekhus/Beach happen and worry about infrastructure needs then. The City must take action NOW.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
11			Finally, the assertion by Public Works that infrastructure planning and financing for Brekhus/Beach is not necessary because it only has a planned build-out of 200-plus units during this planning period is inaccurate. It is clear in the draft Plan (see p. 5-16) that the reconciliation process with Snohomish County yielded an agreement with the City of 606 units for the Brekhus/Beach area based on a development density of 5.5 dwellings per acre. This seems to be at least part of the resolution for accommodating the population projection. We do not understand how this density can be used when there's no assurance that such a density can be achieved within the planning period without adequate infrastructure. We also do not see anywhere in the draft Plan any reference to an acceptable build-out of only 200-plus units for Brekhus/Beach. This is not GMA-compliant.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW

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12			The City concedes that the Draft Plan does not allow Brekhus/Beach to develop up to its OMA-required potential. On page 4-18 of the Draft Plan, the City states that the area is assumed to be a part of the buildable lands inventory. The City also states: "The City faces a paradox where the GMA requires that lands within Urban Growth Areas be developed at urban densities (4+ houses per acre), but there is no market or infrastructure financing available to achieve that level of development. Only a density of 20,000 square feet per acre is permissible without sewer or other facilities." Thus, in its own Comp Plan, the City is stating that it is not complying with GMA requirements in its treatment of Brekhus/Beach as far as density goes, while at the same time agreeing to use an unrealistic 5.5 acre density for growth capacity at Brekhus/Beach to satisfy population projections. This creates an internal inconsistency within the plan, which is also noncompliant with RCW 36.70A.070.	Dannon Traxler	Noted. Thank you.		JXK	MW	10/30/17	MW
			Responses to Public Comments made during the Public Hearing before the City of Arlington Planning Commission on 8/15/2017							
1		General	Public Hearing Notes were obtained from Kristin Foster, City of Arlington Community and Economic Development on	Bruce Angell, Chair			MW	JK	10/30/17	MW
2		General	Clarification as to why Brekhus/Beach is a focus area in the Transportation Plan and not the Water and Sewer Plans?	Commissioner McDonald	Brekhus/Beach was mistakenly included as a focus area in the Transportation 2035 Plan and has been removed from applicable maps and text.		MW	JK	10/30/17	MW
3		General	What the definition is of signaled vs. un-signaled intersections, and is more curious about an un-signaled intersection. What category does a round-a-bout fall into?	Commissioner Levesque	Round-a-bouts have no automated signals and associated infrastructure with which to control the flow of traffic, and therefore are considered un-signaled intersections.		MW	JK	10/30/17	MW
4			Attorney representing Mr. Phillips, Ms. Heigart, and Mr. Pitman of the Brekhus/Beach area.	Dannon Traxler	Noted		MW	JK	10/30/17	MW
5			Comments are condensed for all three Public Hearings as the comments are essentially the same for all	Dannon Traxler	Noted. Thank you.		MW	JK	10/30/17	MW
6			Received an 11 page letter from Mr. Peiffle at the end of the business day today	Dannon Traxler	Noted. ("Today" would be 8/15/2017.)		MW	JK	10/30/17	MW
7			The gist of the letter seems that the City is opposed to our position on the plans that the City needs to complete adequate planning for infrastructure	Dannon Traxler	Noted. Thank you.		MW	JK	10/30/17	MW
8			Last time when commenting on the 2015 Plan update when adding King Thompson, and trying to put all the future growth into that area, we stated “Hey you can’t do that, that’s not GMA compliant because we’ve got this area over here called Brekhus/Beach that you can put your growth.” Staff and the City Attorney didn’t agree with us, but that is the reason we are all here. Snohomish County didn’t agree with the City and said that the City can’t expand in that area (King Thompson) because you do have adequate land capacity to put your growth	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW
9			The City has to plan for the 20 year horizon to meet the growth projections looking at land capacity analysis and Brekhus/Beach is part of that, and these are planning documents to meet current and future population needs	Dannon Traxler	Concur.		JK	MW	10/30/17	MW

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10			This isn't just about capacity, it's about funding infrastructure to get that capacity to the land that needs it so you can meet your growth projections	Dannon Traxler	Concur.		JK	MW	10/30/17	MW
11		WSP Appendix S	The Comp Plan needs to show infrastructure planning for that entire 20 year period, how it's going to be financed, and it needs to be more than conceptual	Dannon Traxler	The roads, water and sewer layouts in WSP Appendix S demonstrate conceptual infrastructure connection points based on this first conceptual layout. The City will continue to work with Brekhaus/Beach representatives as development designs		JK	MW	10/30/17	MW
12			We do see conceptual planning for the Brekhus/Beach area with internal roads, water and sewer infrastructure, and potential connection points, but that's not real planning on how this is actually going to develop to Brekhus/Beach build out	Dannon Traxler	This is a conceptual layout that was developed per input from Brekhaus/Beach representative to identify future connections to City infrastructure (water, sewer and streets).		JK	MW	10/30/17	MW
13			It was stated by staff at the last meeting that you're only planning for 200 plus units at Brekhus/Beach for the 20 year planning period, and that's not the case. In your reconciliation process it was agreed with Snohomish County that you would be building to 606 units, and that is part of satisfying your growth projections. So, within this 20 year planning period you need to show how that is obtainable, and that isn't occurring in your plan. There does need to be some sort of financial component showing how over the next 20 years this can be built out	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW
14			A letter was sent to Planning Commission with citations and including RCWs to back up previous comments (see Traxlor letter dated August 4, 2017)	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW
15			Show an analysis of what funds the City is going to provide vs. what funds the private developer is going to provide	Dannon Traxler	We cannot project infrastructure designs or associated costs if there is no development plan that will connect into the City's infrastructure system (water,		JK	MW	10/30/17	MW
16			We understand that the developer is going to have significant amount of the improvements especially on the property itself within Brekhus/Beach and all the internal systems, but the City is going to have to participate in financing some of the extension to get the infrastructure to the land itself	Dannon Traxler	Noted. Thank you.		JK	MW	10/30/17	MW
17			There needs to be some indication in this plan that the City can provide urban governmental services by the end of the 20 year planning period	Dannon Traxler	The water, sewer, and transportation plans show that these infrastructure services will be available at adequate service levels for the 20 year planning period.		JK	MW	10/30/17	MW
18			The City's Capital Facilities Plan doesn't identify the needed funding.	Dannon Traxler	The water, sewer, and transportation capital plans do so adequate financial funding		JK	MW	10/30/17	MW
19			The Transportation Plan has 280 million dollars over the next 20 years. Why can't some of that money be earmarked towards getting some extensions to Brekhus/Beach so you can satisfy your growth projections over the next 20 years?	Dannon Traxler	Based on Brekhaus/Beach population projections contained in the City's General Comprehensive Plan, the transportation system servicing the Brekhaus/Beach area is adequate to serve a development based on the conceptual design included in Appendix T of the transportation plan.		JK	MW	10/30/17	MW
20			A financing analysis was to be provided at the Workshop and that was ignored	Dannon Traxler	Financial planning is included in the water, sewer, and transportation plans.		JK	MW	10/30/17	MW
21			The letter received from the City Attorney at 5:06 pm wasn't appreciated when a meeting is being held at 7:00 pm	Bob Phillips	Noted. The City apologizes for the late notice. Notice of the public hearing was advertised as required by law.		JK	MW	10/30/17	MW
22			Believes that Mr. Pieffle misunderstand what they are asking for	Bob Phillips	Your opinion is noted.		JK	MW	10/30/17	MW
23			We are asking what is required by the GMA, which is to bring services to the property, not into the property. Plan for roads and support Fire and Police as the growth potentially moves into the area	Bob Phillips	Based on Brekhaus/Beach population projections contained in the City's General Comprehensive Plan and the conceptual Brekhaus/Beach development layout, there are adequate existing or planned city services (water, sewer, and transportation).		JK	MW	10/30/17	MW
24			There is interest in the property, but there is a TDR program in place that means nothing. No one is willing to look when a TDR program is in place, and is under the impression that this was to be abolished last year	Bob Phillips	The TDR program will be appealed and removed from the AMC upon adoption of the GMA Comprehensive Plan by the City Council.		JK	MW	10/30/17	MW
25			We're not looking for infrastructure to the Brekhus/Beach area or for you to build roads per say. Can't expect someone to buy 20 acres, develop it, but plan for 300	Bob Phillips	Noted. Thank you.		JK	MW	10/30/17	MW

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26			Would like everyone to be on the same page	Bob Phillips	Concur.		JK	MW	10/30/17	MW
27			Asking for the City to provide what it is responsible for	Bob Phillips	Concur. This is the City's intent.		JK	MW	10/30/17	MW
28		Recommendation	Planning Commission voted 4-0-0-1 on 8-15-2017 to recommend to City Council approval of the 2017 Amendment to the 2015 WSP (4 commissioners in favor; 1 commissioner abstaining)	Planning Commission	Thank you.		MW	JK	10/30/17	MW
In addition to responses and revisions initiated by Agency comments above, the Final WSP also includes the following revisions to the Agency Review Draft WSP. All necessary replacement pages will be provided to recipients of the Agency Review Draft.										
1	Cover	Top center Lower right	Change "Agency Review Draft" to "Final Amendment"; Change "January 2016" to "October 2017"	COA	OK		MW		10/30/17	MW
2	Behind Cover	Bottom Citation	Change "Agency Review Draft" to "Final Amendment"; Change "January 2016" to "October 2017"	COA	OK		MW		10/30/17	MW
3	Spine	Binder Spine	Create new one and print	COA	add to pdf version		MW		10/30/17	MW
4	iii to iv	Signatures	Circulate "Approvals" page in front of engineering certifications	COA	add to pdf version		MW		10/30/17	MW
5	v to vi	Signatures	James Kelly signature and stamp	COA	add to pdf version		MW		10/30/17	MW
6	vii to xiii	Signatures	Three RH2 signatures and stamps	COA	add to pdf version		MW		10/30/17	MW
7	xi to end	TOC	Regenerate Tables of Contents, etc.	COA	Regenerated all Tables, Lists. Created abbreviated TOC		MW		10/30/17	MW
8	All	Footers	Regenerate the final file name in all footers (does not require reprinting for currently circulating copies)	COA	OK		MW		10/30/17	MW

From: Sleight, Randy
To: Mike Wolanek
Cc: Strandberg, Terri; Zelinski, Michael
Subject: FW: Arlington Water System Plan Amendment
Date: Thursday, August 03, 2017 8:22:32 AM

Mike,

Hope you had a great vacation, please review and revise or edit the portions noted below by Michael Zelinski on the City of Arlington's 2017 Water System Plan Amendment, before I can give a final statement of consistency.
I will see you at the WUCC next week hopefully in Marysville and we can discuss this. This constitutes our comments promised by the 7th to you.

I did not have any further comments on the engineering side of the plan, as it was well done.

Randolph R. Sleight PE, PLS| *Chief Engineering Officer*
Snohomish County Planning and Development Services
3000 Rockefeller Avenue M/S 604 | Everett, WA 98201
O: 425-262-2014 | mailto:Randy.Sleight@snoco.org

NOTICE: All emails, and attachments, sent to and from Snohomish County are public records and may be subject to disclosure pursuant to the Public Records Act (RCW 42.56)

From: Zelinski, Michael
Sent: Monday, July 31, 2017 3:24 PM
To: Strandberg, Terri <terri.strandberg@co.snohomish.wa.us>; Sleight, Randy <Randolph.Sleight@co.snohomish.wa.us>
Subject: Arlington Water System Plan Amendment

Terri & Randy –

I took a look at the City of Arlington's 2017 Water System Plan Amendment. Although it is intended primarily to reflect the elimination of the UGA expansion proposed by the City in 2014-15, I found some sections of the amended plan that continue to include or reflect that expansion proposal. I suspect this is advertent, but I think corrections should be made before we provide the consistency determination. Specifically the following sections need attention:

1. The Executive Summary mentions the city's 2015 Comprehensive Plan update and its application to expand its UGA, but does not mention the city's withdrawal of that application in 2016 and its 2017 comp plan amendment eliminating the UGA expansion (see Section ES 2.2). While this change is clearly explained in Chapter 3, it should also be noted in Section 2.2 of the Executive Summary.

From:	James Kelly
To:	bruce.angell@arlingtonflyin.org
Cc:	Amy Rusko (arusko@arlingtonwa.gov); Marc Hayes (mhayes@arlingtonwa.gov); Paul Ellis (pellis@arlingtonwa.gov); "Reid Shockey"
Subject:	Confirmation of Planning Commission Comments
Date:	Wednesday, August 02, 2017 6:07:00 PM

Bruce –

My notes from last night's meeting showed only two comments from the Planning Commission:

1. Please edit narrative text in Land Use sections of Water, Sewer and Transportation plan to make sure it is consistent with what is stated in City's Comprehensive Plan.

2. After MU Overlay zoning is adopted, please revisit Water, Sewer, and Transportation modeling to make sure area population projections are consistent.

Please let me know if there is any additions or correction to the comments.

Thank you - Jim

James X. Kelly, PE
Public Works Director
City of Arlington
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Summary of Public Questions/Comments for the 8/15/2017 Planning Commission Public Hearing

Commissioner McDonald

- Clarification as to why Brekhus/Beach is a focus area in the Transportation Plan and not the Water and Sewer Plans?

Commissioner Levesque

- What the definition is of signaled vs. un-signaled intersections, and is more curious about an un-signaled intersection. What category does a round-a-bout fall into?

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- Attorney representing Mr. Phillips, Ms. Heigart, and Mr. Pitman of the Brekhus/Beach area.
- Comments are condensed for all three Public Hearings as the comments are essentially the same for all
- Received an 11 page letter from Mr. Peiffle at the end of the business day today
- The gist of the letter seems that the City is opposed to our position on the plans that the City needs to complete adequate planning for infrastructure
- Last time when commenting on the 2015 Plan update when adding King Thompson, and trying to put all the future growth into that area, we stated "Hey you can't do that, that's not GMA compliant because we've got this area over here called Brekhus/Beach that you can put your growth." Staff and the City Attorney didn't agree with us, but that is the reason we are all here. Snohomish County didn't agree with the City and said that the City can't expand in that area (King Thompson) because you do have adequate land capacity to put your growth
- The City has to plan for the 20 year horizon to meet the growth projections looking at land capacity analysis and Brekhus/Beach is part of that, and these are planning documents to meet current and future population needs
- This isn't just about capacity, it's about funding infrastructure to get that capacity to the land that needs it so you can meet your growth projections
- The Comp Plan needs to show infrastructure planning for that entire 20 year period, how it's going to be financed, and it needs to be more than conceptual
- We do see conceptual planning for the Brekhus/Beach area with internal roads, water and sewer infrastructure, and potential connection points, but that's not real planning on how this is actually going to develop to Brekhus/Beach build out
- It was stated by staff at the last meeting that you're only planning for 200 plus units at Brekhus/Beach for the 20 year planning period, and that's not the case. In your reconciliation process it was agreed with Snohomish County that you would be building to 606 units, and that is part of satisfying your growth projections. So, within this 20 year planning period you need to show how that is obtainable, and that isn't occurring in your plan. There does need to be some sort of financial component showing how over the next 20 years this can be built out

- A letter was sent to Planning Commission with citations and including RCWs to back up previous comments (see Traxlor letter dated August 4, 2017)
- Show an analysis of what funds the City is going to provide vs. what funds the private developer is going to provide
- We understand that the developer is going to have significant amount of the improvements especially on the property itself within Brekhus/Beach and all the internal systems, but the City is going to have to participate in financing some of the extension to get the infrastructure to the land itself
- There needs to be some indication in this plan that the City can provide urban governmental services by the end of the 20 year planning period
- The City's Capital Facilities Plan doesn't identify the needed funding.
- The Transportation Plan has 280 million dollars over the next 20 years. Why can't some of that money be earmarked towards getting some extensions to Brekhus/Beach so you can satisfy your growth projections over the next 20 years?
- A financing analysis was to be provided at the Workshop and that was ignored

Bob Phillips
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Arlington, WA 98223

- The letter received from the City Attorney at 5:06 pm wasn't appreciated when a meeting is being held at 7:00 pm
- Believes that Mr. Pieffle misunderstand what they are asking for
- We are asking what is required by the GMA, which is to bring services to the property, not into the property. Plan for roads and support Fire and Police as the growth potentially moves into the area
- There is interest in the property, but there is a TDR program in place that means nothing. No one is willing to look when a TDR program is in place, and is under the impression that this was to be abolished last year
- We're not looking for infrastructure to the Brekhus/Beach area or for you to build roads per say. Can't expect someone to buy 20 acres, develop it, but plan for 300
- Would like everyone to be on the same page
- Asking for the City to provide what it is responsible for

City of Arlington Comprehensive Water System Plan

Agency Comments and City Responses

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No.	Page No.	Section / Paragraph No.	Agency Comment	Commenter Name	City Response (specific ext revisions in bright red font)	For PDS comments only, PDS reply to City response	City Responder Name	City Reviewer Name	Implementation Date	Implementation Initials
			Responses to comments from Department of Ecology in its letter dated 10/21/2015							
1	6-5	Section 6.3.2 Table 6-1, Rows 5, 6, 7	Purpose of use for SWC 5983, GWC 1488, and SWC 10024 should be "Municipal Supply"	Wood, Doug	Modified SWC 5983 to Municipal; modified GWC 1488 to Municipal, Seasonal; modified SWC 10024 to Municipal, Mixed Seasonal & Continuous		MW	JXK	11/25/15	MW
		Section 6.3.2 Table 6-1, Row 10	G1-23085C (turf irrigation) not authorized for withdrawal at Airport Wellfield		Modified table to clearly indicate the Wellfield column is either the existing or target place of use; rearranged columns to emphasize purpose & place of use; title change and footnotes to clarify. It is felt that Section 6.3.2 referencing Table 6-1 is clear in making these distinctions.		MW	JXK	11/25/15	MW
		Section 6.3.2 Table 6-1, Rows 11, 12	GWC 2968 (wetland irrigation) and GWC 2401 (cemetery irrigation) not authorized for withdrawal at Haller Wellfield					JXK		
2	6-10	Section 6.3.4	Application G1-26641 is subject to the Stillaguamish basin closure and the minimum flows of the Stillaguamish Instream Flow Rule. A mitigation plan will be required for impacts in terms of quantities, timing, and location.	Wood, Doug	Understood. These regulations affect or will affect many of the City's water rights, e.g., see interruptibility assessed in Table 6-2. Since the IFR Rule influences all sources of supply, a 4th level header "Instream Flow Rule" has been added to Section 6.3.1 Overview after "MWL" to discuss the basin closure and minimum flows. One sentence has also been added to 6.3.4 indicating the need for a mitigation plan.		MW	JXK	12/4/15	MW
3	6-11 to 6-13	Section 6.3.5	"Three water rights held by the City are mis-characterized as being authorized for 'other' municipal purposes as defined under RCW 90.03.015(4)"....which are rights "issued to a municipal water supplier".	Wood, Doug	RCW 90.03.015(4) says if a governmental entity *holds* a water right that is for governmental or governmental proprietary purposes by a city, town, public utility district, county, sewer district, or water district, its use of water or its delivery of water for any other beneficial use generally associated with a municipality is also for "municipal water supply purposes." Additional text in the same definition and in RCW 90.03.550 indicate that municipal purposes include commercial, irrigation, water quality, habitat, and other environmental uses. As per RCW 90.03.560, a municipal water supplier may request this distinction be made. This explanation, along with acknowledgement that these rights are subject to change (RCW 90.03.380) and diminishment (RCW 90.14.180) statutes, is provided at the bottom of page 6-11 and top of page 6-12. The text indicates how the City beneficially uses each of these rights to meet its current purposes (irrigation), and how we may apply to change them for purposes of potable water supply. No changes have been made to the WSP associated with this response.		MW	JXK	N/A	MW

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					Responses to final comments from Department of Health (Richard Rodriguez) received 12/3/2015					
1		General	We have reviewed the plan and offer the following comments. These comments must be adequately addressed prior to approval of the WSP.	Rodriguez, Richard	All of your comments have been addressed per the responses below.		MW	JXK	N/A	MW
2	N-1	Ch 3, Appendix N	Provide a statement of local government consistency from your Planning Department and Snohomish County Planning and Development.	Rodriguez, Richard	Consistency statements from the City and Snohomish County PDS are included in Appendix N in the Final WSP. Snohomish County PDS has made a finding of NOT consistent.		MW	JXK	3/30/16	MW
3	~8-16	Ch 8 O&M; Section 8.3.2	Has Arlington developed an E. coli response plan in case it should have an E. coli MCL violation or identify E. coli in its raw source water under the Groundwater Rule? Our Mercer Island experience indicates that consumers want this water quality information as soon as possible and an E. coli Response Plan can position a community to be successful.	Rodriguez, Richard	Our Emergency Response Plan (ERP), referenced in Section 8.3.2, includes procedures for initial and confirmed total coliform exceedances above the MCL, and for positive E.coli/fecal coliform samples. The ERP was prepared in 2003, however, and the City is aware that it is in need of revision. The procedures are also somewhat generic. The City anticipates updating the ERP in 2016. Section 8.3.2 has been revised (2 sentences added to the end) to document this need.		MW	JXK	12/4/15	MW
4	~6-32	Ch 8 O&M; Section 6.5.3	The Revised Total Coliform Rule will go into effect on April 1, 2016 and require some water utilities to conduct a Level 1 or Level 2 assessment of its water system and submit it to the department within 30 days of reaching the trigger. Our draft rule will be out for informal comment very soon. Please give some thought to developing an approach to conducting a complete assessment prior to the effective date of the rule.	Rodriguez, Richard	The RTCR is included in Section 6.5.3. Your suggestion to conduct, as an exercise, a complete assessment prior to the effective date is a good one we will implement early in 2016. We have separately contacted you for Health-authored Level 1 and Level 2 assessment templates. No revisions to the WSP will be made in response to this comment.		MW	JXK	N/A	MW
5	8-8	Ch 8 O&M; Section 8.2.10	Please include a blank Construction Completion Report for distribution main replacements and extensions. The utility should maintain completed Construction Completion Reports under Recordkeeping and Reporting.	Rodriguez, Richard	The 8th bullet under Recordkeeping has been modified to clarify Construction Completion Reports are included with project reports, construction documents and drawings, inspections, etc., and to reference the construction completion report form which has been included at the front of Appendix D.		MW	JXK	12/4/2015 01/12/2016	MW
6	~8-16	Ch 8 O&M; Section 8.3.1	Is Arlington a member of WARN, either locally or at the state level?	Rodriguez, Richard	Not at this time. The mutual aid agreement referenced in the text and in Appendix P is unique to Snohomish County utilities. A sentence has been added to the end of section 8.3.1 to clarify this.		MW	JXK	12/4/15	MW
7	iii, v, vii	Preliminary pages	Provide signed PE stamp with the final WSP submittal.	Rodriguez, Richard	The signatures and stamps of PE's approving the Final WSP are included behind the cover page. The signatures of selected other reviewers providing approval are also presented.		MW	JXK	3/31/16	MW
8	Q-1	Appendix Q	Provide a signed SEPA Threshold determination with the final WSP submittal.	Rodriguez, Richard	A signed DNS has been received and is included with the SEPA checklist in Appendix Q.		MW	JXK	12/30/15	MW
9	O-1, T-1	Appendices O, T	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.	Rodriguez, Richard	Public hearings were held December 1 and 15, 2015 before the Arlington Planning Commission. Documentation is provided in Appendix T.		MW	JXK	1/12/16	MW
10	O-1	Appendix O	Prior to DOH approval, the City's governing body must approve and adopt the WSP. This is a new requirement resulting from the Municipal Water Legislation.	Rodriguez, Richard	The Arlington City Council voted to adopt the Final WSP, per the Planning Commission's recommendation, on 1/19/2016. Planning Commission minutes are in Appendix T. City Council Ordinance 2016-002 has been added to Appendix O.		MW	JXK	3/30/16	MW
11	T-1	Appendix T	Please provide copies of any comments made by adjacent purveyors, along with your response to those comments.	Rodriguez, Richard	Comments were received from Snohomish County PUD. No responses were received within 30 days of requests made to the City of Marysville, Seven Lakes Water District, and the nearest non-expanding purveyors described in Section 3.6.2. Phone calls to Marysville and Seven Lakes confirmed "no comments".		MW	JXK	1/11/16	MW

