A. Satellite Water Systems

Appendix A Satellite Water Systems Owned & Operated by Clark Public Utilities

	Water System	Address	ID Number	Connections	Type
1	AMBOY	26131 NE 419 ST	46254	120	A
2	FRENCHMANS BAR PARK	LOWER RIVER ROAD	AA289A	4	A
3	HAAPA PARK	43501 NE Haapa Rd.	AA215K	2	A
4	MORNING MEADOWS[1]	1610 NE 194 AV	00950E	25	A
5	YACOLT	Town of Yacolt	99000V	613	A
6	ALLEN CANYON ACRES	31000 NW 51 AVE	639898	5	B
7	DANIELS	NE 276 AV & BRADFORD RD	AA2339	10	B
8	DOBLER HILL	40500 NE DOBLER HILL RD	05655Y	8	B
9	KING CORNER	NE 252 ST & NE 68 AV	AA300M	12	B
10	LEWISVILLE HEIGHTS[2]	23505 NE 120 CT	02126V	12	B
11	MC KEE ROAD	23519 NE 388 CIR	04478P	3	B
12	MOUNTAIN GLEN	NE 199 AV & NE 48 ST	AA234G	12	B
13	PEKIN FERRY	5101 NW PEKIN FERRY RD	08492C	1	B
14	PROEBSTEL	NE 188 AV NORTH OF NE 73 ST	00736R	3	B
15	SUNNY MEADOWS	36200 NE 247 AV	02764M	3	B
16	SWEET BRIAR ESTATES	SE 282 Ave OFF SE 30 CIRCLE	69223	4	B
17	VERNON ROAD	NE 369 CT. and VERNON RD.	11594	2	B
18	VIEW ACRES	NE 85 AV & NE 379 ST	00062K	5	B
19	VIEW RIDGE	NE 114 CT & NE 410 ST	02125B	8	B
20	ZUMSTEIN	NE 21 AV & NE 406 ST	49651	12	B
21	BRIDGE ROAD	NW 411th CIRCLE AND BRIDGE ROAD	AB775E	12	B
22	LIVINGSTON MOUNTAIN	NE 276th AVE off of BRADFORD ROAD	AA2339	3	B

Notes:

1. Within City of Vancouver Water Service Area. Expected to be served by City of Vancouver soon.
2. Within City of Battle Ground Water Service Area

Clark Public Utilities has previously prepared water system plans for its Group A systems and they are incorporated into this water system plan and are on file at DOH and at the Utility.

B Satellite Water System Management Policy

Appendix VII

Clark Public Utilities (CPU)
Satellite Water Systems

1. POLICY STATEMENT

Satellite systems within CPU's service area. It is CPU's policy to require that CPU's system be extended to provide water service to property within CPU's service area. The term "Service Area" means CPU's service area is delineated in the Clark County Coordinated Water System Plan (CWSP). Established pursuant to RCW 70.116, The Public Water System Coordination Act.

In exceptional situations CPU will permit satellite systems within its service area. CPU's decision to permit a satellite system will be based on the following factors:

A. Whether or not it will work an unreasonable economic hardship on those desiring water service to construct water mains and/or general facilities to CPU's conditions and standard connecting the property to CPU's water system.

B. Whether or not a satellite system will discourage or interfere with normal growth of CPU's system and/or work a hardship on other property owners that would be benefitted by extending the CPU's system.

C. Whether or not a satellite system, existing or to be constructed, will be compatible with CPU's comprehensive water service plan (comprehensive plan) and will not require the satellite system to be improved or replaced when CPU's system is extended to serve the area.

D. Whether or not the satellite system complies with other requirements of CPU's terms and the CWSP.

2. SATELLITE SYSTEMS OUTSIDE CPU'S SERVICE AREA

Whether CPU will provide satellite services outside its service area will be based on the above factors and the following:

A. Whether or not it is appropriate to extend CPU's service area to include the property seeking water service.

B. Availability of other public water supply systems that can more economically or logically serve the area.

C. The criterion and procedures in the CWSP.

3. CONTRACTUAL REQUIREMENTS

A. Inside CPU's Service Area.

All water systems within CPU's service area must enter into a contract with CPU, as a condition to receiving satellite services from the CPU.

B. Outside CPU Service Area.

All water systems outside CPU's service area to be provided with satellite services by CPU must enter into a contract with CPU.

C. Minimum Contract Requirements.

The contract with CPU must include the following: (1) an agreement not to protest formation of a future Local Improvement District; (2) the well driller's record, DOE well permit and other data concerning the well; (3) an agreement to have the water regularly tested and submit copies of the report to CPU; (4) an agreement to at least annually file with CPU its standard report on the operation of such systems; (5) permission for CPU to periodically inspect the satellite system; and (6) other requirements of CPU's terms and conditions.

D. CPU Charges.

If CPU is to provide satellite services, the agreement shall include that all utility charges, including repair and improvement charges, are to be paid by those receiving benefit from the water services provided consistent with CPU's terms and conditions.

4. TYPES OF SATELLITE SERVICES

If CPU determines to provide satellite services to a system within or outside its service area, CPU's services will consist of one or a combination of the following:

- Category A - Technical Service: This category includes CPU contracting for technical and operational services provided on an occasional or temporary basis. These services may include repair, trouble shooting, on-call maintenance, training and water quality sampling. CPU will not own the satellite system, and the system owners will retain the responsibility and liability for system operation.

- Category B - Contract Service (Operation): CPU will contract to operate the water system. Services may include the category A services, system development (construction and/or improvements), full-time operation, emergency operation

and repairs, regulatory compliance and water quality monitoring, as agreed with the owners of the system.

- Category C - Direct Service (Ownership and Operation): CPU will own and operate a system that is directly connected to its mainline service or one that remains a satellite system indefinitely. Ownership of the system will be transferred to CPU, and it will become a part of CPU's system.

5. SERVICE INTERRUPTION RESPONSIBILITY

Because a satellite system will receive water from a single well or aquifer, and may be so located that no emergency water service is reasonably available, the water utility will not under any circumstances undertake liability for emergency or supplemental supply in the event of a decrease, loss, or contamination of the satellite system's water source.

6. MINIMUM STANDARDS

New or expanding satellite systems must meet CPU's conditions and standards. These include, but are not limited to, CPU approved engineering plans, CPU construction inspection, extension of mains to property lines at one or more places as required by CPU, acceptance of the system by CPU.

In addition to the above, CPU must be satisfied that the system has adequate fire and equalizing storage and pressure, as well as other reasonable requirements of a satellite system not contained in CPU terms and conditions.

7. WELL ADEQUACY

CPU must be satisfied that the existing source of water to the satellite system:

A. Has been approved and permitted by the Department of Ecology;

B. Meets all Department of Health and other purity requirements for public water systems; and

C. Has a well of sufficient depth, and the pump and other devices are adequate to provide continuous future supply of water in sufficient volume to meet the needs of connections to the satellite system and governmental standards.

8. STREET GRADES/EASEMENTS

If the streets or roads in which the satellite system mains are located have not been accepted by Clark County for future maintenance, the depth and location of the satellite system mains must meet any street or road grade changes that CPU anticipates should be made in the future.

The system owners must provide or obtain easement which would enable CPU to extend its system past the satellite system in the future, when access through public streets is unavailable.

9. NO PROTEST AGREEMENT

CPU will not provide satellite services inside or outside its service area, unless the property owners served by the satellite system agree in writing not to protest future formation of a Utility Local Improvement District which would enable the CPU to extend its system to serve the satellite area.

10. NEW SATELLITE SYSTEMS/REQUIREMENTS

CPU will not permit any new or expanded satellite system within its service area unless the following are guaranteed:

A. It is constructed or improved to meet CPU's comprehensive plan and conditions and standards.

B. The satellite system owners contract with CPU per Section 3 of these policies. The contract will also include an agreement to improve or construct the satellite system to meet CPU's conditions and standards; cost of extending and/or connecting the satellite system to CPU's standard connection charges, including meter installation charges.

11. EXISTING SATELLITE SYSTEMS/REQUIRED IMPROVEMENTS

Note: An existing satellite system is one that is presently providing water to properties within the service area of the satellite system.

A. Minimum Requirements:

CPU will inspect the water system to determine what improvements must be made prior to the Utility permitting any satellite service, and what improvements must be made in the future to bring it to the Utility's minimum standards and specifications for construction of its water system.

The applicant must, at the applicant's expense, expose for inspection such components of the water system as CPU requires. The foregoing includes, but is not limited to, the well pump and water distribution lines.

The applicant must provide CPU with a copy of the Department of Ecology permit for the well, the well drillers record, and any other requested data or information.

Based on the above, CPU will, in its sole discretion, determine the following: (1) if repairs or improvements must be performed by the applicant prior to CPU providing satellite service; (2) if improvements are necessary in the future to bring the system to CPU's standards and specifications for water system construction; (3) an estimate of the cost of each improvement; and (4) a method of payment for each improvement.

B. Repairs and Improvements:

CPU shall, in its sole discretion, determine whether all repairs and improvements necessary to meet CPU's standards and specifications must be made before satellite services will be permitted, or whether these shall be staged between initial and future improvements, as below.

C. Initial Repairs and Improvements:

Before CPU will permit satellite services to a water system, the applicant must, at the applicant's expense, make such repairs and improvements as CPU determines are necessary to ensure a reliable and adequate supply and distribution of water until such time as the satellite system is improved to meet CPU's standards and specifications.

D. Future Improvements:

The applicant and/or users of the satellite system must agree to pay for the cost of all future improvements beyond the initial improvements, which CPU determines are necessary for the system to meet CPU's standards and specifications, and provide easements satisfactory to CPU for construction of these improvements.

E. Cost Initial and Future Improvements:

The cost of at least the initial repairs and improvements must be paid before satellite services will be permitted. If CPU elects to allow staged future improvements to the satellite system, CPU shall determine the method of payment. This may include monthly installments over and above CPU's rates and/or charges to the users.

If CPU permits monthly payments, the term will be within the discretion of CPU, but may not be longer than 5 years. Payments may be adjusted if CPU determines that the actual cost of the improvements will exceed or be less than the original estimate.

F. Reserve Account:

Whether or not system repairs or improvements are required, CPU will not permit Category A or B satellite services unless the owners of the properties served deposit with CPU an amount that CPU, in its discretion, determines is adequate to pay for emergency or non-routine repairs or replacements, including

the well pumps or other mechanical components of the system. If CPU determines it would be an economic hardship on the owners to immediately pay the entire reserve account, it may permit a portion to be billed and paid to CPU in monthly installments.

12. CONNECTION CHARGES

As a condition to CPU providing satellite service in Category C, the users must pay CPU's system development charge and connection charges, including the meter installation. The method of payment shall be determined by CPU in the same manner as fee paying the cost of future improvements to the satellite.

13. METERS, RATES AND CHARGES

A. Meters:

CPU will not provide Category C satellite services unless all connections are metered. CPU may require metering as a condition to providing Category B satellite services.

B. Rates and Charges:

CPU shall charge its standard labor, material and equipment rates for its Category A satellite services. The rates and charges to users where CPU is providing Category C satellite services shall be determined by CPU based on the cost of service and other factors that CPU is entitled to take into account in setting water rates. In no event shall the rates charged such users be less than those charged the same customer-class connected to CPU's water system. The rates and charges to Category B users may be either/or a combination of the above, but not less than the Category C minimum.

C Agreements (service area, interties, source, wheeling, joint use, cooperation and mutual aid)

INTERLOCAL AGREEMENT FOR ESTABLISHING WATER UTILITY SERVICE BOUNDARIES

BETWEEN

THE CITIES OF BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER, WASHOUGAL, THE TOWN OF YACOLT, AND CLARK PUBLIC UTILITIES

THIS AGREEMENT, entered into by and between the CITIES of BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER, WASHOUGAL, the TOWN of YACOLT, and CLARK PUBLIC UTILITIES, (hereinafter referred to as the WATER PURVEYORS), WITNESS THAT:

WHEREAS, Clark County and the WATER PURVEYORS conduct capital facilities and land use planning under the Growth Managment Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, RCW 70.116 Public Water System Coordination Act, and WAC 246-293-250 require development of a Coordinated Water System Plan, including establishment of service area boundaries; and

WHEREAS, the designation of service area boundaries will help facilitate efficient planning and delivery of water services within Clark County, will help ensure that unnecessary duplication of service is avoided, and will provide predictability to the WATER PURVEYORS, Clark County, and to citizens using water services; and

WHEREAS, the designation of service area boundaries will help assure that water reserved for public water supply proposed with the CWSSA will be utilized in the future in an efficient planned manner;

NOW THEREFORE, in consideration of covenants, conditions, performances, and promises hereinafter contained, the undersigned parties hereto agree as follows:

1. Service Area Boundaries. The undersigned acknowledges that the maps identifying their service area boundaries, dated _____ and attached to this agreement, accurately identifies the water system's future service area. This signed Interlocal Agreement verifies that there are no service area conflicts with adjacent water utilities.

2. Boundary Streets. Where streets or portions of streets serve as a service area boundary, both WATER PURVEYORS may extend service within the street itself. The utility which is located to the north and/or east of the portion of the street serving as a boundary will also be entitled to extend service across the boundary to abutting streetside lots. Any other service extensions into adjacent service area boundaries shall require agreement of the WATER PURVEYORS involved.

3. Boundary Adjustments. If, at some time in the future, it is in the best interests of the undersigned parties to make service area boundary adjustments, such modifications must have the written concurrence of all involved parties and the proper legislative authority(ies), and must be noted and filed with Clark County and Washington State Department of Health.

As specified in WAC 246-293-250, Service Area Agreements-Requirements, this Agreement shall become effective once this document is approved by the Clark County Board of Commissioners.

This Interlocal agreement for establishing water utility service boundaries is hereby approved:

Clark Public Utilities Representative	General Manager/CEO Title	3-18-99 Date
City of Battle Ground Representative	Title	Date
City of Camas Representative	Title	Date
City of Ridgefield Representative	Title	Date
City of Vancouver Representative	Title	Date
City of Washougal Representative	Title	Date
Town of Yacolt Representative	Title	Date

APPROVED BY CLARK COUNTY BOARD OF COMMISSIONERS

_____
Chair

Resolution No._____
Date:_____

Approved As To Form Only
ARTHUR D. CURTIS
Prosecuting Attorney

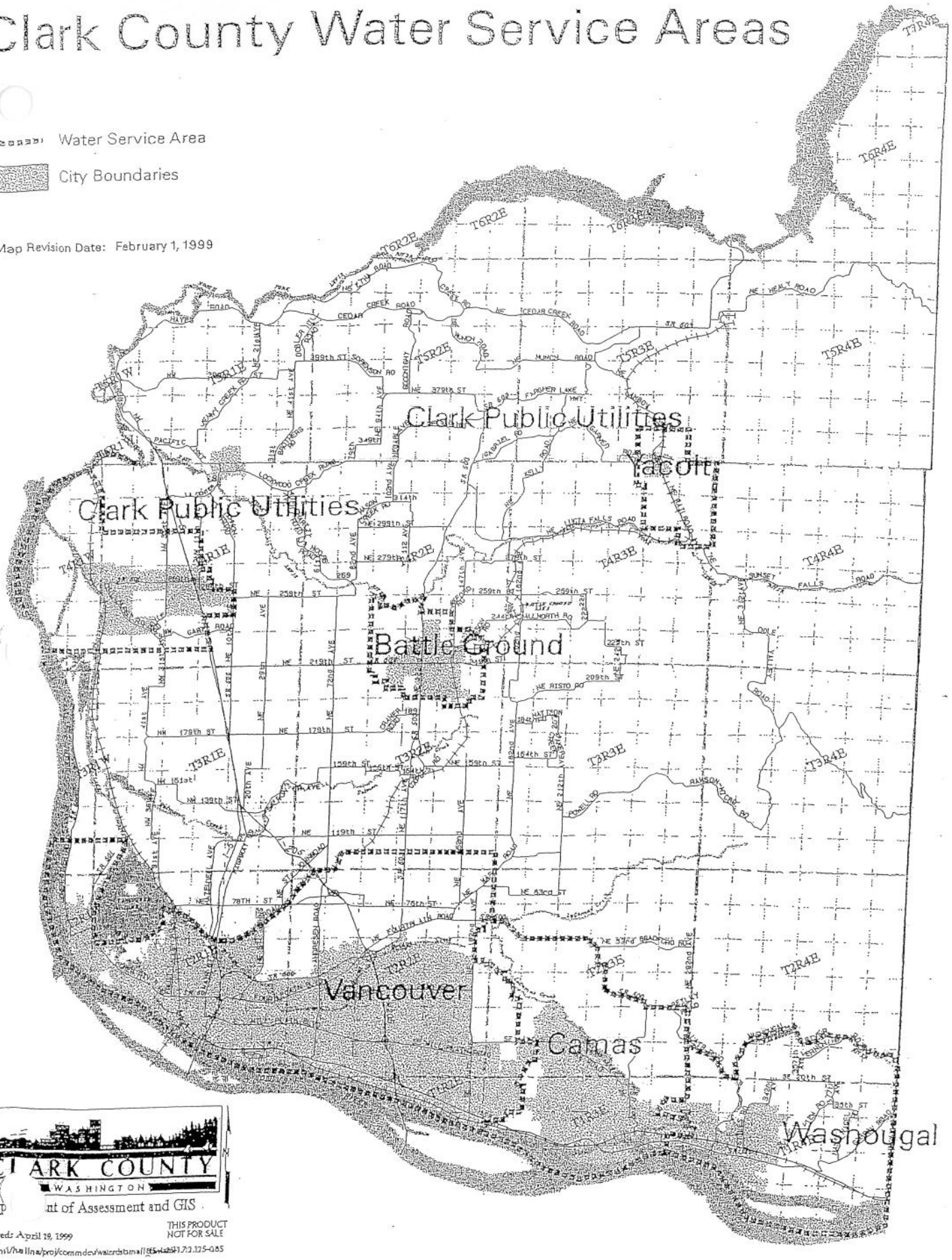
By: _____
Christopher Horne
Deputy Prosecuting Attorney

Clark County Water Service Areas

Water Service Area

City Boundaries

Map Revision Date: February 1, 1999



CLARK COUNTY
WASHINGTON
Department of Assessment and GIS

THIS PRODUCT NOT FOR SALE

ted: April 19, 1999

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Water Supply and Aid to Construction Agreement between Clark Public Utilities and the City of Battle Ground for Calendar Years 2021 - 2040

THIS AGREEMENT is made and entered into this day 2nd day of March, 2021 by and between Clark Public Utilities ("Clark") and the City of Battle Ground (the "City"), collectively the "Parties."

WHEREAS, the authority for this Agreement is granted by the Public Water System Coordination Act of 1977, Chapter 70.116 RCW; and

WHEREAS, such an agreement promotes efficient water resource management within Salmon Creek and Lewis River Basins by utilizing existing water rights permits; and

WHEREAS, such an agreement is consistent with the Clark County Coordinated Water System Plan ("CWSP") to meet regional supply needs; and

WHEREAS, water service areas for each party and responsibilities for water supply service are designated in the CWSP to help assure that time, effort, and money are best used by avoiding unnecessary duplication of infrastructure to properly manage the areas' valuable resources; and

WHEREAS, water system interties are mutually beneficial as part of a cooperative effort to better manage groundwater resources, protect in-stream flows and to provide safe and adequate water supply to North Clark County; and

WHEREAS, during certain times of the year, Clark provides the City with a significant portion of its water supply that is needed to serve the City's residents; and

WHEREAS, Clark currently provides water service to the City through an intertie; and

WHEREAS, based on certain additional improvements to its water system, as requested by the City, Clark anticipates that it will have the ability to provide excess water from its system to the City to help the City meet its water supply needs for the next twenty (20) years; and

WHEREAS, the City of Ridgefield has entered a separate agreement with Clark to receive additional water from Clark's system; and

WHEREAS, the system improvements requested by the City and separately by the City of Ridgefield would not have been performed by Clark at this time, but for this Agreement;

and

WHEREAS, the City has agreed to share the cost of the improvements to Clark's system with the City of Ridgefield as provided herein; and

WHEREAS, except for the shared costs of the improvements to Clark's system, the agreement between the City of Ridgefield and Clark has no impact on the terms and conditions of this Agreement and the water supply to be provided by Clark to the City as contemplated herein; and

WHEREAS, the City is relying on the water provided under this Agreement to meet its requirements under its water system plan; and

WHEREAS, the Parties recognize that Clark has a legal duty to service its customers equally.

NOW, THEREFORE, the Parties, having entered into this Agreement by their signature, agree with the following:

I. GENERAL TERMS AND OBJECTIVES

1. This Agreement shall replace the Short-Term Water Supply Agreement executed by Parties on May 2, 2005, and amended on August 4, 2009, and the Water Supply and Aid to Construction Agreement executed July 7, 2020.

2. Clark owns and maintains the intertie along NE 219th Street (SR 502) east of NE 92nd Avenue (the "Intertie"). The City owns and maintains a booster pump station (the "Booster Station") near the Intertie that houses a static water meter (the "Meter") that measures the volume of water Clark provides the City through the Intertie.

3. Clark is currently supplying up to 1,000 gallons of water per minute (gpm) to the City through the Intertie, which volume is measured by the City's Meter. As additional water supply becomes available through Clark's development of the new Paradise Point Regional Water Supply System ("PPWSS"), which includes the Paradise Point Wellfield and Paradise Treatment Plant, Clark will be able to provide the City with an additional 1,000 gpm (for a total of maximum of 2,000 gpm) except in such circumstances when Clark may be unable to provide up to the full 1,000 gpm as outlined in Section 6 herein. In order to enable Clark to provide this additional water supply, the City has agreed to pay Clark an aid to construction charge for work associated with certain improvement to the PPWSS, as outlined herein.

   The City will pay Clark an amount equal to one-half (50%) of the total costs associated with installing an additional production well (plus associated equipment) at the Paradise Point Wellfield, designated as Well #4. In addition, the City will also pay Clark for one-half (50%) of the cost one (1) filter bank at the Paradise

Treatment Plant. The other one-half (50%) of the total costs associated with these improvements shall be paid for by the City of Ridgefield. Clark will design, construct, own, and operate these additional facilities in the PPWSS.

The total costs of Well #4 (plus associated equipment) and the one (1) filter bank is $1,184,128. The City shall be responsible for one-half (50%) of the total cost for a total payment owed of $592,064. Construction of these facilities is complete, and the City will pay Clark its share of the actual material and construction costs ($592,064.00), which will be invoiced by Clark and payable by June 30, 2021.

When the City later contributes to the construction of a new water transmission line, described in Section I (5), upon terms to be agreed upon separately in a new agreement between the Parties, Clark will make an additional 2,000 gpm available to the City, except in such circumstances where Clark may be unable to provide up to the full 2,000 gpm as outlined in Section 6 herein, for cumulative total water supply that will not exceed 4,000 gpm unless otherwise mutually agreed between the Parties.

4. The Intertie will need to be upgraded by the City before it will be able to use the additional 1,000 gpm described in Section I (3). This work includes, but is not limited to, installing additional pumps at the City's Booster Station and associated control systems. This work will be performed by the City, at its expense, and the City will own and operate these new facilities.

5. At some point in the future, the Parties intend to construct a new large diameter waterline between the City's Intertie and the Paradise Point Water Treatment Plant, which will be known as the "Pioneer to Cherry Grove Transmission Line." Once this line is completed it will have a capacity of up to 4,000 gpm. The design and construction costs of this new line shall be shared equally between Clark and the City. The Parties will work together to develop the planning and construction schedule for the Pioneer to Cherry Grove Transmission Line, which work is expected to start no later than January 1, 2030.

6. Clark acknowledges that during certain times of the year, the City will depend on this additional water capacity to serve its residents. Clark agrees that it will use its best efforts to meet the City's water supply needs, as outlined in this Agreement, and provide uninterrupted service. But the Parties recognize that Clark must treat all of its water customers equally and that it cannot guarantee that it will be able to meet any specific customer's water demand when Clark experiences water shortages as a result of drought, equipment failure, or other causes outside of Clark's control.

7. Once Clark completes construction of its facilities, it shall maintain them at its expense.

8. Clark will continue to operate the Intertie using its Supervisory Control and Data Acquisition (SCADA) system. Clark will also maintain water levels in the City's

reservoirs at agreed set points. If curtailment becomes necessary due to an emergency or limited water supply, Clark and the City will coordinate to minimize the impact to the City's customers. During such event, Clark will provide the City with as much advanced notice as possible.

9. Clark and the City will continue to provide service within their respective water service boundaries, as designated through the CWSP and as shown on the Clark County GIS mapping system.

10. The City and Clark shall periodically review the City's population and demand projections to insure that the planning documents are up to date.

II. CONDITIONS OF SERVICE

1. All interties with the City will be metered.

2. Clark will be responsible for monitoring water quality serving the Intertie. The City will be responsible for monitoring its distribution system's water quality and adding fluoride (if needed). Water quality testing at the Intertie will be coordinated by the Parties.

3. The City will be responsible for maintaining the Booster Station, the Meter, and the main extension within the City.

III. WATER RIGHTS

The City previously transferred excess water rights of 1,000 AF of annual and 1,000 gpm instantaneous flow to Clark in 2005. This was to facilitate Clark's installation of a water supply well capable of meeting the City's first stage demand and to ensure that Clark's annual quantity limit was not exceeded by supplying the City water through the Intertie.

IV. COST OF WATER SUPPLY

1. Clark will charge the City its prevailing rate for water service (Public Authority Service rate class), which rate is subject to change by Clark's Board of Commissioners. Attached as Exhibit "A" is Clark's current water rates. Clark agrees to meet with the City and review any information provided by the City to reevaluate the City's appropriate water rate class.

2. Other rates, fees, and System Development Charges (SDC) for services under this Agreement will also be applied in accordance with the Public Authority Service rate class.

3. The capacity of the water meter at the Intertie will be increased as needed to meet the City's water demand. If the meter capacity is adjusted, the City will be responsible for the applicable SDC.

4. Payments made by the City for one-half (50%) of the construction of Well #4, its associated facilities, and the one (1) filter bank at the Paradise Point Treatment Plant, the total amount of which is $592,064, will be treated as payments in lieu of the City's future SDCs for increased meter capacity on the Intertie, up to the amount paid by the City under this Agreement. The opportunity to use these in lieu payments for SDCs on the Intertie will expire on December 31, 2030.

V. SYSTEM DEVELOPMENT CHARGES

Presently, the City uses the equivalent of a six-inch (6") meter for its water service through the Intertie, which has a current SDC of $271,030. Once Well # 4 is operational and the City increases its use to more than 1,000 gpm, the City will be responsible for a SDC for the equivalent of an eight-inch (8") meter that can measure up to 2,400 gpm. Once this occurs, the value of the City's current six-inch (6") SDC will be credited to the then applicable eight-inch (8") SDC and the available in lieu payment described under Section IV (4) will also be applied.

VI. COOPERATION FOR FUTURE WATER RIGHTS

To assist Clark in the development of future water supply sources, the City will support Clark's efforts to acquire additional water rights and its pursuit of any water system development grants or loans.

VII. ASSIGNMENT/SUBCONTRACTING

No party to this Agreement shall transfer or assign, in whole or in part, its respective rights or obligations under this Agreement without the prior written consent of the other parties. Consent for assignment or transfer shall not be unreasonably withheld.

VIII. INDEPENDENT CAPACITY

Employees or agents of a Party engaged in the performance of projects under this Agreement shall continue to be employees or agents of that Party and shall not be considered employees or agents of any other Party to this Agreement.

IX. ALTERATIONS AND AMENDMENTS

This Agreement may only be amended by written agreement between the Parties that is signed by personnel authorized to bind each Party.

X. DISPUTES

The principal executive or their designee of each Party shall attempt to resolve all disputes regarding the terms of this Agreement in good faith. In the event the dispute is not resolved by the Parties, the matter will be referred to the Superior Court of the State of Washington in and for Clark County.

Parties shall bear their own legal fees, costs, and expenses related to enforcing rights and responsibilities of this Agreement.

XI. RECORDS MAINTENANCE

The Parties shall retain project records that sufficiently and properly reflect all direct and indirect costs incurred for the performance of services in this Agreement. Records shall be subject to inspection, review, or audit by each Party and the Office of the Washington State Auditor. All records shall be retained in accordance with the State of Washington records retention schedule.

XII. GOVERNANCE

This Agreement is entered into under the authority granted by the State of Washington and provisions of the Agreement shall be construed to conform to Washington State laws.

XIII. WAIVER AND SEVERABILITY

Failure by any Party to this Agreement to exercise rights under this Agreement shall not preclude that Party from subsequent exercise of those rights and shall not constitute a waiver of those rights or any other right under this Agreement. Waiver of any rights under this Agreement requires a written statement signed by an authorized representative of the Party waiving such rights.

If any provision of this Agreement or provision of a document incorporated by reference to this Agreement is found invalid, the invalidity shall not affect other provisions of this Agreement if the other provisions can be given effect without the invalid provision. The provisions of this Agreement are declared severable. In the event that certain language or a section of this Agreement is invalidated, the Parties will negotiate alternative terms to effectuate the Parties' intent. If the Parties are unable to reach agreement on alternative terms within 30 days of the invalidity determination, this Agreement will terminate.

XIV. ENTIRE AGREEMENT

This Agreement contains all the terms and conditions agreed upon by the parties on the subject of this Agreement. No other understandings, oral or otherwise, exist or bind the Parties.

XV. INDIRECT OR THIRD-PARTY BENEFICIARIES

The Parties do not intend, by this Agreement, to assume contractual obligations to any other party than the Parties named in this Agreement. There are no indirect or third-party beneficiaries to this Agreement.

XVI. NOTICES

Any notices given under this Agreement shall be delivered and addressed to:

Clark Public Utilities
Attn: Director of Water
PO Box 8900
Vancouver, WA 98668

City of Battle Ground
Attn: City Manager
109 SW 1st Street, Suite 221
Battle Ground, WA 98604

The undersigned Parties agree to all of the terms and conditions contained in this Agreement.

IN WITNESS WHEREOF, the Parties execute this Agreement by their duly authorized officers as of the 2nd day of March, 2021.

CLARK PUBLIC UTILITIES

DocuSigned by:
BY: Lena Kittler
B954A3862E8849F...

TITLE: CEO/General Manager

CITY OF BATTLE GROUND

DocuSigned by:
BY: Erin Erdman
8212D866B3BB448...

TITLE: City Manager

Approved as to form:

DocuSigned by:
John Eldridge
7F643C7B4B14441...

John Eldridge/General Counsel

Approved as to form:

DocuSigned by:
Christine Hayes
[illegible]

Christine Hayes/City Attorney

Exhibit A

CLARK'S CURRENT WATER RATES

Rate Class (per Resolution No, 6974)

PUBLIC AUTHORITIES SERVICE
REVENUE CLASS 0

APPLICABILITY

This revenue class applies to schools, municipalities, political subdivisions, or agencies of county, state, or federal governments.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE AND VOLUME PER BLOCK

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
53 (A or A/B Meter)	5/8" x ¾"	$9.00	0 - 1,800	1,801 - 3,600	Over 3,600
54 (B Meter)	1"	$16.10	0 - 4,500	4,501 - 9,000	Over 9,000
55 (C Meter)	1 ½"	$36.00	0 - 9,000	9,001 - 18,000	Over 18,000
56 (D Meter)	2"	$64.15	0 - 18,000	18,001 - 36,000	Over 36,000
57 (E Meter)	3"	$144.00	0 - 41,400	41,401 - 82,800	Over 82,800
58 (F Meter)	4"	$256.05	0 - 73,800	73,801 - 147,600	Over 147,600
59 (G Meter)	6"	$572.80	0 - 165,600	165,601 - 331,200	Over 331,200
60 (H Meter)	8"	$1018.15	0 - 295,200	295,201 - 590,400	Over 590,400

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for any nonessential household purposes.