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			Responses to comments from Snohomish County PUD No. 1 per email dated 11/6/2015							
1		Table 2-2	I think it would be better to show capacity of the PUD Master Meter as 1,000 gpm, based on the agreement, rather than the 1,138 gpm flow test value. It's good that the text describes the flow test, verifying that the meter and PUD's facilities are capable of meeting the commitment under normal operation.	Heneghan, Karen	Concur. Change to 1,000 gpm has been made in Table 2-2. Note that Tables 1-2 and 6-5, and Section 6.3.6 describing available supply indicate 1,000 gpm. Also made minor text revisions to the first two sentences under the "Master Meter" section above Table 2-2.		MW	JXK	12/7/15	MW
2	2-20	2.5.7	The last sentence in the first full paragraph doesn't make sense to me, saying the agreement with PUD "does not provide access to this water supply even under emergency conditions." I think it could be pointed out that the connection has value in emergency circumstances when Arlington's other water sources are affected, although such use does dip into Arlington's goal to maintain 900 gpm fire flow in the 710 and 540 zones. The Oso Mudslide in 2014 could be cited as a major example, when the city increased usage through the intertie above normal operation while reducing production from the Haller Wellfield during in the aftermath. It is true that supply through this intertie can be interrupted under emergency conditions that affect PUD's water sources, since none of the standby storage in PUD's system is reserved by the agreement for Arlington's use, although we would be committed to restoring the supply as soon as possible. So, maybe it could be described this way.	Heneghan, Karen	Concur. This paragraph was significantly revised to describe the value of this intertie to supply the 540 and 710 zones, provide fire flows in the event of pressure drop in the 520 zone, and serve as a backup source for the entire City should other sources require an emergency shutdown. Any of these variable uses above 100 gpm would detract from fire flows in the 540 and 710 zones.		MW	JXK	12/7/15	MW
3			Here are some more things I have to say about depicting the service area boundary in the figures:	Heneghan, Karen	See responses 3a through 3d.		MW	JXK	12/8/15	MW
3a		Appendix L	I see the letter to the county in Appendix L regarding the service area change between Arlington and Marysville. I also see the county has not yet documented this change on its mapping. So, I assume you are continuing to work with Marysville and the county to provide whatever documentation is necessary to complete this change.	Heneghan, Karen	An MOU documenting our agreement with the City of Marysville has been executed and submitted to Snohomish County PDS. With PDS Planner Gary Idleburg's authorization, PDS staff have modified the boundary on the official CWSP map. The MOU is included in Appendix L.		MW	JXK	3/30/16	MW
3b			In the meantime, I recommend that Arlington show it's proposed water service area in its figures in addition to whatever it considers to be its current service area boundary on record.	Heneghan, Karen	Concurrent with the previous response, we are drafting WSP maps to also reflect the boundary change. The final WSP will be released after the change is accepted at PDS.		MW	JXK	1/11/16	MW
3c			Regarding my earlier comment about expanding the service area to the river to fill in the mapping around the Sudden View, we still support that change if Arlington would like to make it. If our past correspondence is not considered sufficient documentation, this area could also be shown as a proposed change on the figure until it is sufficiently documented to be called final.	Heneghan, Karen	The City previously agreed to this change. This change is now shown in the corrected service area in all affected maps.		MW	JXK	1/11/16	MW
3d	3-4	3.3 Land Use	Section 3.3, Land Use, refers to Chapter 2, but says the boundary has not changed since the 2010 CWSP update. This statement should be corrected, especially based on the change with Marysville.	Heneghan, Karen	Concur. The first sentence of Section 3.3 has been revised, and the second sentence of Section 3.3 has been deleted. Revisions to the total acreage of the WSA to 16,176 acres has been made throughout the WSP. This includes the exchange with Marysville near Smokey Point.		MW	JXK	12/28/15	MW
4	4-12		In the paragraph at the bottom of the page describing Table 4-7, it could help to mention that the average amount of authorized non-revenue consumption is factored into the demand per ERU values, in addition to the DSL. I had trouble reproducing numbers in Table 4-7 until I realized that's what I was missing.	Heneghan, Karen	Concur. Change has been made to define per ERU usage as consumption per customer each year divided by the average amount of non-revenue water (authorized uses, and unauthorized DSL) for the same year.		MW	JXK	12/8/15	MW
5			Overall, this plan looks well done, thanks to the hard work of everyone at Arlington, RH2, and FCS.	Heneghan, Karen	Thank you.		MW	JXK	12/8/15	MW

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			Responses to draft comments from Snohomish County Planning and Development Services per meeting 11/3/2015							
			PDS: Substantive Comments that Affect a Consistency Determination for DOH							
1	3-2		Urban Growth Area: The statement that the CWP update anticipates County approval of its petition for UGA expansion and allocates growth to the expansion area is an area of inconsistency between the City's 2015 Comprehensive Plan and the County's recently adopted Comprehensive Plan. This presumes a de-annexation of the Brekhus –Beach neighborhood which our latest information from the City indicates that this process is unlikely at present.	PDS Staff	I understand that there may have been some confusion as to whether Brekhus Beach area was to be de-annexed, however this was fully explained to the County in a meeting and later followed up in a letter to Clay White (Sep 2014). This is a planning document that is projecting for future water service needs in our Water Service Area, the specific area in question is within the City's Rural Urban Transition Area (RUTA) as designated by the County. Water service may be provided to this area if requested by a new development/water user – whether it is annexed into the City or not.	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
2			If that was the case why were all the waterlines shown in this report to serve that particular area?	PDS Staff	Appendix S is a high level development concept drafted jointly between the City and Brekhus-Beach representatives to demonstrate the City's due diligence to serve this area. Introductory text has been added to Appendix S to explain the background to the conceptual design materials provided.	OK	MW	JXK	12/23/15	MW
3			Please remove the statement that "including expansion west of I-5, were anticipated in all County planning documents and at all levels of PDS staff. In lieu of the removal, please document how these approvals were made by County planning staff and who was contacted for inclusion of this area within the Arlington UGA.	PDS Staff	*The sentence has changed as follows:* The City's Planning staff and its Public Works staff worked with their counterparts in Snohomish County Planning and Development Services (PDS) to assure **they are aware of** the City's service levels, capital development needs, and planning proposals. ~~, including expansion west of I-5, were anticipated in all County planning documents and at all levels of PDS staff.~~	*OK*	MW	JXK	11/30/15	MW
4	3-2		The draft plan states that it/the plan anticipates County approval of the petition for UGA expansion and allocates subsequent growth to this expansion area. The City's initial docket request depicted an area "swap" with no net increase in UGA area. This will potentially represent/create several inconsistencies. The City's current docket request that will be considered by the Snohomish County Council in 2016 should be checked and verified for this WSP.	PDS Staff	There may have been some confusion as to whether Brekhus Beach area was to be de-annexed, however this was fully explained to the County in a meeting and later followed up in a letter to Clay (Sep 2014).	Additional explanation and follow-up response to this comment will be coming.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
5	3-6	3.3.3	TDR says de-annexation of Brekhus-Beach is anticipated. This is inconsistent with the City's recently updated comprehensive plan.	PDS Staff	This reference was an artifact of an earlier preliminary version. It has been deleted and the TDR section revised.	OK	MW	JXK	11/30/15	MW
6			The Consistency Review forms completed by both the City and PDS are included in Appendix N at the bottom of the page. These were not included in either of the WSP documents provided to PDS.	PDS Staff	This document is written as Final – the City's Consistency Review form was completed after the Agency Review Draft was submitted to PDS. It and the County's Consistency Review form are included in the final document.	OK	MW	JXK	3/30/16	MW
7	9-6	9.3.5 CIP WM4	West I-5 Expansion Area Water Main--This section is predicated on the assumption that the County Council will approve the UGA expansion west of I-5 as depicted and that WSDOT will approve the boring of I-5 at this location in two separate locations one of which may be close to the flood plain.	PDS Staff	This is a planning document that is projecting for future water service needs in our Water Service Area, the specific area in question is within the City's Rural Urban Transition Area (RUTA) as designated by the County. Water service will not be provided to this area unless there is development, this is noted in the 25%/75% capital cost split between the City and future developer.	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
8			Chapter 9 (general): There is also no analysis in the CIP of water infrastructure costs related to potential 2016 Docket decisions. The CIP should specifically address the following scenarios for the Brekhus Beach area and any additional area added to the UGA:	PDS Staff	See Responses 8a and 8b below	OK	MW	JXK	N/A	MW

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8a			1) What deficiencies will exist and what improvements would be required, if the docket request is denied. What would be the related costs?	PDS Staff	No deficiencies will exist. The WSP contains plans for water supply and distribution for all projected growth that occurs within the water service area. If growth does not occur, then CIP projects to serve that area will not occur. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
8b			2) What deficiencies will exist and what improvements would be required, if the docket request is approved. What would be the related costs?	PDS Staff	No deficiencies will exist. The WSP contains plans for water supply and distribution for all projected growth that occurs within the water service area. If growth does not occur, then CIP projects to serve that area will not occur. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
9			Service area boundaries should be reconciled with the current CWSP map.	PDS Staff	The City's water service area is as current as allowed by the organization delegated for establishing water service area boundaries, the North Snohomish County Water Utility Coordinating Committee (NWUC). Please see Appendix L.	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
PDS: Questions/Issues that may need further explanation or clarification or to establish timing										
10	ES-3	Exec Smry	When is the Airport well anticipated to be taken out of service since it is aging and has collapsed twice in the last 10 years and pumps have now been placed closer to the area of potential contamination in the industrial area around the airport?	PDS Staff	The Airport well will be taken out of service as soon as we can get a new water source on line. Please see CIP F4, 2016 funding is included in the 2016 City approved capital budget to begin this process. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
11	3-1	3.2.1 Intro	The countywide planning policies (under the GMA) for Snohomish County should also be examined by the City of Arlington.	PDS Staff	The GPP section of the County's Comp Plan is considered, as referenced in 3.2.4. What specifically is missing/omitted?	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
12	3-2 to ~3-4	3.2.2 UGA	This states that the County completed its 2015 Comprehensive Plan Update with adoption by the County Council in June 2015, whereas page 3-3 (3.2.4 Snohomish County Comprehensive Plan) refers to the June 28, 1995 version of the County's plan, last amended December 21, 2013.	PDS Staff	Text in Section 3.2.4 (pg ~3-3) was revised to identify the current update, June 2015. The year 2015 was also inserted into the bullet for the County's Comp Plan in Section 3.2.1 on pg 3-1.	OK	MW	JXK	12/9/15	MW
13	3-5	3.3.2 UGA	This states that a 2015 decision on the city's UGA expansion proposal west of I-5 is anticipated, whereas page 3-2 (3.2.2 Urban Growth Area) says it will be a 2016 decision.	PDS Staff	This has been corrected to reflect an anticipated 2016 decision.	OK	MW	JXK	11/30/15	MW
14	3-7	3.4.2 Existing and Future Population	The draft plan states that the 2035 target population for the City of Arlington and its UGA is 24,937. The figure that they cite is their initial 2035 population target adopted in the Countywide Planning Policies, except that it is only for the City of Arlington (using Dec 13, 2012 city boundaries), and doesn't include their surrounding unincorporated UGA, which is 1,065, resulting in a total Arlington UGA (city + unincorporated) 2035 population target of 26,002 (up from 18,489 in 2011).	PDS Staff	The City's recently updated General Comprehensive Plan (July 2015, Section 5.13) identifies that population within the established UGA is projected to grow from 18,380 in 2014 to 24,937 in 2035. Also, be aware that the service population is decreased where Arlington residents and businesses in Smokey Point are served by Marysville. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW

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	Page No.	Paragraph No.							Date	Initials
15	3-13		Has PSRC weighed in on the MIC as a regional employment center since the projected employment stated in the plan is 12,000?	PDS Staff	The City is working with PSRC to have the Arlington-Marysville MIC recognized as a Regional Center, though full recognition has not yet occurred. PSRC is working on its Regional Center's Update Project and has identified the MIC in the Snohomish County Work Session. Snohomish County has already recognized the Arlington-Marysville MIC as a Regional Center. Employment figures in the WCP are the same as those used in the City's General Comprehensive Plan.	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
16			Has the configuration at the end of the north south runway been looked at carefully to assess the object free clear zone consistent with the FAA requirements and City Airport District Zoning?	PDS Staff	Yes, this is consistent with FAA requirements for the RPZ and OFA. A study is currently being finalized as part of the SR-531 Widening Project that looks at widening SR-531 within the RPZ, a variance memorandum has been forwarded to regional FAA and to FAA Headquarters (DC) for consideration.	Additional explanation and follow-up reply to this comment and response will be included in PDS' Final Comments.	MW	JXK	See Final PDS Comments and Responses listed separately later in this table.	MW
17			This MIC appears to need the 12 inch connection to Burn Road to make the fire flows viable for a manufacturing/industrial development. However, the timing of this infrastructure is assumed to occur over the second ten year period within the 20-year planning horizon.	PDS Staff	This understanding is not correct. The pipe segment you refer to supports pressure zone improvements in our 615 and 710 zones. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
18			What is the schedule for the MIC? Please provide documentation of the City of Arlington and City of Marysville and PSRC assessment of the MIC in an appendix.	PDS Staff	The Arlington portion of the MIC is expanding and growing right now. The WSP identified six growth focus areas; three of the focus areas lie within the MIC boundary. Of the three focus areas, the City is actively working on two--the Central Arlington MIC and the Airport Business Park. The area south of 172nd St is active but deferred to mid-term planning horizon. The City is hoping to have the PSRC recognize the Arlington-Marysville MIC in 2016. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
19			The CPPs show substantial employment growth for the Arlington UGA during this planning period, with total Arlington UGA (city + unincorporated) employment reaching 20,884 in 2035, which is 12,224 jobs higher than the 2011 employment estimate of 8,660 for the Arlington UGA). On page ES-7 (ES 3.3 Historic and Forecast Demand), their statement that "employment within the Water Service Area may increase by as much as 12,000" would appear to be consistent with the CPPs. Here is a link to the CPPs: http://snohomishcountywa.gov/documentcenter/view/8043 (and refer to the 2035 initial growth targets contained in Appendix B, starting on page 20)	PDS Staff	Comment noted. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
20	C-1	Appendix C	Why was the Hydraulic Model Node Diagram in Appendix C missing from the County submittal?	PDS Staff	It was not omitted, please look at the very back of the document in a map pocket. A note has been added to the appendix cover to direct readers to the back. You may also wish to make additional folds to the diagram and place it in Appendix C in the manila envelope provided.	OK	MW	JXK	11/30/15	MW
21		Appendix O	Has any other work been done since 2011 regarding drinking water or water supply since the 2011 Ordinance 2011-025 within the City of Arlington?	PDS Staff	There have been several water right procurements which are listed in Chapter 6. However, the authorizations to proceed with the purchases preceded 2011. We modified our filter backwash discharge system to convey some to the Arlington WRF and some to the Arlington constructed wetland. Ordinances setting rates and addressing administrative items have been added to Appendix O.	OK	MW	JXK	3/30/16	MW

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22		Appendix S	Is Brekhus –Beach a real concept layout with a legitimate funding source for development of the water distribution system shown in the plan?	PDS Staff	It is a real concept developed with respect to critical areas, topography, and landowner input. To our knowledge, it is unfunded. This system layout, and the sewer system layout, lets the City plan for a future connection point of service. Introductory text has been added to Appendix S to explain the background to conceptual design materials provided.	OK	MW	JXK	12/23/15	MW
23		Appendix T	Where are all the agency comments? Presume these comments may be attached to the cover letter for County comments.	PDS Staff	Agency comments on the Agency Review Draft--and the City's responses to each of them--are included in Appendix T of the Final WSP.	OK	MW	JXK	1/12/16	MW
			PDS: Minor Editorial Comments							
24	ES-1	Exec Smry 1st Pgh, last sentence	Last sentence needs re-work. "Their families and possessions stand their best chance against the ravages of fire." Provide better clarity and meaning to this sentence since it seems to imply further risk to the City if inadequate fire flow is provided in the document prior to 2024.	PDS Staff	The introduction to the Executive Summary has been revised to clarify the benefits of water system planning for fire suppression.	OK	MW	JXK	12/3/15	MW
25	ES-2	Exec Smry Planning Efforts	Will the influx of up to 12,000 additional employees or persons in the water service area require an additional supply? Is this the basis to warrant the additional 12 inch connections to the PUD system on Burn Road outside the UGA?	PDS Staff	No, the 12-inch connection is for pressure zone improvements. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
26	ES-3	Exec Smry Top of Page, 2nd bullet	Delete (additional NPDES permit compliance as well) at end of sentence. Since this is likely just one of many permits that were necessary for this project, why name a particular permit in the Executive Summary?	PDS Staff	This is a NPDES waste discharge permit for WTP backwash, and is new since the previous WSP. Revised for clarity.	OK	MW	JXK	12/3/15	MW
27	ES-3	Exec Smry Limitations, last bullet	Under limitations with Aging Physical Infrastructure… Why is an active replacement program resulting in a younger age distribution system, a limitation with aging infrastructure? Reword to reflect that aging water infrastructure needs to be continually replaced based on type of pipe, storage, or water quality treatment systems etc.	PDS Staff	Issue with sentence structure is understood. Revised for clarity.	OK	MW	JXK	12/3/15	MW
28	ES-3	Exec Smry 2nd to last bullet	No mention of the City of Arlington as one of the key hubs for Emergency Response to the Oso Landslide and the influx of many agencies, local, state, and federal to respond to this disaster that further placed a burden on the City's water supply system.	PDS Staff	Concur, text has been revised.	OK	MW	JXK	12/3/15	MW
29	ES-3	Exec Smry Last bullet	What on-going monitoring of drought conditions on the cities groundwater elevations at the well sites is being checked and recorded to reflect these elevation changes over time?	PDS Staff	Modified text to explain that we have continuous monitoring using SCADA system of both well and river levels.	OK	MW	JXK	12/3/15	MW
30	ES-4	Exec Smry Changing Supply/Demand last bullet	Provide the value of what the Stillaguamish River reached in cfs and then indicate it was the second lowest discharge on record, if this was to continue it appears that the City is low on supply in the upcoming 10 year period.	PDS Staff	Revised to provide available river discharge and water consumption data. Low river flows are not anticipated to affect water supplies in the near future. As indicated in 5.2.4, the City is considering climate change in its planning for reliable and sustainable water supply.	OK	MW	JXK	12/22/15	MW
31	ES-7	Exec Smry	Modify wording to reflect what the maximum amount the water treatment plant can send to the system. For example…Currently, the WTP can send 1500 gpm to the distribution system. This raises an issue though, if the clearwell pump efficiency continues to diminish this flow to distribution will also continue to be reduced and we saw no factor over time for this projected reduction.	PDS Staff	Revised paragraph and to reflect design and current capacities. This issue is monitored on a daily basis by WTP operators. Pump replacements are scheduled as CIP project F9 in 2016 and 2017. See Section 9.5.9.	OK	MW	JXK	12/9/15	MW
32	ES-9	Exec Smry	Why emphasize that the change in the City's financial management software as the basis for the incorrect accounting of distribution system losses or leaks from 2012 to present? This value needs to be able to be a directly verifiable number based on SCADA system and metered flows with sales revenues to the system as an independent audit or cross check.	PDS Staff	Revised to reflect financial software manages meter reading and utility billing functions. Metered consumption data is entered into *and reported from* the software. Losses in our annual water balances coincide with the transition in financial software. Our water loss control action plan is considering this as one of several issues to be evaluated.	OK	MW	JXK	12/9/15	MW

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33	2-15		Burn Road Reservoir at the second sentence… The reservoir is (was) located… note the reservoir still seems to exist in the latest Google Earth research aerial dated 7/2015 and has not received permits for demolition even though it has been taken out of service. This could be explained more clearly.	PDS Staff	Issue with sentence structure is understood. Revised for clarity.	OK	MW	JXK	12/9/15	MW
34	~2-22 and ~2-24	Figure 2-2; 2.6.1, 2.6.2	The figure looks fine, but some discussion elsewhere needs to reflect the potential assumption of Arlington Terraces system or other private systems in general reflected on this figure within the next 20 years by the City.	PDS Staff	Non-expanding systems which the City may reasonably assume integration and/or management are addressed in Section 2.6.2. Additional text was inserted as introductions to 2.6.1 and 2.6.2 to explain how/when the City may acquire non-expanding systems.	OK	MW	JXK	12/9/15	MW
35		Figure 2-2	What is the plan to serve areas depicted as white on this figure over the next 20 years between PUD, Arlington, Marysville, or Seven Lakes Water District?	PDS Staff	The City is not aware of any discussions involving purveyors or County planners. It would be premature for the City to consider additional westward expansion of its future WSA at this time. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
36	3-3	3.2.2, Concurrency	There probably should be some clarification made as to whether the City considers water supply to fall under Concurrency or not.	PDS Staff	Understood. Two sentences have been added to this subsection to demonstrate how the WSP meets concurrency requirements.	OK	MW	JXK	12/9/15	MW

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37	3-7	3.4.1 Housing Trends	The last sentence in this section could be either eliminated or the information should be found and reflected in the report.	PDS Staff	We attempted to find more current data in reports based on the 2010 Census but have not been successful. The statement is useful to current readers and future authors, so we have chosen to maintain the original, unedited text.	OK	MW	JXK	12/24/15	MW
38	4-11		See comment above at ES-9 the statement in first paragraph "For reasons not yet understood, however, the City's DSL jumped to 13% in 2014. The sentence could just be rewritten to refer the reader to the Table 4-6.	PDS Staff	Comment noted. No changes have been made to the WSP associated with this response.	OK	MW	JXK	N/A	MW
39	4-20		Suggest adding (97) gpdc to Table 1-3 at the start of the document as this is per capita consumption in gallons per day per capita.	PDS Staff	Table 1-3 has been revised to include this and numerous other acronyms.	OK	MW	JXK	12/28/15	MW
40	9-7	9.5.1	CIP F1 is confusing.	PDS Staff	The original Arlington WTP constructed in 1924 is a vacant building, we plan on demolishing the building and creating a future staging area. The text has been revised for clarity.	OK	MW	JXK	12/9/15	MW
41	9-7	9.5.2	The improvement statement (9.5.2 CIP F2) should probably read "to replace the existing Airport Well."		Concur. Revised as suggested.	OK	MW	JXK	12/9/15	MW
42		9.2	Section 9.2 is helpful.	PDS Staff	Thanks.	OK	MW	JXK	N/A	MW
			PDS: Minor Typographical Comments							
43	ES-2		Add parenthesis at near bottom of page 710(PZ).	PDS Staff	Added several periods on this page. Parentheses not needed.	OK	MW	JXK	12/8/15	MW
44	ES-3		Add comma after youngest, but is not used...	PDS Staff	Done.	OK	MW	JXK	12/8/15	MW
45	3-10		Add space between 2014 and to.	PDS Staff	Done.	OK	MW	JXK	12/8/15	MW
46	3-13		Last paragraph; delete extra period after word area.	PDS Staff	Done.	OK	MW	JXK	12/8/15	MW
47	Q-3 & 4; all	Appendix Q	SEPA Why was the [help] feature not turned off?	PDS Staff	[help] feature and links removed from Word & pdf files; DNS also added in front of SEPA	OK	MW	JXK	1230/15	MW

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Responses to Final comments from Snohomish County Planning and Development Services per email 12/1/2015 (comment numbers link to										
1	3-2		The City's CWP [WSP] should note that it is currently planning for a specific scenario and will make appropriate adjustments if its docket proposal is not approved by the Snohomish County Council.	PDS Staff	We concur. We understand that if the docket proposal for UGA expansion west of I-5 is not approved, then the WSP will require an amendment—not because provision of water service to this area would be denied (it is in our water service area), but because population growth and increases in water demand would need to be allocated to other areas of the City. Text on page 3-2 has been revised to reflect this.	Apparently disputed with NOT CONSISTENT finding per 3/15/16 Barb Mock letter	MW	JXK	12/10/15	MW
4	3-2		The September 2014 letter to Clay White should be directly referenced in the CWP [WSP]. A copy of the letter should be provided in an appropriate appendix.	PDS Staff	We concur. We revised the text to reference the letter, and place the letter in Appendix S.	Apparently accepted (not disputed) per 3/15/16 Barb Mock letter	MW	JXK	1/4/16	MW
7	9-6	9.3.5 CIP WM4	The CWP [WSP] should note that its plans for water service in the City's Rural Urban Transition Area (RUTA) is predicated on a specific future scenario that may or may not occur and simply state that "This is a planning document that is projecting for future water service needs in our Water Service Area, the specific area in question is within the City's Rural Urban Transition Area (RUTA) as designated by the County. Water service will not be provided to this area unless there is development. This is noted in the 25%/75% capital cost split between the City and	PDS Staff	We concur. As this is directly related to your Comment #1, we used this text as a clarification in 9.3.5, and similar text in our revision of 3.2.2. These revisions identify the interdependent nature of CIP WM4 in Section 9.3.5 with County Council approval (3.2.2), and with development proposals.	Apparently disputed with NOT CONSISTENT finding per 3/15/16 Barb Mock letter	MW	JXK	12/10/15	MW
9			Please complete/execute the service area agreement with the City of Marysville and continue to coordinate with PDS-Planning and Technology to update the CWSP map.	PDS Staff	We modified the sample service area agreement you provided to us. The agreement was approved by Arlington City Council and signed by Mayor Barb Tolbert. The agreement was approved by Marysville City Council and signed by Mayor Jon Nehring. The signed agreement is included in Appendix L of the Final WSP. We worked with PDS to assure the most current version of the CWSP map and data is used throughout the WSP, including Appendix L and the following map figures: 2-1, 2-2, 3-1, 3-2, 3-3, 9-1.	Apparently accepted (not disputed) per 3/15/16 Barb Mock letter	MW	JXK	3/30/16	MW
11	3-1	3.2.1 Intro	Please provide specific Countywide Planning Policy (CPP) references then depict and summarize the CWPs consistency with those policies. We have forwarded you a link to the CPP document.	PDS Staff	Thank you for the link. After reviewing the CPPs, we added them to the list in Section 3.2.1. We will also add a new Section 3.2.5 specifically addressing consistency with this document. (Existing text regarding NSWUCC moved backward to 3.2.6.)	Apparently accepted (not disputed) per 3/15/16 Barb Mock letter	MW	JXK	12/18/15	MW
15	~3-13	3.5.2	We think your [draft] responses to our [preliminary] comments should be stated in the text of your CWP [WSP]. "The City is working with PSRC to have the Arlington-Marysville MIC recognized as a Regional Center, though full recognition has not yet occurred. PSRC is working on its Regional Center's Update Project and has identified the MIC in the Snohomish County Work Session. Snohomish County has already recognized the Arlington-Marysville MIC as a Regional Center. Employment figures in the WCP are the same as those used in the City's General Comprehensive Plan."	PDS Staff	The text for the MIC south of 172nd Street in Section 3.5.2 has been revised using a very similar statement to this one.	Apparently accepted (not disputed) per 3/15/16 Barb Mock letter	MW	JXK	12/10/15	MW
16	~3-14	3.5.2	We think your [draft] responses to our [preliminary] comments should be stated in the text of your CWP [WSP]. "(The configuration) is consistent with FAA requirements for the RPZ and OFA. A study is currently being finalized as part of the SR-531 Widening Project that looks at widening SR-531 within the RPZ, a variance memorandum has been forwarded to regional FAA and to FAA Headquarters (DC) for consideration."	PDS Staff	The text for the MIC south of 172nd Street in Section 3.5.2 has been revised using a very similar statement to this one.	Apparently accepted (not disputed) per 3/15/16 Barb Mock letter	MW	JXK	12/10/15	MW
Responses to Public Comments made during Public Hearings before the City of Arlington Planning Commission on 12/1/2015 and 12/15/2015										

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1		Brekhus Beach	Why there is not a water plan for the Brekhus Beach area?	Concerned citizen	Later in the public hearing presentation, it was shown that there is a high level plan in place, with 2 connection points (Appendix S). An introduction was added to Appendix S to help explain the maps provided. Also, additional water rights were purchased for additional development in this area. See additional discussion in Section 3.3.3.		MW	JXK	1/12/16	MW
2	4-10 to 4-12	4.3.3, DSK	What is the amount of water loss per year? Is it caused by [asbestos-] cement pipes?	Concerned citizen	During the public hearing presentation, Mr. Kelly explained where the City water distribution losses occur. Reasons for the erratic trending are thought to be related to errors made in understanding the conversion to a new accounting system (BIAS) in approximately September 2010, and possible actual leaks in the distribution system. While it is true that most water main breaks and leaks in the City occur in AC pipe, relatively little water is lost through these pipes, and some AC pipe appears as sound as the day it was installed. See discussion on pages E-36 and E-37. See all of Appendix E for more information on the City's Water Use Efficiency Program and its Water Loss Control Action Plan.		MW	JXK	1/12/16	MW
3	9-16 to 9-20	Table 9-5	Could the [water main] projects be prioritized on the list? Could Table 9-5 be expanded? This would help serve the public better.	Concerned citizen	Public Works Director James Kelly indicated that changes would be made to address this comment. The list of prioritized water main projects was developed using the criteria presented in Table 9-4 and Section 9.9.1. The expanded computations have been added in a table in a new Appendix U.		MW	JXK	1/12/16	MW
4		Planning Commission	Planning Commission voted 5-0-0-2 on 12-15-2015 to recommend to City Council approval of the 2015 WSP.	Planning Commission	Thank you.		MW	JXK	1/12/16	MW
							MW	JXK	1/12/16	MW

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			Agency Review Draft City-Identified-Errata Corrected for the Final WSP							
1	Exec Smry	New section ES.3	Add section on "What's not changed" in the WSP from previous 2011 version	COA	Added (inserted) Section ES.3 to reflect Appendices F, G, I, and M have not changed.		MW	JXK	12/30/15	MW
2	6-1		Not page 7-1	COA				JXK	12/16/15	MW
3	6-6	6.3.3	Reprint on 11x17"	COA				JXK	12/16/15	MW
4	8-3	8.2.2	Inaccurate descriptions of duties.	COA	Admin Asst--connection fees. Utilities Manager and Ut. Specialist vacant.			JXK	12/16/15	MW
5	8-12	8.5	Position name inconsistent with org chart.	COA	Remove Utilities Specialist (2 words) and indicate GT at 75/25 FTE			JXK	12/16/15	MW
6	9-21	9.10	Reprint on 11x17"	COA				JXK	12/16/15	MW
7	9-2	9.1.1	Delete this subsection	COA				JXK	12/16/15	MW
8	10-xx	Numerous , third level section numbers in Ch. 10	Add space after section numbers: 10.2.1, 10.2.2, 10.3.1, 10.3.2, 10.3.3, 10.4.1, 10.5.1, 10.5.2, 10.5.3, 10.6.1, 10.6.2	COA				JXK	12/30/15	MW
9	C-1	Apdx C	Add note that Hydraulic Node Map is at back, after Appendices	COA				JXK	11/30/15	MW
10	E-1 thru E-39	Apdx E	Review & edit all references to Tables, Charts, etc.; Change references to "E-#". Reference "charts", not "figures".	COA				JXK	12/16/15	MW
11	E-25	Attachment E-2	Reprint on 11x17"	COA				JXK	12/16/15	MW
12	E-39	Table E-1	Reprint on 11x17"	COA				JXK	12/16/15	MW
13	F, all	Apdx F	Correct table references to "F-#"	COA				JXK	12/16/15	MW
14	F, All	Apdx F	Page numbers not bold	COA				JXK	12/16/15	MW
15	F-8	F 6.4	font check?	COA				JXK	12/16/15	MW
16	F-11	F 8.1	font check?	COA				JXK	12/16/15	MW
16a			Section Numbering messed up	COA				JXK	1/11/16	MW
17	After F-16	Apdx 1	Inserts	COA	Decision to include only the main body of the Wellhead Protection Program and not include these particular appendices to that plan in the WSP.			JXK	1/11/16	MW
18	After F-18	Apdx 2	Inserts	COA				JXK	1/11/16	MW
19	After F-20	Apdx 3	Inserts	COA				JXK	1/11/16	MW
20	After F-22	Apdx 4	Inserts	COA				JXK	1/11/16	MW
21	F, even pgs	Apdx F	Change header on even pages (not WLCAP)	COA				JXK	12/16/15	MW
22	G-4	Apdx G	Page # not bold	COA				JXK	12/16/15	MW
23	G, odd pgs	Apdx G	Delete references to "Wastewater"	COA				JXK	12/16/15	MW
24	G, all	Apdx G	Correct table references to "G-#"	COA				JXK	12/16/15	MW
25	H-9	Apdx H	Don to review Table--is it finished?	COA				JXK	N/A	MW
26	H, all	Apdx H	Don to review all	COA				JXK	N/A	MW
27	H, all	Apdx H	Revise table references to H-#	COA				JXK	12/16/15	MW
28	I, all	Apdx I	IWRM, clarify R is Resource (?) or Resources (?)	COA				JXK	12/16/15	MW
29	I-4	I.2.1	TDR references????	COA	Added note to Appendix Cover indicating not updated for 2015 WSP, so this appendix still references Brekhus-Beach for TDR (not West Arlington as per City Comp Plan).			JXK	12/16/15	MW
30	I-11 to I-12	Figure I-1, Chart I-1	Reprint on 11x17"	COA				JXK	12/16/15	MW
31	I-13 and after	Odd page header	Not WWPP. Change to IWRMP	COA				JXK	12/16/15	MW
32	I-25	Table I-4	Repeated table name should be bold font, centered	COA				JXK	12/16/15	MW
33	K, all	Apdx K	Water rights inserts--separate file not yet in massive original	COA				JXK	3/30/16	MW
34	L-1	Apdx L	Front page Apdx L, not Apdx N	COA				JXK	12/16/15	MW
35	~L-5	CWSP Map	Print to fit on 8.5x11	COA				JXK		
36	M-1	Apdx M	Change subheader--not really revised for this 2015 WSP update	COA				JXK	12/16/15	MW
37	N-1	Apdx N cover	Format hanging paragraph @ 0.5"	COA	Did this for title and cover page subheaders for all appendices		MW	JXK	12/16/15	MW
38	P-1	Apdx P cover	Correct to Apdx P, not Apdx Q	COA				JXK	12/16/15	MW
39	After P-1	Mutual Aid	Reprint contact list at 8.5x11" landscape format; ***keep separate and out of public version***	COA				JXK	3/31/16	MW
40	S-3 to S-4	Apdx S maps	Reprint front/back of 11x17"	COA				JXK	12/16/15	MW
41	All Apdces		Header or Title on page 1 should be consistent with chapter titles; remove underlining	COA				JXK	12/16/15	MW
42	11-Apr	4.3.3 DSL	change "is" to "are" in middle of page.	COA	Done		MW	JXK	12/16/15	MW
43	ES-2	ES.2	Corrected population target from 24,965 to 24,937 under "Planning Efforts"	COA	Done			JXK	12/16/15	MW

City of Arlington Comprehensive Water System Plan

Agency Comments and City Responses

Review Phase:	**WSP Agency Review Draft Revised to Final Based on these Responses to Agency Comments**			**Health (RR) Comment Date:**	**final 12/3/2015**
Contact:	**James Kelly and Mike Wolanek (City)**			**Ecology Comment Date:**	**10/21/2015**
	Michele Campbell (RH2 Engineering)			**Snohomish Co PDS Comment Date:**	**pre 11/2; Final 12/15/201**
Date:	**3/31/2016**			**Snohomish Co PUD Comment Date:**	**11/6/2015**

No.	Section		Agency Comment	Commenter Name	City Response (specific ext revisions in bright red font)	For PDS comments only, PDS reply to City response	City Responder Name	City Reviewer Name	Implementation	
	Page No.	Paragraph No.							Date	Initials
44	ES1 to ES6	Executive Summary	Correct headers confirmed for all sections of document	COA				JXK	12/16/15	MW
45	Ch 10	Financial Plan	Replace Chapter 10 with version revised version re-issued December 2015 by FCS	COA PW Dept.	Replaced.			JXK	12/30/15	MW
46	After N-1	Consistency forms	Add completed local gov't consistency forms for City of Arlington and Snohomish County	COA	Added to Appendix N. Snohomish County PDS checklist makes a finding of NOT consistent, and includes a letter from interim Director Barb Mock.			JXK	3/30/16	MW
47	After O-1	City Council	Add any resolutions or ordinances	COA	Added selected ordinances.			JXK	12/28/15	MW
48	After Q-1	SEPA DNS	Added signed DNS (2 pages) to completed SEPA checklist	COA	Added DNS			JXK	12/30/15	MW
49	T-1	Apdx T cover	Reprint without placeholder notes	COA	Done			JXK	12/30/15	MW
50	After T-2	Comments/responses	Insert comments/responses re: Agency Review Version	COA				JXK	3/30/16	MW
51		Entire WSP	Frequent use of phrase "water service area" (>>100x)	COA	Universal search for "water service area" and selective replacement with "WSA"		MW	JXK	12/28/15	MW
52	ES-4	ES 3.1, 1st Pgh	Unnecessary paragraph re: wastewater included in error	COA	Delete paragraph		MW	JXK	12/28/15	MW
53		Chapter photos	Review and replace photos as appropriate	COA	No changes to photos made		MW	JXK	12/30/15	MW
			In addition to responses and revisions initiated by Agency comments above, the Final WSP also includes the following revisions to the Agency Review Draft WSP. All necessary replacement pages will be provided to recipients of the Agency Review Draft.							
1	Cover	Top center Lower right	Change "Agency Review Draft" to "Final"; Change "July 2015" to "January 2016"	COA				JXK	12/4/15	MW
2	Behind Cover	Bottom Citation	Change "Agency Review Draft" to "Final"; Change "July 2015" to "January 2016"	COA				JXK	12/4/15	MW
3	Spine	Binder Spine	Create new one and print	COA	add to pdf version			JXK	3/31/16	MW
4	iii to iv	Signatures	Create "Approvals" page in front of engineering certifications	COA	add to pdf version			JXK	3/31/16	MW
5	v to vi	Signatures	James Kelly signature and stamp	COA	add to pdf version			JXK	3/31/16	MW
6	vii to xiii	Signatures	Three RH2 signatures and stamps	COA	add to pdf version			JXK	3/31/16	MW
7	xi to end	TOC	Regenerate Tables of Contents, etc.	COA	Regenerated all Tables, Lists. Created abbreviated TOC			JXK	12/31/15	MW
8	All	Footers	Regenerate the final file name in all footers (does not require reprinting for currently circulating copies)	COA				JXK	12/30/15	MW
9	Cover	Photo	Replace background photo	COA	Replaced photo with new one Ken took. Trains linear.			JXK	12/31/15	MW
10				COA						
				COA						

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

RECEIVED
OCT 26 2015
PW Utilities

October 21, 2015

Michael D. Wolanek
Water Resources Planner
City of Arlington Public Works
154 W. Cox
Arlington, WA 98223

Dear Mr. Wolanek:

Re: City of Arlington; PWS ID#02950; Snohomish County; Submittal #15-0915; September 2015 Water System Plan

Thank you for the opportunity to review the City of Arlington September 2015 Water System Plan (WSP). Consistent with the Memorandum of Understanding between the Departments of Ecology and Health, I have reviewed the relevant portions of the Water System Plan (WSP) and offer the following comments.

Water Right Assessment

The water rights as listed by the city in Table 6-1 of the WSP while largely consistent with Ecology records has a few discrepancies as listed below.

Water Right Numbers	Discrepancy found in Table 6-1
SWC 5983, SWC 1488, SWC 10024	Purpose should be "Municipal Supply"
G1-23085C	Not currently authorized for withdrawal at Airport Wellfield
GWC 2968, GWC 2401	Not currently authorized for withdrawal at Haller Wellfield

The water right application described in Section 6.3.4, namely G1-26641, was received by Ecology on July 7, 1992. Since that time minimum instream flows have been set for the Stillaguamish River and it has also been closed to further consumptive appropriation through Chapter 173-505 WAC. The closure and minimum flows so established includes applications filed prior to adoption of the rule.

An exemption to the closure and minimum flow rule requires an Ecology approved mitigation plan, which the Washington State Supreme Court has determined must compensate for all impacts in terms of quantities, timing and location.

In Section 6.3.5 of the WSP three water rights held by the City of Arlington are mis-characterized as being authorized for "other" municipal purposes as defined under RCW 90.03.015(4). RCW 90.03.015(4) relates to water rights that were issued to a municipal water supplier. None of the three water rights listed in Table 6-4 were issued to municipal water supplier. They were issued for irrigation purposes to a turf grower (G1-23085C), a farmer (GWC 2968), and to a cemetery which was founded as a non-profit (GWC 2401).

These three water rights may be used to irrigate the lands upon which they were perfected and remain appurtenant. In order to withdraw these rights from a different well, or to beneficially use for a purpose other than as specified on their certificates, the City of Arlington must first apply to Ecology for a water right change, and that change must be approved by Ecology. In addition, although these three rights are likely exempted from statutory relinquishment since they were purchased by the city, the quantities represented by the certificates may have diminished, in whole or in part, since issuance of the certificates (RCW 90.14.180).

Thank you again for the opportunity to review the City of Arlington WSP. Please contact me at (425) 649-7077 or at Doug.Wood@ecy.wa.gov if you have questions regarding this review or need additional information.

Sincerely,

Douglas H. Wood, MS, LHG
Water Resource Program

cc: Richard Rodriguez, Department of Health
Michele Campbell PE, RH2
Kris Wallace, RHR

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

RECEIVED
DEC 08 2015
PW Utilities

December 3, 2015

DONALD SMITH
ARLINGTON WATER DEPARTMENT
154 W COX AVE
ARLINGTON WA 98223

RE: Arlington Water Department, ID# 02950
Snohomish County
Water System Plan – 2015
Submittal #15-0915

Dear Mr. Smith:

Thank you for submitting the Water System Plan (WSP) for the City of Arlington (the City) received in this office on September 25, 2015. We have reviewed the plan and offer the following comments. These comments must be adequately addressed prior to approval of the WSP.

System Description

Provide a statement of local government consistency from your Planning Department and Snohomish County Planning and Development.

Operations & Maintenance

Has Arlington developed an *E. coli* response plan in case it should have an *E. coli* MCL violation or identify *E. coli* in its raw source water under the Groundwater Rule? Our Mercer Island experience indicates that consumers want this water quality information as soon as possible and an *E. coli* Response Plan can position a community to be successful.

The Revised Total Coliform Rule will go into effect on April 1, 2016 and require some water utilities to conduct a Level 1 or Level 2 assessment of its water system and submit it to the department within 30 days of reaching the trigger. Our draft rule will be out for informal comment very soon. Please give some thought to developing an approach to conducting a complete assessment prior to the effective date of the rule.

Design and Construction Standards

Please include a blank Construction Completion Reports for all distribution main replacements and extensions. The utility should maintain completed Construction Completion Reports for all constructed projects under **Recordkeeping and Reporting**.

Other Documentation

Is Arlington a member of WARN, either locally or at the state level?

Provide signed PE stamp with the final WSP submittal.

Provide a signed SEPA Threshold determination with the final WSP submittal.

The water system must meet the consumer input process outlined in WAC 246-290-100(8). Please include documentati of a consumer meeting discussing the WSP, prior to DOH approval of the WSP.

Prior to DOH approval, the City's governing body must approve and adopt the WSP. This is a new requirement resulting from the Municipal Water Legislation.

Please provide copies of any comments made by adjacent purveyors, along with your response to those comments.

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 **March 1, 2016**. 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 for fees for review of planning, engineering and construction documents have been adopted (WAC 246-290-990). Please note that we have included an invoice in the amount of **$3705.00** for the review of the Water System Plan. This fee covers our cost for review of the initial submittal, plus the review of one revised document. Please remit your complete payment in the form of a check or money order within thirty days of the date of this letter to: **DOH, Revenue Section, and P.O. 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

Richard Rodriguez
WSDOH Regional Planner

cc: Erika Lindsey, DOH
Gary Idleburg, Snohomish County Planning and Development Services
Snohomish County Health District
Michael Wolanek, City of Arlington
Michelle Campbell, P.E., RH2

From: Heneghan, Karen
To: Mike Wolanek
Subject: Review of Arlington 2015 Draft WSP
Date: Tuesday, November 03, 2015 11:18:35 AM
Attachments: ARL Service Area Notes.pdf
2015-05 Fullcounty_Group A_Water_Purveyors.pdf

Hello Mike,

Thank you for the opportunity to review Arlington's draft Water System Plan.

It looks like some correction is needed on the eastern edge of the service area boundary in the figures. Please see the attached notes on a clip of Figure 2-2.

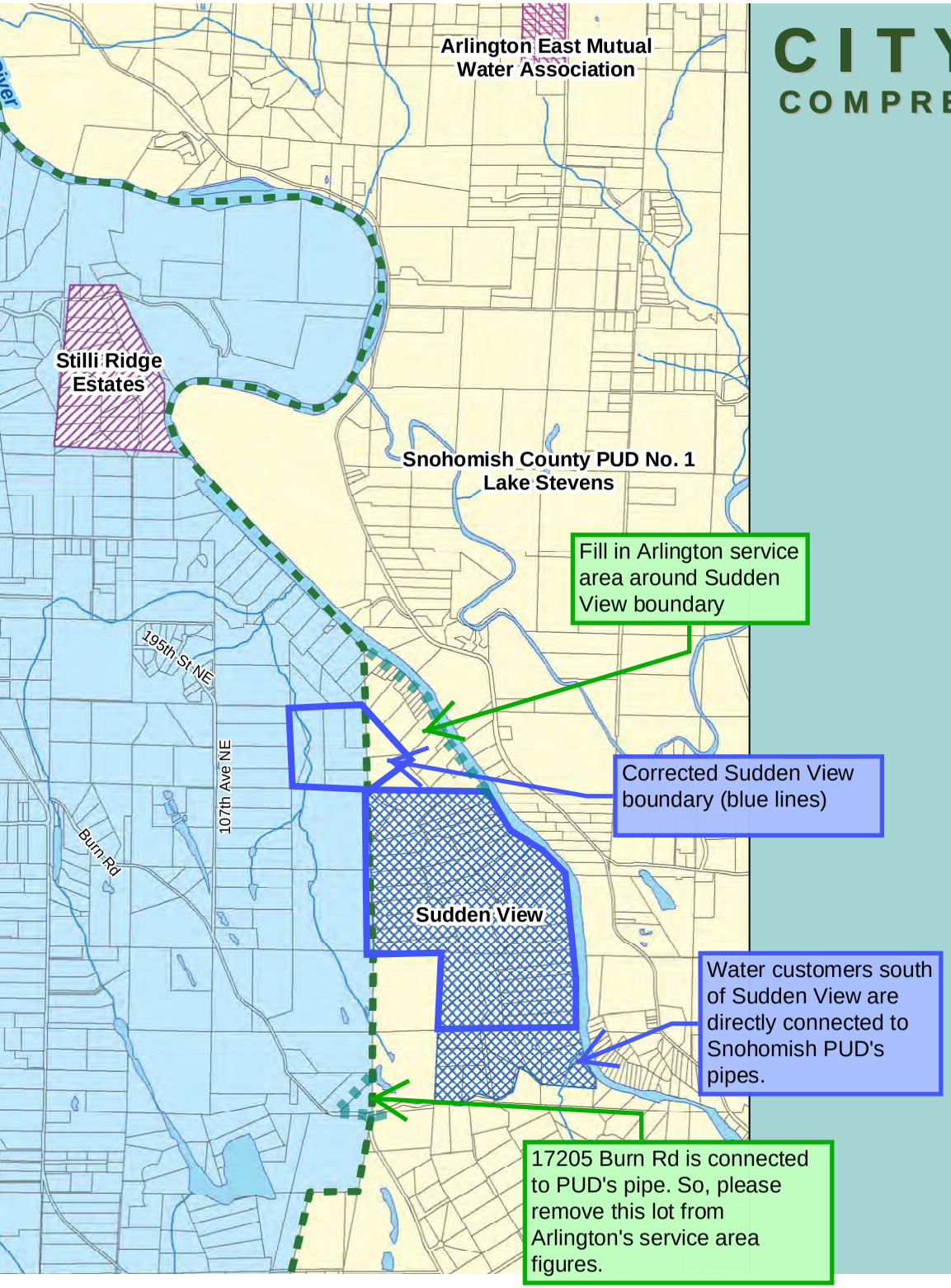
I believe the attached May 2015 edition of the county map correctly captured past communication to get this cleaned up. Sorry for the large attachment, but it seems the county removed the map from its ftp site, at least at the moment.

I haven't read the document yet, but started by checking the service area and want to get this to you now that I noticed it.

Karen Heneghan
SnoPUD Water
(425) 397-3037

CITY OF ARLINGTON
COMPREHENSIVE WATER SYSTEM PLAN

FIGURE 2-2
SERVICE AREA AND ADJACENT SYSTEMS



Legend

- City Limits
- UGA Boundary
- Future Water Service Area

Adjacent Water Systems

- City of Marysville
- Arlington East Mutual Water Association
- Arlington Heights Water Company
- Arlington Terrace
- Arlington View Estates Water Association
- Eagle Ridge Water Association
- Forest Grove Mobile Home Park
- Kingston Water System
- McPherson Hills
- Meadowbrook Homeowner's Association
- New Start Landowners Association
- No Public Water Service
- Sam Lake Improvement Association

From: Heneghan, Karen
To: Mike Wolanek
Cc: Wood, Brant
Subject: RE: Review of Arlington 2015 Draft WSP
Date: Friday, November 06, 2015 11:14:05 AM

Hi again Mike. I finished reading through Arlington's draft WSP, and here are my additional thoughts:

1. In Table 2-2, I think it would be better to show capacity of the PUD Master Meter as 1,000 gpm, based on the agreement, rather than the 1,138 gpm flow test value. It's good that the text describes the flow test, verifying that the meter and PUD's facilities are capable of meeting the commitment under normal operation.

2. In Section 2.5.7, last sentence in the first full paragraph on page 2-20 doesn't make sense to me, saying the agreement with PUD "does not provide access to this water supply even under emergency conditions." I think it could be pointed out that the connection has value in emergency circumstances when Arlington's other water sources are affected, although such use does dip into Arlington's goal to maintain 900 gpm fire flow in the 710 and 540 zones. The Oso Mudslide in 2014 could be cited as a major example, when the city increased usage through the intertie above normal operation while reducing production from the Haller Wellfield during in the aftermath. It is true that supply through this intertie can be interrupted under emergency conditions that affect PUD's water sources, since none of the standby storage in PUD's system is reserved by the agreement for Arlington's use, although we would be committed to restoring the supply as soon as possible. So, maybe it could be described this way.

3. Here are some more things I have to say about depicting the service area boundary in the figures:
    a. I see the letter to the county in Appendix L regarding the service area change between Arlington and Marysville. I also see the county has not yet documented this change on its mapping. So, I assume you are continuing to work with Marysville and the county to provide whatever documentation is necessary to complete this change.
    b. In the meantime, I recommend that Arlington show it's proposed water service area in its figures in addition to whatever it considers to be its current service area boundary on record.
    c. Regarding my earlier comment about expanding the service area to the river to fill in the mapping around the Sudden View, we still support that change if Arlington would like to make it. If our past correspondence is not considered sufficient documentation, this area could also be shown as a proposed change on the figure until it is sufficiently documented to be called final.
    d. Section 3.3, Land Use, refers to Chapter 2, but says the boundary has not changed since the 2010 CWSP update. This statement should be corrected, especially based on the change with Marysville.

4. In the paragraph at the bottom of page 4-12, describing Table 4-7, it could help to mention

that the average amount of authorized non-revenue consumption is factored into the demand per ERU values, in addition to the DSL. I had trouble reproducing numbers in Table 4-7 until I realized that's what I was missing.

I think this covers all of our comments in relation to Snohomish PUD's water systems.

Overall, this plan looks well done, thanks to the hard work of everyone at Arlington, RH2, and FCS.

Karen Heneghan
Principal Engineer
SnoPUD Water
(425) 397-3037

From: Heneghan, Karen
Sent: Tuesday, November 03, 2015 11:18 AM
To: Mike Wolanek <mwolanek@arlingtonwa.gov>
Subject: Review of Arlington 2015 Draft WSP

Hello Mike,

Thank you for the opportunity to review Arlington's draft Water System Plan.

It looks like some correction is needed on the eastern edge of the service area boundary in the figures. Please see the attached notes on a clip of Figure 2-2.

I believe the attached May 2015 edition of the county map correctly captured past communication to get this cleaned up. Sorry for the large attachment, but it seems the county removed the map from its ftp site, at least at the moment.

I haven't read the document yet, but started by checking the service area and want to get this to you now that I noticed it.

Karen Heneghan
SnoPUD Water
(425) 397-3037

From:	Idleburg, Gary
To:	Mike Wolanek; James Kelly
Cc:	Sleight, Randy; Skorney, Steve; Toy, Stephen; Craig, Richard
Subject:	City of Arlington - CWP - Snohomish County Preliminary Comments
Date:	Monday, November 02, 2015 12:11:28 PM
Attachments:	Preliminary Comments on the City of Arlington Water System Plan.pdf

Dear Mike,

Attached is a copy of our draft preliminary comments on your CWP. There are a number of the comments that have to do with how your CWP relates directly to City of Arlington's comprehensive plan and docket proposal. If you don't have enough information to resolve them we will probably need to meet with planning staff.

We will put together a formal memo/letter with the comments to send to you and James after we meet tomorrow.

Thanks,

Gary Idleburg
Senior Planner
Snohomish County PDS
425.388.3311, Ext 2333

Preliminary Comments on the City of Arlington Water System Plan

The County Comments are divided into four areas.

1. **Substantive comments that affect a consistency determination for DOH**
2. **Questions that may need further explanation or clarification or to establish timing**
3. **Minor Editorial comments**
4. **Minor typographical comments**

Substantive Comments that Affect a Consistency Determination for DOH

Chapter 3 Land Use and Population

Page 3-2: Urban Growth Area: The statement that the CWP update anticipates County approval of its petition for UGA expansion and allocates growth to the expansion area is an area of inconsistency between the City's 2015 Comprehensive Plan and the County's recently adopted Comprehensive Plan. This presumes a de-annexation of the Brekhus –Beach neighborhood which our latest information from the City indicates that this process is unlikely at present. If that was the case why were all the waterlines shown in this report to serve that particular area?