SERVICE INSTALLATION FEES (per Resolution No. 7196)

Service Size	**Fee**
Up to 1"	$2,200
1 ½" and larger	Time and Materials

Customers requesting services larger than one inch will be billed for time and material costs for the installation of the service.

Meter Set Only
(Lots in subdivisions that currently have boxes)

Size	Current Charge	(Breakdown)
5/8 x ¾	$3,255	$355 meter + $2,900 SD
¾"	$4,540	$370 meter + $4,170 SD
1"	$7,890	$460 meter + $7,430 SD
1 ½"	$17,380	$670 meter + $16,710 SD
2" Meter	$30,820	$1,130 meter + $29,690 SD
3" Meter	$68,290	$1,480 meter + $66,810 SD
4" Meter	$121,110	$2,320 meter + $118,790 SD
6" Meter	$271,030	$3,760 meter + $267,270 SD

Meter Set and Service
(Land without meter box but water main in the street)

Size	**Total Charge**
5/8 x ¾ Meter	$5,455 total cost
¾" Meter	$6,740 total cost
1" Meter	$10,090 total cost
1 ½" Meter	$19,580*
2" Meter	$33,020*
3" Meter	$70,490*
4" Meter	$123,310*
6" Meter	$273,230*

*Meter sizes greater than 1 ½" are subject to an additional time & material charge.

Water Supply and Aid to Construction Agreement between Clark Public Utilities and the City of Ridgefield for Calendar Years 2021 - 2040

THIS AGREEMENT is made and entered into this 12th day of February 2021, by and between Clark Public Utilities ("Clark") and the City of Ridgefield (the "City"), collectively the "Parties."

WHEREAS, the authority for this Agreement is granted by the Public Water System Coordination Act of 1977, Chapter 70.116 RCW; and

WHEREAS, such an agreement promotes efficient water resource management within Salmon Creek and Lewis River Basins by utilizing existing water right permits in accordance with WACs 173-527 and 173-528; and

WHEREAS, such an agreement is consistent with the Clark County Coordinated Water System Plan ("CWSP") to meet regional supply needs; and

WHEREAS, water service areas for each party and responsibilities for water supply service are designated in the CWSP to help assure that time, effort, and money are best used by avoiding unnecessary duplication of infrastructure to properly manage the areas' valuable resources; and

WHEREAS, water system interties are mutually beneficial as part of a cooperative effort to better manage groundwater resources, protect in-stream flows and to provide safe and adequate water supply to North Clark County; and

WHEREAS, during certain times of the year, Clark provides the City with a significant portion of its water supply that is needed to serve the City's residents; and

WHEREAS, Clark currently provides water service to the City through various interties; and

WHEREAS, based on certain additional improvements to its water system, as requested by the City, Clark anticipates that it will have the ability to provide excess water from its system to the City to help the City meet its current and future water supply needs; and

WHEREAS, the system improvements requested by the City (and the City of Battle Ground) would not have been performed by Clark at this time, but for this Agreement; and

WHEREAS, the City had agreed to share the cost of these improvements with the City of Battle Ground; and

WHEREAS, the City is relying on the water provided under this Agreement to meet its requirements under its water system plan; and

WHEREAS, the Parties recognize that Clark has a legal duty to service its customers equally.

NOW, THEREFORE, the Parties, having entered into this Agreement by their signature, agree with the following:

I. GENERAL TERMS AND OBJECTIVES

1. This Agreement shall replace all prior water service agreements, including the Regional Water Supply Agreement signed April 3, 2003, and the Short-Term Water Supply Agreement executed by Parties on May 17, 2006.

2. The Term of this agreement shall commence on the date fully executed by both Parties and shall continue until December 31, 2040. This Agreement may be extended or terminated or amended only by written agreement of the Parties.

3. Clark primarily provides water service to the City through Intertie #1, located at 800 NE 264th Street, along S 5th Street, east of N 85th Avenue.

   Clark also provides water service to the City through two additional temporary points of connection. The first connection point, Intertie #2, serves Clark County Fire and Rescue Station 21, located at 911 N 65th Avenue. The second connection point, Intertie #3, serves the North Pacific Union Conference of The Seventh-Day Adventists building and the Washington State Department of Transportation Weigh Station. This intertie is located on the NW corner of N 20th Street and NW 11th Avenue.

   Interties #2 and #3 are planned to be disconnected once direct water service is established through the development of a new water transmission line, as described in Section I (5) below.

4. Clark is currently supplying water to the City on an emergency basis through Intertie #1, as measured by Clark's 2-inch meter. As additional water supply becomes available through Clark's development of the new Paradise Point Regional Water Supply System, which includes the Paradise Point Wellfield and Treatment Plant, Clark will be able to provide the City with up to 1,000 gpm, which will be measured by a new 6-inch meter.

   In order to enable Clark to provide this additional water supply, the City has agreed to pay Clark an aid to construction charge for work associated with certain

improvements to the Paradise Point Regional Water Supply System, as outlined herein. The City will pay Clark an amount equal to one-half the total costs associated with installing an additional production well (plus associated equipment) at the Paradise Point Wellfield, to be designated as Well #4. In addition, the City will also pay Clark for one-half the cost of one (1) filter bank at the Paradise Treatment Plant. Clark will design, construct, own, and operate these additional facilities in the Paradise Point Regional Water Supply System.

Well #4 (plus associated equipment) and the filter bank cost is $1,184,128 for a half payment due of $592,064. Construction of these facilities is complete, and the City will pay Clark its share of the actual material and construction costs, which will be invoiced by Clark and payable by June 30, 2021.

5. The Parties intend to construct a new transmission main for a new intertie, located at the City's northern water service boundary, spanning between the City's service area and Clark's existing water main located at approximately 31000 NE 31st Ave, which will be known as the "N. Royle Road Transmission Main." Once completed, the new water main will have a capacity of up to 2,000 gpm. The design and construction costs of this new line will be addressed under a separate agreement. The Parties will work together to develop the planning and construction schedule for the N. Royle Rd Transmission Main, which is anticipated to begin construction no later than January 1, 2030.

   Once this new transmission line is operational, Clark will have the ability to serve the City with up to 2,000 gpm, which represents the maximum capacity available to the City through all interties.

6. Clark acknowledges that during certain times of the year, the City will depend on this additional water capacity to serve its residents. Clark agrees that it will work to meet the City's water supply needs, as outlined in this Agreement, and to provide uninterrupted service. But the Parties recognize that Clark must treat all of its water customers equally and that it cannot guarantee that it will be able to meet any specific customer's water demand when Clark experiences water shortages as a result of drought, equipment failure, or other causes outside of Clark's control.

7. Once Clark completes construction of its facilities, it shall maintain them at its own expense.

8. Clark will monitor the interties using its Supervisory Control and Data Acquisition (SCADA) system. If curtailment becomes necessary due to an emergency or limited water supply, Clark and the City will coordinate to minimize the impact to the City's customers. During such event, Clark will provide the City with as much advance notice as possible.

9. Clark and the City will continue to provide service within their respective water service boundaries, as designated within the CWSP, and as shown on the Clark

County GIS mapping system.

10. The City and Clark shall periodically review the City's population and demand projections to insure that the planning documents are up to date.

11. Each Party will be responsible for complying with all state and federal water quality standards and for maintaining water mains and infrastructure within its respective water system.

II. CONDITIONS OF SERVICE

1. All interties with the City will be metered and such meters will be owned and maintained by Clark.

2. Clark will monitor and maintain water quality to the City's interties. The City will be responsible for monitoring its distribution system's water quality. Water quality testing at the interties will be coordinated by the Parties.

   Clark will be responsible for installation of the meter assembly and will maintain/monitor it.

III. COST OF WATER SUPPLY

1. Clark will charge the City its prevailing rate for water service (Public Authority Service rate class), which rate is subject to change by Clark's Board of Commissioners. Attached as Exhibit "A" is Clark's current water rates. Clark agrees to meet with the City and review any information provided by the City to reevaluate the City's appropriate water rate class.

2. Meter set fees and monthly charges for services under this Agreement will also be applied in accordance with the Public Authority Service rate class.

3. The capacity of the water provided through the proposed 6-inch meter at Intertie #1 will not be increased. Future additional capacity will be provided through the N Royle Road intertie as needed to meet the City's water demand. With installation of additional meter capacity, the City will be responsible to pay Clark the applicable system development charge (SDC).

4. Payments made by the City for one-half of the construction of Well #4, its associated facilities, and the filter bank at the Paradise Point Treatment Plant, which amount is $592,064, will be treated as payments in lieu of the City's future SDCs for increased meter capacity on the Intertie #1, and N Royle Road Intertie, up to the amount paid by the City under this Agreement. The opportunity to use these in lieu payments for SDCs on the interties will expire on December 31, 2030.

IV. SYSTEM DEVELOPMENT CHARGES

Presently, the City uses the equivalent of a two-inch (2") meter for its water service through Intertie #1. Once Well # 4 is operational and the City is authorized to use up to 1,000 gpm, the City will be responsible for a SDC for the equivalent of a six-inch (6") meter that can measure up to 1,000 gpm. Once this occurs, the value of the City's current two-inch (2") meter SDC will be credited to the applicable six-inch (6") meter SDC and the available in lieu payment described under Section IV (4) will also be applied.

V. COOPERATION FOR FUTURE WATER RIGHTS

To assist Clark in the development of future water supply sources, the City will support Clark's efforts to acquire additional water rights and its pursuit of any water system development grants or loans. Additionally, the City and Clark agree to continue exploring partnerships regarding Coordinated Water System Planning and regional source development.

VI. ASSIGNMENT/SUBCONTRACTING

No party to this Agreement shall transfer or assign, in whole or in part, its respective rights or obligations under this Agreement without the prior written consent of the other parties. Consent for assignment or transfer shall not be unreasonably withheld.

VII. INDEPENDENT CAPACITY

Employees or agents of a Party engaged in the performance of projects under this Agreement shall continue to be employees or agents of that Party and shall not be considered employees or agents of any other Party to this Agreement.

VIII. ALTERATIONS AND AMENDMENTS

This Agreement may only be amended by written agreement between the Parties that is signed by personnel authorized to bind each Party.

IX. DISPUTES

The principal executive or their designee of each Party shall attempt to resolve all disputes regarding the terms of this Agreement in good faith. In the event the dispute is not resolved by the Parties, the matter will be referred to the Superior Court of the State of Washington in and for Clark County.

Parties shall bear their own legal fees, costs, and expenses related to enforcing rights and responsibilities of this Agreement.

X. RECORDS MAINTENANCE

The Parties shall retain project records that sufficiently and properly reflect all direct and indirect costs incurred for the performance of services in this Agreement. Records shall be subject to inspection, review, or audit by each Party and the Office of the Washington State Auditor. All records shall be retained in accordance with the State of Washington records retention schedule.

XI. GOVERNANCE

This Agreement is entered into under the authority granted by the State of Washington and provisions of the Agreement shall be construed to conform to Washington State laws.

XII. WAIVER AND SEVERABILITY

Failure by any Party to this Agreement to exercise rights under this Agreement shall not preclude that Party from subsequent exercise of those rights and shall not constitute a waiver of those rights or any other right under this Agreement. Waiver of any rights under this Agreement requires a written statement signed by an authorized representative of the Party waiving such rights.

If any provision of this Agreement or provision of a document incorporated by reference to this Agreement is found invalid, the invalidity shall not affect other provisions of this Agreement if the other provisions can be given effect without the invalid provision. The provisions of this Agreement are declared severable. In the event that certain language or a section of this Agreement is invalidated, the Parties will negotiate alternative terms to effectuate the Parties' intent. If the Parties are unable to reach agreement on alternative terms within 30 days of the invalidity determination, this Agreement will terminate.

XIII. ENTIRE AGREEMENT

This Agreement contains all the terms and conditions agreed upon by the parties on the subject of this Agreement. No other understandings, oral or otherwise, exist or bind the Parties.

XIV. INDIRECT OR THIRD-PARTY BENEFICIARIES

The Parties do not intend, by this Agreement, to assume contractual obligations to any other party than the Parties named in this Agreement. There are no indirect or third-party beneficiaries to this Agreement.

XV. NOTICES

Any notices given under this Agreement shall be delivered and addressed to:

Clark Public Utilities
Attn: Director of Water
PO Box 8900
Vancouver, WA 98668

Copy to: General Counsel

City of Ridgefield
Attn: City Manager
230 Pioneer Street Ridgefield, WA 98642

The undersigned Parties agree to all of the terms and conditions contained in this Agreement.

IN WITNESS WHEREOF, the Parties execute this Agreement by their duly authorized officers as of the 12th day of February, 2021.

CLARK PUBLIC UTILITIES

DocuSigned by:
BY: Lena Wittler
B954A3862E8849F...

TITLE: CEO/General Manager

DATE: February 12, 2021

Approved as to form:

DocuSigned by:
John Eldridge
7F643C7B4B14441...
John Eldridge/General Counsel

CITY OF RIDGEFIELD

DocuSigned by:
BY: Steve Stuart
901AFC1F59CF43B...

TITLE: City Manager

DATE: February 17, 2021

Approved as to form:

DocuSigned by:
Janean Parker
A19EA11FBB1C43B...
Janean Parker/City Attorney

Exhibit A

CLARK'S CURRENT WATER RATES

Rate Class (per Resolution No, 6974)

PUBLIC AUTHORITIES SERVICE
REVENUE CLASS 0

APPLICABILITY

This revenue class applies to schools, municipalities, political subdivisions, or agencies of county, state, or federal governments.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE AND VOLUME PER BLOCK

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
53 (A or A/B Meter)	5/8" x ¾"	$9.00	0 - 1,800	1,801 - 3,600	Over 3,600
54 (B Meter)	1"	$16.10	0 - 4,500	4,501 - 9,000	Over 9,000
55 (C Meter)	1 ½"	$36.00	0 - 9,000	9,001 - 18,000	Over 18,000
56 (D Meter)	2"	$64.15	0 - 18,000	18,001 - 36,000	Over 36,000
57 (E Meter)	3"	$144.00	0 - 41,400	41,401 - 82,800	Over 82,800
58 (F Meter)	4"	$256.05	0 - 73,800	73,801 - 147,600	Over 147,600
59 (G Meter)	6"	$572.80	0 - 165,600	165,601 - 331,200	Over 331,200
60 (H Meter)	8"	$1018.15	0 - 295,200	295,201 - 590,400	Over 590,400

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for any nonessential household purposes.

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4" Meter	$121,110	$2,320 meter + $118,790 SD
6" Meter	$271,030	$3,760 meter + $267,270 SD

Meter Set and Service
(Land without meter box but water main in the street)

Size	**Total Charge**
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*Meter sizes greater than 1 ½" are subject to an additional time & material charge.

Clark County
Coordinated Water System Plan Update

Regional Supplement

NOVEMBER 2011

CLARK COUNTY
WATER UTILITY COORDINATING COMMITTEE

Preface

Water Utility Coordinating Committee Members and Alternates

The Coordinated Water System Plan Update was prepared for the major public water purveyors and the other local general purpose municipalities in Clark County, Clark Public Utilities, Clark County and the Washington State Department of Health, under the guidance of the Clark County Water Utility Coordinating Committee. Committee members and alternates follow:

Doug Quinn, *Chair*
Director of Water Services
Clark Public Utilities

Eric Beck
Engineer Manager—Water Services
Clark Public Utilities

Steve Prather
Water Quality Manager
Clark Public Utilities

Eric Levison
Public Works Director
City of Camas

Scott Sawyer
Public Works Director
City of Battle Ground

Elaine Huber
Operations Manager
City of Battle Ground

Jeff Sarvis
Public Works Director
City of La Center

Bart Stepp
City Engineer
City of La Center

Steve Wall
Public Works Director
City of Ridgefield

Brian Carlson
Public Works Director
City of Vancouver

Tyler Clary, *Vice Chair*
Senior Engineer—Water
City of Vancouver

Michelle Henry
Engineer
City of Vancouver

Trevor Evers
Public Works Director
City of Washougal

John Roth
Water/Wastewater Manager
City of Washougal

Pete Roberts
Public Works Director
Town of Yacolt

Oliver Orjiako
Director of Community Planning
Clark County

Gary Albercht
Planner
Clark County

Pete Capell
Public Works Director
Clark County

Jon Dunaway
Fire Marshal
Clark County

Richard Martin
Assistant Fire Marshal
Clark County

Tom Gonzales
Resource Protection Manager
Clark County Public Health

Joe Ellingson
Environmental Health Specialist
Clark County Public Health

Regina Grimm
Southwest Regional Engineer
Washington State Dept of Health

Darin Klein
Southwest Regional Planner
Washington State Dept of Health

Iloba Odum
Vancouver Field Office Manager
Washington Dept of Ecology

Clark Public Utilities was the administrative headquarters for the update of the Coordinated Water System Plan. City of Vancouver Public Works, in cooperation with the departments of Clark County Community Planning and GIS, provided mapping services for the plan. Rod Orlando, Technical Writing & Planning Services, and Lori Wyrick, Executive Assistant with Clark Public Utilities Water Services, provided professional and administrative support to the Water Utility Coordinating Committee.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
PO Box 47822 • Olympia, Washington 98504-7822
TDD Relay Service: 1-800-833-6388

April 4, 2012

Bill Barron, Administrator
Board of Clark County Commissioners
1300 Franklin Street, 6th Floor
Vancouver, Washington 98666-5000

Subject: Clark County Coordinated Water System Plan Regional Supplement Update; ODW Project #12-0203

Dear Mr. Barron:

The Clark County Coordinated Water System Plan Update (CWSP) received by the Office of Drinking Water (ODW) on February 7, 2012, has been reviewed and in accordance with RCW 70.116 and WAC 246 293 is **APPROVED**.

In your February 3, 2012, letter you stated on January 10, 2012, the Clark County Board of Commissioners took action on the plan, and (1) found it to be consistent with the goals and policies of the Clark County Comprehensive Growth Management Plan, and (2) approved the Interlocal Agreement for Adjusting or Confirming Future Water Utility Service Area Boundaries. You also indicated, once ODW approves the CWSP, the Board of Commissioners will adopt a resolution memorializing its action on the plan. It is my understanding this resolution, once adopted, will be included in Appendix X-B of the CWSP Update and a final copy will be sent to ODW.

We appreciate your efforts and the efforts of the Water Utility Coordinating Committee members who participated in the update. The CWSP recognizes the local commitment to assure the basis for a safe and reliable drinking water supply in Clark County.

It is our understanding Clark Public Utilities serves as the administrative headquarters for the update of the CWSP and is responsible for the review fee. ODW will submit an invoice to Clark Public Utilities for the plan review fee separately.

If you have any questions, please contact Regional Planner Darin Klein at (360) 236-3038, or Regional Engineer Regina Grimm at (360) 236-3035.

Sincerely,

for

Denise A. Clifford, Director

cc: Doug Quinn, Clark Public Utilities
Clark County Health Department
Clark County Planning Department
Amy Nielson, Department of Ecology

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VI-A Clark County Code 40.370.020 Water Supply

VI-B Guidelines for Preparing Interlocal Agreements for Interim Public Water Facilities

VII-A Clark Public Utilities Satellite Water System Policy Framework

X-A Clark County Board of Commissioners Resolution No. 1999-07-03 Actions Pertaining to the Acceptance of the 1999 Clark County Coordinated Water System Plan Update

X-B CWSP 2011Update Review, Action and Approval Documentation

Addenda

Addendum A **Fire Hydrant Intergovernmental Agreement**

Addendum B **Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries**

Glossary of Terms

APWA	American Public Works Association
AWWA	American Water Works Association
BOCC	Board of County Commissioners (Clark County)
CARA	Critical Aquifer Recharge Area
CWSP	Clark County Coordinated Water System Plan
CWSSA	Critical Water Supply Service Area
DOE	Washington State Department of Ecology (Ecology)
DOH	Washington State Department of Health
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
GMA	Washington State Growth Management Act
MOU	Memorandum of Understanding
OFM	Washington State Office of Financial Management
RCW	Revised Code of Washington
SEPA	Washington State Environmental Policy Act
SGA	Sand and Gravel Aquifer
SMA	Satellite (Water) System Management Agency
UGA	Urban Growth Area
UGB	Urban Growth Boundary
USRP	Utility Service Review Procedure
WAC	Washington Administrative Code
WRIA	Water Resource Inventory Area
WSDOT	Washington State Dept of Transportation
WUCC	Clark County Water Utility Coordinating Committee
20-Year Plan	Clark County 20-Year Comprehensive Growth Management Plan

Clark	**Clark Public Utilities**
Clark County GIS	**Clark County Dept of Assessment & GIS**
Community Development	**Clark County Dept of Community Development**
Community Planning	**Clark County Dept of Community Planning**
Coordination Act	**Public Water System Coordination Act**
County Legislative Authority	**Board of Commissioners (Clark County)**
Local Legislative Authority	**City Council or Town Council**
Public Health	**Clark County Public Health Dept**

Section I
Background and Summary Findings

1. BACKGROUND

Clark County is located in southwest Washington along the northern shore of the Columbia River. The City of Vancouver is the major incorporated area within Clark County. There are six other incorporated communities in the county: Camas, Washougal, Battle Ground, Ridgefield, La Center and Yacolt.

The Washington legislature enacted the Water Resource Act, RCW 90.54, in 1971. This law sets forth fundamentals of water resource policy to ensure that the waters of the state will be protected and fully utilized for the greatest benefit to the people of the state. Subsequently, procedures relating to the Reservation of Water for Future Public Water Supply, WAC 173-590, were established. These procedures were available to public water systems within a geographical area for use in reserving water rights required to meet projected municipal and industrial water needs over a 50-year period.

In 1977, the Washington State legislature enacted the Public Water System Coordination Act, RCW 70.116, which established a procedure for the state's water utilities to coordinate their planning and construction programs with adjacent water utilities and other local governmental activities. The Coordination Act specifies that either the Washington Department of Social and Health Services, currently the Department of Health (DOH), or the county legislative authority may declare an area within a county as a Critical Water Supply Service Area (CWSSA). This declaration is based upon the findings of a preliminary assessment which addresses problems related to inadequate water quality, unreliable service or the lack of coordinated planning by the water utilities within the CWSSA. A preliminary assessment of public water system concerns in Clark County was prepared by the Department of Social and Health Services in June 1980.

The Clark County Commissioners recognized the need to address water utility service problems being experienced in the county and identify a program that would guide their decisions in meeting the utility needs of the urbanizing areas. Based upon the findings of the preliminary assessment for the county, the commissioners, with the support of the water utility managers, declared Clark County a CWSSA and initiated the development of the initial Coordinated Water System Plan (CWSP), which was completed in 1983.

The initial 1983 CWSP and subsequent updates of the plan were prepared to fulfill regulatory requirements prescribed in WAC 248-56, Public Water System Coordination

Act. The CWSP serves as the Regional Supplement for DOH-approved local water system plans, which are on file with the municipal water purveyors and the DOH. Additionally, the 1983 CWSP, together with the petition for Reservation of Public Waters, fulfilled requirements under WAC 173-590 relating to reserving water for future public water supply. However, the relevance of this water supply reservation in Clark County has been rendered obsolete by new rules under WAC 173-527 and 173-528, which establish a water resource management program for the Lewis River, Salmon Creek and Washougal River basins WRIAs 27 and 28. This program insures adequate water supplies for the current and future population and economic opportunities, while maintaining in-stream flows to protect fish habitat.

The Clark County Water Utility Coordinating Committee (WUCC) is a standing working group composed of principal managerial and technical officials with Clark County Community Planning, Public Health, Office of the Fire Marshal, Clark Public Utilities, Washington DOH, cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver and Washougal, and the town of Yacolt. The current WUCC members and alternates are identified in the Preface. The By-laws of the WUCC appear in Appendix I-A. Detailed accounts of the committee's proceedings are on file at Clark Public Utilities and Clark County Community Planning. The WUCC was responsible for guiding the development of the initial 1983 CWSP and subsequent updates of the plan.

The Coordination Act calls for the WUCC to review the CWSP every five years or sooner, if the WUCC feels it is necessary. If no changes are needed, the WUCC will submit to the Washington Department of Health a statement verifying that the CWSP is still current.

Principal municipal water purveyors met in 2009 and 2010 to discuss preparing an update of the CWSP, recognizing that a decade had passed since the last update of the plan. The WUCC reconvened with new membership on January 27, 2010 to begin the update of the plan. Clark Public Utilities was designated as the administrative headquarters for the plan update. Rod Orlando, Technical Writing & Planning Services, was engaged to provide the WUCC with staff support and assist in developing the update. Monthly meeting of the WUCC were held to review and revise the plan, adhering to the general organization and format of previous plan updates. The draft plan was completed in May 2011 and circulated to the major water purveyors and other municipalities in the county.

2. SUMMARY FINDINGS BY PLAN SECTIONS

The following findings and conclusions have been derived from the development of the 1983 CWSP and subsequent plan updates, including the current update of the plan. These results are presented under the appropriate section headings.

Background—*Section I*

Coordinated Water System Planning is provided under WAC 246-293 (Public Water System Coordination Act, 1977). A preliminary assessment of Clark County's water systems was conducted in June 1980 and Clark County was declared a Critical Water Supply Service Area. The initial CWSP was developed in March 1983, under the guidance of the Clark County WUCC. Subsequent updates of the plan were completed in 1991 and 1999.

Between 1999 and 2009 the WUCC met only periodically to address specific needs. The first meeting for the 2011 update was held on January 27, 2010. The work program for the 2011 plan update addressed the entire plan, following the basic format of the 1999 plan document. The update also addressed the development of an intergovernmental agreement that enables municipalities receiving fire hydrant services to compensate municipalities providing these services with in-kind value compensation, e.g., right-of-way access and use, rather than monetary compensation. The Fire Hydrant Intergovernmental Agreement appears in Addendum A.

CWSP and Local Legislative Policies—*Section II*

The Washington State Growth Management Act (GMA) calls for plans aimed at encouraging compact orderly growth and development. Local growth management plans identify areas appropriate for various levels of growth. These plans deal with the timely provision of public facilities and services and adequate levels of service in areas where growth is considered appropriate. They identify public water service, among other public facilities and services, as being important to support growth and development within targeted areas. The CWSP is a means by which the plans of water purveyors in the county can be synchronized to complement countywide growth management planning objectives.

The *Clark County 20-Year Comprehensive Growth Management Plan 2004-2024*, which was adopted in September 2007 and amended in 2010, includes the *Community Framework Plan* and the *20-Year Plan Map*. Municipalities prepared individual growth management plans consistent with the county's plan.

Population Growth and Development: Increasingly dispersed development patterns have taken place in the county over the past 20 years. The majority of this growth occurred in the incorporated areas and unincorporated areas surrounding Vancouver and other major urban centers. The projected year 2024 population for each city reflects an assumption that city limits will grow through annexation to fill the established urban growth areas. The county's 20-Year Plan responds to the

anticipated increase in population for the 20-year period ending 2024, based upon a two-percent growth rate—a projected population of 584,310.

Approximately 90 percent of population growth over the next 20 years is expected to occur in designated urban growth areas and 10 percent in unincorporated rural areas. This type of development pattern is consistent with the goals of GMA and supports the long range vision for the county reflected in the Community Framework Plan.

The Clark County Board of Commissioners found the initial CWSP and subsequent updates of the plan to be consistent with county land use and growth management policies.

CWSP Process and Current Water Service Providers—*Section III*

The 2011 CWSP Update involved 16 meetings of the Clark County WUCC. Representatives on the committee were present from all of the major water utilities in the county, Clark County including its departments of Public Works, Community Planning, Health and the Fire Marshal's Office, DOH and DOE. Other municipalities that indicated an interest in being part of the CWSP process also served on the committee.

Major Water Purveyors: Residential, commercial, industrial and other developments in urban and urbanizing areas of the county receive potable water from the following Group A public water purveyors: Battle Ground, Camas, Clark, Ridgefield, Vancouver and Washougal. There are 67 smaller Group A public water service purveyors in the county, each serving 15 or more service connections and/or 25 people daily.

The most current publications of water system plans of Battle Ground, Camas, Clark, Ridgefield, Vancouver and Washougal were analyzed. These plans are on file with these water purveyors and DOH. Group B public water systems are small public water purveyors, usually depending upon a single water supply well. Group B systems serve two to 14 residential dwellings and small businesses employing up to 25 people or having no more than 25 customers daily. There are approximately 850 Group B systems in the county, primarily located in unincorporated areas both within and outside urban growth areas. Clark County Public Health is responsible for reviewing and approving new Group B public water systems. Often the personnel responsible for running these small systems, although well-intentioned, lack the expertise to operate the systems in conformance with federal and state health requirements.

Water is supplied to individual dwellings and small clusters of residential units primarily in rural areas via private wells. It is estimated that there are between 17,000 and 25,000 private wells in the county that provide drinking water to 24 percent of the county's population. Use of private wells is subject to Clark County Public Health approval, contingent upon compliance with GMA water adequacy requirements. The proliferation of private wells raises health concerns, particularly in urban areas and rural locations where land uses may be served by non-conforming or inadequately maintained onsite septic systems, or there are other sources of contaminants to groundwater supplies. Private wells will continue to be the primary water source in the rural area but they should be aggressively phased out in urban areas, as public water becomes fully available.

Future Water Utility Service Areas—*Section IV*

Future service areas have been designated for the major water utilities: Battle Ground, Camas, Clark, Ridgefield, Vancouver and Washougal. Service area boundary revisions involving certain water utilities were addressed in updating the plan. There are no undesignated areas in the county or boundary conflicts. The six major water purveyors have entered into a collective interlocal agreement adjusting or confirming future water service areas. This agreement and maps showing the water service area boundary appear in the plan as Addendum B.

Water Utility Design Standards—*Section V*

The minimum water utility design standards were not reviewed between plan updates. The WUCC reviewed and revised the design standards in the course of preparing the 2011 plan update. Recommended minimum design standards for water systems are included as Appendix V-A.

Particular attention was given to determining when the water utility design standards and fire flow requirements apply. It was determined that the standards should apply to all major public water systems within the Clark County. Detailed fire flow requirements for various types of developments are based upon recommendations from local fire authorities.

The WUCC should meet at least annually to review the water utility design standards and recommend amendments to the standards as it deems appropriate.

Utility Service Review Procedure—*Section VI*

Recommended sequential steps:

- Direct or satellite service by the designated utility.
- Interim or permanent service by an adjacent utility; service area adjusted, if permanent service is arranged.
- Satellite service by Clark Public Utilities as the primary Satellite Management Agency—SMA.
- Satellite service by a DOH-approved secondary SMA.
- Formation of a new utility; service areas adjusted.

In the course of following the sequential steps of the utility service review procedure, each water purveyor should respond to a service request within 30 calendar days after receiving a request for service in a manner that the water purveyor deems appropriate.

Where interim service is to be provided by a provider other than the designated purveyor, an interlocal agreement must be completed by both utilities. Guidelines for preparing an interlocal agreement for interim public water facilities are included as Appendix VI-B. Recommended appeals procedures for water utility service issues are described.

Satellite System Management Program—*Section VII*

Clark Public Utilities was designated as the county's SMA provider in the 1983 CWSP. Clark was re-designated as the primary SMA in subsequent plan updates. As of May 2011, Clark owned and operated eight Group A and 16 Group B satellite water systems.

Recent state regulations pertaining to SMAs allow additional SMAs to be established within a CWSSA. However, Clark is the primary SMA for Clark County and must be considered as the operator of a satellite water system before considering any other SMA. Clark's policy framework concerning the provision of satellite service is included as Appendix VII-A. This policy framework should be viewed as a general guideline, so that it can be followed by secondary DOH-approved SMAs operating satellite systems in Clark County.

Clark's SMA responsibility involves providing assistance to existing or newly formed water utilities. The level of assistance provided depends on the needs of the individual utilities and Clark's ability to provide service in a cost-effective manner. In the event that Clark agrees to operate a satellite system within another

water utilities service area, an agreement will be negotiated between Clark and the primary water provider.

Water Resource Assessment—*Section VIII*

Clark County relies almost entirely upon groundwater for public and private water use. Groundwater supplies have been sufficient to meet needs, with a few isolated exceptions. Population growth and development in the county has progressed at an increasing rate and, consequently, there is concern regarding the adequacy groundwater to meet the future demand for potable water. Moreover, there is concern about the potential degradation of groundwater as a result of certain land use activities. Efforts are underway to manage and protect the county's groundwater and surface water resources.

Existing water system interties are identified. It is recommended that all major public water systems in the county be interconnected or *intertied.* Exchanging water between systems can improve overall system reliability, efficiency and manageability. Interties are also important in providing emergency backup water supplies, in the event of a drought or failure of one of the interconnected systems.

Water Supply—*Section IX*

Washington adopted WAC 173-527 and 173-528, establishing a water resource management program for the Lewis River, Salmon Creek and Washougal River basins. The program is based upon information and recommendations presented in the *Salmon-Washougal & Lewis Watershed Management Plan for WRIAs 27 and 28.* The basic aim of the program is to insure that municipal water purveyors have access to water resources to meet projected water needs of a growing population and pursue economic development opportunities consistent with adopted land use plans, while maintaining in-stream flows to protect fish habitat.

Water right applications are evaluated under the provisions of the water resource management program and its rules. Procedural requirements for issuing water rights under these rules vary depending upon the impact that a proposed surface or groundwater withdrawal will have on stream flows at specific stream locations.

Water rights and existing and projected water demand are presented for each of the major water purveyors, which forecast the adequacy of accessible and permitted water supplies. All of the major municipal water purveyors have sufficient water supplies to meet current and future needs over the next 14 years, with supplemental water supplies obtained via purchase agreements with neighboring water purveyors.

The tidally influenced groundwater supplies in the vicinity of the Vancouver Lake and Steigerwald lowlands and the confluence of the North and East Forks of the Lewis River have great potential for providing abundant potable water for the region without negatively impacting the flows of important upland fish-bearing streams.

Plan Approval Process—*Section X*

The WUCC recommends that the process described below be followed by public agencies that may adopt or otherwise recognize the 2011 CWSP Update. See Section X for approval process details:

1. The WUCC circulates the proposed CWSP Update to affected agencies for review and comment.

2. The WUCC advertises and hosts a public informational meeting on the plan.

3. The WUCC submits the plan to Clark County Community Planning. Community Planning as the lead agency evaluates the plan under the provisions of the Washington State Environmental Policy Act (SEPA) rules to ascertain its impacts on the natural and built environments, and issues a determination regarding the plan's environmental significance. Community planning also submits the CWSP to the Washington Dept of Commerce in compliance with the 60-day notice requirement.

4. Major water purveyors and other municipalities review the plan and consider the following actions:

    - Find the CWSP Update to be consistent with local land use and growth management plans and policies.

    - *Optional*—Water Purveyors: Adopt or endorse the CWSP update.

    - *Optional*—Enter into the Fire Hydrant Intergovernmental Agreement, which appears in the plan as Addendum A.

    - Water Purveyors: Enter into the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries, which appears in the plan as Addendum B.

5. Clark County Public Health considers the plan for endorsement.

6. Community Planning submits the plan to the Clark County Planning Commission for review. The Planning Commission recommends action to be taken on the plan by the Board of Commissioners.

7. The WUCC and Community Planning formally submit the plan to the Clark County Board of Commissioners with the comments received during the plan review process and explanatory remarks and recommendations. The Board conducts a public hearing and considers the following actions on the plan:

   - Find the plan to be consistent with Clark County's land use and growth management plans and policies.

   - *Optional*— Adopt or endorse the plan.

   - *Optional*—Enter into the Fire Hydrant Intergovernmental Agreement, which appears in the plan as Addendum A.

   - Approve the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries, which appears in the plan as Addendum B.

8. Clark County submits the plan to DOH. DOH conducts a 90-day review of the plan and considers it for approval with or without revisions (WAC 246- 293-300).

Section II
CWSP and
Local Legislative Policies

1. INTRODUCTION

Historical information about the CWSP and local legislative policies may be obtained from the initial 1983 CWSP and subsequent updates of the plan. The relationships of the 2011 CWSP to comprehensive growth management plans and development regulations are addressed in this section.

2. BACKGROUND

The largest urban centers of the region are found in the southern portion of Clark County. The governing boards of Vancouver, Camas, Washougal, Clark Public Utilities and Clark County are primarily responsible for rendering decisions regarding water service in this southern urban portion of the county; Battle Ground, Ridgefield, La Center, Yacolt, Clark Public Utilities and Clark County make decisions or participate in decision-making about water service in the northern urban areas, rural centers and other developing portions of the county. Growth management plans have generally limited urban growth to areas within and adjacent to the incorporated communities.

3. GROWTH MANAGEMENT ACT

The Washington State Growth Management Act (GMA) was passed in 1990 (RCW 36.70A.010). This legislation significantly changed the requirements for local land use planning. The law requires urban counties and rapidly growing counties and their incorporated areas and special purpose districts to manage growth through comprehensive land use planning conducted in accordance with state requirements. The establishment of urban growth areas and coordination of public facility development within these areas are mandatory elements of comprehensive plans. Counties that are required to plan under GMA must do so in cooperation with incorporated areas, as well as other providers of public facilities and services.

A. Clark County Growth Management Plan Development

The *Clark County 20-Year Comprehensive Growth Management Plan 2004-2024*, which was adopted in September 2007 and amended in 2010, includes the *Community Framework Plan* and the *20-Year Plan Map*. Municipalities prepared individual growth management plans consistent with the county's plan.

(1) Community Framework Plan

One of the initial milestones of Clark County's growth management planning process was establishing a vision for how growth and development should take place within the county, which would minimize adverse impacts typically associated with growth. The *Community Framework Plan*, adopted April 1993, provides guidance on how future development may best be accommodated. This framework plan calls for distinct urban areas and rural service centers.

(2) 20-Year Comprehensive Growth Management Plans

Clark County and the individual municipalities completed 20-year growth management plans covering their respective planning areas. These plans expand upon the vision of the Community Framework Plan to provide specific goals, policies and implementation measures. The county plan provides substantial guidance on how water service should be provided within unincorporated areas. A review of the goals and policies of the county's 20-Year Plan, as they relate to the Coordinated Water System Plan, are presented in Appendix II-A.

B. Plan Organization and Use

Clark County's 20-Year Plan is organized around 13 elements, eight of which are required by GMA and five are optional but important to the success of growth management planning for the county. A number of the plan elements are directly relevant to the CWSP, as will be explained later in this section. The organization of the plan follows:

Introduction
Community Framework Plan
Plan Elements:

Chapter 1: Land Use
Chapter 2: Housing
Chapter 3: Rural and Natural Resource
Chapter 4: Environmental
Chapter 5: Transportation
Chapter 6: Capital Facilities and Utilities
Chapter 7: Parks and Open Space
Chapter 8: Historic Preservation
Chapter 9: Economic Development
Chapter 10: School
Chapter 11: Community Design
Chapter 12: Annexation
Chapter 13: Procedures for Planning

C. Land Use Element

The Land Use Element, Chapter 1 of the county's 20-Year Plan, provides policy guidance for the location of the following major categories of land uses throughout the unincorporated area of the county: residential, commercial, industrial, agricultural, forestry, parks and undeveloped open space including environmentally critical areas. The chapter sets forth policies providing guidance regarding how and where these uses should be located, and the overall land use pattern that should emerge as the county develops. The 20-Year Plan map describes the location of broad land use designations within the unincorporated area. Specific policies are applied to various mapped land use designations, providing direction for the development of those areas.

The land use element includes a review of existing conditions and analyses of how the county will meet future land use demands. The plan strives to provide adequate land designated to meet residential, commercial, industrial and recreational needs; foster compact orderly development; increase community cohesiveness and livability; and protect environmentally critical areas over the next 20 years and beyond.

The plan policies promote development patterns that enable efficient delivery of services and minimize travel to engage in economic, social and recreational endeavors. The policies make a clear distinction between urban and rural development characteristics, using urban growth boundary designations. Although single family housing will continue to be the most common residential form, certain areas within major activity centers and along transportation

corridors are planned for increased multi-family and mixed-use developments, as well as intensive commercial uses.

(1) Relation to Other Elements of the Comprehensive Plan

The land use element addresses land development throughout the unincorporated area. Goals and policies designed to address certain important rural and natural resource areas are addressed as separate chapters of the plan: Chapter 3—Rural and Natural Resource Lands Element, and Chapter 4—Environmental Element.

The land use chapter is the centerpiece of the county's 20-Year Plan. Other plan elements must be fully consistent with land use development patterns and policies presented on the 20-Year Plan Map. Roadways and other public facilities, for example, must be available to support future development envisioned in the land use element. Hence, the elements that address these public facilities and utilities must support the development patterns set forth in land use chapter.

(2) Relation to Other County Policy Documents

Plan implementing measures are an outgrowth of the 20-Year Plan. The county's land development standards, i.e., zoning, subdivision, stormwater and erosion control, critical areas and shorelines regulations, and its six-year capital improvement program are among the means by which the plan is implemented.

(3) Relation to Municipal Comprehensive Plans

The 20-year plans of other municipalities in the county set the tone for growth and development within incorporated areas. The county has planning jurisdiction over unincorporated land within urban growth areas adjacent to local jurisdictions, although it is recognized that eventually these areas probably will be annexed and become fully urbanized. Hence, there is a clear incentive for the county and local municipalities to cooperate and closely coordinate land use and capital facility planning for these urban growth areas. Inter-jurisdictional coordinated planning provisions are contained in Chapter 13—Procedural Element.

D. Population Distribution and Growth

The pattern of development within the county has become increasingly dispersed over the past 20 years. The cadence of growth that has occurred in various urbanizing areas of the county largely reflects regional trends. From 1990 through 2000, the county's population grew from 238,053 to 345,238. In the past decade the county added 107,185 residents—a 45 percent increase in population. The majority of this increase occurred in the incorporated areas and unincorporated outskirts of Vancouver and other major urban centers.

The projected year 2024 population for each city reflects an assumption that city limits will grow through annexation to fill the established urban growth areas. The county's 20-Year Plan responds to the anticipated increase in population, based upon a two-percent growth rate—a projected population of 584,310 by year 2024.

GMA requires Clark County and its incorporated areas to plan for a total population projection calculated by the Washington State Office of Financial Management (OFM). OFM estimates that the county's population in year 2025 will be between 473,984 and 621,763, given alternative factors influencing growth. Although Clark County may exercise discretion over how OFM's population projection is distributed among the urban growth areas and unincorporated rural areas of the county, the sum of the projections included in the 20-year plans must equal the total OFM population projection for the county.

Approximately 90 percent of population growth over the next 20 years is expected to occur in designated urban growth areas and 10 percent in unincorporated rural areas. This development pattern is consistent with the goals of GMA and supports the long range vision for the county reflected in the Community Framework Plan.

E. Urban Growth Areas

Perhaps the most seminal policy of the 20-Year Plan is the establishment of urban growth areas. Urban uses and densities should occur within these growth areas and public facilities and services operating at urban service levels should be available or capable of being provided in the near-term to support the urbanizing communities.

Urban growth boundaries are intended to reduce service inefficiencies associated with sprawling, pell-mell development and produce an overall compact pattern of urban growth, which enables efficient, cost-effective delivery of services. The growth boundaries also facilitate more efficient timing of growth, as available land supplies within the urban areas are generally utilized before the boundary is extended into nearby adjoining rural areas. The growth boundaries discourage leap frog developments and foster clear distinctions between the urban and rural areas.

F. Rural Areas

Rural areas are located outside of urban growth areas. They are designated to allow low-density residential development, as well as small- and large-scale farming, forestry or mineral extraction activities. These areas are not expected to accommodate large amounts of population growth.

G. Concurrency

GMA requires that public facilities and services necessary to support urban development be available at generally the same time as or *concurrent* with new development. The law requires planning jurisdictions to adopt transportation level of service standards. Development proposals that cannot demonstrate compliance with adopted transportation service standards should be denied. Local jurisdictions may also adopt levels of service standards for water, sewer, stormwater control, schools, parks, fire protection and law enforcement.

Clark County extends the concept of direct concurrency to cover other critical public services: water and sanitary sewer. Indirect concurrent services include schools, fire protection, law enforcement, parks and open space, solid waste, libraries, electrical power, natural gas and government facilities. These services are necessary to support growth to varying degrees.

H. Capital Facilities and Utilities Element

Capital facilities and utilities are the basic services that public agencies provide to support population and development. The Capital Facilities and Utilities Element, Chapter 6 of the county's 20-Year Plan provides a summary of how and when important public facilities and services will be provided to support existing and future growth, as envisioned in the 20-Year Plan, and how these services will be funded.

GMA establishes many of the requirements for the capital facilities and utilities element of the comprehensive plan. The law expresses an overall goal: *ensure that those public facilities and services necessary to support development 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* (RCW 36.70A.020). GMA requires the capital facilities element to include an inventory of existing publicly owned capital facilities; a forecast for the future needs for new or expanded facilities; and a six-year financial plan for making capital improvements.

The capital facilities and utilities chapter is intended to provide a general assessment of major public services that support land uses, rather than a detailed analysis of every service provided by government. This element must be consistent with the other elements of the 20-Year Plan, particularly the land use element. Future development should generally occur in a compact pattern to foster the efficient and cost-effective provision of public facilities and services.

Proposals for new developments that cannot be served by public facilities and services at levels that meets standards may not be approved, unless improvements are made to correct service deficiencies and these improvements are scheduled within six years. Providing new capital facilities in previously undeveloped and un-served areas is strongly discouraged, as these facilities may encourage undesirable development patterns.

While RCW 36.70A provides the requirements for an adequate capital facilities plan, the law does not define capital facilities. The definition is left to the Washington Administrative Code, which provides only guidance rather than regulatory direction. WAC 365-195-315(2)(a) defines capital facilities: water, sewer, stormwater, schools, parks and recreational facilities, law enforcement, and fire protection. RCW 36.70A.070(6) requires transportation and supporting facilities to be addresses as a separate element of the plan. Required components of a capital facilities and utilities element as per RCW 36.70A.070(3):

- Inventory of existing publicly owned facilities including location and capacities of facilities.
- Forecast of future capital facilities needs.
- Identification of the proposed location and capacities of facilities needing expansion and new facilities.

- Six-year financial plan for funding future capital facilities within projected funding capacities, including sources of public funds.
- Methodology used to reassess the land use element, if funding falls short of meeting existing needs, to ensure consistency between the land use element, capital facilities element and the financing plan.

The Washington State Department of Commerce (formerly Community Trade and Economic Development) provides guidance in preparing capital facilities elements, in a procedural manual published in 1992.

I. Applying CWSP Methodology to Other Regional Public Services

Past cooperation among the county's utilities have assisted in developing collaborative administrative systems, which have a synergistic effect on improving public water systems. The provisions of the Coordination Act, although aimed at coordinating public water services, could apply to other public facilities and services of regional significance, e.g., wastewater and stormwater control systems, and parkland.

J. Clark County and Water Purveyor Policy

With the adoption of the CWSP, Clark County establishes its policies for supplying public water on a regional basis. The individual water system plans are incorporated into the CWSP by reference. The county may adopt the CWSP as a Water General Plan, which would permit the county to operate a water utility. However, Clark County has chosen not to be a water utility, as expressed in its 20-Year Plan.

Section III
Coordinated Water System Planning Process and Water Service providers

1. INTRODUCTION

In 1977 the Washington legislature enacted the Public Water System Coordination Act, RCW 70.116 (implemented in WAC 246-293), which established a procedure for the state's water utilities to coordinate their planning and construction programs with those of adjacent water utilities and other local governmental entities. This section provides a summary of the processes followed to create the original 1983 CWSP and subsequent updates of the plan, including the current 2011 CWSP Update.

2. CWSP LEGISLATIVE BASIS

The Washington legislature had previously enacted the Water Resources Act, RCW 90.54, which set forth fundamentals of water resource policy, to ensure that the waters of the state will be protected and fully utilized for the greatest benefit of the people of the state. *Procedures Relating to the Reservation of Water for Future Public Water Supply*, WAC 173-590, were established as an outgrowth of the law. These procedures were set forth for public water purveyors to obtain water rights to meet projected municipal and industrial needs within a given area over the next 50 years. The procedures for obtaining water rights in Clark County have changed significantly with the adoption of a new water resources management program. Details concerning this new program are presented in Section IX *Water Supply*.

The CWSP was prepared in accordance with WAC 246-293-220 (2) (a) and, therefore, serves as a *regional supplement* to local water system plans. Supplementary provisions and policies that address management, service areas, utility review procedures, regional issues and water supply matters throughout the Critical Water Supply Service Area (CWSSA) are included in this regional plan. Appendix III-A lists the supplementary provisions for the Regional Supplement that have been addressed to comply with the Coordination Act.

The plan complies with the regional supplement requirements of DOH and DOE. This section summarizes the process used to develop the CWSP. Future water service area maps are on file at Clark County departments of Community Planning and GIS. Recommended minimum water utility design standards and specifications,

which are part of the regional supplement, are presented in Appendix V-A. The major water purveyors identified in this plan maintain copies of their most current water system plans. These plans are also on file with DOH.

3. CWSP DEVELOPMENT

A. Preliminary Assessment

An informal water service coordinating committee was established in 1977 for Clark County, in an effort to address various water supply issues and concerns. The committee was composed of local water purveyors, planners and health officials. The Public Water System Coordination Act was passed. The committee requested DOH's assistance in evaluating the county's water quantity and quality problems; reliability of water service; and coordination of water systems. The preliminary assessment was completed in June 1980. Several problems were identified, many of which could be solved on an individual basis. However, there were a number of problems that were better resolved by coordinating water systems:

(1) Source of Supply

There was a need for the county and water purveyors to conduct an analysis of potential water resources on a regional basis, in order to determine the most economical and efficient means of providing adequate water supplies for public use. The need for the utilities to coordinate their efforts in reserving water under WAC 173-590 for future public water supplies was also identified. It was recommended that an overall comprehensive water system plan be developed, addressing existing systems and regional facilities.

(2) Water System Planning

The county needed to develop a formal review and approval process for water systems providing service in unincorporated portions of the county. This process was necessary to enable greater control of water system development and insure consistency with land use plans and growth management policies.

(3) Service Areas

Each major water utility in the county had an informal franchise area designated for their system which had been approved by the county. These areas were not exclusive and were not based on a rational service area for efficient utility expansion. It was desirable to establish formal service area agreements between major water systems, which would be approved by the Clark County, in order to systematically and effectively manage growth and development.

(4) Service Area Policy

Municipally-owned water systems needed to evaluate their service policies to determine the most cost-effective methods by which water systems could be developed to meet future needs.

(5) Design Standards

While each of the major water systems had design standards which conformed with DOH's minimum requirements, there was a need for minimum standards for smaller water systems that may be incorporated into larger systems in the future. These minimum standards would help to eliminate problems associated with inconsistent design and construction practices between utilities, minimize the possibilities of constructing inadequate facilities and mitigate problems that may arise when adjacent utilities are interconnected.

(6) Shared Facilities

Given the potential development of regional source of water supply and system interties, there needed to be close coordination and planning between the participating utilities.

Based on the conclusions of the preliminary assessment, Clark County declared the entire county a Critical Water Supply Service Area (CWSSA) on August 13, 1980. After this declaration, the water coordinating committee recommended that the external boundaries of the CWSSA remain the county boundaries. Clark County formally adopted the external boundaries of the CWSSA on May 13, 1981. The resolutions adopting the CWSSA and external boundaries are presented as Appendices III-C and III-D.

B. 1983 CWSP—*Initial Plan*

A formal Water Utility Coordinating Committee was established for Clark County. The WUCC and Regional Planning Council staff worked to prepare the initial 1983 CWSP. This work involved identifying existing and future water utility service areas; establishing minimum countywide water utility design standards; assessing water system capabilities; investigating the prospects of establishing regional water supply and distribution facilities; establishing procedures for approving new water facilities; and determining the role of the Satellite System Management Agency.

A thorough review was made of all available studies and reports regarding water resources, water quality, land use, population projections and other general planning topics. Pertinent existing and proposed federal, state, county and local regulations, ordinances, etc., were examined and evaluated in terms of their relevance to the CWSP.

C. 1991 CWSP Update

The 1991 update of the CWSP involved a less comprehensive effort. The focus was on elements of the plan that warranted significant revisions to reflect changes since the development of the initial plan in 1983. The WUCC was reestablished to guide the planning process. Intergovernmental Resource Center, formerly Regional Planning Council, provided staff and administrative support for the planning project. The update retained most of the same plan elements as the initial CWSP. Significant changes or new information in the 1991 update addressed the following topics:

- Adjustment of future water service areas and completion of interlocal agreements memorializing the service area boundaries.
- Survey of public water systems in the county.
- Revisions to the minimum water utility design standards.
- Revisions to the utility service review procedure.
- Revisions to the satellite system management agency program
- Water demand forecast to year 2000.
- Expanded discussion on water conservation.

D. 1999 CWSP Update

The WUCC met monthly starting in March 1995. DOH grant funding enabled an engineering consultant to assist in preparing the plan. Major planning-related work elements follow:

- Growth management policies and CWSP consistency.
- Interlocal agreements concerning regulating, constructing and operating satellite water systems.
- Review and update of water utility minimum standards.
- Appeals procedures concerning requests for water service for new developments in unincorporated areas.
- Regional program for water conservation.
- Definition of timely and reasonable with respect to requests for water service.
- Other work items: update on status of small water utilities in the county; water service area adjustments; and water rights reservation.

E. 2011 CWSP Update

Representatives from the principal municipal water purveyors met in 2009 and 2010 to discuss preparing an update of the CWSP, recognizing that a decade had passed since the last update of the plan. The WUCC reconvened with new membership in January 2010 to begin the update of the plan. The membership of the WUCC is described in the WUCC By-laws, which appear in Appendix I-A.

Clark Public Utilities was designated as the administrative headquarters for the plan update. A planning consultant was engaged to provide the WUCC with staff support and assist in developing the update. Monthly meeting of the WUCC were held to review and revise the plan, adhering to the general organization and format of previous plan updates. A draft of the plan was completed in May 2011 and circulated to the major water purveyors and other municipalities in the county.

Local municipalities and Clark County are requested to consider a series of actions in the process of recognizing the CWSP. Local municipalities and the county should consider whether the CWSP is consistent with land use and growth management plans policies (although actual adoption or endorsement of the CWSP, even with qualifications, would lend legitimacy to the plan). Water purveyors should consider entering into a collective interlocal agreement

confirming future water service area boundaries and the county should address approving this agreement. Local municipalities and the county should consider a fire hydrant intergovernmental agreement, which enables benefitting jurisdictions to provide fire hydrant purveyors with non-monetary compensation for hydrants and maintenance of these facilities. A series of reviews, public meetings, and a hearing addressing the CWSP were conducted in the course of examining the plan. After the plan is vetted locally, DOH will consider the updated CWSP for approval. The plan review and approval process is outlined in Section X.

4. CURRENT STATUS

A. Drinking Water Purveyors

The major Group A water purveyors in Clark County are Battle Ground, Camas, Clark Public Utilities (Clark), Ridgefield, Vancouver and Washougal. There are 67 smaller Group A public water purveyors in the county, each serving 15 or more service connections and/or 25 people daily.

(1) Clark Public Utilities

Clark is a customer-owned utility providing electric and water service in Clark County. It is a municipal corporation organized under the laws of Washington State. The electric utility provides electrical power countywide. The water utility serves certain unincorporated areas of the county, La Center and Yacolt. Clark has approximately 29,800 service connections on its main regional water system and 30,315 customers including its eight satellite Group A systems. It provides broad water service coverage in the central portion of the county, including urban, suburban and rural service centers. The water utility manages *satellite systems* serving small developments and clusters of dwellings, some of which are located in relatively remote rural areas where water service is not readily available but needed to avoid health and safety problems.

Clark obtains water for its main interconnected system from 34 production wells located throughout the county. These wells have a total pumping capacity of approximately 31 million gallons per day. The utility maintains 31 water supply reservoirs comprising a total storage capacity of 19.6 million gallons. Clark currently has seven emergency interties with other major public water systems: two with Vancouver, one with Battle Ground and three with Ridgefield.

Clark's Water System Plan meets GMA requirements under RCW 36.70A.070 (3). Its water plan is incorporated by reference into the capital facilities and utilities element of the county's 20-Year Plan.

(2) Other Major Public Water Purveyors

There is a substantial amount of land within Vancouver's unincorporated *urban growth area* that is urbanized. Vancouver adopted a capital facilities plan in January 1995, specifying how the urbanizing area outside the city limits will be served. The city reviewed the proposed county land use designations and the 2024 countywide population projection and concluded that projected population in the Vancouver service area can be served by its water system with currently planned water facility improvements.

Camas also serves urbanizing areas and rural service centers within and outside its urban growth area. Other water systems operated by the smaller municipalities—Battle Ground, Ridgefield and Washougal—generally serve development within their corporate boundaries. Unincorporated lands within urban growth areas outside the municipal boundaries of these smaller cities have *urban holding* overlay designations. These designations insure that urban-scale development will not occur until urban services are available or the properties are annexed to the adjacent incorporated area.

(3) Group B Public Water Systems

Group B public water systems are small public water purveyors, usually depending upon a single water supply well. Group B systems serve two to 14 residential dwellings and small businesses employing up to 25 people or having no more than 25 customers daily, e.g., child care centers, churches and convenience stores. There are approximately 850 Group B systems in the county, primarily located within unincorporated areas both inside and outside urban growth areas.

Clark County Public Health is responsible for reviewing and approving new Group B public water systems. These small systems have less monitoring requirements than Group A systems. In 2009, County Public Health surveyed 109 Group B systems and concluded that a large number of them had significant problems. Often the personnel responsible for running these small systems, although well-intentioned, lack the expertise

to operate the systems in conformance with federal and state health requirements. Exhibit III-1 provides details on the public water systems in Clark County as of April 2011.

(4) Private Wells

In rural areas private wells supply water to individual dwellings and small clusters of residential units. It is estimated that there are between 17,000 and 25,000 private wells in the county that provide drinking water to 24 percent of the county's population. Use of private wells is subject to Clark County Public Health approval under GMA water adequacy requirements. Notwithstanding the legality of private wells, their proliferation raises health concerns, particularly in urban areas and rural locations where there are parcels served by non-conforming or inadequately maintained onsite septic systems, or where there are other activities that risk contaminating groundwater—the potable water supply. Private wells will continue to be the primary water source in the rural area but they should be aggressively phased out in urban areas, as public water becomes available.

B. Water System Plans and the CWSP

Each major water purveyor is required to have a DOH-approved water system plan, as required by WAC 246-290-100. Plans for public water systems in urban counties must be developed in conformance with GMA capital facility planning requirements under RCW 36.70A.070(3)(a)(b).

Clark County's role is to coordinate with public water purveyors to insure that their water system plans are consistent with land use plans; that they serve their designated service territories and operate in compliance with health requirements. The CWSP provides a framework upon which the county carries out this role and fulfills regulatory requirements under the Public Water System Coordination Act, as promulgated under WAC 248-56. The CWSP serves as the *regional supplement* for local water system plans.

C. Future Water Service Areas

The boundaries of the future water service areas are determined through a planning process involving adjacent major water purveyors. Interlocal agreements memorize the water service area boundaries between purveyors. The purpose of the service areas are to foster efficient and cost-effective

delivery of public water county-wide and curtail the proliferation of small poorly operated and maintained systems. Future water service areas are addressed in Section IV.

D. Water Facility Design and Performance Standards

The CWSP provides guidance to water purveyors in meeting the minimum water facility design and performance standards required for public water purveyors under WAC 246-290-200. All the major water purveyors meet or exceed the minimum standards for water demand, storage, distribution pressure and reliability, either with their own systems or interties with adjacent purveyors. Standards vary depending upon population, development densities and other land use characteristics. Water facility design and performance standards are addressed in Section V.

E. Water Resources

Protecting and managing existing water resources and identifying and developing additional water supply sources are essential to insuring the economic viability of the county and meeting the needs of growth and development.

Clark Public Utilities and Vancouver have explored the bountiful groundwater supplies in the Vancouver Lake lowlands. Camas and Washougal have explored the Steigerwald lowlands—another area with an abundant supply of groundwater. Clark is developing a well field in the Vancouver Lake lowlands. It has the potential to serve as a regional water supply source, reducing reliance upon groundwater from the Salmon Creek basin and other smaller watersheds containing important fish-bearing streams. The utility is also advancing a regional groundwater supply project in a lowland area at the confluence of the East Fork and North Fork of the Lewis River to meet the growing demand for water by the communities of northern Clark County. Water resources are discussed more thoroughly in sections VIII and IX.

Exhibit III-1
Clark County Public Water System Inventory

Water System Category	*Systems*	*Residential Population Served by Public Water Systems/ % of Total Population*
Major Group A	6	323,872 (88.9%)
Other Group A	67	31,321 (0.9%)
• Group A Subtotal	(73)	(355,093) (97.4%)
Group B	850	9,278 (2.6%)
Total Group A & B Water Systems	**923**	**364,471 (100%)**

Source: Clark County Public Health Water System Data, April 2011.

Major Group A Water Systems: Battle Ground, Camas, Clark Public Utilities and its satellite Group A systems, Ridgefield, Vancouver and Washougal.

Other Group A Water Systems: Community or Non-community water systems with 15 or more connections and/or serving at least 25 people more than 60 days annually. Includes lark's satellite water systems.

Group B Systems: 2 to 14 connections or single-connection publicly accessible facilities serving at least 25 people less than 60 days annually.

Exhibit III-2
Clark County Water Systems, System Plans, Service Area Interlocal Agreements & Service Connections

Purveyor	Water System Plan	Service Area Boundary Reconfirmed	Service Connections
Major Community Systems (alphabetical order)			
Battle Ground	2004	1999	5,923
Camas	2010	2010	7,173
Clark Public Utilities	2011	1999	30,626
Ridgefield	2006	1999	1,668
Vancouver	2007	2010	69,224
Washougal	2004	1999	5,747
			120,361

Information regarding all Group A systems in Clark County may be obtained from the DOH *Sentry* Water System Inventory database:

https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx.

The larger non-municipality Group A systems are important to track, in that they serve 15 or more connections and/or at least 25 people daily. These systems serve small unincorporated communities, e.g., mobile home parks; large planned unit and cluster developments; and non-community populations, e.g., businesses, schools, restaurants, churches and parks.

Exhibit III-3
Current Water System Plans

City of Battle Ground Water System Plan, Odell Engineering, 2004.
City of Camas Water System Master Plan, Gray & Osborne, Inc., June 2010.
City of Ridgefield Water System Plan, Gray & Osborne, 2006.
Clark Public Utilities Water System Plan, CH2M HILL, 2011.
City of Vancouver Water System Plan, HDR Engineering, Inc., February 2007.
City of Washougal Water System Plan. MSA/Wallis Engineering, December 2004.

Section IV
Future Water Service Areas

1. INTRODUCTION

The Coordination Act requires a procedure for identifying existing and future water service areas of major water utilities within a CWSSA. Upon formally designating future service areas for each of the major water utilities, Clark County and DOH recognize each respective utility as the responsible purveyor of public water service within its service area; and each utility is obligated to provide satisfactory water service to customers within the its service area. At present there are no areas within the CWSSA that lie outside a designated service area. In 1992, Clark Public Utilities expanded its service area to include all areas previously designated for satellite system management.