Please remove the statement that "including expansion west of I-5, were anticipated in all County planning documents and at all levels of PDS staff. In lieu of the removal, please document how these approvals were made by County planning staff and who was contacted for inclusion of this area within the Arlington UGA.

Page 3-2: The draft plan states that it/the plan anticipates County approval of the petition for UGA expansion and allocates subsequent growth to this expansion area. The City's initial docket request depicted an area "swap" with no net increase in UGA area. This will potentially represent/create several inconsistencies. The City's current docket request that will be considered by the Snohomish County Council in 2016 should be checked and verified for this CWP.

Page 3-6: 3.3.3 TDR says de-annexation of Brekhus-Beach is anticipated. This is inconsistent with the City's recently updated comprehensive plan.

The Consistency Review forms completed by both the City and PDS are included in Appendix N at the bottom of the page. These were not included in either of the WSP documents provided to PDS.

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Chapter 9 Water System Improvements

9-6 Top of the page 9.3.5 CIP WM4: West I-5 Expansion Area Water Main this section is predicated on the assumption that the County Council will approve the UGA expansion west of I-5 as depicted and that WSDOT will approve the boring of I-5 at this location in two separate locations one of which may be close to the flood plain.

Chapter 9 (general): There is also no analysis in the CIP of water infrastructure costs related to potential 2016 Docket decisions. The CIP should specifically address the following scenarios for the Brekhus Beach area and any additional area added to the UGA:

1) What deficiencies will exist and what improvements would be required, if the docket request is denied. What would be the related costs?

2) What deficiencies will exist and what improvements would be required, if the docket request is approved. What would be the related costs?

Service area boundaries should be reconciled with the current CWSP map.

Questions/Issues that may need further explanation or clarification or to establish timing

ES-3 When is the Airport well anticipated to be taken out of service since it is aging and has collapsed twice in the last 10 years and pumps have now been placed closer to the area of potential contamination in the industrial area around the airport?

Page 3-1: (Section 3.2.1 Introduction), The countywide planning policies (under the GMA) for Snohomish County should also be examined by the City of Arlington.

Page 3-2 (3.2.2 Urban Growth Area) states that the County completed its 2015 Comprehensive Plan Update with adoption by the County Council in June 2015, whereas page 3-3 (3.2.4 Snohomish County Comprehensive Plan) refers to the June 28, 1995 version of the County's plan, last amended December 21, 2013.

Page 3-5 (3.3.2 City of Arlington UGA) states that a 2015 decision on the city's UGA expansion proposal west of I-5 is anticipated, whereas page 3-2 (3.2.2 Urban Growth Area) says it will be a 2016 decision.

Page 3-7: (3.4.2 Existing and Future Population) The draft plan states that the 2035 target population for the City of Arlington and its UGA is 24,937. The figure that they cite is their initial

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2035 population target adopted in the Countywide Planning Policies, except that it is only for the City of Arlington (using Dec 13, 2012 city boundaries), and doesn't include their surrounding unincorporated UGA, which is 1,065, resulting in a total Arlington UGA (city + unincorporated) 2035 population target of 26,002 (up from 18,489 in 2011).

Page 3-13: Has PSRC weighed in on the MIC as a regional employment center since the projected employment stated in the plan is 12,000? Has the configuration at the end of the north south runway been looked at carefully to assess the object free clear zone consistent with the FAA requirements and City Airport District Zoning? This MIC appears to need the 12 inch connection to Burn Road to make the fire flows viable for a manufacturing/industrial development. However, the timing of this infrastructure is assumed to occur over the second ten year period within the 20-year planning horizon. What is the schedule for the MIC? Please provide documentation of the City of Arlington and City of Marysville and PSRC assessment of the MIC in an appendix.

The CPPs show substantial employment growth for the Arlington UGA during this planning period, with total Arlington UGA (city + unincorporated) employment reaching 20,884 in 2035, which is 12,224 jobs higher than the 2011 employment estimate of 8,660 for the Arlington UGA). On page ES-7 (ES 3.3 Historic and Forecast Demand), their statement that "employment within the Water Service Area may increase by as much as 12,000" would appear to be consistent with the CPPs.

Here is a link to the CPPs: http://snohomishcountywa.gov/documentcenter/view/8043 (and refer to the 2035 initial growth targets contained in Appendix B, starting on page 62).

Page C-1: Why was the Hydraulic Model Node Diagram in Appendix C missing from the County submittal?

Appendix O: Has any other work been done since 2011 regarding drinking water or water supply since the 2011 Ordinance 2011-025 within the City of Arlington?

Appendix S: Is Brekhus –Beach a real concept layout with a legitimate funding source for development of the water distribution system shown in the plan?

Appendix T: Where are all the agency comments? Presume these comments may be attached to the cover letter for County comments.

DRAFT

Minor Editorial Comments

Page ES-1: Last sentence in first paragraph needs re-work. "Their families and possessions stand their best chance against the ravages of fire." Provide better clarity and meaning to this sentence since it seems to imply further risk to the City if inadequate fire flow is provided in the document prior to 2024.

Page ES-2: Under Planning efforts will the influx of up to 12,000 additional employees or persons in the water service area require an additional supply? Is this the basis to warrant the additional 12 inch connections to the PUD system on Burn Road outside the UGA?

Page ES-3 top of page second bullet delete (additional NPDES permit compliance as well) at end of sentence. Since this is likely just one of many permits that were necessary for this project, why name a particular permit in the Executive Summary?

Page ES-3: Last bullet under limitations with Aging Physical Infrastructure… Why is an active replacement program resulting in a younger age distribution system, a limitation with aging infrastructure? Reword to reflect that aging water infrastructure needs to be continually replaced based on type of pipe, storage, or water quality treatment systems etc.

Page ES-3: Second to last bullet no mention of the City of Arlington as one of the key hubs for Emergency Response to the Oso Landslide and the influx of many agencies, local, state, and federal to respond to this disaster that further placed a burden on the City's water supply system.

Page ES-3: Last bullet what on-going monitoring of drought conditions on the cities groundwater elevations at the well sites is being checked and recorded to reflect these elevation changes over time?

Page ES-4: under Changing Supply and Demand Scenario last bullet provide the value of what the Stillaguamish River reached in cfs and then indicate it was the second lowest discharge on record, if this was to continue it appears that the City is low on supply in the upcoming 10 year period.

Page ES-7: Modify wording to reflect what the maximum amount the water treatment plant can send to the system. For example…Currently, the WTP can send 1500 gpm to the distribution system. This raises an issue though, if the clearwell pump efficiency continues to diminish this flow to distribution will also continue to be reduced and we saw no factor over time for this projected reduction.

Page ES-9: Why emphasize that the change in the City's financial management software as the basis for the incorrect accounting of distribution system losses or leaks from 2012 to present? This value needs to be able to be a directly verifiable number based on SCADA system and metered flows with sales revenues to the system as an independent audit or cross check.

DRAFT

Page 2-15: Burn Road Reservoir at the second sentence… The reservoir is (was) located… note the reservoir still seems to exist in the latest Google Earth research aerial dated 7/2015 and has not received permits for demolition even though it has been taken out of service. This could be explained more clearly.

Figure 2-2: The figure looks fine, but some discussion elsewhere needs to reflect the potential assumption of Arlington Terraces system or other private systems in general reflected on this figure within the next 20 years by the City.

What is the plan to serve areas depicted as white on this figure over the next 20 years between PUD, Arlington, Marysville, or Seven Lakes Water District?

Page 3-3: There probably should be some clarification made as to whether the City considers water supply to fall under Concurrency or not.

Page 3-7: 3.4.1 Housing Trends; The last sentence in this section could be either eliminated or the information should be found and reflected in the report.

Page 4-11: See comment above at ES-9 the statement in first paragraph "For reasons not yet understood, however, the City's DSL jumped to 13% in 2014. The sentence could just be rewritten to refer the reader to the Table 4-6.

Page 4-20: 97gpdc - Suggest adding this abbreviation to Table 1-3 at the start of the document as this is per capita consumption in gallons per day per capita.

Page 9-7: Section 9.5.1 CIP F1 is confusing.

Page 9-7: The improvement statement (9.5.2 CIP F2) should probably read "to replace the existing Airport Well."

Section 9.2 is helpful.

Minor Typographical Comments

Page ES-2: Add parenthesis at near bottom of page 710(PZ).

Page ES-3: Add comma after youngest, but is not used…

Page 3-10: Add space between 2014 and to.

Page 3-13: Last paragraph; delete extra period after word area.

Appendix Q: SEPA Why was the [help] feature not turned off?

DRAFT

From: Idleburg, Gary
To: Mike Wolanek
Cc: James Kelly; Sleight, Randy; Skorney, Steve; Toy, Stephen
Subject: RE: City of Arlington - CWP - Snohomish County Preliminary Comments
Date: Tuesday, December 01, 2015 6:36:25 PM

Hi Mike & Jim,

Randy Sleight and I went over your responses to our preliminary comments. Below are our final comments on your comprehensive water plan (CWP). They correspond to the numbers on your table; "***PDS: Substantive Comments that Affect a Consistency Determination for DOH"***

We will send these final comments to you/follow up in a formal memo or letter for your records.

#1. The City's CWP should note that it is currently planning for a specific scenario and will make appropriate adjustments if its docket proposal is not approved by the Snohomish County Council.

#4. The September 2014 letter to Clay White should be directly referenced in the CWP. A copy of the letter should be provided in an appropriate appendix.

#7. The CWP should note that its plans for water service in the City's Rural Urban Transition Area (RUTA) is predicated on a specific future scenario that may or may not occur and simply state that "This is a planning document that is projecting for future water service needs in our Water Service Area, the specific area in question is within the City's Rural Urban Transition Area (RUTA) as designated by the County. Water service will not be provided to this area unless there is development. This is noted in the 25%/75% capital cost split between the City and future developer."

#9. Please complete/execute the service area agreement with the City of Marysville and continue to coordinate with PDS-Planning and Technology to update the CWSP map.

#11. Please provide specific Countywide Planning Policy (CPP) references then depict and summarize the CWPs consistency with those policies. We have forwarded you a link to the CPP document.

#15 and #16. We think your responses to our comments should be stated in the text of your CWP:

"The City is working with PSRC to have the Arlington-Marysville MIC recognized as a Regional Center, though full recognition has not yet occurred. PSRC is working on its Regional Center's Update Project and has identified the MIC in the Snohomish County Work Session. Snohomish County has already recognized the Arlington-Marysville MIC as a Regional Center. Employment figures in the WCP are the same as those used in the City's General

Comprehensive Plan."

"(The configuration) is consistent with FAA requirements for the RPZ and OFA. A study is currently being finalized as part of the SR-531 Widening Project that looks at widening SR-531 within the RPZ, a variance memorandum has been forwarded to regional FAA and to FAA Headquarters (DC) for consideration."

- Please send a Consistency Statement form to Randy Sleight for his completion.

Gary Idleburg
Senior Planner
Snohomish County PDS
425.388.3311, Ext 2333

From: Mike Wolanek [mailto:mwolanek@arlingtonwa.gov]
Sent: Tuesday, December 01, 2015 2:57 PM
To: Idleburg, Gary
Cc: James Kelly
Subject: FW: City of Arlington - CWP - Snohomish County Preliminary Comments

Gary, here are the files Jim refers to below, and that we mentioned on the phone several minutes ago.
Mike

Mike Wolanek
Water Resources Planner
City of Arlington Public Works
360-403-3541 (Desk)

154 W. Cox Avenue
Arlington, WA 98223

From: James Kelly
Sent: Tuesday, December 01, 2015 12:59 PM
To: Idleburg, Gary <G.Idleburg@co.snohomish.wa.us>

Cc: Sleight, Randy <Randolph.Sleight@co.snohomish.wa.us>; Skorney, Steve <Steve.Skorney@co.snohomish.wa.us>; Toy, Stephen <Steve.Toy@co.snohomish.wa.us>; Craig, Richard <Richard.Craig@co.snohomish.wa.us>; Mike Wolanek <mwolanek@arlingtonwa.gov>
Subject: RE: City of Arlington - CWP - Snohomish County Preliminary Comments

Gary –

To follow up on Mike's below email, I too was under the assumption that a "Final" set of comments were going to be issued by PDS following our Nov 3, 2015 meeting. We (Mike and I) have converted our notes into electronic format and have prepared a matrix that addresses the "Preliminary" comments based on the Nov 3rd meeting; we can share our notes with you if you would like.

The City is holding a public hearing I am presenting this evening on the Water Comp Plan, and would like to have it approved by City Council in early Jan 2016. Anything you can do to expedite your final comments is greatly appreciated.

Thanks - Jim

James X. Kelly, PE
Public Works Director
City of Arlington
154 West Cox Ave.
Arlington, WA 98223

Phn: 360-403-3505
Cel: 425-754-7431
JKelly@arlingtonwa.gov

From: Mike Wolanek
Sent: Monday, November 30, 2015 4:40 PM
To: Idleburg, Gary <G.Idleburg@co.snohomish.wa.us>; James Kelly <jkelly@arlingtonwa.gov>
Cc: Sleight, Randy <Randolph.Sleight@co.snohomish.wa.us>; Skorney, Steve <Steve.Skorney@co.snohomish.wa.us>; Toy, Stephen <Steve.Toy@co.snohomish.wa.us>; Craig, Richard <Richard.Craig@co.snohomish.wa.us>
Subject: RE: City of Arlington - CWP - Snohomish County Preliminary Comments

Gary, attached is the service area agreement and map as it will go to Kevin Nielsen for his signature. We will forward a signed original to you as soon as possible.

I apologize for not providing you revisions made to date for other commenters and for PDS comments that were generally easy to address. I was under the impression that you all were going to finalize your preliminary comments in response to the talking points we discussed in our meeting. I do have all the comments that we have received from others addressed, but I have not actually made any changes to the WSP in response to PDS' preliminary comments. This is because I want to keep careful track of affected pages for purposes of creating a final WSP from the Agency Review Draft WSP, and it's easier to do if I have final comments that I can number and track only once.

Tomorrow (Tuesday 12/1), I will address PDS' preliminary comments that I feel I can do

"cleanly" and completely. Of the four categories of comments you described in your comment document (received by email from Gary to Mike on 11/2/2015), this probably will include all of the comments under the headings "Minor Editorial Comments" [group 3]and "Minor Typographical Comments" [group 4]. It will include some (perhaps many, perhaps a few) of the comments under the heading "Questions/Issues that may need further explanation to clarification or to establish timing" [group 2]. Finally, it will include revisions in response to few if any of your preliminary, "Substantive comments that affect a consistency determination for DOH" [group 1]. Most of these latter comments, we hope, were addressed during our meeting, and thus we are looking forward to your formal comment letter. I intend to have the above changes completed and I will send you a second draft by COB Tuesday.

Please call me on Tuesday if any of this does not make sense to you.
Thanks,

Mike Wolanek
Water Resources Planner
City of Arlington Public Works
360-403-3541 (Desk)

154 W. Cox Avenue
Arlington, WA 98223

From: Idleburg, Gary [mailto:G.Idleburg@co.snohomish.wa.us]
Sent: Monday, November 30, 2015 3:30 PM
To: Mike Wolanek <mwolanek@arlingtonwa.gov>; James Kelly <jkelly@arlingtonwa.gov>
Cc: Sleight, Randy <Randolph.Sleight@co.snohomish.wa.us>; Skorney, Steve <Steve.Skorney@co.snohomish.wa.us>; Toy, Stephen <Steve.Toy@co.snohomish.wa.us>; Craig, Richard <Richard.Craig@co.snohomish.wa.us>
Subject: RE: City of Arlington - CWP - Snohomish County Preliminary Comments

Hi Mike,

Could you send us copies of you responses to our comments on Nov 3rd…i.e., show us the sections of the plan that you changed based on our comments? We also need your service area agreement to go along with your service area changes.

Thanks,

Gary Idleburg
Senior Planner
Snohomish County PDS
425.388.3311, Ext 2333

From: Mike Wolanek [mailto:mwolanek@arlingtonwa.gov]
Sent: Monday, November 30, 2015 3:04 PM
To: Idleburg, Gary; James Kelly
Cc: Sleight, Randy; Skorney, Steve; Toy, Stephen; Craig, Richard
Subject: RE: City of Arlington - CWP - Snohomish County Preliminary Comments

Hello, Gentlemen! I am following up on a voicemail I just left with Gary. We are looking to complete revisions to our draft WSP and would like to address any comments that may remain after we met with PDS back on Nov 3rd. Please email or call with an estimate. We also need the completed local government consistency checklist.

Thanks in advance!
Mike

Mike Wolanek
Water Resources Planner
City of Arlington Public Works
360-403-3541 (Desk)

154 W. Cox Avenue
Arlington, WA 98223

From: Idleburg, Gary [mailto:G.Idleburg@co.snohomish.wa.us]
Sent: Monday, November 02, 2015 12:11 PM
To: Mike Wolanek <mwolanek@arlingtonwa.gov>; James Kelly <jkelly@arlingtonwa.gov>
Cc: Sleight, Randy <Randolph.Sleight@co.snohomish.wa.us>; Skorney, Steve <Steve.Skorney@co.snohomish.wa.us>; Toy, Stephen <Steve.Toy@co.snohomish.wa.us>; Craig, Richard <Richard.Craig@co.snohomish.wa.us>
Subject: City of Arlington - CWP - Snohomish County Preliminary Comments

Dear Mike,

Attached is a copy of our draft preliminary comments on your CWP. There are a number of the comments that have to do with how your CWP relates directly to City of Arlington's comprehensive plan and docket proposal. If you don't have enough information to resolve them we will probably need to meet with planning staff.

We will put together a formal memo/letter with the comments to send to you and James after we meet tomorrow.

Thanks,

Gary Idleburg
Senior Planner
Snohomish County PDS
425.388.3311, Ext 2333

Snohomish County
Planning and Development Services

RECEIVED
MAR 21 2016
PW Utilities

Dave Somers
County Executive

Barb Mock, Interim Director
3000 Rockefeller Avenue M/S #604
Everett, WA 98201-4046
(425) 388-3311 FAX (425) 388-3832+

March 15, 2016

City of Arlington
Public Works Administrative Office
Arlington, WA 98233

Attn: James Kelly, City of Arlington-Public Works Director

Dear Mr. Kelly:

Planning and Development Services (PDS) staff has carefully reviewed your comprehensive water plan and evaluated it relative to the criteria of the "Local Government Consistency Review Checklist" (consistency statement) pursuant to WAC 246-290-106, WAC 246-290-107, and WAC 246-290-110(4)(b)(ii).

We unfortunately, cannot sign a consistency statement at this time, to verify that your comprehensive water plan is consistent with Snohomish County's comprehensive plan.

Our primary concerns are the following:

1. The water service area maps and underlying land use and zoning assumptions (e.g. Figure 3-1 Land Use) are not consistent with the Future Land Use Map (FLUM) of our comprehensive plan.

2. The comprehensive plan for the City of Arlington is currently being appealed to the Puget Sound Growth Management Hearing Board (GMHB) and a signed consistency statement from us for this particular water comprehensive plan would be premature.

If you are able to revise the pertinent maps in your plan PDS would be willing to reconsider signing a consistency statement. We would also be willing to have a discussion about these issues with you and Washington State Department of Health staff if it would be helpful.

PDS would like to acknowledge yours and Mike Wolenek's work during this process in resolving various technical issues and securing a new service area agreement with the City of Marysville.

Enclosed is an unsigned consistency statement checklist with our comments.

If you have any questions, please contact Gary Idleburg, Sr. Planner, at 425-388-3311, ext. 2333 or Randy Sleight, Chief Engineering Officer, at 425.388.3311 ext. 2014. Thank you for your time and efforts.

Sincerely,

Barbara Mock

Barbara Mock, Interim Director
Snohomish County Planning & Development Services

Attach: Local Government Consistency Review Checklist

cc: Joshua Dugan, PDS Manager
Jacqueline Reid, PDS Supervisor
Randolph Sleight, PDS Chief Engineering Officer
Gary Idleburg, PDS Senior Planner
Michael Wolanek, City of Arlington-Water Resources Planner

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

Local Government Consistency Review Checklist

Water System Name: Arlington Water Department PWS ID: 02950K

Planning/Engineering Document Title: Comprehensive Water System Plan Plan Date: October 2015

Local Government with Jurisdiction: City of Arlington

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations**. This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Fig. 2-2 & Fig. 3-1	No
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Chapter 3, esp. pg. 3-7ff	No
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Chapter 5, Appendices D, O & P	YES
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Pages 5-5 to 5-8; Appendix L	YES
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Reclaimed Water plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Chapters 5, 6, 7 & 9 Appendices L, I & F	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 3/15/2016 Date

Randolph R. Sleight Chief Engr. Snohomish County Planning & Development Services
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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

For **water system plans (WSP)**, a consistency review is required for the retail 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 non-community 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 per WAC 246-290-110(4)(b)(ii).

A) Documenting Consistency: Municipal water suppliers must document all of the elements in a consistency review per WAC 246-290-108.

1 a) Provide 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 are related to water supply planning.

1 b) Include a copy of the **six-year growth projections** that corresponds to the service area. If the local population growth rate projections are not used, provide a detailed explanation on why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

1c) 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.

1 d) Include all **service area policies** for how new water service will be provided to new customers.

1 e) **Other relevant elements** related to water supply planning as determined by the department (DOH). 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 provide direction on how this inconsistency can be resolved.

C) Documenting Lack of Consistency Review by Local Government: 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 their review. Please include: name of contact, date, and efforts made (letters, phone calls, and e-mails). In order to self-certify, please contact the DOH Planner.

The Department of Health is an equal opportunity agency. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

Community & Economic Development

Christopher Young, Director 18204 59 Avenue NE 360-403-3432

To: Memorandum to File/ DOH

From: **Christopher Young**

Date: December 1, 2015

Regarding: COA Water Service Plan and County Planning Policies

Cc: Planning Commission

The purpose of this memo is to respond to the comments submitted by Snohomish County relative to the City of Arlington Water Service Plan (WSP). For purposes of this memo the language highlighted in bold below is taken directly from the County Planning and Development Service (hereafter "PDS") comments submitted as a document entitled "Snohomish County Planning and Development Services' Preliminary Comments on the City of Arlington's September 2015 DRAFT Water System Plan", received by the City of Arlington on 11-13-15, and the City's response is immediately below these bolded statements.

Substantive Comments that Affect a Consistency Determination for DOH

Chapter 3 Land Use and Population

Page 3-2: Urban Growth Area: The statement that the WSP update anticipates County approval of its petition for UGA expansion and allocates growth to the expansion area is an area of inconsistency between the City's 2015 Comprehensive Plan and the County's recently adopted Comprehensive Plan.

CITY RESPONSE:

The City does not agree that it is presently inconsistent. The City of Arlington's ARL3 docket request has not been decided by the County as of yet. In fact, the City requested, and the county concurred with the City's request, to make this part of the reconciliation process for 2016. The Draft WSP is also drafted in such a way as to be consistent with the city's comprehensive plan.

The WSP assumes that the ARL3 proposal would be granted by the County. However, the City is aware that if the ARL3 docket request were to be denied by the County, and any subsequent

appeals by the City of that denial were rejected by appellate bodies, the WSP would have to be updated or revised to achieve consistency.

However, the City believes the proper approach is to anticipate that the County will approve the ARL3 docket request for purposes of the WSP, with recognition that the County's decision may require amendment of both plans.

The above comments apply to all of the subsequent comments relating to the land use element of the comprehensive plan. Strictly speaking, they are not relevant to the issues in the WSP element of the Comprehensive Plan.

This presumes a de-annexation of the Brekhus –Beach neighborhood which our latest information from the City indicates that this process is unlikely at present. If that was the case why were all the waterlines shown in this report to serve that particular area?

CITY RESPONSE:

The City does not agree or, frankly, understand this. As discussed with PDS representatives, the City's comprehensive plan makes it clear that the City does not intend to de-annex the Brekhus – Beach neighborhood. The water lines are depicted in the Brekhus – Beach neighborhood specifically because the City has said the area will not be de-annexed.

Even if the area were to be de-annexed, water service is permitted outside the UGA (unlike sewers) and the Brekhus – Beach neighborhood is within the City's water service area.

Please remove the statement that "including expansion west of I-5, were anticipated in all County planning documents and at all levels of PDS staff. In lieu of the removal, please document how these approvals were made by County planning staff and who was contacted for inclusion of this area within the Arlington UGA.

This statement in the WSP references, among other things, the well-documents history and participation by Arlington in the Transfer of Development Rights (TDR) program with Snohomish County. In addition, this statement is correct because the area is shown in the City's Comprehensive Plan as a rural urban transition area (RUTA):

- " The plan also provides for the designation of rural urban transition areas (RUTAs) outside of UGAs. Rural urban transition areas are intended to set aside a potential supply of land for employment and residential land uses for possible future inclusion in a UGA. The policies provide direction for the designation of rural urban transition areas." Page LU-2

- "**Rural/Urban Transition Area (RUTA**). This designation is intended to reserve a potential supply of land for future addition into the UGA. Developments utilizing rural cluster subdivision will have the option of redeveloping required open space tracts upon inclusion within an urban growth area." Page LU-92.

As the PDS is fully aware, the City of Arlington agreed to be a demonstration TDR participant.

> "This designation (Transfer of Development Rights Sending Area Overlay) is part of the county's Transfer of Development Rights (TDR) pilot program in partnership with the City of Arlington… Receiving areas for the countywide TDR program are designated by policy LU 14.A.7 and are not shown on the Future Land Use Map." Page LU-92.

The history of the City's participation in the demonstration TDR program is summarized more fully in Section 4.5 of the City's adopted Comprehensive Plan. In furtherance of the TDR program, the County adopted numerous CPPs or Comprehensive Plan policies relevant to this issue, including,but not limited to, the Snohomish County planning policies noted in Exhibit "A" to this memo (Land Use Policies 1.A.1, 1.A.3, 1.A.4, 1.A.15, and 1.D.1). See also, County Land Use Policies 3.G.9, 6.I., and Land Use Goal 14 and all of its policies, many of which expressly acknowledge Arlington's participation in the program (see Policies 14.D.1 through 14.D.6). The City crafted its planning in support of the effort and these policies.

Subsequently, the City annexed the Brekhus - Beach area in 2007 as a cooperative gesture to implement this demonstration TDR program. At the time, the City was working cooperatively with an owner and prospective developer of land within the Brekhus – Beach neighborhood to develop a master planned neighborhood there. However, no one, including the City anticipated the unprecedented crash in the real estate market that was about to occur.
The owner/developer of land within Brekhus – Beach failed, as a result of the crash of the real estate market, to package a development proposal together that was fiscally capable after the crash.
All levels of Snohomish County were parties to this well-intended TDR effort as evidenced by the above.

While it is true that the County has argued that other "reasonable measures" could be employed to meet land capacity objectives (See email from Steve Skorney dated 5-12-15), it has refused to acknowledge its role in creating the Brekhus - Beach TDR demonstration effort, or assist in mitigating its failure. The City in the meantime has been challenged in front of the Growth Hearings Board by Brekhus -Beach property owners, who assert that the City should build infrastructure and increase density, without the property owners creating a master plan for the area.
The "Interjurisdictional Coordination" section of the County's adopted comprehensive plan clearly implies that "transitioning" of land and services is a goal. This further implies an emphasis on RUTA areas where the transition will occur. The failure by the County to clarify the role of RUTAs in implementing this section of the Plan is a deficiency that should be corrected to comply with GMA.

Page 3-2: The draft plan states that it/the plan anticipates County approval of the petition for UGA expansion and allocates subsequent growth to this expansion area. The City's initial docket request depicted an area "swap" with no net increase in UGA area. This will potentially represent/create several inconsistencies. The City's current docket request that will be considered by the Snohomish County Council in 2016 should be checked and verified for this WSP.

This City notes this point, but believes it is a re-hash of past arguments and not relevant to the water system plan at present. When ARL3 is finally argued before the Council, the whole history

of the TDR program and the history of Brekhus – Beach will be presented and addressed. We agree that this will be checked and verified at the time of the reconciliation process.

Page 3-6: 3.3.3 TDR says de-annexation of Brekhus-Beach is anticipated. This is inconsistent with the City's recently updated comprehensive plan.

The City considered an up-to-date scenario in its WSP development that recognizes how development would occur in its service area, both the RUTA and in Brekhus – Beach. The County's comments are noted, however.

Chapter 9 Water System Improvements

9-6 Top of the page 9.3.5 CIP WM4: West I-5 Expansion Area Water Main this section is predicated on the assumption that the County Council will approve the UGA expansion west of I-5 as depicted and that WSDOT will approve the boring of I-5 at this location in two separate locations one of which may be close to the flood plain.

The County PDS staff misapprehends the nature of the City's responsibilities within the City's water service area under the North Snohomish County Coordinated Water System Plan (CWSP) and RCW Chapter 70.116.

Whether the County Council approves ARL3 or not, the area is in the City's water service area under the CWSP and is in a RUTA which will allow rural cluster subdivisions prior to its assumed annexation (the assumption for any RUTA).
All statements about what WSDOT will or won't approve is supposition. It's reasonable to discuss how the line will be extended, but unless the ARL3 area is removed from RUTA and the City of Arlington's water service area, then the assumption for sake of Plan consistency must be that the area will be served by the City of Arlington. The Plan describes how the City would intend to do so.

Chapter 9 (general): There is also no analysis in the CIP of water infrastructure costs related to potential 2016 Docket decisions. The CIP should specifically address the following scenarios for the Brekhus Beach area and any additional area added to the UGA:

1) **What deficiencies will exist and what improvements would be required, if the docket request is denied. What would be the related costs?**
2) **What deficiencies will exist and what improvements would be required, if the docket request is approved. What would be the related costs?**

First, the comment that "(T)here is also no analysis in the CIP of water infrastructure costs related to potential 2016 Docket decisions" is incorrect. The Water System Plan stands on its own as an infrastructure analysis regardless of the 2016 Docket decision. As discussed, water systems are allowed within or outside UGA boundaries.

The effect of the County comment is to somehow connect water system needs to GMA requirements. While they are certainly related, a WSP would be required whether or not a GMA Plan was. Because the area lies within a RUTA, cost estimates of a long range water system assuming no future UGA expansion or annexation would be non-responsive to GMA, Health

District or other requirements. The WSP considers costs of a system that can serve either rural or urban densities, which is as it should be in a long range plan.

The pros and cons of ARL3 should and will be assessed under the docket proposal; the WSP, comprehensive plan and Brekhus - Beach "high level" service plan as inputs. ARL3 should not be argued through the WSP adoption process.
Service area boundaries should be reconciled with the current CWSP map.

Questions/Issues that may need further explanation or clarification or to establish timing

Page 3-1: (Section 3.2.1 Introduction), The countywide planning policies (under the GMA) for Snohomish County should also be examined by the City of Arlington.

They were. See Appendix C and throughout the Comprehensive Plan document, which adopts the WSP by reference. Snohomish County needs to be more specific regarding its concerns in order for the City to meaningfully respond.

Page 3-7: (3.4.2 Existing and Future Population) The draft plan states that the 2035 target population for the City of Arlington and its UGA is 24,937. The figure that they cite is their initial 2035 population target adopted in the Countywide Planning Policies, except that it is only for the City of Arlington (using Dec 13, 2012 city boundaries), and doesn't include their surrounding unincorporated UGA, which is 1,065, resulting in a total Arlington UGA (city + unincorporated) 2035 population target of 26,002 (up from 18,489 in 2011).

Population and land capacity is discussed throughout the Comprehensive Plan, including the potential UGA expansion and Brekhus-Beach growth. For example, on Page 4-16/4-17, the following discussion is presented:

> ***King-Thompson***
>
> ***Location:*** *The King-Thompson UGA proposal (County Docket XVII file "Arl3") would add 239 acres with a residential density permitting up to 1800 residents. The area lies west of I-5 and shares a common border with Marysville. The area can be served with new roads and utilities, which will occur upon annexation by new development. As discussed elsewhere in this Plan, this addition will balance the loss of buildable lands in the Brekhus/Beach (Brekhus/Beach) subarea. The property lies within the Rural/Urban Transition Area (RUTA) and, once annexed to Arlington would be zoned for medium density single-family residential.*
>
> ***Infrastructure:*** *The proposal site is within Arlington's water service system and would be served with City sewer. Access from Arlington will be from 200th Street NE which crosses over I-5 from the City into the north portion of the proposal site. Access from the south will be on 19th Avenue NE, and will connect to the Marysville street system to 172nd Street NE (SR-531). Again, roads and utilities will be improved concurrent with development according to City standards and master capital facilities planning.*

….

In 2014, the County's review of the King Thompson addition argued that expansion is not supported by a land capacity analysis. It stated that the expansion area would support an additional population of 2,193 which exceeds any projected capacity shortfall for 2035. The City disagrees and, as discussed elsewhere, the addition is needed to offset lowered expectations for the TDR program in the Brekhus/Beach Subarea.

While the County may continue to disagree with the City's conclusion, the City's Plan has, to its satisfaction, accurately addressed future population estimates.

Page 3-13: Has PSRC weighed in on the MIC as a regional employment center since the projected employment stated in the plan is 12,000?

The 2015 Plan update occurs at a time when an entirely separate study is being conducted of how employment growth will occur in the Arlington-Marysville Area through 2035. The 2005 Arlington Plan discussed the prospect of an "industrial/manufacturing center":

> "The Puget Sound Regional Council and the Snohomish County Countywide Planning Policies have identified Arlington as a candidate "industrial/ manufacturing center." As one of four such centers in Snohomish County, it is recommended that Arlington identify specific geographic boundaries of this center and plan for an ultimate employment population of over 10,000 industrial and manufacturing related jobs at a gross employment density of 20 employees per acre."
>
> -- 2005 Plan Page 10-2

The industrial/commercial center described in the 2005 Plan is different that the MIC currently under review, in terms of both size and make-up. Again, PDS should be aware that there is a high likelihood of designating Arlington and Marysville as a "Manufacturing Industrial Center" (MIC) in the near future (likely in 2016). Initial steps have been taken to make this occur; for example, the legislature approved Senate Bill 5761 on the last day of the last legislative session, which supports the creation of this MIC designation and supports tax exemptions in connection with the designation. Both the mayors of Arlington, Marysville and Lake Stevens testified in support of the designation. See, for more information:
http://lawfilesext.leg.wa.gov/biennium/2015-16/Pdf/Bill%20Reports/Senate/5761%20SBR%20APS%2015.pdf

Recognizing that formal approval of the proposed MIC is still several months away, the 2015 Plan attempted to reconcile forcasted employment as follows:

> " All three growth alternatives being studied by the County call for a significant increase in Arlington employment from 8,660 in 2011 to 20,884 in 2035. This is a reflection of the expected activity around the Arlington Airport. In the County as a whole, there will be a forecasted surplus in employment land capacity in 2035.

> The City is seeking formal designation of a Manufacturing Industrial Center (MIC) including portions of Arlington and Marysville, from the airport to about 136th Street NE. The total area comprises about 2900 acres with a future employment capacity of roughly 77,000 industrial jobs, most aerospace related. The MIC area is a part of the North Puget Sound Manufacturing Corridor as designated by the Economic Alliance of Snohomish County. As the two cities seek formal MIC designation by PSRC, they will jointly pursue master planning of the area, including infrastructure."
>
> (Comprehensive Plan, Page 5-2)

The Cities of Arlington and Marysville are working closely with the PSRC in the analysis of MIC potential in the area. The PSRC is currently conducting the market study.

The CPPs show substantial employment growth for the Arlington UGA during this planning period, with total Arlington UGA (city + unincorporated) employment reaching 20,884 in 2035, which is 12,224 jobs higher than the 2011 employment estimate of 8,660 for the Arlington UGA). On page ES-7 (ES 3.3 Historic and Forecast Demand), their statement that "employment within the Water Service Area may increase by as much as 12,000" would appear to be consistent with the CPPs. Here is a link to the CPPs: http://snohomishcountywa.gov/documentcenter/view/8043 (and refer to the 2035 initial growth targets contained in Appendix B, starting on page 62).

While this represents a major change in thinking compared to the last plan, it is not as a result incorrect in any way.

Appendix S: Is Brekhus –Beach a real concept layout with a legitimate funding source for development of the water distribution system shown in the plan?

This represents a high level plan as an incentive for master plan developers to come forward with a Plan that includes a financing element for infrastructure. That is the funding mechanism and has always been the intended financing mechanism during the city's annexation of the Brekhus – Beach neighborhood as part of the TDR demonstration program. Until owners come forward with such a plan, the density remains suburban to ensure that septic will work for those owners who wish to "shadow plat" their properties.

The City thanks Snohomish County PDS for their comments. We believe they have been fairly addressed in this process as noted above.

Exhibit "A"--Sample Snohomish County Plan excerpts

LU Policies

1.A.1 UGAs shall contain sufficient land capacity for a variety of land uses and densities, including green belts and open space, in suitable locations to accommodate at least 91.5% of the county's 20-year population and employment projections. No expansion of the UGA that increases population or employment capacity shall be permitted if the resulting total additional population capacity within the Snohomish County composite UGA as documented by both City and County comprehensive plans would exceed the total 20-year forecasted UGA population growth by more than 15 percent. A portion of the 20-year forecast UGA population may be reserved for al-location to Transfer of Development Rights (TDR) receiving areas.

1.A.3 Snohomish County shall ensure a no net loss of housing capacity that preserves the County's ability to accommodate the growth targets, as adopted in Appendix D, while pursuing compliance with all relevant federal, state and local laws and regulations.

1.A.4 UGAs shall have existing or planned infrastructure capacity to adequately support urban growth over the 20-year period.

1.A.15 All UGA expansions that add residential land capacity shall be designated as TDR receiving areas and all development approvals in such areas shall be consistent with adopted TDR policies in this chapter.

1.D.1 Following the reconciliation of population and employment projections by Snohomish County Tomorrow and the county, make adjustments to UGA boundaries, if necessary. A UGA boundary adjustment shall be considered only when necessary to ensure adequate capacity for accommodating projected urban growth in the succeeding 20-year period, as required by Policy LU 1.A.10 and when it is consistent with GPP policies and the GMA.

Objective LU14.D The pilot TDR program established in partnership with the City of Arlington shall continue and may be revised by agreement of the city and the county.

14.D.1 TDR credits issued under the pilot TDR program may be transferred and used under the rules of the pilot TDR program but they cannot be used under the rules of the countywide TDR program or in any regional program.

Public Hearings

2015 City of Arlington Comprehensive Water System Plan

2015 City of Arlington Comprehensive Wastewater Plan

And 2015 Water Use Efficiency Goals

Held before the City of Arlington Planning Commission on

- Tuesday, December 1, 2015, and
- Tuesday, December 15, 2015

The attached minutes document public comments on the above plans and goals, and record the recommendations of the Planning Commissioners that the City Council approve them. Public notice of the hearings follows the minutes.

Minutes of the Arlington Planning Commission / Design Review Board Meeting

Council Chambers
110 East Third Street
December 1, 2015

Commissioners Present: Bruce Angell, Craig Chase, Ken Levesque, and Aaron MacDonald, Vernon Beach

Commissioners Absent: Mike Thomas

Staff Present: Chris Young – Building Official, Marc Hayes – Permit Center Manager, James Kelly, Public Works Director, and Amy Rusko – Associate Planner

Commission Chair Angell called the meeting to order at 7:00 p.m., and the pledge of allegiance to the flag followed.

Visitors: There were no visitors at this meeting who wished to speak on items not on the agenda.

Also known to be present: Kevin Hughes, Everett & Zala Osborn, Bob Phillips, and Mike Pitman

APPROVAL OF THE AGENDA
Commissioner Chase made a motion to approve the Agenda. Commissioner Levesque seconded the motion, which passed with a 5-0-0-1 vote.

APPROVAL OF THE CONSENT AGENDA
Commissioner Chase made a motion to approve the Consent Agenda, consisting of the minutes of **November 17, 2015.** Commissioner Levesque seconded the motion, which passed with a 5-0-0-1 vote.

CONTINUED BUSINESS

Public Hearing for Water and Sewer Comprehensive Plan

1. **Public Hearing – 2015 Wastewater Comprehensive Plan.** Commission Chair Angell opened the Public Hearing at 7:01 pm. Commissioner Beach immediately asked to be recused from the Commission, as this topic is a conflict of interest for him. Mr. Kelly conducted a Power Point presentation on the Wastewater Comprehensive Plan.

   Questions:
   - Why does it show the Average Day Flow Per Capita increasing over the next 20 years? Mr. Kelly explained that they use the trending line to average the capita, as the capita rises the average day flows will increase.

- Are the sewer lines in the future UGA expansion west of I-5 going to be developer or City funded? The City would upgrade existing lines but developers would be making the sewer line extensions.
- Why is there a requirement for connecting to sewer if you are within 500 feet of a main line? It seems to be a long ways for a homeowner to extend the line? The City uses Washington State Department of Health requirements. There have been some instances that this is not true. Depending on their current septic system and what their situation is. The Department of Health ultimately decides if they will allow a septic tank/system to be replaced or if they should connect to sewer.
- Will there be incentives for affordable housing; accessory dwellings and multi-family residential? The connection fees are currently being analyzed and there has been a proposal to reduce the fees for affordable housing. This item will be going to Council on December 14, 2015 and December 21, 2015.

Public Comment for the Public Hearing was closed at 8:25 pm.

Commissioner Chase motioned to recommend the 2015 Wastewater Comprehensive Plan to Council for approval. Commissioner Levesque seconded the motion, which passed with a 4-0-0-2 vote.

2. **Public Hearing – 2015 Water System Comprehensive Plan.** Commission Chair Angell opened the Public Hearing at 7:46 pm. Commissioner Beach remained recused from the Commission Board, as this topic is a conflict of interest for him. Mr. Kelly conducted a Power Point presentation on the Water System Comprehensive Plan and Water Use Efficiency Goals.

   Questions:
   - Why there is not a water plan for the Brekhus Beach area? Later in the presentation it was shown that there is a high level plan in place, with 2 connection points. Additional water rights were purchased for additional development in this area.
   - What is the amount of water loss per year? Is it caused by cement pipes? This was shown through the presentation and Mr. Kelly explained where the City water losses occur.
   - Could the projects be prioritized on the list? Mr. Kelly will be making changes to address this issue.
   - Could Table 9-5 be expanded? This would help serve the public better. Mr. Kelly will be expanding Table 9-5 prior to presenting at Council.

   Public Comment for the Public Hearing was closed at 8:25 pm.

   Commissioner Chase motioned to recommend the 2015 Water Comprehensive Plan to Council for approval, with the condition of expanding Table 9-5. Commissioner Levesque seconded the motion, which passed with a 4-0-0-2 vote.

3. **Public Hearing – Water Use Efficiency Goals.** Commission Chair Angell opened the Public Hearing at 8:33 pm. Commissioner Beach remained recused from the Commission Board, as this topic is a conflict of interest for him. Mr. Kelly conducted a Power Point presentation on the Water Use Efficiency Goals. Mr. Kelly discussed the

outreach efforts for conservation and educational purposes. There was no vote required for the Water Use Efficiency Goals.

Public Comment for the Public Hearing was closed at 8:43 pm.

Joint Council Workshop Meeting - 2016 Finalized Work Plan. The work plan has been finalized and will be presented at the December 14, 2015 Council Workshop with the Planning Commissioners. A completed Power Point presentation will be forwarded to the Planning Commissioners.

NEW BUSINESS

Upcoming Design Review Projects. The following is a list of future projects that will be presented in front of the Planning Commission for Design Review Board Approval.

1. San Juan Salsa – 6015 192nd Street
2. Grimmer Lot 168th – 37xx 168th Street
3. Park 77 – 20201 77th Avenue
4. The Park Self Storage – 37xx 166th Place
5. Portage Creek – 84xx 207th Street

Neighborhood Meeting for Park 77 Project. The neighborhood meeting will be held on December 15, 2015 at 5:30 pm, prior to the regularly scheduled Planning Commission meeting. The Park 77 project is a 177-unit apartment complex.

The meeting was adjourned at 8:46 pm

Bruce Angell, Commission Chair

Amy Rusko, Associate Planner

Minutes of the Arlington Planning Commission / Design Review Board Meeting

Council Chambers
110 East Third Street
December 15, 2015

Commissioners Present: Bruce Angell, Mike Thomas, Craig Chase, Ken Levesque, Vernon Beach and Kevin Hughes

Commissioners Absent: Aaron MacDonald

Staff Present: Chris Young – Building Official, Marc Hayes – Permit Center Manager, James Kelly – Public Works Director and Amy Rusko – Associate Planner

Commission Chair Angell called the meeting to order at 7:00 p.m., and the pledge of allegiance to the flag followed.

Visitors: There were no visitors at this meeting who wished to speak on items not on the agenda.

Also known to be present: Councilman Mike Hopson

APPROVAL OF THE AGENDA
Commissioner Chase made a motion to approve the Agenda. Commissioner Levesque seconded the motion, which passed with a 6-0-0-1 vote.

APPROVAL OF THE CONSENT AGENDA
Commissioner Chase made a motion to approve the Consent Agenda, consisting of the minutes of **December 1, 2015.** Commissioner Levesque seconded the motion, which passed with a 6-0-0-1 vote.

CONTINUED BUSINESS
The Public Hearing for the 2015 Wastewater Comprehensive Plan, 2015 Water System Comprehensive Plan and the Water Use Efficiency Goals was brought forth to the Planning Commissioners again. This is due to the wrong date being advertised and posted for the December 1, 2015 Public Hearing. The Public Hearing was re-advertised and was held at the December 15, 2015 Planning Commission Meeting.

1. Public Hearing – 2015 Water System Comprehensive Plan. Commission Chair Angell opened the Public Hearing at 7:01 pm. Commissioner Beach immediately recused himself from the Commission Board, as this topic is a conflict of interest for him. Mr. Kelly went to the podium to answer any additional questions that may arise. The public comment from the December 1st meeting will be used as public testimony. Mr. Kelly addressed the issues that arose from the December 1st meeting and informed the Planning Commission that those issues have been changed. There was no additional Public Comment for the 2015 Water System Comprehensive Plan.

Public Comment for the Public Hearing was closed at 7:03 pm

Commissioner Chase motioned to recommend the 2015 Water Comprehensive Plan to Council for approval. Commissioner Thomas seconded the motion, which passed with a 5-0-0-2 vote.

2. Public Hearing – 2015 Wastewater Comprehensive Plan. Commission Chair Angell opened the Public Hearing at 7:07 pm. Commissioner Beach remained recused from the Commission Board, as this topic is a conflict of interest for him. Mr. Kelly remained at the podium to answer any additional questions that may arise. The public comment from the December 1st meeting will be used as public testimony. Mr. Kelly addressed the issues that arose from the December 1st meeting and informed the Planning Commission that those issues have been changed. Vernon Beach asked questions about what the percentage is for City/Developer split in funds for sewer improvement projects. Mr. Kelly answered the questions and informed Mr. Beach that the Arlington 3 area west of I-5 would be developer funded. Mr. Beach also wanted to know why the City cannot provide infrastructure to the Brekhus Beach area of the City? Mr. Kelly explained that lift stations in the surrounding areas would be upgraded at the City's cost, but the actual lines would be developer driven.

Public Comment for the 2015 Wastewater Comprehensive Plan was closed at 7:20 pm

Commissioner Thomas motioned to recommend the 2015 Wastewater Comprehensive Plan to Council for approval. Commissioner Chase seconded the motion, which passed with a 5-0-0-2 vote.

3. Public Hearing – Water Use Efficiency Goals. Commission Chair Angell opened the Public Hearing at 7:21 pm. Commissioner Beach remained recused from the Commission Board, as this topic is a conflict of interest for him. Mr. Kelly remained at the podium to answer any additional questions that may arise. The public comment from the December 1st meeting will be used as public testimony.

Public Comment for the 2015 Wastewater Comprehensive Plan was closed at 7:22 pm

Commissioner Thomas motioned to recommend the Water Use Efficiency Goals to Council for approval. Commissioner Levesque seconded the motion, which passed with a 5-0-0-2 vote.

4. Council Workshop Follow Up – 2016 Work Plan. Mr. Young discussed the presentation of the 2016 Work Plan at the City Council meeting on December 14, 2015. It was well received by Council and they liked the way everything was explained and shown on the work plan. Mr. Hopson discussed that Council would like to see an anchor and show how everything interconnects with each other. This path should be clear and concise. Mr. Hopson would also like to have clarification on land use, especially between the Arlington – 3 and Brekhus Beach areas. Mr. Young explained that the work plan will show how we get from here to there (the big picture to the details).

NEW BUSINESS

Horizontal Mixed Use Discussion. Mr. Young explained the need from developers to create horizontal mixed use areas, either through an overlay or straight zoning change in the permissible use table. The City allows for vertical mixed use right now and this allows for commercial uses on the first floor and apartments on the second floor and up within the same building. Horizontal mixed use will allow for commercial uses by the street frontages and residential behind in separate buildings, most commonly with the parking area between. The

residential will be allowed to be smaller single family homes, townhouses, condos, cottage housing or apartments. Horizontal mixed use will allow for more variety and help us meet our affordable housing options. The AHA reported that Arlington lacks 1 and 2 bedroom units. This would allow for residential units to come first and then the commercial businesses to follow once they know that there will be a base of people that will shop at the stores. Horizontal Mixed Use will allow for a more Design Based or Form Based zoning which will allow for the City to determine what the project will look like and how it will function. There was some discussion between the Planning Commissioners and Mr. Young.

I-502 Producer/Processor Ordinance Discussion. Mr. Young led the discussion of the Ordinance change for the I-502 Producer/Processors. The current Ordinance is set to sunset on December 31, 2015. We need to develop a new ordinance quickly but should be thought out so we are not asking for a moratorium in a few months. The draft ordinance has been sent to the newspaper for publication and sent to the Department of Commerce for review. We are hoping for an expedited review from DOC. The top items for the Ordinance include increasing the growing canopy and lifting the cap of 14 businesses within the City limits. Currently there are two businesses that want to relocated from the County to the City and there is one business that would like to expand. There was a lengthy discussion about the I-502 Producer/Processors, the MIC designation, jobs and is this what the City really wants. There will be a workshop with the Marijuana Coalition at the January 5, 2015 Planning Commission Meeting. The Coalition will be able to explain what the trends are for the marijuana industry and how many people are employed by the businesses, along with salary detail information.

The meeting was adjourned at 9:03 pm

Bruce Angell, Commission Chair

Amy Rusko, Commission Secretary

CITY OF ARLINGTON
NOTICE OF PUBLIC HEARING
AMC 13.04.110

The City of Arlington will hold an information session and Public Hearing on the 2015 Comprehensive Water System Plan and proposed Water use Efficiency Goals before the Planning Commission on Tuesday, December 15, 2015 at 7:00PM in the City Council Chambers located at 110 East 3rd Street in Arlington. A copy of the Wastewater Plan and related information can be found on the City's website: http://arlingtonwa.gov/index.aspx?page=244

CITY OF ARLINGTON
NOTICE OF PUBLIC HEARING
AMC 13.08.110

The City of Arlington will hold an information session and Public Hearing on the 2015 Comprehensive Wastewater Plan before the Planning Commission on Tuesday, December 15, 2015 at 7:00PM in the City Council Chambers located at 110 East 3rd Street in Arlington. A copy of the Wastewater Plan and related information can be found on the City's website: http://arlingtonwa.gov/index.aspx?page=245

Everett Daily Herald

Affidavit of Publication

State of Washington }
County of Snohomish } ss

Kathleen Landis being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Everett Daily Herald a daily newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a daily newspaper in Snohomish County, Washington and is and always has been printed in whole or part in the Everett Daily Herald and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Snohomish County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of EDH672473 AMC 13.04.110 as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 12/07/2015 and ending on 12/07/2015 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is $20.64.

Kathleen Landis

Subscribed and sworn before me on this 8 day of Dec, 2015.

Debra Ann Grigg

Notary Public in and for the State of Washington.