The Coordination Act provides a legal mechanism for municipalities, special purpose districts and private water utilities to establish future water service areas within unincorporated areas. WAC 246-293-110 (12) defines a future water service area as one for which water serve is planned by a public water system as determined by written agreement between purveyors. Future water service areas are often referred to as simply *water service areas*. This terminology is used in previous updates of the CWSP and supporting policy documents, e.g., interlocal agreements establishing or resetting service area boundaries.

The establishment of water service areas has proven to be mutually beneficial to utilities, developers and Clark County. Each major utility has selected a distinct, exclusive service area within which it will provide water service. A utility has the assurance that its future planning, capital improvement programs and financial commitments will remain in effect to serve its area. Designated service areas of the major water utilities may extend beyond urban growth areas to serve future growth beyond the 20-year planning horizon or existing developments located outside urban growth areas which, given their size or other characteristics, may require reliable water service by a responsible utility.

The designation of service areas greatly curtails competition for service territory among adjacent utilities and reduces the likelihood of redundant water facilities being constructed. Property developers know during the planning phase of their projects the appropriate utilities to contact for water service once their developments are completed, thus avoiding administrative difficulties, frustration and cost. Designated service areas assign responsibility for efficient utility service to accommodate growth consistent with the land use plans.

The Public Water System Coordination Act provides guidance in designating future service area boundaries. WAC 246-293-250 (3) lists factors that should be taken into account in establishing service areas: topography; readiness and ability to serve; local franchise areas; legal water system boundaries; municipal boundaries; water rights; population and land use projections; and sewer service areas (although some of these factors may not be relevant in establishing some service areas). A water service area must be consistent with adopted growth management plans, policies and implementing ordinances of the county and those of other municipalities with planning jurisdiction in the area. A major water purveyor's service area must be addressed in a DOH-approved water system plan. WAC 246-293-610 (7) defines a water system plan as a document identifying present and future water system needs and establishing a program for meeting those needs in the most efficient manner possible, and consistent with other relevant plans and policies affecting the area in which the system is located.

The procedure used for establishing service area boundaries in conjunction with the development of the 1983 CWSP allowed each community water system serving 10 or more connections (Class I or II systems) to indicate the areas they were serving or anticipated serving in the future. Whenever an existing water utility decided not to extend service to an adjacent area, the neighboring water utilities were given the opportunity to identify the area as part of its future service area. Areas that were currently served were not allowed to be claimed by an adjacent utility. Through this process each water utility ultimately identified its service area.

A similar procedure was followed in reviewing service area boundaries in conjunction with the 1991 and 1999 CWSP updates. However, the dynamics of planning under GMA had an important influence upon determining service areas. As the county and local governments began completing comprehensive growth management plans, several water service boundaries warranted adjustments. These service area modifications were addressed in the 1999 CWSP update.

The current update of the CWSP includes designated water service areas of the major utilities, which have been or are being memorialized by interlocal agreements. With the Clark County Board of Commissioners' action on updated plan and approval of the collective water service area interlocal agreement, water utilities are assured that their service areas are formally recognized, irrespective of existing municipal and urban growth boundaries or future changes in these boundaries. As boundaries of municipalities and urban growth areas expand, growth management plans, policies, municipal codes, conditions of service, etc., may need to be modified to address multiple water utilities serving certain municipalities and urban growth areas.

2. SERVICE AREA COMMITMENTS

The purpose of designated water service areas is to identify territories in which existing major utilities are willing to provide reliable water service. Each service area is the exclusive franchise territory of a particular utility, giving that utility the responsibility to plan the water system and exercise primary control over the providing water services within its area. An important distinction is that a utility's water facilities, e.g., water supply wells, transmission mains and reservoirs, may be located outside a utility's water service area within another utility's service area. These facilities may not be used to provide direct service by the utility that owns the facilities within another utility's service area, without permission of the utility designated to serve the area.

The Coordination Act requires that, following the establishment of the external boundaries of the CWSSA, no new water systems can be established within a designated service area, unless the existing water utilities are unable or unwilling to provide service. If service cannot be provided by existing utilities, including the designated satellite water system management agency, and a new utility may be formed; and water service area boundaries should be adjusted to provide a service territory for the new utility.

Alternatives for providing service to new developments where public water is necessary are discussed in detail in Section VI, Utility Service Review Procedures, and Section VII, Satellite System Management Program.

3. SERVICE AREA ESTABLISHMENT

During the preparation of the 1983 CWSP, small community water systems serving 10 to approximately 100 connections were asked to participate in the process of establishing service areas. None of these water purveyors indicated an interest in expanding their services beyond the areas they served.

Water service areas were originally established for nine major systems: Vancouver, Camas, Washougal, Battle Ground, Ridgefield, La Center, Yacolt, Meadow Glade and Clark Public Utilities. Boundary conflicts involving Vancouver, Camas and Ridgefield arose and remained after the completion of the 1983 CWSP but were resolved in 1984. Clark Public Utilities currently owns and operates the water systems of La Center, Yacolt and Meadow Glade.

The number of Group A water systems has grown significantly since 1983. In 1983, there were 18 Class I and II water systems (10 or more connections) serving

approximately 172,850 people. By 1997 there were 85 Group A systems (15 or more connections) serving about 239,780 people. Over the past 14 years additional small Group A systems have been established, while the major water utilities have absorbed other small systems, resulting in a net of 73 Group A systems serving approximately 355,090 people, according to Clark County Public Health. Currently, the major Group A water utilities are Battle Ground, Camas, Clark Public Utilities, Ridgefield, Vancouver and Washougal, which collectively serve about 323,870 people. Vancouver is the largest water utility serving approximately 188,307 people.

Maps describing the future water utility service areas of the major water utilities is attached to the collective *Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries*, which is presented in Addendum B. A detailed digital map of the service areas is on file at Clark County GIS.

4. SERVICE AREA ADJUSTMENTS

If upon reviewing a request for service it is found that either permanent service by an adjacent utility or service by a newly created utility is the only option, adjustments to water service area boundaries would be in order. Additionally, if a utility finds that its service area is not the desirable size, boundaries may be revised, provided that agreements can be reached with the adjacent utilities.

5. SERVICE AREA INTERLOCAL AGREEMENTS

Establishing new or adjusting future water service areas that are necessary to be effective between updates of the CWSP requires the involved water utilities to complete new interlocal agreements with supporting maps showing the new service area or adjusted service area boundaries. Addendum B may serve as a template for an interlocal agreement memorializing adjustments to future water service area boundaries that may be necessary between updates of the CWSP. Service area agreements and supporting documents will be on file with each of the affected water utilities and included with the next updates of local water system plans.

The Clark County Board of Commissioners must approve the water service area boundary interlocal agreements, as required under WAC 246-293-250 (1), and the approved agreements must be filed with Clark County Community Planning. Maps showing the approved service areas boundaries must be submitted to the Clark County GIS, which will update the countywide mapping system to reflect the new boundaries. The revised service area boundaries must also be submitted to DOH. The affected utilities will maintain records of the interlocal agreement addressing the

service area boundary adjustments and include the new boundaries in the next update of their water system plans and the CWSP.

The WUCC may address water service area revisions at any time. All water service areas are reviewed in the process of updating the CWSP. A boundary adjustment addressed during the update of the CWSP also must follow the interlocal agreement procedures and filing requirements described above, if the boundary change must become effective before the CWSP is adopted. Otherwise, boundary changes may be arranged informally by the involved water purveyors and incorporated into the next update of the CWSP. These boundary changes will become effective with action on the CWSP update, which involves the water utilities' adoption of the previously mentioned water service area interlocal agreement contained in the CWSP; the Board of Commissioners' approval of the service area agreement; and DOH's approval of the CWSP.

Water service area boundary changes have been included in this update of the CWSP. Boundary changes involving Vancouver, Camas, Washougal, Battle Ground, Ridgefield and Clark Public Utilities and the status of formalizing these changes via interlocal agreements are outlined in Exhibit IV-1. At present there are no water service area boundary conflicts. The countywide map of the water service areas, which appears in Addendum B, has been updated to reflect changes in the service areas of the major water purveyors.

The water service areas that are not consistent with the urban growth boundaries will need to address capital facilities and capital budgets to serve areas inside and/or outside urban growth boundaries, and resolve retail service areas and future service area issues with DOH.

DOH reviews water service area interlocal agreements in conjunction with its review of water system plans. This review considers a utility's ability to serve the area. If the state is not convinced that a service area presented in a water system plan can be served adequately, changes in service area boundaries may be required, in which case action by the affected water utilities, i.e., new interlocal agreements, may need to be negotiated. New service area maps accompanying the interlocal agreements must be submitted to the Clark County GIS, which will update the countywide mapping system to reflect the new boundaries.

Exhibit IV-1
2011 Future Water Service Area Adjustments

Purveyors Involved	*Status*
Camas-Vancouver	Complete
Camas-Washougal	Complete
Clark Public Utilities-Vancouver	Complete
Clark Public Utilities-Battle Ground	Complete
Clark Public Utilities-Ridgefield	Complete

Pending adoption of the collective Interlocal Agreement Adjusting or Confirming Future Water Service Area Boundaries, which occurred on January 10,2012. See Addendum B.

6. SERVICE AREAS FOR NEW WATER UTILITIES

Previous efforts to establish water service area interlocal agreements for the smaller water systems were met with very limited success. Most of the small Group A water systems do not have mapped service areas, unless the system has obtained water rights. However, the geographic limits of these smaller systems are sufficiently described in documents establishing the systems, which are on file with the DOH. Moreover, the boundaries of major Group A water systems, including Clark's satellite system management area, which embraces the unincorporated portion of the county that is not within other designated water service areas, essentially set the boundaries of the small Group A systems.

One of the overarching objectives of the CWSP is to discourage the proliferation of small, poorly managed water utilities. All areas within the county that have or may experience developments that require public water are within the service areas of major water purveyors. A new utility may be created only if all other alternatives for water service by existing utilities are exhausted, as detailed in Section VI Utility Service Review Procedure.

Small Group A and Group B systems are not allowed to expand, except as provided under the provisions outlined in Section VI, in which case the utility would be assigned a service area commensurate with its service capabilities. The utility must complete an interlocal agreement establishing its new service area in conjunction with the major purveyor presently designated for the area, meet the appropriate planning requirements and abide by CWSP procedures and DOH requirements.

Section V
Water Utility Design Standards

1. INTRODUCTION

A primary component of the CWSP is to develop minimum design and performance criteria for the water utilities in Clark County. This section presents the recommended engineering and construction design criteria that were developed to achieve the overall objectives of the CWSP.

2. MINIMUM STANDARDS AND SPECIFICATIONS

The Public Water System Coordination Act requires development of minimum standards applicable to water system improvements within the CWSSA. The *Clark County Water System Minimum Standards and Specifications* appear as Appendix V-A. These standards are recommended minimum performance, design, and construction requirements. Each purveyor, as part of their water system plan, is required by WAC 246-290-100 to identify their standard design specifications. By reference to these Minimum Standards and Specifications, the intent of this requirement may be satisfied.

These standards should apply to all new public water systems and replacement or expansion of existing water system facilities within incorporated and unincorporated Clark County. It is recommended that each water purveyor adopt standards for their utility that are at least as stringent as these minimum standards. Retroactive application of these standards is at the discretion of the water utility, unless necessary to meet minimum state health standards.

The content of the standards are consistent with DOH's minimum design standards and the specifications of AWWA. In addition, these standards adopt by reference the most current edition of the *Standard Specifications for Road, Bridge and Municipal Construction,* which were developed by WSDOT and the Washington Chapter of the APWA and published by WSDOT. Other special source, design, material and construction criteria are also identified in the standards.

The By-laws of the WUCC call for review of the standards on an annual basis. The committee should monitor the application of the standards and evaluate their appropriateness to the conditions and needs that exist within the county. The WUCC should also monitor the application of the standards by the regulatory agencies and utilities to insure that the objectives of uniform standards are achieved.

3. UTILITY STANDARDS

These standards established for water systems within the CWSSA are considered the minimum permitted for all new and expanding water systems. Water utilities may consider these standards to be inadequate to meet requirements of their service area. Each utility has the authority to require more stringent standards. It is recommended that utilities not reduce the county standards for new services. If any utility chooses to expand upon the minimum standards, they are encouraged to coordinate development of such standards with adjacent systems to promote consistency.

DOH procedure for approving water system plans encourages the development of standard construction specifications by the water utility. By referring to the adopted county standards, which include both APWA and AWWA's standard construction specifications, the state requirements are fulfilled. This reference, however, also places the water utility under the obligation to use these standards as minimum construction standards, unless amended.

The 20-Year Plan identifies general service levels for public water systems providing potable water and fire protection. The level of service provisions were prepared in recognition of the appropriate levels of service for different growth management land use classifications. The following exhibit was derived from information presented in the county's 20-Year Plan.

Exhibit V-1
Growth Management Water Systems Minimum Levels of Service

Service	Urban Area	Urban Reserve	Rural Area	Rural Center
Water	Public water for domestic and fire flow.	Coordinate water systems to match future plans, discourage potable wells for individual dwelling units or use of satellite systems.	Private wells	Public water
Fire	Fire protection rating of 3 or better; urban fire flow of 1,000 gpm or better.	Fire protection rating of 3 or better; urban fire flow of 1,000 gpm or better.	Fire protection rating of 6 or less; rural fire flow of 500 gpm.	Fire protection rating of 6 or better.

Notes: gpm—gallons per minute. *Source*: Table 6.11 General Service Provision Levels, *20-Year Comprehensive Growth Management Plan* (September 2007)

The Coordinated Act also includes specific minimum performance standards related to fire protection, including provisions for their application and enforcement, and calls for them to be incorporated into the design and construction of new or expansion of existing water systems within the CWSSA. Local legislative authorities (county or local municipalities) may adopt standards that exceed these minimum levels. Exhibit V-2 summarizes the minimum flow requirements established under WAC 246-293-601. These values are provided only as reference as current county ordinances establish higher fire flow requirements.

The following exhibit provides the minimum fire flows for unincorporated areas. The information may apply to only those jurisdictions that have not adopted the new level of service standards for water service, which are contained in Washington State Building Code Chapter 51-50 WAC International Building Code 2009 Edition (includes amendments to the 2009 International Existing Building Code and ICC/ANSI A117.1-2003). Clark County has adopted these new standards.

Exhibit V-2
CWSSA Minimum Fire Flow Requirements

Development Classification (WAC 246-293-640)	Minimum Fire Flow Requirements
Rural (>1 acre lot size)	None
Residential (<1 acre lot, small multi-family)	500 gpm for 30 minutes
Commercial and multifamily structures greater than 4,000 sq ft	750 gpm for 60 minutes
Industrial	1,000 gpm for 60 minutes

Notes: Minimum flows are in addition to requirements for normal domestic maximum use. Commercial and industrial buildings may be subject to higher flow requirements when evaluated on an individual basis by the local fire protection authority.

Minimum standards in most cases require less flow than categories in the guidelines published by the Insurance Service Office and, therefore, may not result in lower insurance rates.

There may be a need to address the upsizing of water meter connections for single and two-family dwelling units from 5/8 x 3/4-inch to 1 inch to accommodate fire suppression sprinkler systems, if rules are passed requiring this change. State and local codes

typically do not require sizing single and two-family residential meter connections to support sprinkler systems. One inch meter connections on numerous small residential dwelling units may increase instantaneous water usage requiring water facilities to be sized to meet peak water demand. Nonetheless, changes in the rules to reflect the sprinkler system requirements under International Fire Code are likely to be made during the 2012-13 code revision cycle.

4. APPLICATION OF STANDARDS

These standards apply to all public water systems within the CWSSA. Specific minimum requirements for provisions of fire protection will be as established by the local fire protection authority based on currently adopted local ordinances and the particular needs of a proposed development. In recognition of potential for special fire protection needs, the Clark County Fire Marshal may increase or decrease the standards as appropriate for specific development proposals.

Section VI
Utility Service Review Procedure

1. INTRODUCTION

A lack of well-defined procedures to guide water system developments can lead to confusion among property owners, regulatory agencies and water purveyors, resulting in administrative frustration, inadequate water service or duplication of water facilities. The utility service review procedure is one of the most important element of the CWSP. The purpose of the procedure is to determine which purveyor will provide water service to a new development when rules require public water.

The success of the procedure depends on the recognition of water service territories and diligent cooperation among major water providers. The procedure is structured so that certain water providers are given an opportunity to serve a new development before other providers or methods are used to provide water. This section presents the administrative procedures for reviewing applications for water service in unincorporated areas of the county.

2. LAND USE CONSIDERATIONS

A general philosophy of the CWSP is that water utility service should not dictate growth patterns. On the contrary, land use policies should establish growth trends within the water utility service areas to permit the water utility management program to be responsive to, and provide service commensurate with, the county's adopted land use policies.

Individual water system plans must address the water system facilities required to accommodate growth which is projected to occur within each utility's service area, based upon growth management plans. Capital improvements are planned and constructed to conform with the anticipated service requirements associated with the adopted plans.

If an applicant for water service is proposing a land use change, such a change could result in a significant financial burden on the provider of water service. Because water utilities must develop their systems to conform with the existing land use plan, any major change in land use may require substantial system improvements to serve the proposed development. Therefore, special review procedures will apply to applications which propose a land use change.

3. PUBLIC WATER SUPPLY REQUIREMENTS

The requirement for a public water supply to serve a proposed development or to support a proposed building will be based on applicable state, county and local ordinances. Clark County Code 40.370.020 *Water Supply*, which is presented in Appendix VI-A, determines the requirements for public water supply within unincorporated urbanizing areas of Clark County.

Clark County Community Development identifies which proposed developments must obtain public water supply for potable and/or fire protection needs, pursuant to Title 40 of the Clark County Code. At present there are no requirements for public water within sparsely developed rural areas. Public water is required for some building permits and all new developments within urban or urbanizing areas. Community Development and the Fire Marshal's Office should be consulted for specific requirements applicable to a proposed development. Once the determination that public water is required or desired, the utility service review procedure outlined in Subsection 5 will be followed. If public water service cannot be obtained from the designated utility, the applicant must coordinate with Clark County Public Health to insure that an alternative public water service for the development will comply with state rules: WAC 246-290 or 246-291.

Clark County Public Health may review the proposed use of a private well to serve three to 14 service connections in rural areas, in accordance with the department's Guidelines for the Approval of Group B Public Water Systems. Proposals for use of private wells to serve up to two service connections must conform to the department's guidelines for source development. In cases where it is determined that use of a private water supply source will pose a health hazard or would not provide an adequate water supply, Public Health will not allow the development of a private well, thereby requiring the applicant to contact the appropriate existing utilities, which would initiate the utility service review procedure.

4. TIMELY PROVISION OF PUBLIC WATER

Current state law defines timely service as within 120 days but fails to clearly define when this time limit starts and ends. Washington rules allow local agencies to adopt specific definitions of timely service. The CWSP has adopted specific guidelines to provide for timely provision of public water supply. Guidelines for the timely provision of public water have been separated into two components: request for water availability and formal application for service.

Water Availability: When a preliminary plan is submitted or service is otherwise requested, an administrative decision regarding whether a water purveyor will provide water service and the general conditions of services will be made within 30 days.

Application for Service: When an applicant submits a technically complete application for water service for a proposed development, the water purveyor will provide final approval of the design within 120 days. Purveyors will have a goal of a 15-day period for review of preliminary development plans. This period includes only those days when project submittals are being considered by the purveyor.

Water utilities and Clark County Public Health may adopt service standards which are higher than these goals and are strongly encouraged to develop clear service applications and review procedures to expedite requests for service.

5. UTILITY SERVICE REVIEW PROCEDURE

The Utility Service Review Procedure (USRP) is applied to all proposed water use activities that require public water. Clark County Community Development insures that all appropriate agencies have been involved in the review process. When public water is a condition of approval, Community Development requires the applicant to obtain written verification from the designated utility that potable water is available, before issuing a building permit or preliminary plat approval. Each utility may have specific requirements for requests for service.

A. USRP General Sequential Steps

- Direct or satellite service by the designated utility.
- Interim or permanent service by an adjacent utility; service areas adjusted if permanent service is arranged.
- Satellite service on an interim basis by Clark, if the new service is located outside Clark's mainline service territory.
- Satellite service by another DOH-approved SMA on an interim or permanent basis.
- Formation of a new utility; service areas adjusted.

B. Land Use Proposals Conforming to the 20-Year Plan

Each water purveyor must respond in writing to a service request within 30 calendar days after receiving a request for service. This written request must be made in the form deemed appropriate by the water purveyor.

(1) The project proponent is responsible for initiating and completing the USRP and providing written documentation of requests for service to the appropriate water purveyors. Assistance with the USRP may be provided by the Clark County Community Development.

(2) A proposed development projects requiring public water service must be reviewed by the water utility designated to serve the area in which the development may be sited. The utility identifies the engineering, financial, managerial and other requirements contingent to the provision of service. The utility has operational and managerial responsibility for the proposed activity and may require more stringent utility standards than minimum presented in the CWSP.

(3) The designated water utility provides written documentation of its intent to provide service to the applicant prior to issuing a building permit or preliminary plat approval. The utility specifies its intent to implement one of the following options:

(a) Public water provided by direct service. Conditions of service (fees, facility design and construction requirements necessary to serve the development) are clearly outlined. Actual connection may require the applicant to complete the design and construct additional water facilities in order to support the proposed development in accordance with the designated utility's standards.

(b) An interim satellite water system installed within the utility's existing service area, contingent upon a legal contract between the applicant and the utility. This contract will verify that the utility will assume responsibility for providing or arranging for the appropriate level of managerial and operational duties until the two systems are interconnected. The interim satellite system would typically be operated by the utility. However, comprehensive operation and management service may also be provided by an approved satellite management agency, if an interlocal agreement is completed which stipulates the conditions of service.

(4) If the designated utility is unable or unwilling to serve the applicant in a timely and reasonable manner, either directly or as a satellite system, the proponent seeks direct service from all adjacent utilities. The adjacent utilities have the opportunity to provide direct service on an interim basis or permanently. If permanent service is provided, the adjacent utility incorporates the proposed development into its service area, after completing an interlocal agreement

adjusting service area boundaries. If an adjacent utility does not provide service, the application is forwarded to Clark Public Utilities.

(5) Once all adjacent utilities have declined direct service, the proponent seeks interim satellite service from the primary SMA, Clark Public Utilities. Generally, Clark will assume operational responsibilities only when it is cost-effective and when water facilities are installed in public rights-of-way or utility easements. Interim public water service requires an the completion of an interlocal agreement. If Clark declines to serve, all other available secondary DOH-approved SMAs must be evaluated for possibly providing service.

(6) If interim service is available from an SMA, an interlocal agreement must be completed. If no SMA is willing and able to provide service, an independent water utility may be formed.

(7) A new utility may only be formed after all other options have been evaluated and service cannot be otherwise provided. Formation of a new utility should meet the minimum design requirements of the CWSP and obtain approval by Clark County Public Health and DOH. DOH may require management or operation by an approved SMA in the future, if such management or ownership can be made with reasonable economy and efficiency.

(8) If the applicant accepts the conditions of service prescribed by an existing water purveyor or SMA, written documentation is provided to Clark County Community Development to support issuance of the required approval/permit. If the applicant disagrees with the conditions of service, the applicant may initiate an appeal. See Subsection 6, F.

(9) After the preliminary plat is approved, it is recommended that a written contract be developed between the utility and applicant to formalize the conditions of service and responsibilities of each party. Prior to final plat approval, the water facilities is installed in conformance with the utility's requirements, or bonded for completion, if acceptable to the water utility.

C. Land Use Proposals Requiring 20-Year Plan Amendment

Each utility is contacted and allowed to comment on applications which propose land use changes within their service areas. The special review procedures listed below are important in insuring that the USRP is effectively utilized as a mechanism for reviewing land use change requests:

(1) An applicant will be referred to the water utility that would serve the proposed development, when the applicant files for a land use change. The utility will review the impact of the applicant's proposal on the water system. In addition to connecting the development to the water system, various external facilities may be required to ensure provision of reliable utility service. Major capital improvements may be necessary, e.g., providing additional storage capacity, source capacity and transmission system improvements or extensions. The economic impacts of providing these facilities required as a direct consequence of the land use change are identified.

(2) The economic impacts identified by the utility for providing service commensurate with proposed land use change are presented to the applicant and Clark County for their consideration. If the applicant is willing to fulfill the financial requirements pertaining to water service, the application can proceed to seek a decision by the county, which will be based on water service considerations and the availability of other public services, e.g., transportation, wastewater management, stormwater control, schools and parks.

(3) If the land use change is approved, the application is considered via the previously described utility service review procedure. If the land use change is denied, the application may be amended to conform with existing land uses or modified for reconsideration to remain an active application.

The information obtained while sequencing through the USRP facilitates Community Planning's evaluation of proposal and strengthens recommendations to the Clark County Planning Commission and Board of Commissioners regarding the plan amendments.

This process should provide for improved water service to county residents by enabling individual water utilities to more efficiently plan and finance capital improvements. In addition, the utilities will be able to adjust water rates to finance water system facility improvement and cover operating costs. By identifying new or additional utility costs associated with proposed changes in land use as part of the evaluation, potential development impacts can be integrated into the decision-making and budgeting processes.

6. SPECIAL REVIEW CONSIDERATIONS

A. Water Service to Commercial Uses

Commercial properties represent a fire flow responsibility that may greatly exceed flows required for residential uses. These flow requirements are critical to the sizing of the storage, pumping and piping facilities. Because of the costs associated with provision of fire flow capacities, it is desirable to coordinate the issuance of building permits for applicants proposing use of private wells before issuing a building permit. This process allows the utility and applicant to evaluate and discuss the benefits and costs of an immediate connection to the utility's system relative to the use of an individual well for the development. Therefore, it is recommended that commercial building permits featuring individual wells be issued only after the water utility and Clark County Public Health verify that the water source development conforms to appropriate standards and DOH guidelines.

B. New Group A Water Systems

Over the past 14 years a number of small Group A systems have been established while other previously established small systems have been absorbed by the major systems, resulting in a net of 73 Group A systems serving approximately 364,470 people, as discussed previously in Section IV, Subsection 3. It is recommended that Clark County review the DOH Water System Inventory annually and include information about new Group A systems in CWSP updates.

C. Non-Transient Non-Community (NTNC), Transient Non-Community (TNC) and Group B Water Systems

The establishment of new NTNC, TNC and Group B water systems is limited by the CWSP. This justification is based on the fact that many such systems due to their size or seasonal nature are limited in the financial and managerial capacities to operate effectively and continuously. The CWSP, while acknowledging the existence of a number of small systems, does not attempt to identify service areas for these systems. Their ability to expand is remote and must be dealt with on a case-by-case basis. Again, it is recommended that Clark County conduct an annual review the DOH's inventory of small water systems and track the status of these systems in the appropriate planning-related exercises.

There are 850 residential and nonresidential Group B water systems (2 to 14 connections) serving approximately 9,280 people with an average of six people served by each system, according to Water System Data maintained by DOH's Office of Drinking Water, April 2011. Clark County Public Health completed an

inventory of 651 Group B systems in 2010, which does not include two-connection systems located on a single parcel (e.g., a connection serving an accessory dwelling detached from the principal residence on a parcel) and found the following deficiencies:

- 74% (80 out of 109) of the water systems were not current with water quality monitoring.
- 20% (22 out of 109) of well caps were not sealed.
- 9.2% (10 out of 109) of the water systems had biological contaminants located within 100 ft of a water supply well.
- 9.2% (10 out of 109) of the water systems had obvious chemical contaminant hazards (e.g., gasoline, diesel fuel and pesticides) located within 100 ft of a well.
- 40% (31 out of 96) of well houses were not secure and rodent free. 13 of the water systems were not equipped with a well house.

The procedures which have been developed for reviewing and approving new TNC and Group B systems are incorporated into the previously described USRP. The creation of a new system would be the last service alternative considered. Special consideration is required for expanding TNC or Group B systems inside designated service areas.

A small water system located within the service area of a major utility may not expand without the sanction of the major water utility designated to serve the area. In the course of obtaining a permit to expand a small water system, perhaps during a land use development review process, Clark County Community Development or the local land use permitting authority office should required the applicant to contact the designated water utility for the area and Clark County Public Health and obtain from the designated major utility a written finding concerning the availability of public water. If it is decided that a small water system should expand, the system will need to function as a responsible utility and meet water system planning and operational requirements under WAC 246-290.

D. Interim Public Water Facilities Interlocal Agreements

Interim service may be either through the creation of a satellite water system or temporary direct service. In the event interim service will be provided by a

purveyor other than the purveyor designated to serve an area, an interim service interlocal agreement should be negotiated. This agreement is intended to improve coordination between the primary purveyor and the interim service provider with respect to long-term use of water system facilities.

An interim service interlocal agreements memorializes the understanding between the two purveyors. The interlocal agreement may identify water system design and material standards, compensation for transfer of assets, restrictive covenants, and timing for transfer of interim facilities. Guidelines for preparation of interlocal agreements for interim public water system facilities appear in Appendix VI-B.

E. Failing Public Water Systems

Failing systems will likely be identified by Clark County Public Health or DOH. When systems are experiencing difficulties, assistance from a SMA should be encouraged. If the system refuses to accept assistance or make necessary improvements, DOH may initiate receivership proceedings under which the water utility assets are transferred to the most appropriate agency that is willing and able to continue to provide water service. The recommended process to select the agency to receive the water facilities follows the same order as the utility service review procedure: designated or primary purveyor, adjacent purveyor, Clark as the SMA and, finally, a secondary SMA.

F. Appealing Decisions on Public Water Service

Most appeals are likely to result during Clark County or a local municipality's review of land development proposals. Disputes should be resolved rapidly with the least amount of outside involvement as possible to limit the administrative burdens on all affected parties. Purveyors and applicants should make every effort to avoid appeals. Purveyors should have clearly defined policies and conditions of service on which to base their decisions. Applicants should also make every effort to comply with these policies and conditions of service before making appeals. If an applicant still believes that the conditions of water service are unreasonable and/or service cannot be provided in a timely manner, an appeal of a decision may be considered.

Appeals may not be made to DOH concerning the timeliness and reasonableness of water service. The only appeals which may be made to DOH concern water service area disputes between purveyors with respect to sites that may not have been included within a water service area. Since all areas of the county are presently covered by existing water service areas, these appeals cannot be made.

Clark County Community Development, Community Planning or any agency represented on the WUCC may refer a dispute to the WUCC for advisory consideration. Involvement of the WUCC will be limited to making recommendations to assist other agencies in resolving the dispute.

The WUCC's conclusions and recommendations should be based upon the policies of relevant growth management plans; Washington administrative rules relating to public water systems; approved local water system plans; and adopted standards, guidelines and policies of any public water system involved. Written findings, conclusions and recommendations should be circulated to the applicant and all other parties identified in the appeal. If the appeal process continues to authorities with jurisdiction, WUCC findings and recommendations should be available to those authorities.

Community Planning may provide staff support to the WUCC in rendering advice on disputes. Even though the WUCC's conclusions on a dispute are only advisory, the committee should have an opportunity to shed light on the matter. The WUCC is composed of technical and managerial staff with good working knowledge of public water service, land use and growth management subjects. The committee's findings on issues surrounding a dispute are likely to be valuable.

(1) Issues that are Not Appealable

- Issues concerning the recommended minimum design standards as adopted under the CWSP or an applicable DOH-approved water system plan.

- Issues concerning the facilities of a water purveyor offering service on an interim basis within another purveyor's service territory. These issues should be negotiated in an interim service interlocal agreement.

- Adopted rates and fees.

- Annexation provisions as a condition of service.