City of Arlington/LEGAL ADS | 14100277
AMY RUSKO

DEBRA ANN GRIGG
Notary Public
State of Washington
My Commission Expires
October 31, 2017

CITY OF ARLINGTON
NOTICE OF PUBLIC HEARING
AMC 13.04.110

The City of Arlington will hold an information session and Public Hearing on the 2015 Comprehensive Water System Plan and proposed Water use Efficiency Goals before the Planning Commission on Tuesday, December 15, 2015 at 7:00PM in the City Council Chambers located at 110 East 3rd Street in Arlington. A copy of the Wastewater Plan and related information can be found on the City's website:
http://arlingtonwa.gov/index.aspx?page=244
Published: December 7, 2015. EDH672473

B4

Everett Daily Herald

Affidavit of Publication

State of Washington }
County of Snohomish } ss

Kathleen Landis being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Everett Daily Herald a daily newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a daily newspaper in Snohomish County, Washington and is and always has been printed in whole or part in the Everett Daily Herald and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Snohomish County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of EDH672472 AMC 13.08.110 as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 12/07/2015 and ending on 12/07/2015 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is $18.92.

Kathleen Landis

Subscribed and sworn before me on this 8 day of Dec, 2015.

Debra Ann Grigg

Notary Public in and for the State of Washington.

DEBRA ANN GRIGG
Notary Public
State of Washington
My Commission Expires
October 31, 2017

City of Arlington/LEGAL ADS | 14100277
AMY RUSKO

CITY OF ARLINGTON
NOTICE OF PUBLIC HEARING
AMC 13.08.110

The City of Arlington will hold an information session and Public Hearing on the 2015 Comprehensive Wastewater Plan before the Planning Commission on Tuesday, December 15, 2015 at 7:00PM in the City Council Chambers located at 110 East 3rd Street in Arlington. A copy of the Wastewater Plan and related information can be found on the City's website:
http://arlingtonwa.gov/index.aspx?page=245
Published: December 7, 2015. EDH672472

COMMUNITY & ECONOMIC DEVELOPMENT
PLANNING & LAND USE DIVISION

ARLINGTON AIRPORT OFFICE
18204 59th Ave NE
Arlington, WA 98223
8am – 5pm M-F
Closed Holidays

360.403.3551
arlingtonwa.gov

CITY AFFIDAVIT OF POSTING

I, AMY RUSKO, do hereby certify that on 12/07/2015, (mm/dd/year) I posted public notice for planning File № PLN#1666 at the following locations:

☒ City Hall ☒ Arlington Library ☒ Arlington Post Office
☒ Smokey Point Post Office ☐ City Website ☐ On-Site

and to the following persons and agencies:

☐ Applicant ☐ Agencies with Jurisdiction ☐ Property Owners (w/in 500' radius) ☐ Parties of Record

Stating:

1) that a public hearing will be held by the

☒ Planning Commission ☐ City Council ☐ Hearing Examiner

In the City Council Chambers, located at 110 East 3rd Street in Arlington, WA on

DECEMBER 15, 2015, (mm/dd/year) at 7:00 PM (time)

2) ☐ the City issued SEPA Threshold Determination for this project

3) ☐ the City issued Notice of Application for this project

4) ☐ the City issued combined Notice of Application and SEPA Threshold Determination

Amy Rusko
Signature

December 8, 2015
Date

STATE OF WASHINGTON)
) ss.
COUNTY OF SNOHOMISH)

I certify that I know or have satisfactory evidence that Amy Rusko is the person who appeared before me, and said person acknowledge that (he/she) posted the attached notice on the date specified and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument:

MARY B. HINE NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 1-09-19

Mary B Hine
Notary Public in and for the State of Washington residing at

Marysville
My appointment expires 1-9-19

COMMUNITY & ECONOMIC DEVELOPMENT
PLANNING & LAND USE DIVISION

ARLINGTON AIRPORT OFFICE
18204 59th Ave NE
Arlington, WA 98223
8am – 5pm M-F
Closed Holidays

360.403.3551
arlingtonwa.gov

CITY AFFIDAVIT OF POSTING

I, Amy Rusko, do hereby certify that on 12/02/2015, (mm/dd/year) I posted public notice for planning File № PLN#170 at the following locations:

☒ City Hall ☒ Arlington Library ☒ Arlington Post Office
☒ Smokey Point Post Office ☐ City Website ☐ On-Site

and to the following persons and agencies:

☐ Applicant ☐ Agencies with Jurisdiction ☐ Property Owners (w/in 500' radius) ☐ Parties of Record

Stating:

1) that a public hearing will be held by the

☒ Planning Commission ☐ City Council ☐ Hearing Examiner

In the City Council Chambers, located at 110 East 3rd Street in Arlington, WA on

DECEMBER 15, 2015, (mm/dd/year) at 7:00 PM (time)

2) ☐ the City issued SEPA Threshold Determination for this project

3) ☐ the City issued Notice of Application for this project

4) ☐ the City issued combined Notice of Application and SEPA Threshold Determination

Amy Rusko
Signature

December 8, 2015
Date

STATE OF WASHINGTON)
) ss.
COUNTY OF SNOHOMISH)

I certify that I know or have satisfactory evidence that Amy Rusko is the person who appeared before me, and said person acknowledge that (he/she) posted the attached notice on the date specified and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

MARY B. HINE NOTARY PUBLIC COMMISSION EXPIRES 1-09-19

Mary B Hine
Notary Public in and for the State of Washington residing at

Marysville
My appointment expires 1-9-19

U WATER MAIN REPAIR AND REPLACEMENT CRITERIA AND PRIORITIZATION

U.1 SPREADSHEET CONTAINING WATER MAIN REPAIR AND REPLACEMENT CRITERIA AND PRIORITIZATION (6 PAGES)

The calculations in this appendix provide the details of the prioritization process for the water mains identified for possible replacement in Table 9-5 of this 2015 WSP.

The parameters identified in this spreadsheet are discussed in Section 9.9.1 and Table 9-4.

The results of this analysis are considered when scheduling water mains for replacement under CIP Project WM1. See Section 9.3.2 and Table 9-6.

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City of Arlington 2015 Comprehensive Water System Plan

Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
1	Broadway St	Falcon St	Haller Ave	131	6	12	J-7	J-989	3	P-1574	1960	2	AC	3	2	10	31	H
1	Broadway St	Haller Ave	Dead-end	130	4	12	J-7	J-993	3	P-1584	0	1	DI	1	2	7		
1	Haller Ave	West Ave	Broadway St	457	4	12	J-2	J-7	3	P-6	1960	2	AC	3	2	10		
1	Haller Ave	Broadway St	Dead-end	214	8	12	J-7	J-994	3	P-1583	0	1	DI	1	2	7		
1	Railroad St	WTP	Haller Park	124	8	12	J-1	J-876	3	P-1367	1990	1	DI	1	2	7		
2	Burke Ave	Broadway St	Newberry St	450	6	12	J-990	J-991	1	P-1578	1960	2	AC	3	2	8	34	H
2	Burke Ave, Manhattan Ave	Newberry St	Gilman Ave	795	6	12	J-991	J-11	1	P-1579	1960	2	AC	3	2	8		
2	Manhattan Ave	Gilman Ave	Rockery Rd	162	4	12	J-11	J-995	3	P-1585	1960	2	AC	3	2	10		
2	Manhattan Ave	Rockery Rd	Division St	210	4	12	J-995	J-12	3	P-1586	1960	2	AC	3	2	10		
2	Manhattan Ave	Division St	Fifth St	525	4	12	J-12	J-20	3	P-22	1950	3	AC	3	2	11		
3	Gilman Ave	Railroad St	Broadway St	446	4	12	J-5	J-9	2	P-11	1960	2	AC	3	2	9	27	H
3	Gilman Ave	Broadway St	Newberry St	479	4	12	J-9	J-265	2	P-12	1960	2	AC	3	2	9		
4	Talcott St, Division St	Gilman Ave	Just West of Alcazar Ave	855	8	12	J-517	J-1024	2	P-1645	1990	1	DI	1	2	6	18	M
4	Division St	Just West of Alcazar Ave	Alcazar Ave	35	8	12	J-1024	J-879	2	P-1646	2014	1	DI	1	2	6		
5	Division St, SR9	West Ave	Burke Ave	1919	6	12	J-3	J-877	3	P-1371	1960	2	AC	3	1	9	29	H
5	Burke Ave	SR9	West Ave	390	8	12	J-877	J-231	3	P-1372	1960	2	DI	1	1	7		
6	Olympic Ave	Division St (North)	Division St (South)	141	8	12	J-441	J-442	3	P-761	2000	1	DI	1	1	6	20	M
7	Division St	French Ave	Manhattan Ave	308	4	8	J-12	J-268	3	P-21	1950	3	AC	3	2	11	34	H
7	Division St, Dunham Ave	French Ave	Fifth St	842	6	8	J-18	J-268	2	P-351	1990	1	DI	1	2	6		
7	French Ave	Division St	Fifth St	524	4	8	J-19	J-268	2	P-350	1950	3	AC	3	2	10		
8	Park Hill Dr	Alcazar Ave	Just East of Alcazar Ave	116	8	12	J-25	J-26	1	P-25	1950	3	DI	1	1	6	26	H
8	Park Hill Dr	Just East of Alcazar Ave	Dead-end	628	6	12	J-26	J-519	3	P-871	1970	2	DI	1	1	7		
9	Fifth St	Clara St	Clara St Dead-end	856	8	12	J-46	J-47	3	P-64	1960	2	DI	1	1	7	23	M
9	Driveway	Clara St Dead-end	Parking Lot	390	6	12	J-47	J-48	3	P-65	1980	2	DI	1	1	7		
10	Clara St	Fourth St	Clara St Dead-end	613	4	8	J-52	J-998	1	P-1595	0	1	AC	3	2	7	26	H
10	Clara St	Fourth St	Fifth St	486	6	8	J-49	J-52	1	P-68	1950	3	AC	3	2	9		
11	Broadway St	SR530	Gilman Ave	279	6	12	J-990	J-9	2	P-1582	1960	2	AC	3	2	9	31	H
11	Broadway St	Gilman Ave	Division St	310	6	12	J-9	J-910	2	P-13	1960	2	AC	3	2	9		
11	Division St	Broadway St	Dunham Ave	254	8	12	J-10	J-878	3	P-1373	1990	1	DI	1	2	7		
11	Division St, Rockery Rd	Dunham Ave	Manhattan Ave	802	2	12	J-878	J-995	3	P-1587	0	1	PVC	1	2	7		
12	Fifth St	West Ave	Railroad St	337	NA	12	J-690	J-848	3	P-1288		1		1	2	7	34	H
12	Fifth St	Railroad St	Olympic Ave	127	8	12	J-16	J-690	3	P-634	0	1	DI	1	2	7		
12	Fifth St	Olympic Ave	Macleod Ave	260	6	8	J-16	J-17	1	P-27	1950	3	AC	3	2	9		
12	Fifth St	Macleod Ave	Dunham Ave	316	6	8	J-17	J-18	1	P-28	1950	3	AC	3	2	9		
12	Fifth St	Dunham Ave	French Ave	328	6	8	J-18	J-19	1	P-29	1950	3	AC	3	2	9		
12	Fifth St	French Ave	High St	322	6	8	J-19	J-20	1	P-30	1950	3	AC	3	2	9		
12	Fifth St	High St	Gifford Ave	282	6	8	J-20	J-21	1	P-31	1950	3	AC	3	2	9		
12	Fifth St	Gifford Ave	Just West of Washington Ave	271	6	8	J-21	J-22	1	P-32	1950	3	AC	3	2	9		
12	Fifth St	Just West of Washington Ave	Washington Ave	19	6	12	J-22	J-999	2	P-1596	1950	3	AC	3	2	10		
12	Fifth St	Washington Ave	Stillaguamish Ave	273	6	12	J-999	J-23	2	P-1597	1950	3	AC	3	2	10		
12	Fifth St	Stillaguamish Ave	Just West of Alcazar Ave	219	6	12	J-23	J-997	2	P-1590	1950	3	AC	3	2	10		
12	Parking Lot	West Ave	Parking Lot	133	8	12	J-1001	J-1003	3	P-1602	0	1	DI	1	1	6		
12	Parking Lot	Parking Lot	Parking Lot	211	2	12	J-1003	J-1002	3	P-1603	0	1	GALV	2	1	7		
13	Fourth St	SR9	West Ave	422	4	8	J-15	J-521	3	P-874	1960	2	AC	3	1	9	29	H
14	Fourth St	Macleod Ave	Dunham Ave	308	4	8	J-762	J-31	1	P-1072	1960	2	AC	3	2	8	31	H
14	Fourth St	Olympic Ave	Just West of Olympic Ave	67	8	12	J-1005	J-689	3	P-1607	0	1	DI	1	2	7		
15	Fourth St	Gifford Ave	West of Washington Ave	135	8	12	J-39	J-40	2	P-55	1990	1	DI	1	2	6	18	M
15	Fourth St	West of Washington Ave	Washington Ave	141	8	12	J-40	J-41	2	P-56	1990	1	DI	1	2	6		
15	Fourth St	Washington Ave	Stillaguamish Ave	294	8	12	J-41	J-42	1	P-59	1990	1	DI	1	2	5		
16	Gifford Ave	Fifth St	School	444	6	12	J-21	J-39	1	P-53	1950	3	AC	3	2	9	30	H
16	Washington Ave	Fifth St	School	457	4	12	J-41	J-22	1	P-58	1950	3	AC	3	2	9		
16	Washington Ave	School	Third St	423	8	12	J-41	J-637	1	P-454	0	1	DI	1	2	5		
16	Stillaguamish Ave	Fifth St	Fourth St	446	4	12	J-42	J-23	2	P-61	1950	3	AC	3	2	10		
17	Washington Ave	Fifth St	Dead-end	263	6	12	J-999	J-1000	3	P-1598	0	1	DI	1	1	6	20	M
18	School Property	North Side of School Building	North Side of School Building	169	8	12	J-636	J-39	1	P-451	0	1	DI	1	2	5	14	L
18	School Property	North Side of School Building	Third St	457	8	12	J-1006	J-636	1	P-1610	0	1	DI	1	2	5		
19	Clara St	Fifth St	Fourth St	204	8	12	J-647	J-648	3	P-468	2006	1	DI	1	1	6	20	M
20	Third St	SR9	West Ave	259	2	12	J-28	J-1004	3	P-1604	0	1	GALV	2	2	8	34	H
20	Third St	West Ave	Centennial Trail	199	6	12	J-28	J-764	1	P-1075	1950	3	AC	3	2	9		
20	Third St	Centennial Trail	Just East of Centennial Trail	114	8	12	J-764	J-29	2	P-1160	0	1	DI	1	2	6		
20	Third St	Just East of Centennial Trail	Olympic Ave	115	6	12	J-29	J-30	2	P-44	1960	2	AC	3	2	9		
20	Third St	Olympic Ave	Macleod Ave	253	8	12	J-30	J-32	1	P-45	1990	1	DI	1	2	5		
20	Third St	Macleod Ave	Dunham Ave	307	8	12	J-32	J-33	1	P-46	1990	1	DI	1	2	5		
20	Third St	Dunham Ave	French Ave	337	8	12	J-33	J-34	1	P-47	1960	2	AC	3	2	8		
20	Third St	French Ave	West of Lenore Ave	325	8	12	J-34	J-37	1	P-51	1960	2	AC	3	2	8		
20	Third St	West of Lenore Ave	Lenore Ave	42	8	12	J-37	J-1006	1	P-1608	1960	2	AC	3	2	8		
20	Third St	Lenore Ave	Gifford Ave	271	8	12	J-1006	J-38	1	P-1609	1960	2	AC	3	2	8		
20	Third St	Gifford Ave	East of Washington Ave	197	8	12	J-38	J-637	1	P-452	1960	2	AC	3	2	8		
20	Third St	East of Washington Ave	Washington Ave	158	8	12	J-637	J-58	1	P-453	1960	2	AC	3	2	8		
20	Third St	Washington Ave	Stillaguamish Ave	315	8	12	J-58	J-59	1	P-82	1960	2	AC	3	2	8		

City of Arlington 2015 Comprehensive Water System Plan

Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
20	Third St/E Robinhood Dr	Stillaguamish Ave	Dead-end	825	6	12	J-59	J-520	3	P-873	1970	2	DI	1	1	7		
21	West Ave	Third St	Second St	438	8	12	J-763	J-764	1	P-1077	0	1	DI	1	2	5	14	L
21	Second St	West Ave	Centennial Trail	207	8	12	J-61	J-763	1	P-1074	0	1	DI	1	2	5		
21	Second St	Centennial Trail	Macleod Ave	326	8	12	J-61	J-270	1	P-600	0	1	DI	1	2	5		
22	Macleod Ave	Third St	Second St	445	8	12	J-32	J-270	1	P-353	1990	1	DI	1	2	5	23	M
22	Macleod Ave	Second St	First St	449	6	12	J-270	J-269	1	P-354	1960	2	AC	3	2	8		
23	Second St	French Ave	Lenore Ave	322	6	12	J-62	J-63	1	P-87	1990	1	DI	1	2	5	14	L
24	Parking Lot	Macleod Ave	Parking Lot	59	8	12	J-443	J-1097	3	P-1788	0	1	DI	1	1	6	20	M
25	Second St	Washington Ave	Stillaguamish Ave	295	6	8	J-64	J-65	1	P-90	1980	2	DI	1	2	6	17	M
26	Parking Lot	71st Ave NE	Parking Lot	263	8	12	J-116	J-1043	3	P-1683	0	1	DI	1	1	6	20	M
26	Parking Lot	71st Ave NE	Aerospace Manufacturing Tech	852	8	12	J-1040	J-1044	3	P-1684	0	1	DI	1	1	6		
27	First St	French Ave	Lenore Ave	315	8	12	J-68	J-69	1	P-97	2000	1	DI	1	2	5	14	L
27	First St	Lenore Ave	Gifford Ave	289	8	12	J-69	J-70	1	P-99	2000	1	DI	1	2	5		
27	First St	Gifford Ave	Washington Ave	315	8	12	J-70	J-71	1	P-102	2012	1	DI	1	2	5		
27	First St	Washington Ave	Stillaguamish Ave	328	8	12	J-71	J-72	1	P-103	2012	1	DI	1	2	5		
28	218th Pl NE	87th Ave NE	Dead-end	206	8	12	J-436	J-439	1	P-757	1990	1	DI	1	1	4	12	L
29	217th Pl NE	87th Ave NE	Dead-end	190	8	12	J-438	J-440	1	P-758	1990	1	DI	1	1	4	12	L
30	Maple St	Stillaguamish Ave	East of Stillaguamish Ave	309	4	8	J-89	J-90	2	P-126	1950	3	AC	3	2	10	30	H
30	Maple St	East of Stillaguamish Ave	West Side of Hamlin Dr	181	6	8	J-90	J-300	2	P-547	1960	2	DI	1	2	7		
30	Maple St	West Side of Hamlin Dr	East Side of Hamlin Dr	41	6	12	J-300	J-1025	1	P-1650	1990	1	DI	1	2	5		
30	Maple St	East Side of Hamlin Dr	87th Ave NE	712	6	8	J-1025	J-211	1	P-1651	1990	1	DI	1	2	5		
31	Lenore Ave	First St	School	103	8	12	J-69	J-631	2	P-440	1950	3	AC	3	2	10	34	H
31	School	NW Corner of Building	West of Building	256	8	12	J-631	J-634	3	P-445	1950	3	AC	3	2	11		
31	School	West of Building	SW Corner of Building	273	NA	12	J-634	J-635	3	P-1284		1		1	2	7		
31	School	French Ave	SW Corner of Building	328	8	12	J-81	J-635	2	P-446	1990	1	DI	1	2	6		
31	School	SW Corner of Building	South of Building	289	8	12	J-635	J-82	2	P-447	1990	1	DI	1	2	6		
31	School	South of Building	East of Building	323	8	12	J-82	J-633	2	P-442	1990	1	DI	1	2	6		
31	School	NW Corner of Building	NE Corner of Building	681	8	12	J-631	J-632	2	P-441	1950	3	AC	3	2	10		
31	School	NE Corner of Building	East of Building	144	8	12	J-632	J-633	1	P-444	1950	3	AC	3	2	9		
31	School	East of Building	Washington Ave	301	8	12	J-633	J-83	1	P-443	1990	1	DI	1	2	5		
32	Driveway off Old Burn Rd	Driveway	Driveway	179	4	8	J-986	J-985	3	P-1572	0	1	DI	1	1	6	20	M
33	Maple St	West Ave	Olympic Ave	510	8	12	J-78	J-79	1	P-108	1950	3	AC	3	1	8	24	H
34	Union St	Cobb Ave	West of Olympic Ave	199	4	12	J-85	J-426	3	P-734	1950	3	AC	3	2	11	34	H
34	Union St	West of Olympic Ave	Olympic Ave	60	4	12	J-426	J-86	3	P-735	1990	1	DI	1	2	7		
34	Union St	Olympic Ave	East of Olympic Ave	62	4	12	J-86	J-427	3	P-736	1990	1	DI	1	2	7		
34	Union St	East of Olympic Ave	Macleod Ave	236	4	12	J-427	J-87	3	P-737	1950	3	AC	3	2	11		
34	Union St	Macleod Ave	Dunham Ave	314	4	8	J-87	J-88	3	P-121	1960	2	AC	3	2	10		
35	Cobb Ave	Union St	Highland Dr	840	6	8	J-95	J-85	3	P-131	1950	3	AC	3	2	11	34	H
36	Jackson St	Olympic Ave	~Macleod Ave	86	8	12	J-424	J-425	3	P-733	1990	1	DI	1	1	6	20	M
37	Maple St	Dunham Ave	Alley West of Dunham Ave	209	8	12	J-80	J-880	3	P-1379	1990	1	DI	1	2	7	31	H
37	Maple St, Macleod Ave	Alley West of Dunham Ave	Union St	762	4	8	J-80	J-87	3	P-123	1960	2	AC	3	2	10		
37	Macleod Ave	Union St	Highland Dr	836	4	8	J-97	J-87	3	P-135	1960	2	AC	3	2	10		
37	Macleod Ave	Highland Dr	Dead-end	236	8	12	J-97	J-702	2	P-894	0	1	DI	1	2	6		
38	French Ave	Fifth St	Fourth St	445	6	12	J-19	J-35	3	P-48	1950	3	AC	3	2	11	34	H
38	French Ave	Fourth St	Third St	457	6	12	J-35	J-34	3	P-49	1950	3	AC	3	2	11		
38	French Ave	Third St	Second St	431	6	12	J-34	J-62	1	P-85	1950	3	AC	3	2	9		
38	French Ave	Second St	First St	452	6	12	J-62	J-68	1	P-94	1950	3	AC	3	2	9		
38	French Ave	First St	Maple Ave	422	6	12	J-68	J-81	2	P-112	1950	3	AC	3	2	10		
38	French Ave	Maple Ave	Highland Dr	1258	6	12	J-81	J-99	2	P-139	1950	3	AC	3	2	10		
39	Hospital Property	West Side of Hospital	Stillaguamish Ave	650	8	12	J-459	J-460	3	P-792	1980	2	DI	1	2	8	25	H
39	Hospital Property	West Side of Hospital	Highland Dr	654	NA	12	J-460	J-847	3	P-1283		1		1	2	7		
40	Stillaguamish Ave	Third St	Second St	420	8	8	J-59	J-65	1	P-89	1960	2	AC	3	2	8	26	H
40	Stillaguamish Ave	Second St	First St	436	8	8	J-65	J-1007	1	P-1614	1960	2	AC	3	2	8		
40	Stillaguamish Ave	First St	North of School Driveway	194	8	12	J-72	J-76	1	P-106	2012	1	DI	1	2	5		
40	Stillaguamish Ave	North of School Driveway	School Driveway	246	8	12	J-83	J-76	1	P-116	0	1	DI	1	2	5		
40	Stillaguamish Ave	School Driveway	South of School Driveway	66	8	12	J-83	J-1008	1	P-1615	2000	1	DI	1	2	5		
40	Stillaguamish Ave	South of School Driveway	Maple St	251	8	12	J-1008	J-89	1	P-1616	1950	3	AC	3	2	9		
40	Stillaguamish Ave	Maple St	Hospital Parking Lot Entrance	168	8	12	J-459	J-89	1	P-791	1950	3	AC	3	2	9		
40	Stillaguamish Ave	Hospital Parking Lot Entrance	Arlington Gospel Hall Entrance	148	8	12	J-358	J-459	1	P-790	1950	3	AC	3	2	9		
40	Stillaguamish Ave	Arlington Gospel Hall Entrance	Medical Center Dr	221	8	12	J-93	J-358	1	P-638	1950	3	AC	3	2	9		
40	Stillaguamish Ave	Medical Center Dr	Highland Dr	434	8	12	J-102	J-93	1	P-142	1950	3	AC	3	2	9		
40	Stillaguamish Ave	Highland Dr	Wesley St	289	10	12	J-102	J-209	1	P-157	1960	2	AC	3	2	8		
40	Stillaguamish Ave	Wesley St	East Apartment Driveway	299	10	12	J-209	J-302	1	P-551	1990	1	DI	1	2	5		
40	Stillaguamish Ave	East Apartment Driveway	West Apartment Driveway	97	10	12	J-302	J-775	1	P-1099	1990	1	DI	1	2	5		
41	Medical Center Dr	Stillaguamish Ave	North Apartment Driveway	446	8	12	J-93	J-1027	1	P-1658	0	1	DI	1	2	5	14	L
41	Medical Center Dr	North Apartment Driveway	South Apartment Driveway	223	8	12	J-701	J-1027	1	P-1655	0	1	DI	1	2	5		
41	Medical Center Dr	South Apartment Driveway	212th St SE	249	8	12	J-698	J-701	1	P-875	0	1	DI	1	2	5		
41	Apartment Property	North Apartment Driveway	West of Hamlin Dr	189	8	12	J-1028	J-1027	1	P-1657	2006	1	DI	1	2	5		
41	Apartment Property	West of Hamlin Dr	South End of Hamlin Dr	136	8	12	J-1026	J-1028	1	P-1656	1990	1	DI	1	2	5		
41	Hamlin Dr	South End of Hamlin Dr	Maple St	329	8	12	J-1025	J-1026	1	P-1652	1990	1	DI	1	2	5		
42	Highland Dr	Hazel St	SR9	147	6	12	J-94	J-1009	3	P-1618	1950	3	AC	3	2	11	34	H
42	Highland Dr	SR9	Cobb Ave	119	6	12	J-1009	J-95	3	P-1619	1950	3	AC	3	2	11		