(2) Initiating an Appeal

Only the affected party may file an appeal. Appeals to the WUCC should be submitted in writing to Chair of the committee. The appeal may be expressed in a letter stating the issue or the decision that is being appealed and the

reason for the appeal. Copies of the letter should be conveyed from the appropriate land use regulatory authority to all agencies named in the appeal.

An appeal to the Clark County Hearing Examiner must be submitted on a completed *appeal application form* and accompanied by payment of necessary fees and four copies of an appeal letter, and mailed to Clark County Community Development Department.

(3) Recommended Appeal Paths

The route that an appeal should follow will vary depending on the issues involved. The following guidelines recommend the path considered appropriate for most appeals:

Exhibit VI-1
Recommended Water Service Dispute Appeal Path

Nature of Dispute	***Dispute Resolution or Appeal Path***
Interlocal Agreement	WUCC (advisory)
Interpretation and application of water utility service boundaries	WUCC
Schedule for providing service (timeliness)	Water purveyor
Conditions of Service (excluding adopted rates and fees)	Land use planning/permitting authority; Community Development/ Hearing Examiner

All disputes may also be appealed to the legal system.

Section VII
Satellite System Management Program

1. INTRODUCTION

When each water utility initially identified their existing and future service areas, there remained a large portion of the county for which no existing utility was identified to provide water service. Therefore, it was important to recognized that, under certain circumstances, public water service may need to be provided in certain outlying areas and that it was worthwhile to identify procedures for establishing satellite water systems to serve these areas.

In addition to having satellite areas in which no existing utility had been identified to provide water service, there was and continues to be concern about the ability of the smaller water utilities in the county to provide satisfactory water service. These smaller water utilities often lack the technical expertise and revenue base to independently meet water supply requirements, under state and federal regulations, carryout everyday system operational, maintenance and administrative functions, and readily react to a variety of unusual circumstances. Satellite System Management Agencies (later shortened to Satellite Management Agencies—SMAs) provide the solution these concerns.

DOH recently implemented regulations providing for the establishment of SMAs (WAC 246-295) with complementary revisions to its regulations for Group A and B water systems (WAC 246-290 and 246-291). These regulations require all new water systems to attempt to have an SMA operate and manage or own their systems, as a condition of their approval. Only where existing SMAs are unwilling or unable to provide service may a new, independent system be created, provided that it satisfy additional DOH requirements.

2. SATELLITE SYSTEM MANAGEMENT AGENCY

The initial CWSP called for the establishment of an SMA to assume the role of providing service to newly developing remote areas or assistance to existing utilities. Due to the functions anticipated for the SMA, it was necessary for this agency to possess countywide authority and have the administrative and technical ability to operate and manage remotely located water systems in the county.

On September 13, 1982, the Clark County Board of Commissioners requested that Clark Public Utilities assume the SMA role for a period of two years, which was later

extended. Clark has continued to accept the responsibility as the primary SMA for the county with each update of the CWSP.

As of August 2010, Clark owned and operated eight Group A and 16 Group B satellite water systems. Clark also is the contract operator for one private Group A system. These 25 satellite systems have a total of 868 service connections. Because Clark is a major water utility it is capable of providing the required services in a cost effective manner without significantly altering its existing operations. Since most satellite systems are located within Clark's service territory, the utility has been able to connect certain former satellite systems to its mainline service. Clark's satellite systems located in other service areas are transferred to the major utilities designated to serve those areas, once it is operationally practical for these utilities to connect the satellites to their distribution systems.

Recent Washington regulations pertaining to SMAs allow the establishment of additional satellite water system management agencies within a CWSSA. Presently there are three secondary DOH-approved SMAs for Clark County and one of them operates two satellite water systems. Clark is the primary SMA for the county and must be considered as an operator of a satellite system before considering any other SMA, i.e., Clark has the *right of first refusal* to operate a satellite water system. Clark may coordinate provision of SMA services with other DOH-approved operators.

Note: A utility designated to serve a given water service area may choose to operate a satellite water system within its service area, as provided for under the utility service review procedure described in Section VI. If the designated utility does not choose to operate a satellite water system, Clark has first priority in providing satellite water services.

Clark's principal responsibilities as the primary SMA for the county include owning or operating satellite water systems and providing technical assistance to new or existing water utilities. Clark's program for providing satellite services is presented below. This program may be generally construed to apply to other DOH-approved satellite water system operators. Clark's detailed Satellite Water System Policy Framework is presented in Appendix VII-A.

3. CLARK PUBLIC UTILITIES SATELLITE SYSTEM MANAGEMENT PROGRAM

Clark's SMA responsibility includes providing assistance to existing or newly formed water utilities. The level of assistance provided depends on the needs of the individual utilities and Clark's ability to provide service in a cost-effective manner. This assistance program is provided under the following service arrangements:

- *Direct Service.* Transfer of existing system ownership and operation to Clark or assumption of responsibilities for development and operation of new systems. Clark's provision of satellite service within another purveyor's service area requires completion of an interlocal agreement.

- *Contract Service.* Provision of emergency or scheduled repair services, system operation and maintenance, laboratory services, billing services, etc., under a contractual arrangement.

- *Technical Service.* Cooperation in improving water service. Activities could include dissemination of public information, joint purchasing agreements to achieve economies of scale, as well as providing expertise to assist smaller utilities with specific operation problems.

The service arrangements outlined above complement the efforts of the smaller existing water utilities and help establish a comprehensive program of water system improvements within the county. Because the requirements for assistance will differ based on the needs of existing water purveyors, growth pressures and the cost-effectiveness of individual situations, the final determination of the level of service to be provided will be made on a case-by-case basis. Current SMA regulations require that all new systems receive one of the first two types of satellite service by an approved SMA.

A. Direct Service

The direct service arrangement places Clark in a position of assuming responsibility for a diverse group of water utilities throughout the county. Under this program, Clark can either assume ownership and operation of existing systems or provide operation and management services to newly developed utilities.

If direct service is implemented, the attitude of the customers of existing utilities is an important consideration. The anticipated cost of improvements and operation must be clearly defined prior to Clark's commitment to assume ownership responsibility.

Also of concern is the adequacy of new water systems. If the objectives identified in the CWSP are to be achieved, the obvious problems of assuming the liabilities associated with existing inadequate systems must be addressed. Clark must evaluate the adequacy of the design of a proposed system or the design

and operational characteristics of an existing system. Serious deficiencies must be identified and corrected before Clark assumes responsibility for the system. Clark will evaluate the prospect of incorporating a system into its future construction and/or operations program, if the new system is located within Clark's designated service area. Otherwise, Clark will examine the feasibility of providing interim satellite service within the designated service area of another utility. Clark's provision of satellite service within another purveyor's service area requires completion of an interlocal agreement to enable the designated purveyor to appropriately plan for future service.

The procedures outlined herein are designed to limit the establishment of new, small inadequate systems. Clark County Public Health will not approve new systems serving subdivisions, short plats and small communities without assurance that the systems will be properly operated and maintained. The following are the major steps involved in establishing a direct service arrangement with Clark:

(1) Transfer of Ownership and Operation of Existing Water Systems

(a) The utility makes an official request for Clark to evaluate assumption of ownership by, for example, a petition and/or action by the officers of the utility.

(b) Clark establishes policies and conducts a preliminary survey of the water system to estimate the costs of system operations, maintenance and minimum facility improvements.

(c) The requesting utility reviews the preliminary survey to verify its accuracy and may authorize Clark to perform or contract for an engineering feasibility study. The requesting utility would fund the study, which would include an analysis of the capital improvements required, projected cost of operation and maintenance, a preliminary financing plan and rate structure. The financing plan for improvements will consider the following:

- Minimum improvements required to meet health standards. These improvements would be financed with revenue obtained from a direct assessment of the utility's customers.

- Improvements to meet future needs including storage, metering, fire flow, etc., to meet state and county standards. Funds to

make these improvements would be obtained from one or more of the following:

- State and federal grants and/or loans
- Revenue derived from direct assessment of the utility's customers
- Rate surcharges for capital improvements

(d) If the requesting utility approves of the recommendations outlined in the feasibility study and authorizes Clark to proceed, the necessary system improvements will be designed and construction scheduled. DOH will be notified of the pending improvements or change of ownership.

(e) Clark will assume operational responsibility in accordance with the agreement to assume ownership.

(2) New System Development and Operation

(a) The proponent of a new water system must accept comprehensive management and operation and possible ownership by an approved SMA within the county, as a condition of the system receiving DOH approval.

(b) All engineering design and construction must be consistent with minimum county standards presented in the CWSP.

(c) Clark will assume operating responsibility after DOH has certified that the project was constructed in accordance with state requirements under WAC 246-290. Clark County Public Health will initially certify that the water system construction satisfies requirements under WAC 246-291.

(d) Clark may be asked to provide direct or satellite service to a development within the service territory of another primary water purveyor. Considering that in the future the primary purveyor might be in a position to extend mainline service to the development, Clark and the primary purveyor will negotiate an interlocal agreement for providing interim service. The agreement will provide the primary purveyor with a clear understanding of the design of the system and the terms by which its ownership would ultimately be transferred; hence, the primary purveyor would be able to prepare for the time when it would assume responsibility for operating the system. See Section VI, Subsection 6, D and Appendix VI-A regarding the requirements and guidelines for preparing interlocal agreements for interim public water service.

(3) Policy Implementation

(a) Direct service will be limited to public water systems as defined by DOH.

(b) Clark will require existing systems requesting direct service to be upgraded to meet the applicable state and federal requirements for water supply service. This requirement addresses water quality, quantity and public health considerations.

(c) Each water utility will cover the cost of service or assistance, including capital improvements and system operation and maintenance. Funds for capital improvements will be obtained from direct assessment of the utility's customers, state and/or federal grants and loans, revenue bonds and rate surcharges.

(d) Clark will require system improvements to be coordinated and/or integrated with adjacent water systems or developments.

(e) Clark will provide water service based upon established procedures and criteria. If Clark assumes ownership of an existing water system, cash payments will generally not be made for such systems. Available system assets will be used to finance capital improvements for the system and extend water service.

(f) Before providing direct service to a development, Clark may require property owners to sign "no protest" agreements concerning future assessments for water system improvements. Property owners might be required to promise that they would not object to the formation of a Local Utility District through which revenue would be raised to finance improvements that would meet minimum design standards and fire flow requirements.

(g) Clark may relinquish direct service to the designated water purveyor for the area when that purveyor's mainline service is within 200 feet of the satellite system, if it is operationally practical for the designated utility to provide service. The designated utility will make the connection and transfer meters after notifying the water customers.

B. Contract Service

The major limitation to the proper operation of the existing utilities is the availability of funds and qualified technical assistance. Under the contract service arrangement, Clark may provide services such as emergency or scheduled repair, system operation and maintenance, laboratory services, billings, etc. The cost of these services would be identified in the contract. Before entering into a contract the utility must complete minimum improvements as may be necessary to meet public health or operational requirements. These improvements will simplify future system maintenance and advance efforts to monitor water quality and the general performance of the system. The major steps to obtain assistance under a contract with Clark follow:

(1) Service Request Process

Clark will require certain minimum system improvements as a condition for contract service to eliminate any public health or system operational problems. The minimum improvements would be the responsibility of the requesting utility and would be paid for by direct assessment of the utility's customers.

(a) The water utility makes a request for assistance. In order for Clark to consider the request, the following minimum system information/requirements would apply:

- *As-built* drawings of system

- Operating procedures
- Minimum water quality and water use monitoring
- Legal authority to contract and assess costs
- Access for service and repairs
- Minimum capital improvements, if required, for public health and/or operating reasons

(b) Clark provides criteria and policies, conducts system evaluation addressing public health and operating problems and advises the water utility as to required improvements.

(c) Water utility accepts/rejects assistance.

(d) CPU and utility enter into agreement.

(2) Policy Considerations

(a) Assistance would be made available throughout the county based on cost-effectiveness.

(b) Contract for assistance would typically be for one year with an option for contract extension for a specified period.

(c) If the utility intends to expand its service area, Clark must approve the expansion and/or be given the option to discontinue the contract services.

(d) Applicant must have designated a responsible official whom Clark may contact.

(e) When an approved SMA is not willing or able to provide service to a new utility, the system may be created. However, DOH may require the system to obtain SMA service when it becomes available or if necessary to correct operational difficulties.

C. Technical Service

Clark provides technical service aimed at improving water utility service in the county. This form of assistance is primarily designed to support and assist the smaller water utilities in the county:

- Engineering and other technical expertise where required to address situations in which a small utility lacks the expertise or equipment to handle a circumstance.
- Technical support programs for operator training.
- Administration of joint purchasing of equipment and supplies to help achieve economies of scale for the smaller utilities.
- Leadership and support to the smaller utilities to help ensure that the views of these utilities are considered in proposed local and state regulatory actions.
- Financial management/grant procurement assistance.

These services would usually be rendered for one-time occurrences on a fee basis that is either established in a schedule of charges or by contract. Technical service is viewed as a voluntary relationship between the requesting utility and Clark and will not interfere with the service recipient's operational or financial autonomy.

Section VIII
Water Resource Assessment

1. WATER SUPPLY

Clark County relies almost entirely upon groundwater sources for potable water supplies, including water for residential, commercial and industrial uses, as well as agricultural activities in many areas. The sources of groundwater in the county have been addressed in a number of studies. A report entitled *Geology and Ground Water Resources of Clark County, Washington, Water Supply Bulletin No. 9*, M.J. Mundorff, published by USGS, 1960, characterizes the county's surface and groundwater resources, and provides a good base study for further investigation.

The Mundorff study describes the Clark County region as a portion of the Cascade mountain range which has been depressed by a combination of down-warping basalt lava flows and subsequent erosion to form a large basin in the Portland-Vancouver area. The basin was then filled with various sedimentary material which was probably transported from eastern Washington by the Columbia River and its tributaries. It is estimated that the basin is approximately 1,000 feet deep. The basic geological formations which lie within the county follow with the deepest formation identified first:

- *Older Consolidated Rocks*: Primarily Columbia River basalt from early volcanic activity.
- *Sand and Gravel Aquifer (also called the Sandy River Mudstone Aquifer)*: The deepest aquifer in the Portland basin over-lays the older consolidated rocks and isolated from the overlying Troutdale formations by regionally extensive silt and clay units.
- *Lower Troutdale Formation*: Silt, sand and clay deposits from the ancestral Columbia River.
- *Upper Troutdale Formation*: Sandy gravel with quartzite pebbles deposited by ancestral Columbia River.
- *Pleistocene Alluvial Deposit*: Sand and gravel deposits from the ancestral Columbia River.

- *Recent Alluvium*: Silt, clay, sand and gravel deposits from modern stream flows in the area.

- *Boring Lava*: Basalt lava flows extended through the two Troutdale formations and the Pleistocene alluvial deposits

Current evaluation of water pumped within the Portland basin indicates that most groundwater is withdrawn from the Pleistocene alluvial deposits and the upper Troutdale formation. Nearly all of the water used for industrial purposes is withdrawn from the Pleistocene alluvial deposits. However, in recent years Clark Public Utilities, the cities of Portland and Vancouver, and SEH America, which is a very large semiconductor manufacturer, have established significant sources of water supply in the Sand and Gravel Aquifer. The most recent full year groundwater production by the major water purveyors is summarized in Exhibit VIII-1.

Exhibit VIII-1
Major Purveyors Water Production 2009

Purveyor	*Average Annual Production*	
	Millions of Gallons	*Acre-feet*
Battle Ground	513.34	1,575
Camas	1,355.14	4,159
Clark	4,208.73	12,916
Ridgefield	207	635
Washougal	647.37	1,987
Vancouver	9,411.40	28,883
Total	**16,342.98**	**50,155**

Notes: All values are from groundwater sources except for Camas, which includes 385 acre-feet of surface water from Jones and Boulder creeks. Clark's value includes 22 acre-feet transferred to Battle Ground and 20 acre-feet to Ridgefield.

Groundwater supplies have generally been adequate to meet needs in Clark County. Recent population growth in Clark County along with commercial and industrial developments makes planning for future water supplies critical for the major water

purveyors. There are concerns regarding whether groundwater supplies can reliably produce adequate supplies in the future for certain areas of the county. There are areas of the county where seasonal declines in groundwater levels have increased. Battle Ground has required emergency water supply from Clark in recent years to meet its summer demands while it develops additional water sources and, because of this situation, has entered into a 20-year water purchase agreement with Clark.

Moreover, concerns have been raised about the potential degradation of ground water resources as a result of activities associated with commercial and industrial development, as well as other land uses. There are at least 50 sites in the county where hazardous chemicals are suspected or known to have contaminated groundwater resources. Both Clark and Vancouver have sources of supply which have been threatened or impacted by hazardous chemicals.

2. GROUNDWATER MANAGEMENT PLANNING

In order to protect the quality of the existing groundwater resources, the county and major water purveyors have engaged in ongoing groundwater planning. These planning efforts involve close cooperation among local governmental agencies within the county. The primary objective of these planning projects is to develop and implement programs that will protect the quality and quantity of the groundwater resource.

Clark County's Groundwater Management Planning Program was initiated in September 1987, following Ecology's recognition of Clark County as a critical groundwater supply area. A network of advisory committees and boards were established to guide the development of plans. A variety of public and private interests are represented on these committees and boards, including local and state governmental agencies, business and industry, and the public at large. The involvement of principal technical and policy officials in the planning process was fostered through these committees and boards.

The technical methods used to develop groundwater management plans include hydrogeologic data collection and analysis, aquifer susceptibility mapping, and regional groundwater flow modeling. Subjects relating to the impacts of land and water use on groundwater include abandoned wells, hazardous materials, landfills, underground storage tanks, stormwater runoff, industrial waste discharge, and water demand. The plans set forth implementation strategies which involve a broad range of short and long-term programs and services. These activities will address water quality and quantity monitoring, regulatory actions and siting limitations, land use management and education. Various public agencies will be responsible for conducting programs and providing services.

Clark County groundwater management planning documents include the following: *Wellhead Protection Program* (November 1993) which was prepared to guide evaluation of the size and shape of wellhead protection areas and the type of groundwater protection measures appropriate within these areas; *Wellhead Protection Area Delineations for Clark County* (September 1995) which compiles previous wellhead protection areas and new delineations to cover all Group A water systems; adoption of the *Critical Aquifer Recharge Area* (CARA) ordinance (May 1997). The purpose of the CARA legislation is to protect public health, safety, and welfare by preventing degradation and, where possible, enhance the quality of groundwater which will or might be used in the future for drinking water supply or business purposes. Under the CARA program, activities which have the potential to contaminate groundwater will be required to obtain permits and meet appropriate requirements to minimize the potential threats.

In 2006, the U.S. Environmental Protection Agency designated the Troutdale Aquifer system in Clark County a *sole source aquifer*, in response to a locally generated petition for such designation. The Troutdale Aquifer lies beneath roughly half of the county as well a neighboring areas within the region including Portland. The Sole Source Aquifer Program is authorized by the Safe Drinking Water Act of 1974 (Public Law 93-523 42 U.S.C. 300 et.seq). A sole source aquifer system must supply at least 50 percent of the drinking water consumed within the natural boundaries of the aquifer system without there being economically feasible alternative sources of supply. The Troutdale Aquifer supplied over 99 percent of the drinking water for people residing in the area, at the time the designation was made, and remains an important source of supply. Projects within the portion of the county designated as a sole source aquifer area that involve federal funding support or approval are subject to additional environmental scrutiny by EPA.

Each major water purveyor is required to include a wellhead protection plan in its water system plan, consistent with WAC 246-290.135(4). A wellhead protection plan focuses on preventing contaminants from entering the water supply. It sets forth emergency procedures that will be undertaken in the event a water source is threatened by contamination. Updates of the wellhead protection plan are required every two years.

In addition to wellhead protection, municipal water providers utilize other methods to protect groundwater. Some groundwater protection efforts include encouraging and facilitating proper disposal of household hazardous wastes; inspection and maintenance of subsurface sewage disposal systems; encouraging and facilitating proper decommissioning of abandoned water supply wells; and installing stormwater control, retention and treatment facilities designed to enable clean runoff to recharge groundwater resources.

In 2003 the city of Vancouver adopted a Water Protection ordinance (VMC 14.26) which codifies a watershed approach for pollution source control. The ordinance designates all land within the city a Critical Aquifer Recharge Area, identifying all aquifers beneath the city as potential sources of drinking water, regardless of time of travel zones around water supply wells. The ordinance also prohibits several types of activities within city borders, such as chrome plating operations and disposal of hazardous wastes, and regulates other activities including pesticide use and hazardous material handling. Additional restrictions apply to land uses within 1,900 feet of municipal drinking water supply wells.

Vancouver's Water Protection Field Inspector regularly visits businesses and industries that store or manage hazardous liquids to verify that they are following pollution prevention Best Management Practices. The inspector also responds to water-related complaints and referrals, routinely provides technical assistance, recommends action to address potential groundwater contamination issues and initiates enforcement actions, when necessary. As of mid-2010 there had been over 300 thorough inspections of business facilities. The city receives approximately 10 water protection complaint/referral calls monthly.

Vancouver's Water Protection Program also conducts public outreach and water quality monitoring activities. A GIS display found on the city's Website identifies the location of industries of concern and contaminated sites.

3. WATERSHED MANAGEMENT PLANNING

There have been several major programs related to surface water management in Clark County. The county has prepared watershed management plans and programs aimed at maintaining and enhancing stream flows. The county completed the Burnt Bridge Creek Watershed Management Plan in April 1996. Most of the Burnt Bridge Creek watershed and the entire mainstem are now within the city of Vancouver, as the result of annexations.

The *Salmon Creek and Lakeshore Watershed Plan*, 1997, involved the participation of many stakeholder agencies and the general public. The plan proposes facilities and excavations designed to control floodwaters; block contaminants from reaching surface waters; protect and enhance fish habitat; and control stormwater runoff and erosion within riparian areas. Other significant aspects of the plan include public education and provisions for ongoing operation and maintenance of facility improvements.

Clark has also been active in watershed management programs through the requirements of the *Salmon Creek Memorandum of Understanding* (MOU) between Clark and DOE. This agreement was completed in 1991 and sought to evaluate conditions within the Salmon Creek watershed and determine the potential for groundwater withdrawals which may negatively impact stream flows and fish habitat. The results of this program were intended to provide information to enable DOE to authorize additional water rights for Clark and other participants within the watershed. The Salmon Creek MOU offered the potential for water utilities to provide resources to support DOE's review and administration of water rights applications, as well as protect and improve water resources. The Salmon Creek MOU is no longer relevant to issuing water rights. It has been superseded by a new Water Resource Management Program for WRIAs 27 and 28, which will be discussed subsequently.

Clark is currently active within the East Fork Lewis River watershed. The utility is monitoring surface water and groundwater quality and quantity, and restoring riparian areas.

In 2004 and 2005, Clark County assessed the conditions of streams within the Whipple Creek watershed. This work involved examining 25 miles of streams (544 reaches) within the basin to determine the impacts of stormwater runoff and opportunities for stream improvement projects. The investigation resulted in a list of problems that needed immediate attention and an identification of areas where preservation of existing fish habitat should be considered. It confirmed that the Whipple Creek corridor had been heavily impacted by past and current human activities. Increased runoff from past clearing and development has resulted in significant channel incision and floodplain disconnection along many of the stream reaches within the watershed. Whipple Creek serves as a good example of the extent to which human activities can degrade stream function and habitat. The investigation, which is presented in a Clark County publication entitled *Whipple Creek Watershed Assessment*, 2005, generated information that is used in stormwater planning for the Whipple Creek watershed and may be useful in planning other projects in this area.

In July 2006, Clark, Cowlitz and Skamania counties adopted the *Salmon-Washougal & Lewis Watershed Management Plan for Water Resource Inventory Areas 27 and 28*. Work on the plan began in 2002. The plan was prepared under the direction of the Lower Columbia Fish Recovery Board. Existing watersheds conditions were inventoried. A range of water resource issues specific to WRIAs 27 and 28 were addressed, including the management of water supplies, stream flow, surface water quality, groundwater quality and fish habitat. Alternative approaches for managing water resources were identified and analyzed, and the most appropriate implementation strategies were recommended. Plan implementation measures are

currently underway, which impact public water system plans and operations. This new watershed management program has rendered obsolete most of the provisions of the previously described 1991 Salmon Creek MOU.

4. WATER SYSTEM DEVELOPMENT

Major sources of water supply have been developed in highly productive aquifers underlying southern Clark County. Camas and Washougal have high production wells in the vicinity of the Washougal River. Vancouver has nine water stations with five of its southern wells being the most productive. Clark has developed a large number of water sources but they are relatively dispersed throughout its service area. Battle Ground has experienced difficulties in developing additional groundwater supplies despite extensive efforts.

Interconnecting water system can improve the overall reliability, efficiency and manageability of the intertied systems. System interties are important in providing emergency backup supplies of water, in the event of a drought or failure of one of the connected systems. Connected systems may benefit from a highly production well field. It is recommended that all major public water systems in the county be intertied. All water system interties are subject to DOH review and approval. Existing water system interties follow:

Exhibit VIII-2
Major Water System Interties

Clark → Battle Ground [1]	SW Eaton Blvd at Maple Grove School
Vancouver → Clark [2]	NE 78th St east of St Johns Blvd
Vancouver → Clark [2]	NE 72nd Ave and NE 99th Street
Clark → Ridgefield [1]	N 65th Ave and N 10th St
Clark → Ridgefield [1]	N 20th St and N 65th Ave
Clark → Ridgefield [2]	S 5th St and S 85th Ave
Camas ↔ Washougal [2]	SE James Ave and Whitney St
Camas ↔ Washougal [2]	Sheppard Rd and Lebrun Blvd

[1] Periodic or continuous operational (non-emergency) supply
[2] Emergency supply

Clark Public Utilities-Battle Ground interties at NE 10th Street and NE Grace Avenue, and NE 219th Street and 92nd Avenue are proposed for construction within the next two years. For additional information on the existing and proposed water facilities of the major purveyors, see the individual water system plans.

5. ADDITIONAL WATER SUPPLY SOURCES

The original 1983 CWSP evaluated the feasibility of developing regional water supply sources to augment existing groundwater sources. The three main options were the Lewis River (North Fork), Columbia River well fields and the Columbia River.

The 1991 CWSP update noted that studies had identified alternative sources of high volume groundwater in the vicinity of the Vancouver Lake lowlands. Groundwater in this area may be reached at depths ranging from 50 to 100 feet and is rapidly recharged by the Columbia River. Another high volume ground water source identified in the plan was and remains the deep Sand and Gravel formation—SGA.

Clark and Vancouver have explored the bountiful groundwater supplies in the Vancouver Lake lowlands. Camas and Washougal have investigated the Steigerwald lowlands—another area with an abundant supply of groundwater. The shallow aquifers in these areas are tidally influenced sources of water supply and, therefore, will not have a negative impact on the flows of upland fish-bearing streams.

Clark is also advancing a regional groundwater supply project in a lowland area at the confluence of the East Fork and main stem of the Lewis River—a location called Paradise Point, which is also a tidally influenced. Details about these important water supply sources are provided in Section IX, subsection 6.

The water demand forecasts presented in the most recent local water system plans were used in this CWSP update. These forecasts were derived from recent growth management planning efforts. Section IX includes a summary of existing and projected water demands as they relate to water rights, which forecasts the adequacy of permitted water supplies.

6. WATER CONSERVATION PROGRAMS

The efficient use of water is an integral part of water supply planning and a requisite for approving additional water rights. There are no specific requirements for water conservation planning within the CWSP, however, it is recommended that the major purveyors seek opportunities to coordinate their individual programs to achieve greater effectiveness.

Previous updates of the CWSP outlined measures that the major water purveyors in Clark County had taken to conserve water and promote water conservation practices by customers. These measures included metering of all source and service meters, monitoring unaccounted for water, education programs using bill inserts, and adopting metered rate structures. Certain utilities had also adopted conservation oriented water rate structures (e.g., increasing block rate fee structures) and completed leak detection surveys to reduce water loss. They have adopted policies encouraging efficient water use, as well as those calling for voluntary or mandatory reduction in water consumption during periods of drought or other extreme circumstances.

In 2003, the Washington legislature passed the Municipal Water Law to address the increasing demand on the state's water resources. The law requires all municipal water suppliers to use water more efficiently in order to meet future demand for the resource. The legislature directed DOH to adopt an enforceable Water Use Efficiency Rule, which became effective on January 22, 2007. These requirements are designed to promote good stewardship of the water resources and ensure efficient management of water systems.

The water use efficiency requirements affect all municipal water suppliers, which include all Group A community water systems with 15 or more residential connections and some non-community water systems that use water in a residential manner (RCW 90.03.015). DOH requires each major utility's water system plan to include a program to address the water use efficiency requirements. DOE requires compliant water conservation programs in water right applications. Water conservation must be evaluated and implemented as an alternate source of water supply, before the state approves applications for expanded water rights.

The program must include water conservation goals and measures that will be undertaken to achieve the goals. It must provide for data collection and analysis intended to track water consumption and water loss from leaks in the system. The program must evaluate alternative rate structures and determine the feasibility of adopting a structure that will encourage water conservation. Each utility is required to submit to DOH annual performance reports on progress toward achieving water

use goals. Outlined below are measures that are being utilized, refined or considered by the major water purveyors in Clark County to address the supply and demand aspects of water conservation:

- Meter water sources and programmatically test and re-calibrate meters at supply wells.

- Meter or otherwise measure backwash water discharged from water treatment facilities.

- Meter or otherwise measure the amount of water used to flush water mains.

- Meter customer connections and programmatically replace older meters that have been online for 10 to 15 years.

- Conduct studies to detect leaks in water distribution systems and calculate water supply losses.

- Collect production and consumption information, which is utilized in calculating leakage; forecasting water demand; identifying areas where water can be used more efficiently; and evaluating the success of the program.

- Examine water storage and distribution facilities to detect leaks and replace deteriorated facilities.

- Explore water reuse opportunities, particularly the use of high quality effluent from upgraded wastewater treatment facilities.

- Install telemetry systems to monitor system components (meters, water mains, supply wells, reservoirs, booster stations, pressure reducing valves and hydrants among other water facilities). Programmatically inspect, test, maintain, repair and replace facilities, as necessary.

- Establish inclined block water rate structures. (This method of pricing applies a higher charge for water once the amount consumed exceeds certain thresholds, depending upon the size of the meter and the customer class. It is a tiered rate that reflects the increased cost of supplying water to the system during the peak use summer period, when the demand for water is generally three times the average over the year.)

- Impose newly adopted penalties for water theft without the appropriate meter and connection.

- Send water conservation messages to certain high water using customers.

- Examine industrial, commercial and residential water uses to detect, e.g., leaking plumbing systems and water pressure irregularities.

- Encourage fire districts to meter or otherwise measure the amount of water used in training exercises, hydrant testing and fire fighting.

- Include water consumption history on utility bills.

- Disseminate information to water utility customers and the general public on ways to conserve water in irrigating lawns; how to detect leaking pumping; and water saving devices on household fixtures (e.g., low-flow toilets and showerheads, and faucet aerators)—using utility bill correspondence, and messages obtained from or posted on information kiosks and Websites.

- Offer rebates on water and energy-efficient appliances.

- Promote water conservation in landscape irrigation (set sprinkler system timers to irrigate when needed and/or in early mornings or late evenings to limit water evaporation; apply mulch around plants to minimize surface water evaporation; monitor irrigation rate to match the soil's ability to absorb water; install drip irrigation systems or soaker hoses that discharge slow, steady supplies of water to plant roots and not surrounding impermeable surfaces; use rain barrel water to augment irrigation water supplies; and landscape with native drought-tolerant plants).

- Centralize control of irrigation systems on public lands, e.g., parks and school grounds.

- Amend building codes to require variable or low-flow toilet flushing and low-flow showerheads in new residential construction (e.g., require toilet tanks rated at 1.6 gallons and showerheads at 2.5 gallons per minute).

Clark Public Utilities water service employees are tasked to provide its customers with information about conserving water. They respond to customer inquiries about

water service matters and use the opportunity to suggest water conservation methods; staff information booths at the annual Clark County Fair and the Home & Garden Idea Fair; and lead students on tours of the utility's water operations center in Orchards and watershed restoration project sites in the Salmon Creek basin.

Vancouver's Water Resources Education Center is a focal point for information about the city's environmental and water conservation programs. Vancouver, as well as other major water purveyors in the county, disseminates information to residents about the efficient use of water. A variety of public information techniques are used, including advertisements in the local print, radio and television media and Websites; utility billing inserts; and public information partnerships with Clark and other water providers.

Section IX
Water Supply

1. BACKGROUND

The Water Resource Act of 1971, RCW 90.54, sets forth the fundamentals of water resource policy designed to insure that the waters of the state will be protected and fully utilized to the greatest benefit of the people of the State of Washington. This law directed the DOE (Ecology) to develop and implement a water resources program which provides a process for making decisions on future water resource allocations and use. Pursuant to this Act Ecology adopted WAC 173-590, outlining procedures for reserving water for future public water supply.

The 1983 CWSP initiated the process for the reservation of public waters to accommodate the projected countywide water demand over the next 50 years. Water rights held by each of the major utilities were presented in the 1983 CWSP and compared with projected water needs to determine water right deficiencies or projected water deficits.

The CWSP and a petition for Reservation of Public Waters were filed with Ecology and approved on August 13, 1986, as required under WAC 173-590, which became the effective date of the reservation. Chapter 173-592 WAC, Reservation of Public Water Supply for Clark County, has the same effective date, August 13, 1986, which is also the priority date for all future water appropriations under the reservation. The reservation established the priority of the appropriation at the date of the reservation so that public water supply rights have seniority with respect to other appropriations not falling under the reservation.

WAC 173-592-070 established a water supply reservation of 97,000 gpm and 65,300 acre-feet/year for public water supplies in Clark County. Three groundwater aquifers were identified as being generally available under the reservation: 1A Columbia River Alluvium; 1B-2B Upper Troutdale; and 1C Sandy River Mudstone (Sand and Gravel).

2. WATER RESOURCE MANAGEMENT PROGRAM

In 1971, the state legislature authorized the establishment of Water Resource Inventory Areas (WRIAs) under the Water Resources Act, Chapter 90.54 RCW. These watershed areas were formalized under WAC 173-500-040. The state is divided into 62 WRIAs for planning purposes. Each WRIA generally represents the watershed of a major stream or closely associated streams within a basin or neighboring stream basins. Washington

DOE, Natural Resources and Fish & Wildlife jointly established the WRIA boundaries in 1970, and updated them in 1998 and 2000. DOE is responsible for overseeing the development of water resource management plans for these watersheds.

The state encourages the development of water resource management plans for watersheds throughout the state. In 1998 the Washington Legislature passed the Watershed Management Act, Chapter 90.82 RCW, which provides a planning framework for citizens, interest groups and government organizations to resolve water resource issues in each of the watersheds.

In 2002, work began on a watershed management plan for WRIAs 27 and 28. These WRIAs cover Clark County as well as portions of Cowlitz and Skamania counties. HDR/EES Environmental Consultants prepared the plan under the direction of the Lower Columbia Fish Recovery Board. Watershed conditions were inventoried at the outset of the planning process. A range of water resource issues specific to WRIAs 27 and 28 were addressed, including the management of water supplies, stream flow, surface water quality, groundwater quality and fish habitat. Alternative approaches for managing water resources were identified and analyzed, and the most appropriate implementation strategies were recommended.

In July 2006, Clark, Cowlitz and Skamania counties adopted the *Salmon-Washougal & Lewis Watershed Management Plan for WRIAs 27 and 28*, as described in Section VIII. Plan implementation measures are currently underway, which impact municipal water system plans and operations.

On December 22, 2008, the state adopted WAC 173-527 and 173-528, establishing a Water Resource Management Program for the Lewis River, Salmon Creek and Washougal River basins—WRIAs 27 and 28. The program is based upon information and recommendations presented in the *Salmon-Washougal & Lewis Watershed Management Plan for WRIAs 27 and 28.* The basic aim of the program is to insure that municipal water purveyors have access to water resources to meet projected water needs of a growing population and pursue economic development opportunities consistent with adopted land use plans, while maintaining in-stream flows to protect fish habitat. The procedure for reserving water for future water supplies and the water supply reservation of 97,000 gallons per minute and 65,300 acre-feet annually identified under WAC 173-592 were repealed by WAC 173-527-120 and WAC 173-528-120.

On January 1, 2009, the state adopted WAC 173-527-120 and 173-528-120, which confirm August 13, 1986 as the priority date for water rights. However, these new rules repealed WAC 173-592. The repeal returns the remaining water under the reservation to the state and directs the allocation of water rights consistent with the provisions of the new Water Resource Management Program for WRIAs 27 and 28.

3. NEW WATER SUPPLIES—*WATER RIGHTS*

The procedure for considering applications for new or expanded water supplies is presented in WAC 173-527 and 173-528. The rules include detailed information concerning discrete stream locations. This information is key to evaluating a municipal water purveyor's application for water rights. Procedural requirements under the rules vary depending upon the impact that a proposed surface or groundwater withdrawal will have on stream flows at specific stream locations.

The following procedure for evaluating applications for new water rights was derived from Chapter 3 of the *Salmon-Washougal & Lewis Watershed Management Plan for WRIAs 27 and 28,* which serves as the basis for the water resource management programs under WAC 173-527 and 173-528. This description merely highlights the water right application procedure and should not to be considered a roadmap to obtaining new water rights.

A. New Water Right Application Threshold Review

Ecology is responsible for reviewing water right applications. Ecology may issue water right permits only if the proposed water supply meets the following four-part test , as provided under RCW 90.03.290.

- Water will be put to beneficial use.
- There is no impairment to existing or senior water rights.
- Water is available for appropriation.
- Issuance of the requested water right will not be detrimental to the public welfare, taking into account the potential impacts on surface waters.

B. Water Right Applications under the Water Resource Management Program

The new procedure for reviewing water right proposals in WRIAs 27 and 28 encourages the use of groundwater and discourages using surface water as a new supply source. Ecology discourages new or expanded surface water diversions, except in limited cases where there is no feasible or cost-effective alternative. However, in shallow aquifers groundwater may communicate with surface water. Understanding this connectivity is important to maintaining adequate in-stream flows that support fish. Withdrawals from shallow wells in proximity to tributary streams may negatively impact stream flows; hence, Ecology gives priority to water right

applications proposing to withdraw from groundwater sources that do not connect or have limited connectivity to surface waters, particularly in areas where there are sensitive fish habitats.

A municipal water purveyor requesting additional groundwater rights to serve projected water demand must evaluate the impact of the proposed groundwater withdrawals on stream flows. If the results of the evaluation indicate that the new source of supply will not impact stream flows, Ecology may grant water rights sufficient to meet projected water demand. Municipal water purveyors receiving new or additional water rights are statutorily required to conserve water by employing techniques set forth in their locally prepared and DOH-approved water use efficiency program.

If the evaluation indicates that the proposed groundwater withdrawal will impact the stream flow regime, the applicant must analyze alternative water supply options. Supply alternatives may include withdrawing water from a deeper aquifer or a tidally-influenced groundwater source; or purchasing water from an adjacent purveyor or a regional water system.

If no practical water supply alternative is available, the applicant may petition Ecology to utilize a *reservation of water defined within state rule*. (WAC 173-527-120 and 173-528-120 transferred un-appropriated water from the existing reservation for Clark County under WAC 173-592-070 to the users and areas of use in Clark County set forth in WAC 173-528-110, Table IV and WAC 173-527-110, Table V.) Ecology, in cooperation with Washington State Fish & Wildlife, evaluates requests for reservation, taking into account actions that may off-set and mitigate stream flow impacts.

C. Mitigating Water Rights Permitted under the Water Reservation Rule

Predicted stream flow depletion must be mitigated to the maximum extent economically and logistically practical through flow-related actions. No less than half of the predicted stream flow depletion must be offset through the acquisition of active upstream water rights or other flow augmenting actions in the same sub-basin upstream from the proposed water right, where possible. Any remaining offset requirement must be mitigated through other habitat improvement actions designed to reduce the effects of depleting stream flow. The purveyor's mitigating actions are carried out under Ecology's direction consistent with the water resource management program guidelines. These actions may include, e.g., restoration of wetlands and side-channels that increase surface water storage; improvement of stream width to depth relationships; or improvement of landscape-level hydrologic processes.

4. EXISTING WATER SUPPLIES NEGATIVELY IMPACTING IN-STREAM FLOWS

In cases where *existing* municipal supplies have the potential to negatively impact flows in critical stream reaches, Ecology encourages municipalities to voluntarily expand or refine their conservation efforts and research alternative sources of supply. If feasible, these water purveyors should cease or limit the use of certain existing supplies and develop alternative sources of supply that are less likely to impact flows in critical stream reaches. Water supply alternatives may include purchasing water from an adjacent purveyor or a regional water system; or withdrawing water from a source that is not connected or less connected to surface waters supporting fish habitat, e.g., a deep confined aquifer or a tidally-influenced source.

5. WATER RIGHTS AND PROJECTED WATER DEMAND

At present all of the major municipal water purveyors except Ridgefield have sufficient water rights to meet current and future needs over the next 14 years, which is the growth management planning horizon that is currently recognized. The following table summarizes the general status of the water rights of major purveyors with respect to current and future water needs, as presented in the most recent water system plans or reliable data that is being used to update plans.

Exhibit IX-1
Major Purveyor Water Rights, Existing & Projected Water Demands

Purveyor	*Certificated Primary Water Rights & Claims (acre-feet)*	*Year 2009 Total Production (acre-feet)*	*Year 2015 Projected Needs (acre-feet)*	*Year 2024 Projected Needs (acre-feet)*
Battle Ground	4,697	1,575	2,777	4,066
Camas	11,090	4,159	6,638	9,775
Clark	23,746	12,917	15,970	18,500

Purveyor	*Certificated Primary Water Rights & Claims (acre-feet)*	*Year 2009 Total Production (acre-feet)*	*Year 2015 Projected Needs (acre-feet)*	*Year 2024 Projected Needs (acre-feet)*
Ridgefield	962	369	1,018	3,217
Washougal	3,786	1,987	2,723	3,342
Vancouver	48,626	28,883	39,902	46,691
TOTAL	**92,907**	**49,890**	**69,028**	**85,591**

A water claim is a documented historical assertion to a source of water that predates the water permitting system, which may or may not have been adjudicated and established as a state-certificated water right.

Clark's water rights include 9,900 acre-feet for South Lake SGA wells.

Projected water demand is based upon average annual demand.

Clark projected water demand excludes water that may be provided to the Battle Ground and Ridgefield to meet their water needs.

Ridgefield and Battle Ground projected water demand includes water Clark may provide to meet their water needs.

Sources: Most recently adopted/approved water system plans or plans in progress.

Analysis: The data presented in Exhibit IX-1 indicates that the total 14-year projected water demand can be met under the collective water rights held by the major water purveyors in Clark County. Battle Ground and Ridgefield have found it economically practical to purchase water from Clark Public Utilities to augment their water supplies. Clark conveys water to these systems via interties, under terms described in interlocal water supply purchase agreements. The interlocal agreements are included in recently updated water system plans of the participating purveyors. These water supply arrangements are consistent with the new Water Resource Management Program, which calls for purveyors to purchase water from a neighboring purveyor before seeking new water rights or a new source of water supply.

6. REGIONAL WATER SUPPLY SOURCES

The municipal water purveyors in Clark County are statutorily required to conserve water by engaging in practices identified in locally developed and DOH-approved water use efficiency programs, which are described in Section VIII *Water Resource Assessment*. Water rights held by the municipal purveyors are optimized by entering into interlocal agreements insuring reliable water supplies via system interties. Notwithstanding these efforts, additional sources of water supply will be needed, perhaps before the end of the current 14-year planning horizon, to accommodate anticipated population growth in urbanizing areas of the county and pursue economic development opportunities.

The Water Resource Management Program for WRIAs 27 and 28 identifies important, *preferred* regional water supply sources that finish in the Pleistocene Alluvial Aquifer within tidally-influenced areas near the Columbia River: Vancouver Lake lowlands (west of the Burlington Northern Santa Fe Railroad right-of-way); the lower reach of the Lewis River (west of Interstate-5, north of the East Fork Lewis River and east and north of the Lewis River mainstem within the Lewis River subbasin); and the Steigerwald Wildlife Refuge (east of 15th Street in Washougal, south of State Route-14 and west of Lawton Creek).

Clark recently began operating a well field in the Vancouver Lake lowlands. This facility is currently pumping water from the deep Sand and Gravel Aquifer (SGA). Clark has a water right application on file with Ecology for 36 million gallons per day from the SGA. Water production during the initial phase of the well field's operation will range between 3.6 and 10 million gallons per day, as additional deep wells are brought online and water transmission facilities extending from the facility are upgraded. Eventually the well field will withdraw water from the shallow Pleistocene Alluvial Aquifer, which will greatly increase the production capacity of the well field. The facility has the potential to serve as a regional water supply source, reducing reliance upon groundwater from the Salmon Creek basin and other smaller watersheds containing important fish-bearing streams.

Clark is also advancing a regional groundwater supply project in a lowland area at the confluence of the East Fork and main stem of the Lewis River—Paradise Point. It is estimated that the Paradise Point well field will ultimately produce 14.4 million gallons of potable water daily to meet the growing demand for water in the developing communities of northern Clark County.

Camas, Washougal and the Port of Camas-Washougal are pursuing the development of a well field to withdraw tidally-influenced groundwater from the Steigerwald lowlands near the Columbia River. The nine-acre project site is on port-owned property south of State Route14 within Washougal's unincorporated UGA. Camas and Washougal have an

interlocal agreement to develop the well field and have jointly applied to Ecology for water rights totaling 17,213 gallons per minute and 13,555 acre-feet annually for the prospective well field. The well field will be developed in phases. The first phase of construction could begin in 10 years. The specific responsibilities of the participating local agencies in managing this cooperative venture have yet to be determined. This new water supply source in the Steigerwald lowlands has the capacity to meet the water needs of the area over the next 50 years and it has the potential to serve as a regional water supply source.

7. AVAILABILITY OF AFFORABLE WATER TO FOSTER VIABLE AGRICULTURAL OPERATIONS IN CLARK COUNTY

The *Clark County 20-Year Comprehensive Growth Management Plan* addresses the need to maintain and enhance productive agricultural lands. The county's agricultural lands planning goal and policies strive to encourage conservation of designated farmland for long-term agricultural uses and protect opportunities for these lands to support a wide variety of agricultural products. This update of the CWSP supports the county's agricultural lands planning goal and policies, which are presented in Appendix II-A.

Water must continue to be available to support the natural environment, domestic needs and existing and future agricultural operations. As a result, farmers have experienced difficulty obtaining additional water rights, particularly given the new rules under the Water Resource Management Program for the Lewis River, Salmon Creek and Washougal River basins, which emphasize maintaining in-stream flows to protect fish habitat.

In 2006 the Salmon-Washougal and Lewis Planning Unit, which was composed of Clark, Cowlitz and Skamania county commissioners and representatives from a broad range of water resource interest groups, approved the recommendations contained in the Salmon-Washougal & Lewis Watershed Management Plan, in accordance with RCW 90.82.130. The watershed plan served as the basis for water resource management rules pertaining to these basins (WAC 173-527 and WAC 173-528). The Washington Dept of Ecology is bound by these rules in making decisions about the use of water resources, including the issuance of water rights, within this watershed—WRIAs 27 and 28. See Section IX, Subsection 3.

In recognition of the problems applicants have in accessing additional water for agricultural operations Ecology has proposed measures for expediting the issuance of water rights which involve fostering the transfers of rights among agricultural property owners, when water rights are not being used. The *Clark County Agriculture Preservation Strategies Report,* March 2009, recommends that Clark County work with Ecology, the Clark-Cowlitz Farm Bureau and other interested parties to develop a streamlined process for transferring agricultural water rights.

Regional workshops should be conducted that explore means by which affordable water can be made more available for agricultural operations. Topics addressed during these workshops may include water right issuance procedures; measures that Ecology should take to expedite the issuance of water rights; incentives for transferring water rights among farmers; irrigation energy efficiency and water conservation methodologies; and local, state and federal financial incentives for using the best available energy and water conservation technologies. Washington State University Extension Service and the Clark-Cowlitz Farm Bureau may be the appropriate organizations to arrange and co-sponsor these workshops.

Another agency that should be consulted regarding increasing the availability of affordable water for agricultural operations is the Farmland Information Center. The center is a public-private partnership between the USDA Natural Resources Conservation Service and the American Farmland Trust, which is authorized under the federal Farmland Protection Policy Act. The center provides internet access to a compilation of laws and technical literature on farmland protection and stewardship (www.farmlandinfo.org). In addition to responding to requests for information, the center's staff monitors and reports on farmland protection activities. Staff is also available on a contractual basis to conduct detailed research on farmland protection issues.

Clark Public Utilities provides financial incentives to farmers for energy-saving projects which employ new electrical technologies for irrigation systems, e.g., premium efficiency pump motors that withdraw water from the source of supply and deliver it to cropland; variable frequency drive pumps that are capable of adjusting the power and flow of water to irrigation systems, depending upon varying water needs; and smart irrigation systems that sense the moisture content of soils and deliver water as needed. These projects reduce the amount of energy used to operate irrigation systems and often result in water conservation.

Payments to farmers for qualifying agricultural energy-saving projects are calculated at $0.25 per kilowatt-hour of electrical power saved up to 50 percent of the total project cost. The Bonneville Power Administration provides some financial support for Clark's energy-saving financial incentive program. An applicant for incentive payments must submit information to Clark about the proposed energy-saving project. Additional information about this program and application requirements are available on Clark's website (www.clarkpublicutilities.com).

Section X
Plan Approval

1. INTRODUCTION

The 2011 CWSP Update was prepared to fulfill the objectives of the Washington State Public Water System Coordination Act, 1977 (WAC 246-293). The CWSP serves as the regional supplement to local water system plans that have been or will be approved by DOH. The WUCC guided the development of the 2011 CWSP Update, as well as previous updates of the plan, and ensured that the plan is acceptable to the major public water purveyors in the county and other interested public agencies.

2. APPROVAL PROCESS

The WUCC, serving in an advisory capacity to Clark County, DOH, local public water purveyors and other public agencies having roles in implementing the plan, recommends that the process described below be followed by the public agencies that may adopt or otherwise recognize the 2011 CWSP Update:

A. The WUCC circulates the proposed CWSP Update to affected agencies for review and comment (WAC 246-293-260).

B. The WUCC advertises and hosts a public informational meeting on the plan. Comments received from public agencies and local residents on the plan are recorded and filed with the WUCC [WAC 246-293-260(4)(b)].

C. The WUCC submits the plan to Clark County Community Planning. Community Planning as the lead agency evaluates the plan under the provisions of the Washington State Environmental Policy Act (SEPA) to ascertain its impacts on the natural and built environments, and issues a determination regarding the plan's environmental significance (WAC 197-11). Community Planning will also submits the CWSP to the Washington Dept of Commerce in compliance with the 60-day notice requirement.

D. Major water purveyors and other municipalities (Battle Ground, Camas, Clark Public Utilities, La Center, Ridgefield, Vancouver, Washougal and Yacolt) review the plan and consider the following actions. Each municipality may wish to accompany its actions with stipulations, concerns, etc:

(1) Find the CWSP Update to be consistent with local land use and growth management plans and policies [WAC 246-293-220 (4)].

(2) *Optional*—Water Purveyors: Adopt or endorse the CWSP update.

(3) *Optional*—Enter into the Fire Hydrant Intergovernmental Agreement, which appears in the plan as Addendum A.

(4) Water Purveyors: Enter into the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries Between the Cities of Battle Ground, Camas, Ridgefield, Vancouver and Washougal, and Clark Public Utilities, which appears in the plan as Addendum B (WAC 246-293-250 (1) and WAC 248-56-730).

E. Clark County Public Health considers the plan for endorsement, with particular attention to the plan's Water Utility Design Standards and Utility Service Review Procedure (WAC 246-293-260).

F. Community Planning submits the plan to the Clark County Planning Commission for review. The Planning Commission recommends action to be taken on the plan by the Board of Commissioners.

G. The WUCC and Community Planning formally submit the plan to the Clark County Board of Commissioners with the comments received during the plan review process and explanatory remarks and recommendations. The Board conducts a public hearing and considers the actions on the plan listed below. The Board may wish to accompany its actions with stipulations, concerns, etc. (WAC 246-293-260(4)(a) and Appendix X-A—Board of Commissioners Resolution 1999-07-03 which culminated action on the previous CWSP):

(1) Find the plan to be consistent with Clark County's land use and growth management plans and policies.

(2) *Optional*— Adopt or endorse the plan.

(3) *Optional*—Enter into the Fire Hydrant Intergovernmental Agreement, which appears in the plan as Addendum A.

(4) Approve the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries between the Cities of Battle Ground,

Camas, Ridgefield, Vancouver and Washougal, and Clark Public Utilities, which appears in the plan as Addendum B.

H. Clark County submits the plan to DOH. DOH conducts a 90-day review of the plan and considers it for approval with or without revisions (WAC 246-293-300).

Documents memorializing reviews of the CWSP 2011 Update and various actions taken on elements of the plan, as well as adoption and approval of the entire plan, appear in Appendix X-B and Addenda A and B.

3. NEXT CWSP UPDATE

The CWSP should be reviewed and updated every five years, as required under WAC 246-293. Therefore, the WUCC should convene before 2016 to begin reviewing the CWSP. If no changes are necessary, the WUCC will submit to the Washington Department of Health a statement verifying that the CWSP remains current.

Coordinated Water System Plan Update 2011

Appendices

Appendix I-A

BY-LAWS
OF THE
CLARK COUNTY
WATER UTILITY COORDINATING COMMITTEE

SECTION 1: *Name*

The name of the Committee shall be the Clark County Water Utility Coordinating Committee (hereinafter referred to as the WUCC).

SECTION 2: *Legal Authority and Purpose*

WAC 248.56 under the Public Water System Coordination Act provides for the establishment of the WUCC, after an assessment has been made of water system problems and the area has been declared a Critical Water Supply Service Area by the county or state. The Clark County Board of Commissioners declared Clark County as a Critical Water Supply Service Area on August 13, 1980, and the WUCC was formally established.

The purpose of the WUCC shall be to organize a local partnership of water purveyors, and health, planning, and legislative authorities to find workable solutions to water system problems. The WUCC shall insure that water system developments in the Critical Water Supply Service Area are consistent with regional needs and meet minimum design standards.

The principal responsibility of the WUCC is to prepare and maintain current the regional supplement to local water system plans (the Coordinated Water System Plan for Clark County) as set forth under WAC 248.56.720, and further the implementation of the local and regional plans.

SECTION 3: *Membership*

RCW 70.116.040 provides for the voting members of the WUCC to be representatives from the county legislative authority (office of the Clark County Board of Commissioners), county planning agency (Clark County Community Planning), county health agency (Clark County Public Health), local municipal water providers, and the Washington State Department of Health. Representatives from other organizations and individual parties recognized by the WUCC may serve on the WUCC, and participate in

discussions leading to decisions on various issues that may come before the WUCC but shall not have the power to vote in accordance with Section 8 of these By-Laws.

SECTION 4: ***Appointments, Terms, and Vacancies***

Each water purveyor and other agency identified in Section 3 of these By-Laws may appoint one (1) representative to the WUCC. There shall be no specific term of membership. Vacancies on the WUCC shall be filled by the water purveyor or other agency responsible for making the initial appointment to the WUCC.

SECTION 5: ***Duration***

The duration of the WUCC shall be perpetual.

SECTION 6: ***Meeting Scheduling and Notice***

The WUCC shall meet at least quarterly in the course of updating the Coordinated Water System Plan for Clark County. During other periods, the WUCC shall meet as needed. A regular meeting schedule may be established by the WUCC.

Any member of the WUCC may call for a meeting. The date, time, and place of a meeting shall be established by the presiding officer of the WUCC. Written notice of a meeting and an agenda shall be circulated to members of the WUCC by e-mail at least five (5) days prior to the meeting.

SECTION 7: ***Official Meetings***

A meeting of the WUCC shall not be official unless a membership quorum is achieved. A quorum shall consist of a simple majority of the WUCC voting membership. Actions taken by members of the WUCC shall not be official unless such actions are taken within the context of an official meeting of the WUCC, and such actions are consistent with these By-Laws.

SECTION 8: ***Voting Procedures***

Questions brought before an official meeting of the WUCC may be decided without a formal vote of the membership, provided that it is clear to the presiding officer that there is consensus on the issue. If it is not clear that there is a consensus on an issue, a vote of a majority of the members present and voting shall decide any questions before an official meeting.

Any part of the proceedings of a meeting of the WUCC shall be governed by the current edition of Roberts Rules of Order, at the request of any member of the WUCC.

SECTION 9: ***Officers, Duties and Terms of Office***

The officers of the WUCC shall include, but not be limited to, a Chairperson and a Vice Chairperson.

The primary duties of the Chairperson shall be to preside over official meetings of the WUCC, and perform other duties of the presiding officer described in these By-Laws. In the event of the absence of the Chairperson, the Vice Chairperson shall perform the duties of the Chairperson.

The WUCC shall conduct an election of officers at its first meeting of the calendar year. An election of officers may be conducted at any official meeting of the WUCC, provided that an announcement of the election is made at least thirty (30) days prior to the election at an official meeting of the WUCC. An election of officers shall be conducted in accordance with Section 8 of these By-Laws. The term of office for the officers of the WUCC shall be one (1) year.

SECTION 10: ***Meeting Reports***

A report shall be made on the proceedings of each meeting of the WUCC. Reports shall be circulated to the WUCC membership by e-mail. A meeting report shall not be official until it has been circulated to the full membership and accepted by the WUCC at a subsequent official meeting.

SECTION 11: ***Meeting Attendance***

A membership position on the WUCC may be declared vacant if a representative or a representative's alternate fails to attend three (3) consecutive meetings without valid cause as recognized by the WUCC. Vacancies shall be filled in accordance with Section 4 of these By-Laws.

SECTION 12: ***Amendments to By-Laws***

Any member of the WUCC may propose an amendment to these By-Laws. The proposed written amendment shall be circulated to the WUCC membership by e-mail at least thirty (30) days prior to action on the proposed amendment by the WUCC at an official meeting. Action on the proposed amendment shall be in accordance with Section 8 of these By-Laws.

SECTION 13: ***Administrative Support***

The WUCC shall designate a member agency to be responsible for completing the update of the CWSP, under the direction of the WUCC. Following the development of a CWSP update, Clark County's departments of Community Planning and Assessment & GIS shall maintain and provided access to supporting documentation pertaining to the CWSP, which shall include, but shall not be limited to, maintenance of current service area agreements and exhibits illustrating service area boundaries. The designated agency shall arrange staff support for meetings of the WUCC to assist the committee in carrying out its ongoing responsibilities identified in the CWSP. Staff support shall include, but shall not be limited to, preparing meeting reports and WUCC correspondence, publishing formal actions of the WUCC, and maintaining WUCC records. Costs associated with providing administrative support to the WUCC during the CWSP update shall be shared by the WUCC member agencies under the terms of a cost-sharing agreement negotiated at the beginning of the process of updating the CWSP. Costs associated with providing ongoing administrative support following the CWSP update shall be shared by the WUCC member agencies under the terms of a cost-sharing agreement negotiated after the CWSP is updated.

ADOPTED this 8th day of December 2010 by the Clark County Water Utility Coordinating Committee.

Doug Quinn
WUCC Chairperson

Rodney Orlando
Staff and Recording Secretary

Appendix II-A

Clark County 20-Year Comprehensive Growth Management Plan Goals & Policies and the CWSP

The preparation of the 2011 Update of the Coordinated Water System Plan involved a review of relevant goals and policies in Clark County's 20-Year Comprehensive Growth Management Plan 2004-2024, adopted September 2007 and amended in January 2010. The goals and policies appear in the county's plan as follows:

1. County-wide Planning Policies

2. Framework Plan Policies

3. 20-Year Plan Policies

The policies listed in the table that appears below were selected for potential relevance to the CWSP. The most significant are repeated in full and those of lesser impact are summarized. Inclusion of these goals and policies as an appendix to the CWSP is intended to provide convenient reference. For additional information, the source documents should be perused.

The notations pertaining to CWSP implementation are briefly stated adhering to the following formats:

(a) If implementation of the goals, policies, strategies and implementation has been essentially completed without significant revision in the 2011 CWSP Update, it is noted by posting the plan date(s) that provides for implementation or consistency.

(b) If it appears that the appropriate implementation lies outside the CWSP, the table notes the agency or planning-related records considered more appropriate for implementation.

(c) If the 2011 CWSP Update process included specific revisions, etc., an entry briefly identifying the changes is provided.

(d) Other polices have been included only for general reference but without specific CWSP implementation. Paraphrased policies are posted within brackets.