City of Arlington 2015 Comprehensive Water System Plan

Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
42	Highland Dr	Cobb Ave	Olympic Ave	262	6	8	J-95	J-96	2	P-132	1950	3	AC	3	2	10		
42	Highland Dr	Olympic Ave	Macleod Ave	221	6	8	J-423	J-97	2	P-731	1950	3	AC	3	2	10		
42	Highland Dr	Macleod Ave	Dunham Ave	319	6	8	J-97	J-98	2	P-136	1950	3	AC	3	2	10		
42	Highland Dr	Dunham Ave	French Ave	305	6	8	J-98	J-99	2	P-138	1950	3	DI	1	2	8		
42	Highland Dr	French Ave	Lutheran Church	758	6	12	J-99	J-100	2	P-140	1950	3	DI	1	2	8		
42	Highland Dr	Lutheran Church	Hospital Property	227	8	12	J-100	J-847	1	P-1377	1960	2	AC	3	2	8		
42	Highland Dr	Hospital Property	Stillaguamish Ave	184	8	12	J-847	J-102	1	P-1378	1960	2	AC	3	2	8		
42	SR9	Highland Dr	Between Florence St and Marion St	390	6	12	J-1009	J-1010	3	P-1620	0	1	AC	3	2	9		
43	Easement	Joanne Ln	67th Ave NE	361	6	8	J-104	J-106	2	P-147	1980	2	DI	1	1	6	19	M
44	Hazel St	Highland Dr	Florence St	264	4	12	J-94	J-107	1	P-148	1960	2	AC	3	2	8	31	H
44	Florence St	Hazel St	Hillcrest Dr	338	4	8	J-107	J-1075	3	P-1743	1960	2	AC	3	2	10		
44	Hillcrest Dr	Florence St	Dead-end	240	4	12	J-1075	J-1076	3	P-1745	0	1	AC	3	2	9		
44	Florence St	Hillcrest Dr	Corner of Florence St and Kona Dr	174	4	8	J-1075	J-512	3	P-1744	1960	2	AC	3	2	10		
44	Kona Dr	Corner of Florence St and Kona Dr	Joann Ln	118	4	8	J-512	J-558	3	P-925	1980	2	DI	1	2	8		
44	Kona Dr	Joann Ln	Marion St	331	4	8	J-513	J-558	3	P-927	1970	2	DI	1	2	8		
44	Marion St	Kona Dr	Dead-end	666	4	8	J-881	J-513	3	P-1381	1980	2	DI	1	2	8		
44	Marion St	Kona Dr	Hazel St	536	4	8	J-513	J-108	3	P-150	1960	2	AC	3	2	10		
45	Wesley St, Parking Lot	Stillaguamish Ave	Parking Lot	978	8	12	J-209	J-210	1	P-275	1990	1	DI	1	2	5	14	L
46	79th Ave NE	Portage St	Cul-de-Sac	248	8	12	J-1016	J-563	1	P-1632	1980	2	DI	1	1	5	23	M
46	Portage St	210th Pl NE	Dead-end	208	8	12	J-213	J-562	3	P-933	2000	1	DI	1	1	6		
46	Retirement Home	Parking Lot	Parking Lot	139	8	12	J-1014	J-1011	3	P-1625	0	1	DI	1	1	6		
46	Retirement Home	Parking Lot	Parking Lot	105	8	12	J-1013	J-1012	3	P-1626	0	1	DI	1	1	6		
47	Jensen St	Hazel St	Jensen St Halfway Point	630	4	12	J-109	J-110	3	P-153	1960	2	AC	3	2	10	31	H
47	Jensen St	Jensen St Halfway Point	Dead-end	428	6	12	J-110	J-111	3	P-154	1970	2	DI	1	1	7		
48	Oso Lumber	67th Ave NE	SW Corner of Lot	912	8	12	J-229	J-1070	2	P-1736	1990	1	DI	1	2	6	18	M
48	Oso Lumber	SW Corner of Lot	East Corner of Lot	1367	8	12	J-1070	J-1071	2	P-1738	0	1	DI	1	2	6		
48	Oso Lumber	SW Corner of Lot	South Corner of Lot	499	8	12	J-1070	J-1073	2	P-1740	1990	1	DI	1	2	6		
48	Oso Lumber	South Corner of Lot	East Corner of Lot	475	8	12	J-1073	J-1071	2	P-1741	0	1	DI	1	2	6		
48	Oso Lumber	East Corner of Lot	Hazel St	428	8	12	J-1071	J-770	1	P-1742	0	1	DI	1	2	5		
49	Hazel St	Jensen St	Oso Lumber	421	6	12	J-109	J-770	1	P-1088	1990	1	DI	1	2	5	31	H
49	Hazel St	Oso Lumber	North of 204th St NE	668	6	12	J-770	J-1039	3	P-1674	1990	1	DI	1	2	7		
49	Dead-End	North of 204th St NE	Just West of Hazel St	75	8	12	J-1039	J-1038	3	P-1676	0	1	DI	1	1	6		
49	Hazel St	North of 204th St NE	204th St NE (N)	226	6	12	J-1039	J-1035	3	P-1675	1990	1	DI	1	2	7		
49	Hazel St	204th St NE (N)	204th St NE (S)	11	10	12	J-1035	J-113	1	P-1667	1960	2	AC	3	2	8		
50	Safeway Property	Olympic Pl	Safeway Building	275	8	12	J-797	J-798	1	P-1143	0	1	DI	1	2	5	22	M
50	Safeway Property	Safeway Building	Olympic Pl	631	8	12	J-798	J-799	1	P-1146	0	1	DI	1	2	5		
50	Autozone Property	Olympic Pl	Dead-end	173	8	12	J-799	J-1019	3	P-1636	0	1	DI	1	1	6		
51	Keith Ln	207th St NE	81st Dr NE	394	8	12	J-218	J-1017	1	P-1633	1990	1	DI	1	2	5	14	L
51	81st Dr NE	Keith Ln	North Dead-end	266	8	12	J-1017	J-1018	1	P-1635	0	1	DI	1	1	4		
51	81st Dr NE	Keith Ln	South Dead-end	419	8	12	J-1017	J-219	1	P-1634	1990	1	DI	1	1	4		
52	Stillaguamish Ave	Lower Burn Road PRV	School Property	340	8	12	J-624	J-352	1	P-1019	0	1	DI	1	3	6	16	M
52	School Property	Stillaguamish Ave	207th St NE	991	8	12	J-352	J-271	1	P-626	1990	1	DI	1	2	5		
52	Stillaguamish Ave	School Property	207th St NE	320	8	12	J-112	J-352	1	P-625	1990	1	DI	1	2	5		
53	210th St NE	66th Ave NE	Cul-de-Sac	434	8	12	J-602	J-603	1	P-990	1980	2	DI	1	1	5	15	L
54	Circle Bluff Dr	Circle Bluff Dr	Circle Bluff Dr	603	NA	8	J-585	J-583	1	P-1294		1		1	2	5	14	L
55	Lantern Ln	204th St NE	Cul-de-Sac	346	6	8	J-121	J-607	1	P-995	1960	2	AC	3	1	7	21	M
56	64th Dr NE	204th St NE	206th Pl NE	774	6	8	J-118	J-117	1	P-165	1960	2	AC	3	2	8	23	M
56	Easement	206th Pl NE	64th Dr NE Dead-end	339	6	8	J-119	J-118	1	P-164	1960	2	AC	3	2	8		
56	64th Dr NE	Dead-end	208th St NE	332	6	8	J-120	J-119	1	P-163	1960	2	AC	3	2	8		
56	208th St NE	64th Dr NE	West of Ronning Rd	441	6	8	J-466	J-120	1	P-800	1980	2	DI	1	2	6		
56	208th St NE, Ronning Rd	West of Ronning Rd	210th St NE	849	6	8	J-602	J-466	1	P-989	1980	2	DI	1	2	6		
56	Ronning Rd	210th St NE	211th Pl NE	605	6	8	J-511	J-602	1	P-987	1980	2	DI	1	2	6		
57	Easement	67th Ave NE	69th Ave NE	262	8	12	J-604	J-605	3	P-993	1980	2	DI	1	1	7	23	M
57	69th Ave NE	Dead-end	North of 204th St NE	332	8	12	J-605	J-606	3	P-994	1980	2	DI	1	1	7		
58	204th St NE	71st Ave NE	74th Ave NE	907	12	12	J-115	J-297	1	P-531	1960	2	AC	3	2	8	31	H
58	204th St NE	74th Ave NE	SR9	385	12	12	J-297	J-113	1	P-532	1960	2	AC	3	2	8		
58	204th St NE	SR9	77th Ave NE	657	10	12	J-113	J-1033	1	P-1668	0	1	AC	3	2	7		
58	Parking Lot	77th Ave NE	Parking Lot	270	4	12	J-1030	J-1031	3	P-1661	0	1	DI	1	1	6		
58	Parking Lot	77th Ave NE	Parking Lot	371	4	12	J-1029	J-1032	3	P-1662	0	1	DI	1	1	6		
58	207th St NE	207th St NE	80th Ave NE	81	8	12	J-221	J-1020	2	P-1639	1990	1	DI	1	2	6		
59	Haggen Property	74th Ave NE	North of Haggen Building	1113	8	12	J-571	J-572	1	P-947	2003	1	DI	1	2	5	22	M
59	Haggen Property	North of Haggen Building	74th Ave NE	635	8	12	J-572	J-298	1	P-1673	2003	1	DI	1	2	5		
59	Haggen Property	74th Ave NE	Dead-end	135	8	12	J-573	J-1037	3	P-1672	0	1	DI	1	1	6		
60	Portage Green Mobile Home Park	Portage Green North Entrance	Portage Green NW Corner	102	8	12	J-779	J-565	2	P-1108	1990	1	DI	1	2	6	18	M
60	Portage Green Mobile Home Park	Portage Green NW Corner	Portage Green NE Corner	282	8	12	J-565	J-567	2	P-1110	1990	1	DI	1	2	6		
60	Portage Green Mobile Home Park	Portage Green NE Corner	Portage Green East Intersection	639	8	12	J-566	J-567	1	P-939	1990	1	DI	1	2	5		
60	Portage Green Mobile Home Park	Portage Green East Intersection	Portage Green SE Corner	413	8	12	J-566	J-568	2	P-940	1990	1	DI	1	2	6		
60	Portage Green Mobile Home Park	Portage Green SE Corner	Portage Green South Entrance	211	8	12	J-568	J-569	2	P-941	1990	1	DI	1	2	6		
61	62nd Dr NE	Cemetery Rd	202nd Pl NE	340	6	8	J-122	J-609	1	P-997	1960	2	AC	3	2	8	23	M
61	202nd Pl NE	62nd Dr NE	Dead-end	226	6	8	J-609	J-610	1	P-999	1960	2	AC	3	1	7		
61	201st Pl NE	62nd Dr NE	Dead-end	325	6	8	J-123	J-608	1	P-996	1960	2	AC	3	1	7		
62	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	92	NA	12	PMP-352	J-899	#N/A	P-1870		1		1	3	#N/A	16	M

City of Arlington 2015 Comprehensive Water System Plan

Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
62	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	168	NA	12	J-816	PMP-352	#N/A	P-1869		1		1	3	#N/A		
62	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	155	NA	12	J-816	PMP-347	#N/A	P-1335		1		1	3	#N/A		
62	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	Vicinity of 520 Zone Reservoir	98	NA	12	PMP-347	J-1136	#N/A	P-1871		1		1	3	#N/A		
63	Mobile Home Park	199th St NE	Center of Park	1260	8	12	J-295	J-296	2	P-529	1990	1	DI	1	2	6	22	M
63	Mobile Home Park	Center of Park	South of Park	70	NA	12	J-295	J-529	3	P-1921		1		1	2	7		
63	Mobile Home Park	South of Park	67th Ave NE	220	8	12	J-453	J-529	3	P-883	2003	1	DI	1	2	7		
63	Mobile Home Park	Center of Park	67th Ave NE	370	8	12	J-294	J-295	2	P-528	1990	1	DI	1	2	6		
64	197th St NE	63rd Ave NE	East of 63rd Ave NE	434	8	12	J-456	J-457	2	P-787	2003	1	DI	1	2	6	18	M
64	197th St NE	East of 63rd Ave NE	67th Ave NE	847	8	12	J-452	J-456	2	P-784	2003	1	DI	1	2	6		
65	Cedarbough Loop	Woodlands Way	Oakwood Pl	407	6	8	J-176	J-183	1	P-243	1980	2	DI	1	2	6	17	M
65	Oakwood Pl	Cedarbough Loop	Dead-end	152	6	8	J-183	J-970	1	P-1541	0	1	DI	1	1	4		
65	Cedarbough Loop	Oakwood Pl	Shady Grove Pl	247	6	8	J-183	J-184	1	P-244	1980	2	DI	1	2	6		
65	Shady Grove Pl	Cedarbough Loop	Dead-end	174	6	8	J-184	J-971	1	P-1542	0	1	DI	1	1	4		
65	Cedarbough Loop	Shady Grove Pl	Cedarbough Loop	289	6	8	J-184	J-509	1	P-1426	0	1	DI	1	2	5		
65	Cedarbough Loop	Cedarbough Loop	Cedarbough Loop	170	6	8	J-510	J-509	1	P-1543	0	1	DI	1	2	5		
65	Cedarbough Loop	Cedarbough Loop	West of Country Club Dr	256	6	8	J-185	J-510	1	P-861	1980	2	DI	1	2	6		
65	Sprucewood Pl	Woodlands Way	Dead-end	220	6	8	J-969	J-968	1	P-1540	0	1	DI	1	1	4		
66	54th Dr NE	Cemetery Rd	Dead-end	140	4	8	J-527	J-528	3	P-882	1970	2	AC	3	1	9	29	H
67	51st Dr NE	198th Pl NE	Dead-end	992	6	12	J-129	J-232	3	P-300	1970	2	DI	1	3	9	27	H
67	Airport Property	Dead-end	Airport Property	784	NA	12	J-1063	J-232	3	P-1920		1		1	3	8		
68	196th Pl NE, 50th Ave NE	49th Ave NE	Dead-end	622	6	8	J-131	J-132	1	P-180	1970	2	DI	1	1	5	15	L
69	Airport Property	47th Ave NE	NW Corner Gravel Parking Lot	110	8	12	J-1060	J-1061	3	P-1717	0	1	DI	1	2	7	22	M
69	Airport Property	NW Corner Gravel Parking Lot	North Side of Gravel Parking Lot	554	8	12	J-1061	J-1062	3	P-1719	1990	1	DI	1	2	7		
69	Airport Property	North Side of Gravel Parking Lot	East Side of Gravel Parking Lot	681	8	12	J-1062	J-1063	3	P-1720	0	1	DI	1	2	7		
69	Airport Property	Gravel Parking Lot Loop	Gravel Parking Lot Loop	1254	8	12	J-1061	J-1062	3	P-1718	1990	1	DI	1	2	7		
70	62nd Ave NE	195th St NE	192nd St NE	1180	6	12	J-135	J-137	1	P-186	1980	2	DI	1	2	6	34	H
70	Parking Lot	192nd St NE	South Side of Parking Lot	618	8	12	J-1092	J-838	1	P-1783	1980	2	DI	1	2	6		
70	Parking Lot	South Side of Parking Lot	West Side of Parking Lot	74	8	12	J-1092	J-1093	3	P-1782	1980	2	DI	1	2	8		
70	Parking Lot	South Side of Parking Lot	East Side of Parking Lot	369	8	12	J-145	J-1092	1	P-1781	1980	2	DI	1	2	6		
70	Easement	East Side of Parking Lot	188th St NE	681	8	12	J-145	J-144	1	P-197	1950	3	AC	3	2	9		
70	Easement	192nd St NE	Parking Lot	329	8	12	J-941	J-942	3	P-1491	0	1	DI	1	1	6		
71	Hampton Lumber	67th Ave NE	Hampton Lumber Yard	215	10	12	J-448	J-248	1	P-1688	1970	2	AC	3	2	8	31	H
71	Hampton Lumber	Hampton Lumber Yard	North of Hampton Lumber Yard	995	8	12	J-248	J-250	1	P-325	1980	2	DI	1	2	6		
71	Hampton Lumber	Hampton Lumber Yard	UPS Building	408	8	12	J-248	J-249	1	P-324	1970	2	DI	1	2	6		
71	UPS	UPS Building	Dead-end	550	8	12	J-1048	J-1047	3	P-1692	0	1	DI	1	1	6		
72	Easement	63rd Ave NE	Dead-end	56	NA	12	J-938	J-939	3	P-1923		1		1	1	6	20	M
72	Easement	63rd Ave NE	Dead-end	238	8	12	J-939	J-940	3	P-1487	0	1	DI	1	1	6		
73	Easement	192nd St NE	Dead-end	646	6	12	J-613	J-614	3	P-409	1970	2	DI	1	1	7	23	M
74	Airport Property	Hangars	Hangars	1382	8	12	J-910	J-538	2	P-1443	2012	1	DI	1	2	6	27	H
74	Airport Property	Hangars	59th Dr NE	346	8	12	J-540	J-910	2	P-1442	2012	1	DI	1	2	6		
74	Airport Property	59th Dr NE	59th Ave NE	366	8	12	J-143	J-540	1	P-897	1990	1	DI	1	2	5		
74	W.E. Evans Park	59th Ave NE	188th Pl NE	544	10	12	J-142	J-1094	1	P-1786	1960	2	AC	3	2	8		
75	Airport Property	59th Ave NE	Hangars	1412	8	12	J-538	J-539	1	P-896	1990	1	DI	1	2	5	14	L
75	Airport Property	Hangars	59th Dr NE	649	8	12	J-136	J-538	1	P-893	1990	1	DI	1	2	5		
76	Easement	191st Pl NE	Dead-end	179	8	12	J-948	J-253	3	P-1500	0	1	DI	1	1	6	22	M
76	Easement	67th Ave NE	Easement	239	8	12	J-643	J-767	2	P-1082	0	1	DI	1	2	6		
76	Easement	Easement	Dead-end	97	8	12	J-767	J-644	3	P-1083	0	1	DI	1	1	6		
76	Easement	Easement	Easement	208	8	12	J-768	J-767	2	P-1085	0	1	DI	1	2	6		
76	Easement	Easement	Easement	105	8	12	J-844	J-768	1	P-1270	0	1	DI	1	2	5		
76	Easement	Easement	Easement	221	8	12	J-645	J-844	2	P-1269	0	1	DI	1	2	6		
76	Easement	Easement	191st Pl NE	258	8	12	J-645	J-1049	2	P-1696	2007	1	DI	1	2	6		
77	66th Ave NE	188th St NE	South of 67th/66th Intersection	1052	10	12	J-146	J-140	1	P-199	1960	2	AC	3	2	8	23	M
78	188th St NE	67th Ave NE	East of 67th Ave NE	466	6	12	J-147	J-170	2	P-228	1980	2	DI	1	2	7	21	M
78	188th St NE	East of 67th Ave NE	Iris Ct	288	6	8	J-170	J-615	2	P-410	1980	2	DI	1	1	6		
79	188th St NE	67th Ave NE	Lumber Yard	388	10	12	J-622	J-146	1	P-198	1960	2	AC	3	2	8	31	H
79	Lumber Yard	188th St NE	Dead-end	1194	8	12	J-622	J-623	3	P-420	1960	2	DI	1	1	7		
79	Lumber Yard	188th St NE	67th Ave NE	1178	4	8	J-1091	J-1090	1	P-1780	0	1	DI	1	2	5		
80	Mobile Home Park	188th St NE	Dead-end	544	6	12	J-946	J-947	3	P-1499	0	1	DI	1	1	6	20	M
81	59th Ave NE	188th St NE	South of 188th St NE	1252	10	12	J-151	J-143	1	P-1516	1960	2	AC	3	2	8	23	M
82	Airport Property	Flightline	Flightline	576	8	12	J-540	J-541	2	P-898	1990	1	DI	1	2	6	18	M
82	Airport Property	Flightline	Airport Well	823	8	12	J-541	J-911	2	P-1446	2012	1	DI	1	2	6		
82	Airport Property	Airport Well	Flightline	525	8	12	J-911	J-912	2	P-1449	2012	1	DI	1	2	6		
83	School Property	Eaglefield Dr	School Property	330	8	12	J-434	J-435	3	P-751	2000	1	DI	1	2	7	22	M
83	School Property	School Property	School Property	273	8	12	J-433	J-434	3	P-748	2000	1	DI	1	2	7		
83	School Property	School Property	School Property	351	8	12	J-432	J-433	3	P-747	2000	1	DI	1	2	7		
83	School Property	School Property	School Property	357	8	12	J-431	J-432	3	P-746	2000	1	DI	1	2	7		
83	School Property	School Property	Eaglefield Dr	557	8	12	J-430	J-431	3	P-745	2000	1	DI	1	2	7		
84	175th St NE	85th Ave NE	Dead-end	90	8	12	J-380	J-981	3	P-1565	0	1	DI	1	1	6	20	M
84	84th Ave NE	85th Ave NE	Dead-end	69	8	12	J-381	J-982	3	P-1566	0	1	DI	1	1	6		
84	Shooting Range Parking Lot	SR531	Parking Lot	95	8	12	J-262	J-983	3	P-1567	0	1	DI	1	1	6		
85	Junkyard	Easement	Private Property	393	8	12	J-1082	J-1081	3	P-1760	0	1	DI	1	1	6	20	M
86	Easement	59th Ave NE	Private Property	509	8	12	J-965	J-916	1	P-1535	0	1	DI	1	2	5	21	M