3.0 County 20 -Year Plan Goals & Policies	***CWSP Implementation***
GOAL To maintain and enhance productive agricultural lands and minimize incompatibilities with adjacent uses.	*Section IX Water Supply, Subsection 7 Availability of Affordable Water to Foster Viable Agricultural Operations in Clark County* *Washington Right to Farm Enabling Statute WA; State Laws; Wash. Rev. Code §§ 7.48.300 to 7.48.320 (2005).* *RCW Chapter 36.70A.070 Comprehensive plan, mandatory elements (5) Rural Element* *WAC 246-293 Water System Coordination* *WAC 246-293-180 Establishment of External Critical Water Supply Service Area Boundaries—Criteria (1) The water utility coordinating committee, in recommending, and county legislative authority(ies), in determining the location of external critical water supply service area boundaries shall consider factors including, but not limited to (a) Existing land use; (b) Projected land use and permitted densities as documented in adopted county or city plans, ordinances and/or growth policies for at least ten years into the future.* *WAC 246-293-220 Coordinated Water System Plan* *WAC 173-527 Water Resource Management Program for the Lewis Basin WRIA 27* *WAC 173-528 Water Resource Management for the Salmon-Washougal Basin WRIA 28*

3.0 County 20 -Year Plan Goals & Policies	**CWSP Implementation**
3.4.1 The county shall encourage the conservation of the county's designated agricultural lands for long-term commercial and non-commercial agricultural uses and shall protect the opportunity for these lands to support the widest variety of agricultural crops and products as listed in RCW 36.70A.030(2) by: • Encourage cooperative resource management among agricultural land owners, environmental groups, state and federal resource agencies and federally recognized Native American tribes for managing the county's public and private agricultural lands; • Encouraging the continuation of commercial agriculture by: 1) supporting land trades that result in consolidated agricultural ownership, 2) encouraging the maintenance of agricultural lands in current use property tax classifications, including those classifications as provided for in RCW 84.34 and CCC Chapter 3.08, and 3) working with agricultural landowners and managers to identify and develop other incentives for continued farming; and, • Encouraging agricultural land use as a clean industry incorporating tax breaks, right to farm, purchase of development rights, transfer of development rights and other economic means and develop strategies to support farming practices.	Indicators of long term commercial significance under GMA do not include the availability of affordable and accessible water for farmers to irrigate agriculture land. This is an inherent conflict in GMA between difficulty of obtaining and keeping water rights and preservation of agriculture.
3.4.4 Land uses on commercial agricultural lands shall include all standard agricultural practices and supporting activities, including farm worker housing and use of water resources for irrigation.	Local policies
3.4.9 Public services and utilities within and adjacent to designated agricultural areas should be designed to prevent negative impacts on agriculture and allow for continued resource activity.	Individual water system plans

6.0 Countywide Planning Policies	**CWSP Implementation**
6.0.13. The county, municipalities, special districts and public health (agencies) will work cooperatively to develop fair and consistent policies and incentives to eliminate private water and sewer/septic systems in the urban areas; and to encourage connection to public water and sewer systems.	Fundamental objective of the initial 1983 CWSP and 2011 CWSP Sections I and III
6.0.14. Within Urban Growth Areas, cities and towns should be the providers of urban services. Cities and towns should not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human health is threatened. In areas where utilities presently extend beyond city or town limits, but are within UGAs , the city or town and the county should jointly plan for development, with the county adopting development regulations which are consistent with the city or town standards.	Urban Growth Boundaries were an important factor in adjusting the service areas of the major water utilities; 2011 CWSP Sections II
6.0.15. Plans for providing public utility services shall be coordinated with plans for designation of urban growth areas, rural uses, and for the transition of undeveloped land to urban uses.	Individual water system plans . 2011 CWSP Sections II, IV and VI inter-local agreements are required for all interim water service
6.0.3. Public facilities and utility services shall be planned so that service provision maximizes the efficiency and cost effectiveness and ensures concurrency.	Local growth management plans and individual water system plans
6.0.4. The county, municipalities and special districts shall, to the greatest extent possible, agree upon present and future service provision within the urban areas.	2011 CWSP Section II and individual water system plan adjustments

6.2 Framework Plan Policies	CWSP Implementation
6.2.2 Adequate public water service should be extended throughout urban areas. (An "adequate" public water system is one that meets Washington State requirements and provides minimum fire flow as required by the Fire Marshal. Various levels of public water service are considered adequate, depending upon the specific land uses and densities of development being served.)	Individual water system plans
6.2.3 When it is appropriate to provide public water service in rural areas, the level of service may be lower than that provided in urban areas. However, public water service in rural areas must meet the minimum requirements for an adequate public water system, given the specified land uses and densities being served (see 6.2.2).	2011 CWSP Sections V and VI. Minimum standards recognize lower level of service may be appropriate for rural areas
6.2.4 Construction of new private wells in urban areas should be discouraged. New private wells will be considered only on an interim basis, until adequate public water service becomes available to an area.	Local policies and codes
6.2.7 Ensure compliance with Washington State requirements which call for a proposed development to provide proof that there exists a source of public or private domestic water which produces sufficient quantity and quality of water to meet minimum requirements before a development permit may be issued.	2011 CWSP Section VI utility review process requires documentation from purveyor for public water supply
6.2.8 New wells may be constructed in rural areas, but only to serve developments on rural lots that are without practical access to public water systems. Existing public water purveyors should be given an opportunity to serve a new development. The first opportunity to serve a development should be given to the utility provider designated to serve the areas in which the development is proposed. If the designated utility cannot serve the development, an adjacent utility should be given the	2011 CWSP Section VI provides a procedure for identifying the appropriate water utility.

6.2 Framework Plan Policies	CWSP Implementation
opportunity to serve the development. If an existing utility cannot serve the development, construction of a new private or public well may be permitted. This procedure is set forth in the Clark County Coordinated Water System Plan Update, which was adopted by Clark County and the Washington State Department of Health in 1991.	
6.2.10 The Clark County Coordinated Water System Plan is designed to be responsive to the County's Comprehensive Plan and other local comprehensive plans, and land use regulations intended to implement the Comprehensive Plan. Public water system plans must be consistent with the Coordinated Water System Plan and the Comprehensive Plan, as provided under WAC 248-56. [re codified to 246-293]	Fundamental CWSP concept: land use determines water utility needs. 2011 CWSP Section II

20 -Year Plan Goals & Policies	CWSP Implementation
GOAL Ensure that necessary and adequate capital facilities and services are provided to all development in Clark County in a manner consistent with the 20-Year Plan.	
6.1.2 The primary role of Clark County regarding service provisions shall involve the planning and delivery of regional, rather than urban, services. It is the policy of Clark County, that in general, cities are the most appropriate units of local government to provide urban governmental services, and that in general it is not appropriate that urban governmental services be extended to rural areas except in those limited circumstances shown to be necessary to protect basic public health and safety and the environment and when such services are financially supportable at rural densities and do not permit urban development.	2011 CWSP Section II. Land use plans and development regulations determine water service (and conversely implies that availability of public water does not influence land use)
6.1.4 Encourage and assist other utilities, service districts and providers to pursue the use of impact fees, special assessments and improvement districts and other local	Individual water system plans

20 -Year Plan Goals & Policies	CWSP Implementation
financing techniques to fund new facilities and services.	
6.1.5 Assist and facilitate the siting of capital facility and service infrastructure in a manner consistent with the 20-Year Plan, through appropriate land use planning and development review policies and procedures.	Individual land use and water system plans
GOAL Provide water service to all households minimizing environmental impacts and at least long-term public cost.	
6.2.1 All new development in the urban area shall be served by a connection to a public water system. Existing developments within the urban area using private wells shall be encouraged to convert to public water usage.	1999 - Question of public water requirement deferred to County and local ordinances
6.2.2 Private wells may be used in the rural area, subject to the review by the Clark County Health Department	2011 CWSP Section VI addresses only public water supply issues.

6.2.3 In cases where public water service is needed, it shall be provided by a water purveyor under the following order of preference, articulated within the Coordinated Water System Plan (CWSP): a. Direct or satellite service by the water utility designated by the CWSP to serve the area. b. Interim or permanent service by an adjacent water utility. CWSP service area designations shall be adjusted if permanent service is arranged. c. Satellite service on an interim basis by Clark Public Utilities, if the development to be served is located outside Clark's service territory. d. Satellite service by another DOH-approved SMA (consistent with 2011 CWSP update). e. Formation of a new utility and construction of a new public water system to serve only the development. CWSP service areas shall be adjusted to reflect the change.	2011 CWSP Section VI Utility Service Review Procedure
6.2.4 The CWSP shall be reviewed and updated at a	WAC 246-293 Public

minimum of every five years. Design standards shall be reviewed and amended annually, if necessary.	*Water System Coordination Act; 2011 CWSP Sections I & III*
6.2.5 Clark Public Utilities shall continue to be recognized as the satellite water system management agency for Clark County.	*2011 CWSP*
6.2.6 Clark Public Utilities may construct and manage Satellite water systems within the service territory of other water utilities, but only if a prior agreement is reached with the utility designated by the CWSP to serve the area. Such agreements shall address issues of equipment compatibility, asset transfer and other issues deemed appropriate by the parties.	*2011 CWSP Section VII and individual water system plans require inter-local agreements for all interim water service arrangements*
6.2.7 Major water utilities, including Clark Public Utilities, may construct extensions of existing services in the rural area only if service is provided at a level that will accommodate only the type of land use and development density called for in the 20-Year Plan, recognizing maximum build-out and reasonable allowances in design of facilities to promote overall system efficiency. Extension of water service shall be permitted to public regional park facilities that are outside of but adjacent to an urban growth boundary.	*Individual water system plans*
6.2.8 Water transmission lines constructed in rural areas for the purpose of connecting water systems shall be limited from use for tributary line tie-ins.	*Reflects desire for the existence of water utilities to discourage financially premature expansion of water systems*
6.2.9 The CWSP shall be amended to reflect any water service extensions in the rural area.	*Reflects need to update water system boundaries*

6.2.10 Proposed developments shall demonstrate a	*Developer responsibility*

sufficient and sustainable source of water before development approval is issued.	*with purveyor/Clark County Health Department approval*
6.2.11 Water service plans shall be coordinated with the adopted 20-Year Plan map and policies, including the designation of urban growth areas.	*General requirement for individual water system plans to be based on and consistent with land use plans*
6.2.12 Work with other cities and special districts to develop fair and consistent policies/incentives to eliminate private water systems in urban areas, and to encourage connection to public water systems. Unused wells should be identified and decommissioned.	*Local policies and individual water system plans*
6.2.13 Practice and encourage water conservation.	*Individual water system plans and 2011 CWSP Section VIII in deference to Water Use Efficiency requirements RCW 70.119A.180*
6.2.14 Work with water service providers to encourage. public education and outreach programs on water reuse, conservation, reclamation and other new water efficient technology.	
6.2.15 Encourage water pricing structures to facilitate conservation and to cover the full cost of providing water service.	
GOAL Ensure that capital facilities and services are provided in as cost efficient manner as possible and are consistent with the land use objectives of the 20-Year Plan and State Growth Management Act.	
6.10.2 Encourage and work with utilities, special districts and other service providers to ensure their functional plans are consistent with county level of service standards.	*2011 CWSP Section V minimum standards reference GMA minimum level of service standards*
6.10.3 Encourage and facilitate inter-jurisdictional	*Local policies and*

Cooperation and analysis to assess fiscal and other impacts to service delivery related to annexation.	*individual water system plans*
6.10.4 Encourage and facilitate the exploration of shared use of facilities and service between service providers where feasible. Activities to be encouraged range from shared responsibility agreements between police and fire service providers, to development of joint facilities such as schools and parks.	*2011 CWSP Section VIII discussion of regional and shared facility proposals currently being considered*
6.10.8 Pursue true cost pricing service policies and encourage other providers to pursue similar policies, which allocate the full and true cost of connection to and use of facility and service systems to new system users, and do not allocate costs created by systems additions to existing system users.	*Local policies and individual water system plans*
6.10.9 [Availability of public water does not justify increased development density]	*Fundamental CWSP concept*
6.10.11 [Efficiency of service and growth impacts shall be considered for proposed extension of urban level services beyond UGB]	*Individual water system plans*
6.10.14 [Urban level of service is acceptable in rural areas for non-residential developments where overall efficiency is increased, or there is a need to permit urban service extension to a non-residential development that conforms with the 20-Year Plan and for reasons of public health, safety and welfare.]	*Local policies and individual water system plans*

20-Year Plan Strategies and Implementation	
Water reuse and reclamation techniques at new large commercial and industrial developments and high water users such as schools, parks, and golf courses	*2011 CWSP Section VIII and local water system plans*
Maintain a project listing of priority watersheds for basin planning and priority capital improvement projects	*2011 CWSP Section VIII*

[Encourage the use of installed fire protection or increased fire resistant construction materials or designs, and increase use of sprinklers]	*2011 CWSP Section V and local building codes*

Appendix III-A

Supplementary Provisions
Public Water System Coordination Act

The Supplementary Provisions fulfill part of the requirements of a Coordinated Water System Plan as identified in the Public Water System Coordination Act (WAC 246-293). They are intended to address area-wide concerns within the Critical Water Supply Service Area, which are not ordinarily included in each utility's water system plan. The regional supplement is expected to contain, but not be limited to, the following:

1. Assessment of all related plans and policies which have been adopted by local, regional and state governmental entities. These include water resource plans, water quality plans, comprehensive land use plans, etc.

2. Compilation of future water service areas as identified in each purveyor's water system plan, including:

   A. A map depicting existing and future service areas.

   B. Copy of the collective service area agreement between major water purveyors (CWSP Addendum B).

   C. Maps showing the location of well fields, water system interties and other attributes of water supply and distribution systems are contained in local water system plans, which are on file with the individual water utilities and DOH (*see footnote concerning local water system plans).*

3. Establishment of minimum design standards applicable to water system improvements within the Critical Water Supply Service Area. Maps of development classifications pertaining to fire flow as identified in each purveyor's water system plan (*see footnote concerning local water system plans).*

4. Establishment of a process for assessing new public water systems located within the Critical Water Supply Service Area should be consistent with those requirements outlined in WAC 246-293-190. The process should address:

A. How the minimum water system design standards are to be applied.

B. A method for counties to assess water supply to new developments.

5. Identification of potential joint-use or shared water system facilities as outlined in each purveyor's water system plan, including:

   A. A map of all potential joint-use or shared facilities, including interties (see *footnote concerning local water system plans*).

   B. List joint-use or shared facilities to be developed, together with documentation from the utilities involved, outlining arrangements for development and use of such facilities (see *footnote concerning local water system plans*). This topic should be closely related to the discussion on alternatives and projection or improvements included in each purveyor's water system plan.

6. Identification of major area-wide water sources intended to supply future area-wide water system needs. Include appropriate ground water and surface water studies and arrangement for development and delivery of the water supply.

7. Assessment of the feasibility of a single entity being responsible for the maintenance and operation of several individual water systems, including:

   A. Identification of entity or entities willing to assume maintenance and operation of another system or systems.

   B. Identification of water systems willing to have maintenance and operation provided by another entity.

   C. Development of a water system management program and schedule for its implementation.

8. Discussion of any additional topic, which is a recognized water supply concern, pertaining to the critical water supply service area.

9. Relationship and compatibility between the supplementary provisions and proposed or adopted land use plans and/or growth policies applicable to the area.

10. Provisions for continuation of Water Utility Coordinating Committee activities.

11. Information needed to comply with the State Environmental Policy Act (WAC 248-06 and WAC 197-10).

Note: The CWSP does not contain maps showing the location of the water distribution networks, storage facilities, well fields, system interties and other attributes of the individual water systems. These maps are contained in the local water system plans, which are addressed in the CWSP by reference. Copies of individual water system maps may be obtained from the water purveyors identified in the CWSP or the Washington Department of Health, Southwest Regional Office of Drinking Water.

Appendix III-B

105637

CLARK COUNTY, WASHINGTON

RESOLUTION NO. 1980-08-40

WHEREAS, the Board of County Commissioners of Clark County, pursuant to the provisions of the Revised Code of Washington, Section 36.32.120 (6) has the care of the County property and the management of County funds and business; and

WHERAS, the Clark County Commissioners, pursuant to Chapter 70.116.4 (1) RCW has the authority to designate areas as Critical Water Supply Service Areas; and

WHEREAS, Clark County concurs with the Preliminary Assessment of the problems related to public water supply service; and

WHEREAS, representatives of public water systems in Clark County, the Department of Social and Health Services, the Clark County Planning Department, and other interested parties discussed the Preliminary Assessment and agreed that problems related to public water systems do exist.

BE IT THEREFORE RESOLVED by the Board of County Commissioners of Clark County, Washington, that the entire area of Clark County shall be designated a Critical Water Supply Service Area and the provision of Chapter 70.116 RCW be initiated.

PASSED and ADOPTED by the Board of County Commissioners this 13th day of August, 1980.

Attest:

Clark County Auditor

Approved as to Form Only:
JAMES E. DUNLAP
Prosecuting Attorney

By Linda Margaret Johnson
Richard S. Lowry
Deputy Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

By
Chairman

Commissioner

Commissioner

CONSTITUTING THE BOARD OF
COUNTY COMMISSIONERS,
CLARK COUNTY, WASHINGTON

Appendix III-C

RESOLUTION NO. 1981-05-35

A RESOLUTION relating to designation of external critical water supply service area boundary for Clark County pursuant to Chapter 70.116 Revised Code of Washington and Chapter 248-56 Washington Administrative Code.

WHEREAS, the Board of County Commissioners of Clark County, Washington is in regular session this 13th day of May, 1981; and

WHEREAS, each member of the Board has had due notice of the time, date, place and purpose of this meeting; and

WHEREAS, the Board passed Resolution No. 1980-80-40 declaring Clark County a critical water supply service area; and

WHEREAS, the Water Utility Coordinating Committee held a duly advertised public meeting on March 11, 1981 to obtain public input on its recommended external boundary for Clark County; and

WHEREAS, the Board of County Commissioners held public hearings on April 22 and April 29, 1981, wherein it considered the committee's report, written and oral testimony from the public, and reports of the staff and declaration of non-significance prepared by Regional Planning Council; now, therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS FOR CLARK COUNTY, WASHINGTON as follows:

Section 1. Findings. The findings contained in the report of the Water Utility Coordinating Committee dated March 19, 1981 are incorporated herein by this reference.

Section 2. Adoption of External Boundary Designation. The Board hereby adopts and approves the committee's formal report appearing in Exhibit "A" (consisting of a map and narrative description of recommended boundary and a narrative statement outlining the reasons for the boundary, criteria use and relative importance of each) entitled External Boundary Designation by this reference incorporated herein and made a part hereof.

Appendix III-C *Continued*

Section 3. Designation of Non-Significance. The Board of County Commissioners has reviewed the declaration of non-significance prepared by the planning staff of Clark County Regional Planning Council, which declaration can be found in the Board's file on these proceedings, and the Board finds that said declaration is an adequate assessment of the environmental and economic impacts associated with the designation of an external critical water supply service area boundary for Clark County adopted by this resolution.

This resolution shall be located in the Board's file on these proceedings and a certified copy thereof shall be filed and recorded with the Clark County Auditor and the Water Utility Coordinating Committee.

ADOPTED this 13th day of May, 1981.

Attest:

Clark County Auditor

Approved as to Form Only:
ARTHUR D. CURTIS
Prosecuting Attorney

By Linda Langsdorf Johnson
Linda Langsdorf Johnson
Chief Civil Deputy

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

By
John S. McKibbin, Chairman

David W. Sturdevant, Commissioner

Vernon V. Veysey, Commissioner

Appendix V-A

Clark County Water System
Minimum Standards & Specifications

I. INTRODUCTION

The Clark County Water System Minimum Standards and Specifications are recommended minimum base level performance, design and construction standards used to maintain uniformity of design between adjacent water utilities. More stringent standards may apply within each purveyor's service area. Standard design documents will be maintained for reference by the Clark County Community Planning .

The standards presented in this appendix are intended to serve as guidelines. The facility and performance specification set forth in local water system plans that have been approved by DOH will take precedence. Moreover, the standards herein need not supersede any other legally constituted standards that are more stringent than these standards.

II. SOURCE

A. Source Construction

New water sources must conform with the latest revisions to all standards required by the Washington State Department of Ecology (DOE) and the Washington Department of Health (DOH). Specifically, this includes WAC 173-160, Minimum Standards for Construction and Maintenance of Water Wells administered by DOE, and WAC 246-290, regulations pertaining to Group A Public Water Supplies administered by DOH.

B. Water Rights

Water rights are required for the construction of a new water source which will withdraw more than 5,000 gallons/day, except for irrigating a lawn or a non-commercial garden of less than one-half acre. When water rights are required for a new source or to enable additional withdrawal from an existing source, they must be obtained in accordance with DOE regulations and procedures and transferred to utility ownership.

C. Well Specifications

All test and production wells should be drilled in accordance to detailed drilling and testing specifications, which have either been prepared by or received prior approval of the designated utility.

D. Water Quality

Water quality should be proven to conform with DOH criteria specified in WAC 246-290 Part 4 and/or any additional requirements more stringently applied by the Clark County Public Health Dept. Each utility may reserve the right to reject any source whose raw water quality does not meet these criteria.

III. DESIGN CONSIDERATIONS

A. Pipe Sizing

The minimum main size should be established by a hydraulic analysis using the appropriate land use designation to develop both domestic and fire flow requirements. When a hydraulic analysis is not completed, the minimum main size should be 6 inches in diameter for a looped system and 8 inches in diameter for an un-looped system. Whenever practical, water mains should be looped to provide enhanced reliability and eliminate dead-end water mains.

B. Required Minimum Fire Flows

Fire protection requirements are determined by the Clark County Fire Marshal with assistance of other local fire authorities. Current guidelines for minimum fire flow requirements depend on land use and the structure to be protected. Minimum standards as of the preparation of these standards require the flows presented in the table below. These values may be increased or decreased at the discretion of the Fire Marshal. Specific measures to reduce fire flow requirements include changes in building materials, building setbacks and installation of automatic fire sprinkler systems.

Fire flow requirements apply for all new land development and some building permit applications. The office of the local fire protection authority should be contacted for assistance for specific requirements.

Type of Development	Minimum Fire Flow Requirements
Residential inside UGA	1,000 gpm for 60 minutes
Residential outside UGA	500 gpm for 30 minutes
Non-residential	minimum of 1,000 gpm for 120 minutes with higher values required based on building type, occupancy, and size.

Source: Clark County Code 15.12.9000 Appendices adopted June 2, 2008.

The above information may apply to only those jurisdictions that have not adopted the new level of service standards for water service, which are contained in Washington State Building Code Chapter 51-50 WAC International Building Code 2009 Edition (includes amendments to the 2009 International Existing Building Code and ICC/ANSI A117.1-2003). Clark County has adopted these new standards.

The local fire protection authority may require or allow, and should approve, any variance in required fire flow and/or other requirements in consideration of factors not encompassed within this standard (e.g., large commercial complexes, large structures with exposure hazards, consideration of automatic sprinkler protection, etc.). The water utility will be expected to develop facilities that will perform to meet the International Building Code.

The Fire Marshal and/or local Fire Chief in conjunction with the water utility, using the International Fire Code for municipal fire protection as a guide, may establish or require additional standards or specifications as required for water supply criteria not specifically set forth herein.

C.. Water Pressure

Water systems should be hydraulically designed to provide a service pressure within the range of 30-100 psi with a desired range of 40-90 psi. The minimum pressure at all services should be 30 psi during peak hour demands. A minimum pressure of 20 psi should be maintained throughout the distribution system during maximum day water demands plus fire flow demands. Pressures within water transmission mains (no service connections) should have a positive pressure during all design conditions.

D. Storage

Public water systems should provide sufficient storage to meet any seasonal or diurnal variations in demand, fire flows, and emergency demands during critical periods such as power outages and equipment failures. Storage is evaluated based on the following five components:

- Operational storage
- Equalizing storage
- Standby (emergency) storage
- Fire suppression storage
- Dead storage, if any

E. Valving

Valving should be installed at all crosses and tees in a number equaling the number of connecting pipes minus 1, except in cases of short blocks of under 100 feet, thereby eliminating the need for one of the valves. In addition, un-valved lengths of pipe should not exceed 500 feet in school, commercial, or multi-family areas, and 1,000 feet in residential areas, where customers are being served.

F. Fire Hydrants

Installation of hydrants should be required of all developments for which fire flow requirements apply (see Section V.4). Fire hydrants should be connected to a 6-inch minimum diameter main. When fire hydrants are located more than 50 feet from the water main, a minimum 8-inch diameter lateral pipe should be used unless a 6-inch pipe can provide service acceptable to the local fire authority and the designated utility based on hydraulic analysis of the specific distribution system. When the required fire flow exceeds 2,500 gpm for a commercial or industrial development, a minimum of three fire hydrants supplied by a looped water main should be required.

Fire hydrant location should be determined by the appropriate local fire authority. In general, hydrants should be predicated on the location of street intersections wherever possible, and located to minimize the hazard of damage by traffic. They should have an average normal spacing of 600 feet within residential areas measured along the street frontage. In no case should hydrants be place farther than 700 feet apart in residential areas and no lot should be more than 500 feet from the nearest hydrant. In commercial or industrial areas, the maximum hydrant spacing should be 300 to 400 feet.

Hydrant spacing in remote rural areas should be determined by the local fire authority and designated utility with a desirable spacing of 1,000 feet.

The schedule for the installation of fire hydrants should be in accordance with the International Fire Code. Fire hydrant requirements should be reviewed by the local fire authorities. Proposed fire protection components of water system facilities should be approved by the local fire authority prior to final plan approval by the water utility.

Fire hydrants should be installed in compliance with these minimum standards and located within publicly or utility-owned easements and right-or-ways. Fire protection authorities may enter into contracts with public water systems to ensure proper maintenance of new and existing public fire hydrants. Said contracts should assign responsibility to the appropriate fire protection authority for such items as inspection, flow testing, painting, visibility and accessibility. The water purveyor should be responsible for mechanical maintenance.

G. Facility Placement

All water mains should generally be installed along the north and east sides of public right-of-ways in accordance with the county-wide utility locating system. All piping, pumping, source, storage, and other facilities should be located on public rights-of-way or dedicated utility easements. Utility easements should be a minimum of 10 feet in width and piping should be installed no closer than 5 feet from the easement's edge. Exceptions to this minimum easement may be approved by the operating water utility. Unrestricted access should be provided to all public water system lines and public fire hydrants that are maintained by public agencies or utilities.

H. Pipe Cover

A 2.5-foot minimum cover is required from the finished grade to the top of the pipe for all installed transmission, distribution and service piping.

I. Air and Air-Vacuum Relief Valves

Air relief or combination air and vacuum relief valves shall be situated at designated points of high elevation throughout the system.

J. Blow-off Valves

A blow-off assembly should be installed on all permanent dead-end runs and at designated points of low elevation within the distribution system. The blow-off assembly should be installed in the public right-of-way or utility easement. In no case should the location be such that there is a possibility of back-siphoning into the distribution system.

K. Separation Distances

Transmission and distribution water piping should be separated at least ten feet horizontally and 18 inches vertically from on-site waste disposal piping, drainfields, and/or wastewater gravity or force mains whenever feasible. All parallel and crossing installations of water and sewer lines should be installed in accordance with provisions of WAC 248-96 and the Washington State Criteria for Sewage Works Design published by DOE, which allows for less separation of water and sewer lines than 10 feet under certain guidelines.

L. Auxiliary Power

Unless directed otherwise by the utility, all source and booster pumping facilities should be equipped with auxiliary power pigtail outlets and at least manual transfer switching devices.

M. Utility Interties

When evaluation specific location, size and alignment for major water lines, utilities should consider opportunities for emergency interties with adjacent water utilities.

N. Flow Measurement

At the discretion of the designated utility, all service lines should be installed so that each residential, commercial and industrial structure will have a separate metered service for domestic water received from the utility. If approved by the designated utility, domestic water consumption may be measured by a master meter for service to a complex under single ownership and where water utility line subdivision is impractical. Service lines providing fire flow may be required to be equipped with flow detection check or other appropriate metering devices, as directed by the designated utility.

O. Cross Connection Control

Water utilities shall develop and implement a cross connection control program that meets the requirements of WAC 246-290-490, but may establish a more stringent program. Where the possibility of contamination of the supply exists, water services should be equipped with appropriate cross connection control devices in accordance with WAC 246-290-490. The designated utility cross-connection control program should determine the need, size, kind, and location of the device.

IV. MATERIAL SPECIFICATIONS

A. Introduction

All pipe, valves, meters, hydrants, fittings, and special material should be new, undamaged and designated for use in potable water systems. Material used on water projects should comply with each projects' detailed plans and specifications. All materials and specifications should be in conformance with the standards referenced by American Public Works Association (APWA), the specification of the American Water Works Association (AWWA), and the specifications of the American Society of Testing and Materials (ASTM), except as modified by each designated utility.

B. Pipe, Joints and Fittings

(1) Pipe Size and Material

All pipe sizes, as shown on the drawings, and as specified herein, are in reference to nominal diameter, unless otherwise indicated. One type of pipe should be used throughout the entire project except as necessary to match existing piping or as otherwise specified. Where relocation of or replacement of existing piping is necessary during construction, materials used should be subject to the approval of the designated utility.

(2) Ductile Iron Pipe (DI)

Ductile iron pipe should conform to the requirements of AWWA C151 specifications. Pipe thickness should be of Class 50 or greater, if required in accordance with the criteria specified in AWWA C150. Ductile iron pipe should be cement lined and sealed in accordance with AWWA C104. In addition, all pipe should have push-on rubber gasket joints and

be furnished in 10- to 20-foot lengths unless design conditions dictate otherwise.

(3) Polyvinyl Chloride (PVC)

Polyvinyl chloride pipe should meet standards specified within the current edition of APWA, except as modified by the utility provided that the performance of the material meets or exceeds the APWA standard, and should bear the National Sanitation Foundation seal for potable water pipe.

All pipe 4 inches in diameter or greater should meet the requirements of AWWA C900 with a minimum pressure class of 150. For smaller pipelines, the minimum pipe should be Schedule 40 PVC. Glued joints are not acceptable for pipe greater than 4 inches in diameter. All pipe should be furnished in 18- to 20-foot lengths unless design conditions dictate otherwise and assembled with a lubricant approved for use in potable water systems. Polyvinyl chloride pipe should be installed with locating devices as approved by the designated utility.

(4) Galvanized Iron Pipe

Galvanized iron pipe should conform to the latest revision of ASTM A-120 or A53, Grade A, Schedule 40, seamless pipe. Pipe should be hot-dip galvanized. Pipe fittings should be galvanized and equipped with screwed fittings.

Cast iron screwed fittings should be ASTM A-126 and A-153 which conform to ANSI B 16, 4, 125 psi class.

(5) Polyethylene Pipe (PE)

All polyethylene pipe should be rated for a maximum working pressure of 160 psi with a standard dimension ratio of 1/7. This pipe should comply with ASTM D-2239 and D-1248. The pipe should be appropriately marked to designate the nominal pipe size, type of plastic material, pipe dimension ratio or pressure rating and ASTM or AWWA designation code. The pipe should bear the National Sanitation Foundation seal signifying its use for potable water. Installation of polyethylene pipe should be in accordance with AWWA specifications. The pipe should be installed with locating devices as approved by the designated utility.

Caution should be exercised in using polyethylene pipe where it could come in contact with gasoline and other petroleum products, as these products can permeate polyethylene pipe.

(6) Copper Pipe

All copper service pipe should be rated in accordance with ASTM Designation B88, Type K, soft copper tubing, and the 1990 National Sanitation Foundation Standards 61 Section 6 concerning joining and sealing.

(7) Fittings

All fittings should be of the size, type, and type of joint as specified by the designated utility or by the pipe manufacturer.

C. Valves

(1) Gate Valves

Valves should be manufactured and tested in accordance with AWWA C 500 specifications. They should be equipped with mechanical joints or flange ends of Class 125 in accordance with ANSI B16-1. Gate valves, 3 inches and larger, should be iron body, bronze-mounted, double disc, and "O"-ring stem seal. Gate valves smaller than 3-inch should be 125 psi, wedge disk, all brass or bronze valves with screwed, soldered, or flanged ends compatible with the connecting pipe. All valves should open counter-clockwise and, unless otherwise specified, should be non-rising stem type equipped with standard AWWA 2-inch square stem operating nuts.

(2) Butterfly Valves

Butterfly valves should meet or exceed all AWWA C504 specifications and should be Class 150-B with short body which are suitable for direct bury. When they are installed they should have a position indicator which clearly shows position of the disc. All valves should be equipped with an underground manual operator with AWWA 2-inch square stem operating nut and should open with a counter-clockwise rotation.

(3) Check Valves

Check valves, 3 inches or larger, should be iron body, iron disc, bronze-mounted, swing type, clearway, quiet closing, level and spring valves flanged ends. All valves should comply with AWWA C508 specifications. Check valves, 2.5-inch or smaller, should be bronze body, bronze mounted, swing type with flanged or threaded ends depending upon installation.

(4) Air and Air-Vacuum Relief Valves

Air and air-vacuum relief valves should have cast iron bodies and covers and stainless steel floats. Float guides, bushings, and lever pins should be stainless steel or bronze. (However, DOH recognizes new technology utilizing composite material and, hence, the stainless steel or bronze material standard is subject to modification.) Valves should be designed for operating service to 150 pounds per square inch (psi).

(5) Pressure Reducing Valves

Pressure reducing valves (PRV) should maintain a constant downstream pressure regardless of varying inlet pressure. PRVs should be hydraulically operated, pilot-controlled, diaphragm-type globe or angle style valves. The main valve should have a single removable seat and a resilient disc. The stem should be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there should be no pistons operating the main valve or any pilot controls.

The pilot control should be a direct-acting, adjustable, spring loaded, normally open, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting. The control system should include a fixed orifice. All valves should be equipped with mechanical joints or flanged ends.

D. Valve Boxes

All valve boxes should be cast iron, two-piece, and equipped with suitable extension for at least a 36-inch trench depth. The top section and lid will be designed for installation in traffic areas. Lid is to labeled "W" with lid tabs pointing along the alignment of the water main.