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Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
86	Easement	Easement	Private Property	233	8	12	J-965	J-964	2	P-1530	0	1	DI	1	2	6		
86	Easement	Easement	Private Property	253	8	12	J-964	J-962	2	P-1531	0	1	DI	1	2	6		
86	Easement	Easement	Private Property	567	8	12	J-962	J-961	2	P-1532	0	1	DI	1	2	6		
86	Easement	Easement	Private Property	286	8	12	J-964	J-164	2	P-1534	0	1	DI	1	2	6		
86	Easement	Easement	Private Property	265	8	12	J-164	J-963	2	P-1523	1980	2	DI	1	2	7		
86	Easement	Easement	Private Property	278	8	12	J-962	J-963	2	P-1533	0	1	DI	1	2	6		
87	Easement	59th Ave NE	Easement	472	8	12	J-166	J-246	2	P-555	1990	1	DI	1	2	6	22	M
87	Easement	Easement	Easement	771	8	12	J-304	J-246	2	P-557	1990	1	DI	1	2	6		
87	Easement	59th Ave NE	Easement	475	8	12	J-305	J-304	1	P-559	1990	1	DI	1	2	5		
87	Easement	Easement	Easement	488	8	12	J-245	J-304	1	P-556	1990	1	DI	1	2	5		
87	Easement	Easement	Easement	181	8	12	J-475	J-245	3	P-819	2000	1	DI	1	2	7		
87	Easement	Easement	Easement	510	8	12	J-474	J-475	3	P-818	2000	1	DI	1	2	7		
87	Easement	59th Ave NE	Easement	513	8	12	J-472	J-474	2	P-817	2000	1	DI	1	2	6		
88	Airport Property	Hangars	Hangars	632	8	12	J-549	J-550	3	P-914	1990	1	DI	1	1	6	20	M
89	Easement	172nd St NE	Easement	1107	10	12	J-800	J-842	1	P-1260	1980	2	DI	1	2	6	17	M
90	Easement	59th Ave NE	Easement	234	8	12	J-668	J-1080	2	P-1757	0	1	DI	1	2	6	18	M
90	Easement	Easement	Easement	267	8	12	J-667	J-668	2	P-490	0	1	DI	1	2	6		
90	Easement	Easement	Easement	134	8	12	J-666	J-667	2	P-489	0	1	DI	1	2	6		
90	Easement	Easement	Easement	502	8	12	J-665	J-666	2	P-488	0	1	DI	1	2	6		
90	Easement	Easement	59th Ave NE	361	8	12	J-664	J-665	2	P-487	0	1	DI	1	2	6		
91	Airport Property	59th Dr NE	Flightline	236	8	12	J-912	J-953	1	P-1506	0	1	DI	1	2	5	22	M
91	Airport Property	Flightline	Flightline	360	8	12	J-922	J-912	1	P-1513	0	1	DI	1	2	5		
91	Airport Property	Flightline	59th Dr NE	279	8	12	J-951	J-922	1	P-1505	2012	1	DI	1	2	5		
91	59th Dr NE	59th Dr NE	59th Dr NE	195	8	12	J-951	J-950	1	P-1508	0	1	DI	1	2	5		
91	59th Dr NE	59th Dr NE	59th Dr NE	258	8	12	J-921	J-951	3	P-1504	2012	1	DI	1	2	7		
91	59th Dr NE	59th Dr NE	59th Dr NE	595	8	12	J-920	J-921	3	P-1464	2012	1	DI	1	2	7		
91	Airport Property	59th Dr NE	Hangars	286	8	12	J-919	J-920	2	P-1461	2012	1	DI	1	2	6		
91	Airport Property	Hangars	Hangars	352	8	12	J-918	J-919	2	P-1460	2012	1	DI	1	2	6		
91	Airport Property	Hangars	Hangars	491	8	12	J-917	J-918	2	P-1457	2012	1	DI	1	2	6		
92	59th Ave NE	Business Park	Business Park	240	8	12	J-914	J-915	1	P-1453	2012	1	DI	1	2	5	18	M
92	59th Ave NE	Business Park	Business Park	486	8	12	J-915	J-916	1	P-1454	2012	1	DI	1	2	5		
92	59th Ave NE	Business Park	Business Park	301	8	12	J-163	J-916	1	P-1518	0	1	DI	1	2	5		
92	59th Ave NE	Business Park	Truck Yard	380	8	12	J-166	J-163	1	P-219	1990	1	DI	1	2	5		
92	59th Ave NE	Truck Yard	Smokey Point Distributing	369	8	12	J-166	J-548	1	P-558	1990	1	DI	1	2	5		
92	Airport Property	59th Ave NE	Hangars	34	8	12	J-547	J-548	1	P-911	1990	1	DI	1	2	5		
92	Airport Property	Hangars	Hangars	89	10	12	J-547	J-241	1	P-908	1990	1	DI	1	2	5		
92	59th Ave NE	Smokey Point Distributing	Smokey Point Distributing	578	8	12	J-548	J-305	1	P-910	1990	1	DI	1	2	5		
92	59th Ave NE	Smokey Point Distributing	Smokey Point Distributing	316	8	12	J-305	J-833	2	P-1222	2000	1	DI	1	2	6		
92	59th Ave NE	Smokey Point Distributing	SR531	248	8	12	J-833	J-471	2	P-1223	2000	1	DI	1	2	6		
92	59th Ave NE	SR531	Business Park	236	8	12	J-471	J-1080	2	P-1755	2000	1	DI	1	2	6		
92	59th Ave NE	Business Park	Business Park	193	8	12	J-1080	J-472	2	P-1756	2000	1	DI	1	2	6		
92	59th Ave NE	Business Park	Business Park	371	8	12	J-472	J-473	2	P-816	2000	1	DI	1	2	6		
92	59th Ave NE	Business Park	Business Park	216	8	12	J-473	J-664	2	P-486	0	1	DI	1	2	6		
92	59th Ave NE	Business Park	Business Park	125	NA	12	J-1130	J-664	2	P-1857		1		1	2	6		
93	Business Park	Business Park	Business Park	140	8	12	J-157	J-1083	1	P-1761	1980	2	DI	1	2	6	25	H
93	Business Park	Business Park	Business Park	1	8	12	J-1083	J-156	1	P-1762	1980	2	DI	1	2	6		
93	Business Park	Business Park	Business Park	416	8	12	J-1083	J-162	3	P-1763	0	1	DI	1	1	6		
93	Business Park	Business Park	Business Park	612	8	12	J-155	J-156	2	P-215	1980	2	DI	1	2	7		
93	Business Park	Business Park	Business Park	48	8	12	J-155	J-959	2	P-1525	0	1	DI	1	2	6		
93	Business Park	Business Park	Business Park	641	8	12	J-959	J-967	1	P-1536	0	1	DI	1	2	5		
93	Business Park	Business Park	Business Park	259	8	12	J-959	J-961	2	P-1527	0	1	DI	1	2	6		
93	Business Park	Business Park	Business Park	637	6	12	J-961	J-960	2	P-1528	0	1	DI	1	2	6		
94	Airport Property	Flightline	Flightline	109	8	12	J-686	J-687	3	P-599	0	1	DI	1	1	6	20	M
95	Bowman Manufacturing	51st Ave NE	SE Corner of Building	528	8	12	J-243	J-551	1	P-915	1990	1	DI	1	2	5	14	L
95	Bowman Manufacturing	SE Corner of Building	Flightline	553	8	12	J-551	J-552	1	P-918	1990	1	DI	1	2	5		
96	Buzz Inn	51st Ave NE	Parking Lot	890	8	12	J-553	J-306	3	P-920	1990	1	DI	1	1	6	20	M
97	Airport Property	51st Ave NE	Hangars	114	8	12	J-554	J-555	2	P-922	2003	1	DI	1	1	5	20	M
97	Airport Property	Hangars	Hangars	214	8	12	J-555	J-556	3	P-923	2003	1	DI	1	1	6		
97	Airport Property	51st Ave NE	Hangars	262	8	12	J-928	J-927	3	P-1474	0	1	DI	1	1	6		
97	Airport Property	Hangars	Hangars	129	8	12	J-929	J-928	3	P-1475	0	1	DI	1	1	6		
97	Airport Property	Hangars	Hangars	558	8	12	J-930	J-928	3	P-1476	0	1	DI	1	1	6		
98	187th Pl NE	35th Ave NE	Dead-end	411	8	12	J-734	J-735	1	P-1032	0	1	DI	1	1	4	12	L
99	Bjorn Rd	35th Ave NE	Smokey Point Blvd	647	8	12	J-726	J-696	1	P-1017	2004	1	DI	1	2	5	14	L
99	Smokey Pt Blvd	Bjorn Rd	Just North of Bjorn Rd	42	10	12	J-696	J-1055	1	P-1707	0	1	DI	1	2	5		
100	Parking Lot	Smokey Point Blvd	Jake's House Church - North Side	141	8	12	J-681	J-682	1	P-545	0	1	DI	1	2	5	22	M
100	Parking Lot	Jake's House Church - North Side	Puget Sound Kidney Center	169	8	12	J-682	J-1056	3	P-1710	0	1	DI	1	1	6		
100	Parking Lot	Jake's House Church - North Side	Jake's House Church - Northwest Corner	288	8	12	J-682	J-683	1	P-563	0	1	DI	1	2	5		
100	Parking Lot	Jake's House Church - Northwest Corner	Bjorn Rd	432	8	12	J-683	J-684	1	P-567	0	1	DI	1	2	5		
100	Parking Lot	Bjorn Rd	Parking Lot	225	8	12	J-884	J-925	1	P-1469	0	1	DI	1	2	5		
100	Parking Lot	Parking Lot	Parking Lot	62	8	12	J-925	J-926	1	P-1471	0	1	DI	1	2	5		
100	Parking Lot	Parking Lot	Parking Lot	148	8	12	J-925	J-885	1	P-1470	0	1	DI	1	2	5		
101	186th Pl NE	35th Ave NE	East of 35th Ave NE	456	8	12	J-727	J-728	1	P-1022	0	1	DI	1	2	5	18	M

City of Arlington 2015 Comprehensive Water System Plan

Water Main Replacement Priority Ranking

CIP	Location				Diameter		Start Node	Stop Node	Available Fire Flow	Exist.	Pipe	Pipe Year	Exist.	Pipe Material	Benefit Area	Total	Weighted	
No.	In	From	To	Length	Ex	Prop	No.	No.	Capability	Pipe No.	Year	Points	Pipe Mat	Points	Points	Points	Maximum	Ranking
101	186th Pl NE	East of 35th Ave NE	Easement	202	8	12	J-728	J-729	2	P-1023	0	1	DI	1	2	6		
101	Easement	186th Pl NE	Easement	356	8	12	J-729	J-1021	2	P-1705	0	1	DI	1	2	6		
101	Easement	Easement	End of Driveway	179	8	12	J-731	J-1021	2	P-1706	0	1	DI	1	2	6		
101	Driveway	35th Ave NE	End of Driveway	646	8	12	J-730	J-731	2	P-1026	0	1	DI	1	2	6		
102	Easement	Smokey Point Blvd	Just East of 32nd Ave NE	512	NA	8	J-753	J-832	1	P-1221		1		1	2	5	14	L
102	185th Pl NE	Smokey Point Blvd	Dead-end	206	8	12	J-882	J-883	1	P-1384	1990	1	DI	1	1	4		
103	183rd Pl NE	Smokey Point Blvd	Dead-end	581	8	12	J-736	J-737	1	P-1035	0	1	DI	1	1	4	12	L
104	Driveway	Smokey Point Blvd	36th Dr NE	466	NA	12	J-732	J-1051	3	P-1924		1		1	2	7	22	M
104	36th Dr NE	Driveway	181st Pl NE	130	6	12	J-1050	J-1051	3	P-1700	0	1	DI	1	2	7		
104	181st Pl NE	Smokey Point Blvd	36th Dr NE	460	6	12	J-1053	J-1050	3	P-1699	0	1	DI	1	2	7		
104	36th Dr NE	181st Pl NE	36th Dr NE End of Pavement	110	6	12	J-1050	J-1052	3	P-1701	0	1	DI	1	2	7		
104	Easement, 180th Pl NE	36th Dr NE End of Pavement	Smokey Point Blvd	756	NA	12	J-1052	J-122a	3	P-1925		1		1	2	7		
105	185th Pl NE	31st Ave NE	Dead-end	283	8	12	J-749	J-750	1	P-1052	0	1	DI	1	1	4	12	L
106	184th Pl NE	31st Ave NE	Dead-end	239	8	12	J-747	J-748	1	P-1049	0	1	DI	1	1	4	12	L
107	Driveway	182nd St NE	Dead-end	156	8	12	J-744	J-745	1	P-1044	0	1	DI	1	1	4	12	L
108	Driveway	182nd St NE	Dead-end	178	8	12	J-740	J-1101	3	P-1796	0	1	DI	1	1	6	20	M
108	Driveway	Easement	Easement	179	8	12	J-741	J-1098	3	P-1789	2000	1	DI	1	1	6		
109	31st Ave NE	181st St NE	180th St NE	229	8	12	J-739	J-796	1	P-1140	0	1	DI	1	1	4	12	L
110	Parking Lot	Smokey Point Blvd	Parking Lot	213	8	12	J-691	J-908	3	P-1440	2013	1	DI	1	1	6	20	M
111	43rd Ave NE	SR531	Walmart Parking Lot	509	NA	12	J-935	J-1133	1	P-1866		1		1	2	5	22	M
111	Walmart Parking Lot	43rd Ave NE	SR531	1479	NA	12	J-1133	J-934	1	P-1867		1		1	2	5		
111	SR531	SR531	Just North of SR531	37	8	12	J-931	J-933	3	P-1479	2014	1	DI	1	1	6		
111	SR531	SR531	Just South of SR531	45	8	12	J-932	J-931	3	P-1480	2014	1	DI	1	1	6		
112	I-5	Smokey Point Blvd	Portage Creek	134	NA	12	J-923	J-1145	1	P-1915		1		1	3	6	16	M
113	193rd St NE	Smokey Point Blvd	Dead-end	359	4	12	J-1057	J-1058	3	P-1713		1	DI	1	1	6	20	M
	Average	#N/A																

Ranking	From	To	Count
High	36	54	34
Medium	28	35	57
Low	18	27	22
			113



City of Arlington

2019 Amendment to the

2015 Comprehensive Water System Plan





Prepared by:

City of Arlington

Water System ID 02950K

With assistance from:

RH2 ENGINEERS PLANNERS SCIENTISTS

and

FCS GROUP Solutions-Oriented Consulting

January 2016

Amended October 2017

Amended December 2019



City of Arlington

2019 Amendment to the

2015 Comprehensive Water System Plan





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January 2016

Amended October 2017

Amended December 2019

Cover photos:

Foreground photo shows the Stillaguamish River and the Northern Pacific railroad trestle at confluence of the North and South Forks at Arlington. The River is one of three water sources used by the City of Arlington and can produce more than 90 percent of its annual water supply. Background photo shows the Pacific Keystone filter trains within the Water Treatment Plant. Water from riverbank wells is filtered through up to three trains with filtration media consisting of sand and anthracite. The WTP can treat 1700 gpm, or more than 2.4 MGD.

Recommended citations:

City of Arlington. 2019. 2019 Amendment to the 2015 Comprehensive Water System Plan. Released December 2019..

City of Arlington. 2017. 2017 Amendment to the 2015 Comprehensive Water System Plan. Released October 2017. Prepared with assistance from RH2 Engineering, Inc. and FCS Group Inc.

City of Arlington. 2016. 2015 Comprehensive Water System Plan, Final. Released January 2016. Prepared with assistance from RH2 Engineering, Inc. and FCS Group Inc.

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City of Arlington
Planning Commission

Bruce Angell, Chair 11-7-2017 Date

City of Arlington
City Council

Barbara Tolbert, Mayor 11-2-2017 Date

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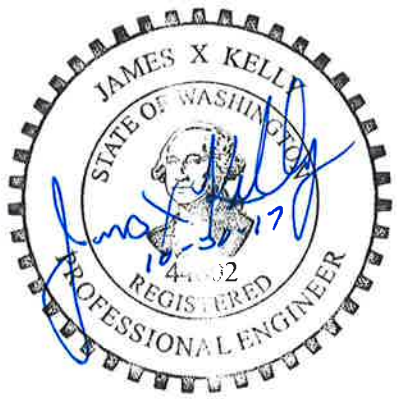
City of Arlington Certification

Chapters 1, 2, 3, 4, 5, 6, and 8 of the 2015 Comprehensive Water System Plan (WSP), and the 2017 Amendment to the WSP, were prepared by City of Arlington staff under the direction of the following registered professional engineer. Chapter 10 was prepared for the 2015 WSP by FCS Group under the direction of the same, and City of Arlington staff made minor modifications to Chapter 10 in the 2017 Amendment. City of Arlington staff received support from RH2 Engineering on Chapter 4 in both the 2015 WSP and the 2017 Amendment.

10-30-17

James X. Kelly, P.E.



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RH2 Engineering Certification

Chapters 4, 7, and 9 of the 2017 City of Arlington Water System Plan Amendment were prepared under the direction of the following registered professional engineers.



08/29/2017

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08/29/2017

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Reviser's Note Regarding The 2019 Amendment

A Water System Plan (WSP) is required under WAC 246-290-100 to: demonstrate a purveyor's capacity to provide potable water; identify its approach to handling increased demand and system expansion; assure consistency with applicable laws and plans; and establish eligibility for State funding.

The WSP of a Group A community water system like the Arlington Water Department may be *updated* on a 10 year cycle, and it may need to *revised or amended* more frequently for various reasons identified in WAC 246-290-100. The 2015 WSP was completed in January 2016, and is due for a complete WSP Update again by April 20, 2026. The City amended the 2015 WSP in 2017 in order to maintain consistency with the comprehensive plans required of the City of Arlington and Snohomish County under the Growth Management Act. That amendment was initiated by the retraction of the City's plans to grow (and serve water to) west of I-5. Numerous modifications to the text and tables of the 2015 WSP made during the 2017 Amendment were described in the Reviser's Note which follows this one.

This 2019 amendment is much simpler, and stems from the expansion of the City's water service area (WSA) beyond that boundary identified in the 2017 amendment [WAC 246-290-100 (2)(e)(i)]. In September 2017, as the 2017 WSP amendment was going to press, the Cities of Arlington and Marysville completed the exchange of several, contiguous Smokey Point parcels totaling approximately17.89 acres to the Arlington WSA, consistent with procedures established in the 2012 North Snohomish County Coordinated Water System Plan. The exchange was precipitated by the need of a developer for water pressures which the City of Marysville could not provide. As development progressed in 2019, the parcels were served within the 342 pressure zone by the installation of about 2,136 feet of 12-inch ductile iron water main and various valves and hydrants, consistent with all COA construction standards and guidelines for water systems.

The 2019 amendment consists of the following replacement pages in duplex format: binder cover; inside cover; Table of Contents; Expanded Table of Contents; 2019 Reviser's Note (2017 Reviser's Note moved back one page); and the Appendix L cover page. It also includes a five-page insert, referred to as L.5, to be placed at the back of Appendix L. *No other modifications to text, tables, figures, or maps have been made as a result of this WSA boundary adjustment.* Only those pages above may have a header and/or footer which reflect they are part of the 2019 Amendment.

Reviser's Note Regarding The 2017 Amendment

The City of Arlington 2015 Water System Plan (WSP) planned for the expansion of the City's Urban Growth Area (UGA) and its water distribution system west of I-5. This effort reflected the City's intent to develop west of the freeway in order to accommodate its 2035 population targets established under the Growth Management Act (GMA). The City acted on this intent in the 2014 filing of a petition with Snohomish County for the westward expansion of its UGA.

Planning for the expansion of the water distribution system also assured consistency of the WSP with the City's 2015 GMA Comprehensive Plan. Snohomish County's Planning and Development Services reviewed the 2015 WSP but could not find it consistent with the County's own 2015 GMA Comprehensive Plan, which did not include the City's proposed UGA expansion. Later in 2016, the City withdrew its petition and began revision of its GMA Comprehensive Plan in order to plan for an alternative population placement that was consistent with Snohomish County's plan. For purposes of consistency among all plans, this 2017 Amendment to the 2015 WSP also drops expansion of the distribution system west of I-5, and evaluates the re-allocation of additional population across the City, and its effect on the capacity of the water supply to meet the additional demand.

These planning modifications did not result in revisions to WSP Chapters 4 and 5, nor to most of the appendices. Chapters 1, 2, 6, 7, 8, and 9 in this amended WSP had relatively minor revisions, and these are documented in this publication using underlined insertions and strikeout deletions to quickly and clearly show the effects of the amendment.

Although many portions of Chapter 3 (Land Use) have not changed, there are enough revisions that complete re-printing of the chapter is appropriate. Where changes may be significant, the amended text describes the change. Tables and figures which have substantial changes are also completely replaced, and the word "amended" follows the table and figure numbers in parentheses.

Changes to Chapter 10 (Financial Plan) are relatively minor, but individual revisions are not shown. The primary changes to the Financial Plan are the replacements of Tables 10-4 and 10-5.

The only appendices containing modifications are Appendix C (Hydraulic Model Node Diagram), Appendix N (Consistency Review Checklist), and Appendix Q (SEPA). Agency review comments and responses will be included in Appendix T in the final WSP.

L RETAIL WATER SERVICE AREA AGREEMENTS

L.1 CWSP 2015 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE AND AGREEMENT

L.2 CWSP 2015 BOUNDARY ADJUSTMENT (MARYSVILLE) MAP

L.3 CWSP WATER PURVEYORS MAP 2015

L.4 NORTH SNOHOMISH COUNTY COORDINATED WATER SYSTEM PLAN (CWSP) SIGNED AGREEMENT—1990

L.5 CWSP 2017 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE, AGREEMENT, AND MAP

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L.5 [NEW TO 2019 AMENDMENT]

CWSP 2017 BOUNDARY ADJUSTMENT (MARYSVILLE) CORRESPONDENCE, AGREEMENT, AND MAP

Snohomish County
Planning and Development Services

Barb Mock
PDS Director

(425) 388-3311
FAX (425) 388-3870

M/S #604
3000 Rockefeller Avenue
Everett, WA 98201-4046

September 15, 2017

James X. Kelly
Public Works Director
City of Arlington
154 W. Cox Avenue
Arlington, WA 98223

Re: CWSP Boundary Adjustment
Cities of Arlington and Marysville

Dear Mr. Kelly,

Thank you for notifying Snohomish County of the negotiated adjustment to the water provider service area boundary between the Cities of Arlington and Marysville. Attached are the signed Water Service Area Change Agreement documents acknowledging receipt by the county. The county will coordinate changes to the service area map in the Coordinated Water System Plan (CWSP).

If you have not already done so, this revision to your mutual service area should be evaluated for possible requirements administered by the Boundary Review Board as per Section III.4.B of the CWSP which states:

> *…the Boundary Review Board should be notified of those utilities that have signed Service Area Agreements, of the service area boundary of each such utility, and be requested to recognize these boundaries in the conduct of the Boundary Review Board responsibilities.*

Because this service area adjustment is within the city limits of Arlington, it is assumed that franchise agreements with the county are not applicable in this case. Please let me know if this assumption is incorrect so that I can alert the county's Public Works Department. I can be reached by phone at 425-262-2359 or email at terri.strandberg@snoco.org.

Thank you again for your efforts to coordinate with the county.

Sincerely,

Terri Strandberg, Principal Planner
Snohomish County Planning and Development Services

City of Arlington
Public Works

September 8, 2017

Terri Strandberg
Principal Planner
Snohomish County Planning & Development
3000 Rockefeller Ave. M/S #604
Everett, WA 98201

Re: CWSP Boundary Adjustment
Cities of Arlington and Marysville

Ms. Strandberg,

The City of Arlington and the City of Marysville have negotiated an adjustment of our mutual water service area boundary in accordance with the North Snohomish County Coordinated Water System Plan (CWSP). The boundary adjustment is shown on Exhibit A of the attached Water Service Area Change Agreement.

Two original copies of the agreement, signed by the mayors of both cities, are enclosed with this letter. Please coordinate changes to the CWSP water service area map, sign both copies of the agreement and return them to my attention. Please call me at 360.403.3505 if you have any questions about this water service area boundary adjustment or if I can assist with the processing of this request.

Sincerely,

James X. Kelly,
Public Works Director

cc: Kevin Nielsen

enc (1)

154 W. Cox Avenue - Arlington, WA 98223 - 360-403-3526 - fax 360-435-7944 - www.arlingtonwa.gov

WATER SERVICE AREA CHANGE AGREEMENT

between

CITY OF ARLINGTON and

CITY OF MARYSVILLE

An Agreement between the City of Arlington (Arlington) and the City of Marysville (Marysville), individually a "Party" and collectively the "Parties":

WHEREAS, the above Parties each provide retail water service to a Water Service Area agreed to and established in the North Snohomish County Coordinated Water System Plan and identified on the Coordinated Water Service Plan (CWSP); and

WHEREAS, Arlington and Marysville each previously signed an "Agreement for Establishing Water Utility Service Area Boundaries," on file with Snohomish County Planning and Development Services (PDS), an example of which can be found in Appendix D of the 2010 update to the North Snohomish County Coordinated Water System Plan; and

WHEREAS, the current respective water service areas of the Parties to this Agreement are indicated in Figure 1-1 of the CWSP (December 2010 edition); and

WHEREAS, Section Ill 2.D. of the CWSP allows service area boundaries to be revised at any time with the execution of revised service area agreements by authorized representatives of each affected purveyor; and

WHEREAS, this Agreement shall serve as an amendment to the agreements on file with PDS;

NOW, THEREFORE, the Parties hereby agree to adjust their respective water service areas to match the Proposed Boundaries on Exhibit A attached hereto and included herein by reference.

THIS AGREEMENT SHALL BE EFFECTIVE with respect to each Party when that Party's authorized representative executes the agreement. The original signature pages shall be delivered to the attention of Terri Strandberg at PDS, which maintains the file of water service area agreements under the CWSP. Copies of the signature pages shall be delivered to each Party to this Agreement. This Agreement may be executed in counterparts.

IN AGREEMENT WHEREOF, the undersigned parties execute this Agreement

City of Arlington Water Utility

Barbara Tolbert
City of Arlington

9-7-17
Date

City of Marysville Water Utility

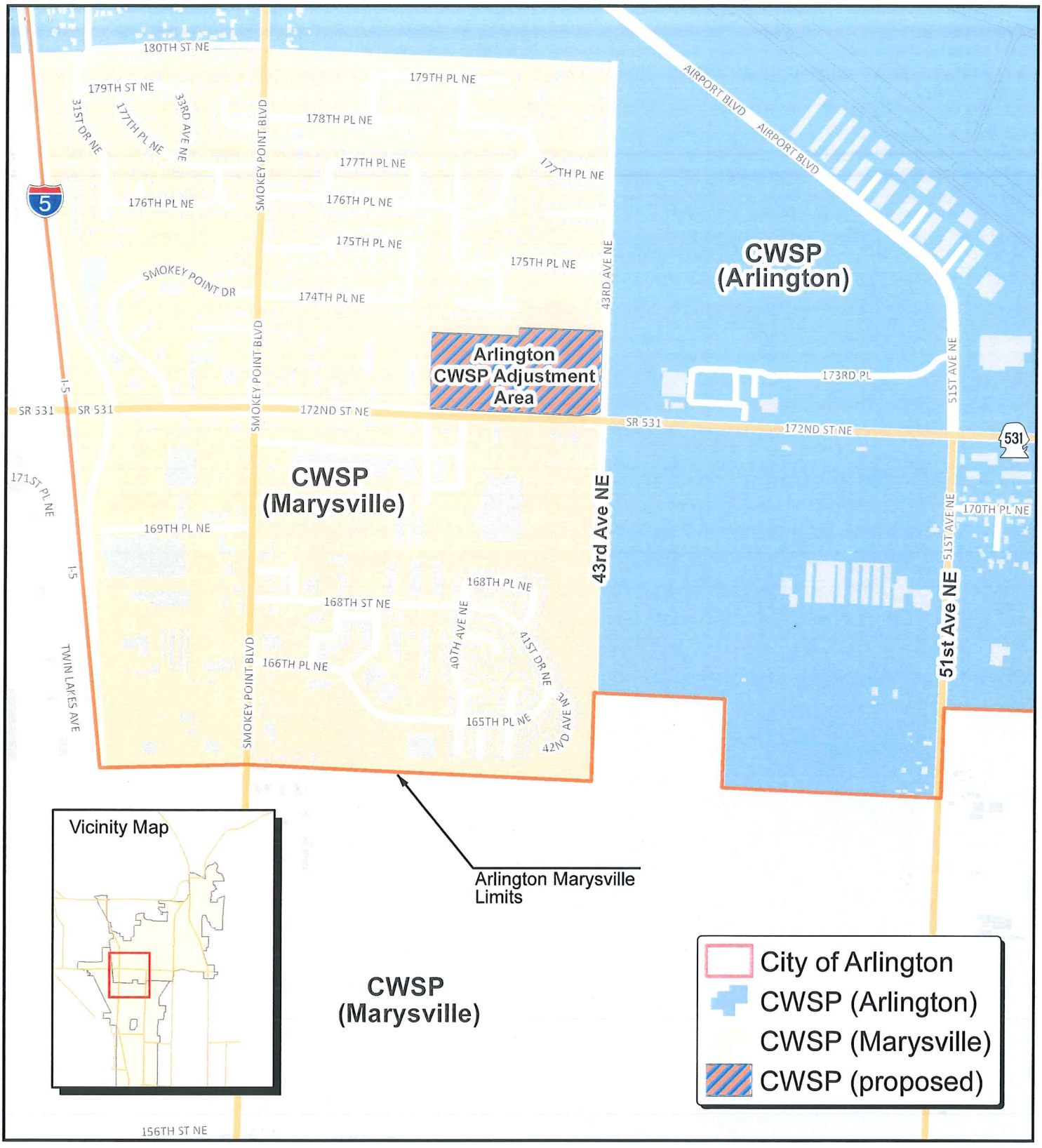
John Nehring
City of Marysville

8/30/17
Date

Receipt Acknowledged

Terri Strandberg
Principal Planner
PDS-Snohomish County

9-15-17
Date



Legend

State Routes
Roads
Buildings

N

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City of Arlington

South Arlington CWSP Adjustment Exhibit A

Scale:	File:
1 inch = 1,000 feet	SArlMarUtilExp8.5x11portrait_17
Date:	**Cartographer:**
9/8/2017	akc