E. Fire Hydrants

Fire hydrants should conform to AWWA Standards for post-type, dry-barrel, self-draining hydrants suitable for at least a 36-inch burial depth. Each hydrant should be equipped with a 6-inch inlet, a minimum valve opening of a 5.25-inch hose connections, and one 4.5-inch pumper port. All ports should have national standard threads and the 4.5-inch pumper port should also include a "Storz" type adapter unless waived by the local fire authority and the County Fire Marshal's office. All valves and caps should open counter-clockwise and have a 1.5-inch flat point pentagon operation and cap nuts. Hydrants should be break-away traffic models. Fire hydrant valves should comply with Section IV.C.1. or 2. and should be provided with a valve box as specified therein. Fire hydrants should be of a model approved by the designated utility.

F. Cross Connection Control Devices

All cross connection control devices will be specified by the water utility based on the degree of potential hazard. Such devices will comply with models acceptable to the DOH in accordance with WAC 246-290-490(4)(c).

V. CONSTRUCTION STANDARDS

A. General

Except as specified by the individual water purveyors or in these standards and specifications, installation of water systems in Clark County should conform at minimum to the standards which the APWA has adopted by reference, the Specifications of the American Water Works Association, and in accordance with to the recommendations of the material or equipment manufacturer. Prior to construction within the county right-of-way, a county utility permit should be applied for and approved by the County. All requirements of the permit should become part of these specifications. Any additional permits required for the project should also be obtained prior to construction.

B. Fire Hydrant Installation

Hydrant installation should conform to AWWA Standard C600 provisions. Fire hydrants should stand plumb and be set to the finish grade. The center of the lowest outlet of the hydrant should be not less than 18 inches above finished grade.

In addition, all hydrants should be installed with a minimum of a 36-inch unobstructed radius around the hydrant. Hydrants should be aligned so that pumper ports face toward the road or most probable route of access, if roads are not available, as determined by the appropriate local fire protection authority and coordinated through County Fire Marshal's office to ensure consistency throughout the County. Proposed locations of all fire hydrants should be staked in the field and approved by the local fire authority prior to installation.

C. Hydrostatic Pressure Test

A hydrostatic and pressure leakage test will be conducted on all newly-constructed water mains, fire lines, fire hydrant leads and stub-outs in accordance with APWA Standards or AWWA C600 specifications, unless specified otherwise by the designated utility.

D. Disinfection and Bacteriological Testing

All new water mains, storage, treatment or well facilities should be flushed and disinfected in accordance with the standards of the AWWA C651 through C654 and D101-53 as appropriate, or APWA Standards unless specified otherwise by the designated utility.

VI. STANDARDS COMMITTEE

The WUCC should convene annually to review these standards and their implementation. The WUCC should take official action on changes in the design standards it deems appropriate. Action by the WUCC should be in accordance with its current Bylaws.

Appendix VI-A

Clark County Code 40.370.020 Water Supply

A. Definitions.

1. For the purpose of this section, "public water system" means a potable water supply system operated by a designated public agency including a city, town or Clark Public Utilities.

B. Purpose.

Water serving new development in urban areas is necessary.

C. Connection Required for Building Permits.

1. Inside urban growth boundaries, connection to public water is required as a condition of building permit issuance for multifamily dwellings exceeding three (3) units, and all structures required to meet fire flow standards.

2. In areas located inside urban growth boundaries, where the public agency purveyor is willing and able to provide safe and reliable service, connection to public water is required as a condition of building permit issuance for all new residential uses of less than four (4) units, and other uses that are not required to meet fire flow standards, when public water is within seven hundred fifty (750) feet of the lot. Subject to a Type I review, the responsible official may conclude that public water is not available to the developer with reasonable economy and efficiency, within the above distances, based on the following considerations:

   a. Permission cannot be obtained from intervening property;
   b. Intervening property contains natural or manmade obstructions which make extension extraordinarily expensive, such as a deep canyon, solid rock or reconstruction of a road or sidewalk; and
   c. Intervening changes in elevation make adequate service to the property extraordinarily expensive.

D. Connection Required for Land Divisions.

Inside urban growth boundaries, connection to public water is required for all new lots, as a condition of preliminary plat or short plat, and site plan approval. Priority for public water service will be the extension from an existing public water line and, secondly, by construction of, or connection to, a satellite system built to standards established, and operated, by the designated water purveyor

in the applicable water service area. Where the purveyor refuses to accept the option of accepting a satellite system the third option is to approach an adjacent purveyor for service. No private wells shall be permitted for purposes of providing potable water intended for human consumption.

Appendix VI-B

Guidelines for Preparing Interlocal Agreements for Interim Public Water Facilities

The WUCC has determined that the preparation of interlocal agreements governing interim public water service within another purveyor's water service area shall be completed. Interim service may be either through the creation of a satellite water system or temporary direct service. The previous water service review procedures excluded the primary purveyor after they had determined they were unable to provide direct or satellite service. The use of interlocal agreements covering the proposed interim service is intended to improve the coordination between the primary purveyor with respect to their long-term water system facilities. The completion of interlocal agreements must be by mutual agreement between the two purveyors. The WUCC has considered the components to be considered during the preparation of the interlocal agreement and identified several areas which should be addressed including water system design and material standards, compensation for transfer of assets, restrictive covenants, and timing for transfer of interim facilities.

Interlocal agreements are required for all interim water service arrangements. The level of detail and formality of the agreement appropriate for the specific situation shall be determined by the parties involved.

The considerations for preparation of the interlocal agreement apply equally to satellite systems or mainline extensions of the utility offering to provide interim service within another purveyor's designated water service area.

1. Water System Design and Material Standards

   The jurisdiction designated to serve the area (designated purveyor) may require the interim water service facilities be designed and constructed to its standards. For interim facilities proposed for construction within an urban growth boundary, water construction design standards shall be at the sole discretion of the primary purveyor.

2. Compensation for Transfer of Assets to the Designated Utility

   The cost of constructing interim facilities including expenses associated with water supply, storage, distribution, acquisition of water rights, and other necessary components should be borne by the proponent of the development.

Fees paid by service recipients to the utility providing interim service should cover the cost of operating the facilities. Under these circumstances, interim water facilities should be transferred to the designated utility without compensation. Unanticipated capital or maintenance expenses incurred by the interim service provider that are not covered by the developer or service recipients may be subjects of negotiation. The portion of fee revenues set aside for future capital improvements might be addressed within the interlocal agreement as well, if these funds are significant enough to warrant consideration.

3. Restrictive Covenants

The designated utility may wish to require the interim service provider to require the proponent of the development to place covenants on properties which would allow for future capital improvements particular to the area being served. This agreement would consist of covenants prohibiting property owners from protesting the formation of a local improvement district to secure financing for connecting the development to mainline service, installing fire hydrants or making other upgrades to the system. If the utility designated to serve the area is a city or town and desires deed restrictions prohibiting property owners from protesting future annexation, the designated utility would need to negotiate directly with the proponent of the development to secure these property covenants.

4. Timing of Transfer of Interim Service Facilities

The circumstances which may trigger the transfer of a satellite system or other interim facilities to the designated utility shall be clearly agreed upon at the outset. Circumstances triggering transfer of facilities may include annexation, when mainline service is available within a particular distance, or in the case of a satellite system when the designated utility determines that it has the financial, administrative, and operational capabilities to operate the system.

Appendix VII-A

Clark Public Utilities
Satellite Water System Policy Framework

The following is Clark Public Utilities' policy framework for operating satellite water systems. This policy framework may be generally construed to apply to other DOH-approved satellite water system operators. Adherence to the satellite water system design standards are preferred but not mandatory for other DOH-approved SMAs.

1. POLICY STATEMENT

Satellite systems within Clark Public Utilities' service area. It is Clark's policy to require that its system be extended to provide water service to property within Clark's service area. The term "Service Area" means Clark's service area as delineated in the Clark County Coordinated Water System Plan (CWSP). Established pursuant to RCW 70.116, The Public Water System Coordination Act.

In exceptional situations Clark will permit satellite systems within its service area. Clark's decision to permit a satellite system will be based on the following factors:

A. Whether or not it will work an unreasonable economic hardship on those desiring water service to construct water mains and/or general facilities to Clark's conditions and standard connecting the property to Clark's water system.

B. Whether or not a satellite system will discourage or interfere with normal growth of Clark's system and/or constitute a hardship on other property owners that would be benefitted by extending Clark's system.

C. Whether or not a satellite system, existing or to be constructed, will be compatible with Clark's current Water System Plan and will not require the satellite system to be improved or replaced when Clark's system is extended to serve the area.

D. Whether or not the satellite system complies with other requirements of Clark's terms and the CWSP.

2. SATELLITE SYSTEMS OUTSIDE CLARK'S SERVICE AREA

Whether Clark will provide satellite services outside its service area will be based on the above factors and the following:

A. Whether or not it is appropriate to extend Clark's service area to include the property seeking water service.

B. Availability of other public water supply systems that can more economically or logically serve the area.

C. The criterion and procedures in the CWSP.

3. CONTRACTUAL REQUIREMENTS

A. Inside Clark's Service Area

All water systems within Clark's service area must enter into a contract with Clark , as a condition to receiving satellite services from the Clark .

B. Outside Clark's Service Area

All water systems outside Clark's service area to be provided with satellite services by Clark must enter into a contract with Clark .

C. Minimum Contract Requirements

The contract with Clark must include the following: (1) an agreement not to protest formation of a future Local Improvement District; (2) the well driller's record, DOE well permit and other data concerning the well; (3) an agreement to have the water regularly tested and submit copies of the report to Clark ; (4) an agreement to at least annually file with Clark its standard report on the operation of such systems; (5) permission for Clark to periodically inspect the satellite system; and (6) other requirements of Clark's terms and conditions.

D. Clark Public Utilities Charges

If Clark is to provide satellite services, the agreement shall include that all utility charges, including repair and improvement charges, are to be paid by those receiving benefit from the provided water services consistent with Clark's terms and conditions.

4. TYPES OF SATELLITE SERVICES

If Clark determines to provide satellite services to a system within or outside its service area, Clark's services will consist of one or a combination of the following:

Category A - Technical Service: This category includes Clark's contracting for technical and operational services provided on an occasional or temporary basis. These services may include repair, trouble shooting, on-call maintenance, training and water quality sampling. Clark will not own the satellite system, and the system owners will retain the responsibility and liability for system operation.

Category B - Contract Service (Operation): Clark will contract to operate the water system. Services may include the category A services, system development (construction and/or improvements), full-time operation, emergency operation and repairs, regulatory compliance and water quality monitoring, as agreed with the owners of the system.

Category C - Direct Service (Ownership and Operation): Clark will own and operate a system that is directly connected to its mainline service or one that remains a satellite system indefinitely. Ownership of the system will be transferred to Clark, and it will become a part of Clark's system.

5. SERVICE INTERRUPTION RESPONSIBILITY

Because a satellite system will typically receive water from a single well or aquifer, and may be so located that no emergency water service is reasonably available, the water utility will not under any circumstances undertake liability for emergency or supplemental supply in the event of a decrease, loss, or contamination of the satellite system's water source.

6. MINIMUM STANDARDS

New or expanding satellite systems must meet Clark's conditions and standards. These include, but are not limited to, Clark- approved engineering plans, Clark construction inspection, extension of mains to property lines at one or more places as required by Clark, acceptance of the system by Clark.

In addition to the above, Clark must be satisfied that the system has adequate fire and equalizing storage and pressure, as well as other reasonable requirements of a satellite system not contained in Clark's terms and conditions.

7. WELL ADEQUACY

Clark must be satisfied that the existing source of water to the satellite system:

A. Has been approved and permitted by the Washington State Department of Ecology;

B. Meets all Washington State Department of Health and other purity requirements for public water systems; and

C. Has a well of sufficient depth, and the pump and other devices are adequate to provide continuous future supply of water in sufficient volume to meet the needs of connections to the satellite system and governmental standards.

8. STREET GRADES/EASEMENTS

If Clark County has not accepted for future maintenance the streets or roads in which the satellite system mains are located, the depth and location of the satellite system mains must meet any street or road grade changes that Clark anticipates for the future. The system owners must provide or obtain easement which would enable Clark to extend its system past the satellite system in the future, when access through public streets is unavailable.

9. NO- PROTEST AGREEMENT

Clark will not provide satellite services inside or outside its service area, unless the property owners served by the satellite system agree in writing not to protest future formation of a Utility Local Improvement District, which would enable Clark to extend its system to serve the satellite area.

10. NEW SATELLITE SYSTEMS/REQUIREMENTS

CLARK PUBLIC UTILITIES will not permit any new or expanded satellite system within its service area unless the following are guaranteed:

A. It is constructed or improved to meet specifications contained in Clark's Water System Plan and other conditions and standards.

B. The satellite system owners contract with Clark per Section 3 of these policies. The contract will also include an agreement to improve or construct the satellite system to meet Clark's conditions and standards; cost of extending and/or connecting the satellite system to Clark's standard connection charges, including meter installation charges.

11. EXISTING SATELLITE SYSTEMS/REQUIRED IMPROVEMENTS

Note: An existing satellite system is one that is presently providing water to properties within the service area of the satellite system.

A. Minimum Requirements

Clark will inspect the water system to determine what improvements must be made prior to the utility permitting any satellite service, and what improvements must be made in the future to bring it to the utility's minimum standards and specifications for construction of its water system.

The applicant must, at its expense, expose for inspection such components of the water system as Clark requires. The foregoing includes, but is not limited to, the well pump and water distribution lines.

The applicant must provide Clark with a copy of the Washington State Department of Ecology permit for the well, the well driller's record, and any other requested data or information.

Based on the above, Clark will, in its sole discretion, determine the following: (1) if repairs or improvements must be performed by the applicant prior to Clark providing satellite service; (2) if improvements are necessary in the future to bring the system to Clark's standards and specifications for water system construction; (3) the estimated cost of each improvement; and (4) a method of payment for each improvement.

B. Repairs and Improvements

Clark will, in its sole discretion, determine whether all repairs and improvements necessary to meet Clark's standards and specifications must be made before satellite services will be permitted, or whether these will be staged between initial and future improvements as below.

C. Initial Repairs and Improvements

Before Clark will permit satellite services to a water system, the applicant must, at its expense, make such repairs and improvements as the utility determines are necessary to ensure a reliable and adequate supply and distribution of water until such time as the satellite system is improved to meet Clark's standards and specifications.

D. Future Improvements

The applicant and/or users of the satellite system must agree to pay the cost of all future improvements beyond the initial improvements, which Clark determines are necessary for the system to meet Clark's standards and specifications, and provide easements satisfactory to Clark for construction of these improvements.

E. Cost Initial and Future Improvements

The cost of at least the initial repairs and improvements must be paid before satellite services will be permitted. If Clark elects to allow staged future improvements to the satellite system, Clark will determine the method of payment. This may include monthly installments over and above Clark's rates and/or charges to users.

If Clark permits monthly payments, the term will be at Clark's discretion, but may not be longer than 5 years. Payments may be adjusted if Clark determines that the actual cost of the improvements will exceed or be less than the original estimate.

F. Reserve Account

Whether or not system repairs or improvements are required, Clark will not permit Category A or B satellite services unless the owners of the properties served deposit with Clark an amount that Clark determines is adequate to pay for emergency or non-routine repairs or replacements, including well pumps or other mechanical components of the system. If Clark determines it

would be an economic hardship on the owners to immediately pay the entire reserve account, it may permit a portion to be billed and paid to Clark in monthly installments.

12. CONNECTION CHARGES

As a condition to Clark providing satellite service in Category C, the users must pay the utility's system development charge and connection charges, including the meter installation. The method of payment will be determined by the utility in the same manner as setting fees to cover the cost of future improvements to the satellite.

13. METERS, RATES AND CHARGES

A. Meters

Clark will not provide Category C satellite services unless all connections are metered. Clark may require metering as a condition to providing Category B satellite services.

B. Rates and Charges

Clark will charge its standard labor, material and equipment rates for its Category A satellite services. The rates and charges to users where Clark is providing Category C satellite services will be determined by Clark based on the cost of service and other factors that Clark is entitled to take into account in setting water rates. In no event will the rates charged such users be less than those charged the same customer-class connected to Clark's water system. The rates and charges to Category B users may be either/or a combination of the above, but not less than the Category C minimum.

Appendix X-A
Clark County Board of Commissioners Resolution No. 1999-07-03
Actions Pertaining to the Acceptance of the 1999 Clark County Coordinated Water System Plan Update

RESOLUTION NO. 1999-07-03

A RESOLUTION regarding the Coordinated Water System Plan.

WHEREAS, the Board, following a duly advertised public hearing, concludes that the Coordinated Water System Plan and the Interlocal Agreement for Establishing Water Utility Service Boundaries are in the public interest; now, therefore:

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY, STATE OF WASHINGTON, as follows:

Section 1. Findings. The Board finds that the Coordinated Water System Plan is not inconsistent with the goals and policies within the Clark County Comprehensive Growth Management Plan.

Section 2. Approvals. The Board hereby approves the attached Interlocal Agreement for Establishing Water Utility Service Boundaries.

Section 3. Instructions to the Clerk. The Clerk to the Board shall:

(1) Transmit a copy of this Ordinance to the Washington State Department of Community Trade and Economic Development within ten (10) days of its adoption, pursuant to RCW 36.70A.106.

(2) Record a copy of this Ordinance with the Clark County Auditor.

(3) Cause notice of adoption of this Ordinance to be published forthwith pursuant to RCW 37.70A.290.

ADOPTED this 13 day of July, 1999.

Attest:

Clerk to the Board

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

By
Judie Stanton, Chair

Approved as to Form Only
ARTHUR D. CURTIS
Prosecuting Attorney

By
Christopher Horne
Deputy Prosecuting Attorney

By
Craig A. Pridemore, Commissioner

By
Betty Sue Morris, Commissioner

PL 99-69

INTERLOCAL AGREEMENT FOR ESTABLISHING WATER UTILITY SERVICE BOUNDARIES

BETWEEN

THE CITIES OF BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER, WASHOUGAL, THE TOWN OF YACOLT, AND CLARK PUBLIC UTILITIES

THIS AGREEMENT, entered into by and between the CITIES of BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER, WASHOUGAL, the TOWN of YACOLT, and CLARK PUBLIC UTILITIES, (hereinafter referred to as the WATER PURVEYORS), WITNESS THAT:

WHEREAS, Clark County and the WATER PURVEYORS conduct capital facilities and land use planning under the Growth Managment Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, RCW 70.116 Public Water System Coordination Act, and WAC 246-293-250 require development of a Coordinated Water System Plan, including establishment of service area boundaries; and

WHEREAS, the designation of service area boundaries will help facilitate efficient planning and delivery of water services within Clark County, will help ensure that unnecessary duplication of service is avoided, and will provide predictability to the WATER PURVEYORS, Clark County, and to citizens using water services; and

WHEREAS, the designation of service area boundaries will help assure that water reserved for public water supply proposed with the CWSSA will be utilized in the future in an efficient planned manner;

NOW THEREFORE, in consideration of covenants, conditions, performances, and promises hereinafter contained, the undersigned parties hereto agree as follows:

1. Service Area Boundaries. The undersigned acknowledges that the maps identifying their service area boundaries, dated 7-13-99 and attached to this agreement, accurately identifies the water system's future service area. This signed Interlocal Agreement verifies that there are no service area conflicts with adjacent water utilities.

2. Boundary Streets. Where streets or portions of streets serve as a service area boundary, both WATER PURVEYORS may extend service within the street itself. The utility which is located to the north and/or east of the portion of the street serving as a boundary will also be entitled to extend service across the boundary to abutting streetside lots. Any other service extensions into adjacent service area boundaries shall require agreement of the WATER PURVEYORS involved.

3. Boundary Adjustments. If, at some time in the future, it is in the best interests of the undersigned parties to make service area boundary adjustments, such modifications must have the written concurrence of all involved parties and the proper legislative authority(ies), and must be noted and filed with Clark County and Washington State Department of Health.

As specified in WAC 246-293-250, Service Area Agreements-Requirements, this Agreement shall become effective once this document is approved by the Clark County Board of Commissioners.

This Interlocal agreement for establishing water utility service boundaries is hereby approved:

Clark Public Utilities Representative	General Manager/CEO Title	3-18-99 Date
City of Battle Ground Representative	Title	Date
City of Camas Representative	Mayor Title	3/17/99 Date
City of Ridgefield Representative	Mayor Title	3/15 Date
City of Vancouver Representative	City Manager Title	3/30/99 Date
City of Washougal Representative	Mayor Title	6/9/99 Date
Town of Yacolt Representative	MAYOR Title	5-1999 Date

APPROVED BY CLARK COUNTY BOARD OF COMMISSIONERS

Chair

Resolution No. 1999-07-03
Date: 7-13-99

Attest: Louise Richards
H.K. Shorthill, City Clerk
By: Judith Hoggatt, Deputy

Approved As To Form Only
ARTHUR D. CURTIS
Prosecuting Attorney

By: Christopher Horne
Deputy Prosecuting Attorney

Approved as to form:

Ted. H. Gathe, City Attorney

Appendix X-B

CWSP 2011 Update Review, Action and Approval Documentation

Clark County

CWSP Update Review

proud past, promising future

CLARK COUNTY
WASHINGTON

COMMUNITY PLANNING

File Name: Coordinated Water System Plan Update
File Number: CPZ2011-00016
Date Published: July 6, 2011

Today's Date: **June 29, 2011**

Attached is an environmental Determination of Non-significance (DNS) and associated environmental checklist issued pursuant to the State Environmental Policy Act (SEPA) Rules (Chapter 197-11, Washington Administrative Code). The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11. You may comment on this determination within fourteen (14) days of the DNS publication date of **July 6, 2011**, the lead agency will not act on this proposal until the close of the **14-day comment period, which ends on July 21, 2011.**

Please address any correspondence to: Clark County Community Planning
RE: SEPA Comments
Attn: **Gary Albrecht**
PO Box 9810
Vancouver, WA 98660-9810

DISTRIBUTION:

Federal Agencies:
Bonneville Power Administration
Federal Aviation Administration, Aeronautics Division
Gifford Pinchot National Forest USDA
US Army Corps of Engineers
US Fish & Wildlife Service, Ridgefield, WA
US Fish & Wildlife Service, ESA Division Manager, Portland, OR
US Forest Service, NSA Office, Hood River, OR

Native American Interest:
Chehalis Tribal Council
Chinook Nation/Indian Country
Columbia River Inter-Tribal Fish Commission
Confederated Tribes of Grand Ronde
Confederated Tribes of Warm Springs
Cowlitz Tribe, Longview, WA
Nisqually Indian Tribe
Quinault Nation Business Committee
Shoalwater Bay Tribe
Yakima Indian Nation
Nez Perce Tribe, Lapwai, ID

State Agencies:
WSDOT, SW Region – Donald Wagner
WSDOT, SW Region – Jeff Barsness
WSDOT, SW Region – Ken Burgstahler

State Agencies required by Dept. of Commerce:

Department of Commerce – Ike Nwankwo
Department of Commerce - David Andersen
Department of Corrections, Olympia, WA
Department of Health, Office of Drinking Water, Olympia, WA
Department of Ecology SEPA/GMA Coordinator
Department of Ecology – Environmental Review
Department of Fish & Wildlife, Region 5 - Lisa Renan, Vancouver, WA
Department of Fish & Wildlife – Jennifer Hayes
Department of Fish & Wildlife - Dave Price
Department of Natural Resources – SEPA Center
Department of Natural Resources, SW Region – Kirk Willis
Department of Social & Health Services – Edwin Valbert
Department of Transportation – Katherine Klockenteger
Parks and Recreation Commission, State of WA – Randy Kline
Utilities and Transportation Commission
WA Office of Archaeology & Historic Preservation - Robert Whitlam

Regional Agencies:

Regional Transportation Council – Lynda David
SW Clean Air Agency - David Joyner

Local Agencies:

Clark County Department of Community Development
- Building Division - Jim Muir
- Fire Marshal's Office

Clark County Public Works:
- 78th Street
- Environmental Services – Jo Anne Berg
- Transportation Division – Rob Klug

Clark County Sheriff's Office - Sheriff Gary Lucas
Clark County Emergency Management
Clark County Prosecutor's Office – Christine Cook
City of Vancouver:
- Community Planning – Laura Hudson
- Clark Vancouver Parks & Recreation
- Transportation – Thayer Rorabaugh

Clark County Health Department – Carla Sowder

School Districts:

Battle Ground School District
Camas School District
Evergreen School District
Green Mountain School District
Hockinson School District
La Center School District
Ridgefield School District
Vancouver School District
Washougal School District
Woodland School District

Cities and Town:

City of Battle Ground – Robert Maul
City of Camas – Phil Bourquin
City of La Center – Dale Miller
City of Ridgefield – Jim Perry
City of Vancouver – Laura Hudson
City of Washougal – Joanne Boys
City of Woodland – Kei Zushi
Town of Yacolt – Rod Orlando

Special Purpose Agencies:
C-Tran – Jeff Hamm
C-Tran – Debbie Elven-Snyder
C-Tran – Jim Quintana
Clark County Public Utilities (PUD) - Jim Sanders
Clark Regional Wastewater District
Natural Resources Conservation Service (NRCS) – Rebecca Morris
Port of Camas-Washougal – David Ripp, Executive Director
Port of Ridgefield
Port of Vancouver
Vancouver Housing Authority

Libraries:
Battle Ground Library
Camas Library
Cascade Park Library
Vancouver Community Library
Ridgefield Library
Vancouver Mall Library
Washougal Library
Woodland Library

Fire Districts:
East County Fire & Rescue - Chief Scott Koehler
Fire Protection District No. 2 – Chief Michael Jackson
Fire Protection District No. 3 - Chief Steve Wrightson
Fire Protection District No. 5 & 81 - Chief Don Bivins
Fire Protection District No. 6 - Chief David Taylor
Fire Protection District No. 10 - Chief Sam Arola
Clark County Fire & Rescue - Chief Dennis Mason
Fire Protection District No. 13 - Chief Ben Peeler

Neighborhoods & Homeowner Associations:
Andresen/St. Johns Neighborhood Association – Neil Chambers
Concerned Citizens of Hockinson Neighborhood Association - Jack Bremer
Daybreak Neighborhood Association - Sam & Julia Richard
East Fork Frontier neighborhood Association – Sandra Bennett
East Fork Hills Rural Association - Val Alexander
East Minnehaha Neighborhood Association - Sue Lintz
Enterprise Paradise Point Neighborhood Association – VaNessa Duplessie
Evergreen East Neighborhood Association - Doug Paulson, c/o L. Meharry
Fairgrounds Neighborhood Association - Bridget Schwarz
Felida Neighborhood Association - Milada Allen
Fern Prairie Neighborhood Association – Jim Fisher
Fisher-Mill Plain Neighborhood Association - Stacey Johnson
Greater Brush Prairie Neighborhood Association - Sam Kim
Green Meadows Neighborhood Association – Dave Socolofsky
Heritage Neighborhood Association – Christie BrownSilva
Maple Tree Neighborhood Association – Sean & Alyson Janson
Meadow Glade Neighborhood Association - Harold Hansen & Wayne Turvey
NE Hazel Dell Neighborhood Association - Bud Van Cleve
N.A.C.C.C. - Doug Ballou (mail: Art Stubbs)
N.Fork Lewis River Neighborhood Association - D. Petersen c/o Paul Sorenson
North Salmon Creek Neighborhood Association – Paul Scarpelli
Pleasant Highlands Neighborhood Association – Ron Price
Proebstel Neighborhood Association – Wendy Garrett

Ramblin' Ck Estates/S.Salmon Ck Ave. Neighborhood Assoc. - Rick Dronen
Ridgefield Junction Neighborhood Association – Dave Kelly
Roads End Neighborhood Association - Barbara Murray
Sherwood Hills Neighborhood Association - Dick Durland
Sifton Neighborhood Association – Christie BrownSilva
Sunnyside Neighborhood Association - George White
Truman Neighborhood Association – Eldon & Venus Kohler
Washougal River Neighborhood Association – Brendan Addis
West Hazel Dell Neighborhood Association - Ila Stanek

Media:

Camas-Washougal Post Record – Heather Acheson
Columbian - Elisa Williams
KGW NW TV Ch. 8 - Joe Arndt
KOIN News Center 6 - Bruce Williams
KPDX – Fox 49
Oregonian, Vancouver – Bill Stewart
Reflector, Battle Ground – Marvin Case

Other Interested Parties:

BIA (Building Industry Assoc.) of SW Washington – Steve Madsen
CC Airport Owners & Managers Association – Dale Detour
CCNRC - Clark County Natural Resource Council - John & Diane Karpinski
Chamber of Commerce – John McKibben
Clark County Association of Realtors
Clark County Citizens in Action - Jan Baldwin
Clark County Citizens in Action – Thomas McConathy
Clark County Citizens United - Carol Levanen
Clark County Citizens United – Nick Redinger
Columbia River Economic Development Council (CREDC) – Bart Phillips
Cowlitz-Wahkiakum COG – Rosemary Siipola
County Road Administration Bd (CRAB) - Sam Wentz
Eric Fuller & Associates
Foster Pepper & Shefelman - Tayloe Washburn
Friends of Clark County
Friends of Columbia Gorge – Richard Till
Kent Landerholm & Associates, Inc.
Landerholm Law Firm - Randy Printz
Miller Nash LLP - James Howsley
Miller Nash LLP - Meridee Pabst
PBS Environmental - Bart B. Phillips
Rural Clark County Preservation Association (RCCPA) - Dennis Dykes
Stoel Rives LLP - Mark Feichtinger
SW WA Contractors Association – Mike Bomar
WSU, Finance & Operations - Lynn Valenter
Aaby, Clifford
Collier, Mark
Cooper, David
Dreyfuss, Robert
Hadley, Ken
Herron, Wuanita M.

Affidavit of Publication
STATE OF WASHINGTON)
) ss:
County of Clark)

Columbian

MARILEE McCALL, OAIII
CLARK CO COMMUNITY PLANNING-L
PO BOX 9810
VANCOUVER WA 98666-9810

REFERENCE: 70914 DNS WATER SYS. PLAN
3134758 NOTICE OF DETERMINAT

I, the undersigned say,

That I am over the age of eighteen and not interested in the above entitled matter; that I am now, and at all time embraced in the publication herein mentioned, was, the principal clerk of the printer of The Columbian, a daily newspaper printed, published and circulated in the said county and adjudged a newspaper of general circulation by the Superior Court of the County of Clark, State of Washington, under Proceeding No. 802006715; that the advertisement, of which the annexed is a true printed copy, was published in the above-named newspaper on the following dates, to wit:

PUBLISHED ON: 07/06

TOTAL COST: 101.00
FILED ON: 07/06/11

NOTICE OF DETERMINATION OF NON SIGNIFICANCE (DNS)

NOTICE IS HEREBY GIVEN that the following proposal has been determined to have no probable significant adverse impact on the environment, and that an environmental impact statement is not required under RCW 43.21C.030(2)(c). Written comments on the following proposal, or DNS, may be submitted to the Responsible Official by **July 21, 2011.**

DESCRIPTION: Coordinated Water System Plan 2011 Update

The Coordinated Water System Plan includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling back-up water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat.

Copies are available upon request. The staff contact person and telephone number for any questions on this review is Gary Albrecht, Planner II, (360) 397-2280 ext. 4318.

ACTION REQUESTED: It is requested that the Board of County Commissioners review the plan to determine if it is consistent with Clark County's land use and growth management plans and policies, approve the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries between the Cities of Battle Ground, Camas, Ridgefield, Vancouver and Washougal, and Clark Public Utilities. And to consider: (a) adoption or endorsement of the plan and (b) enter into the Fire Hydrant Intergovernmental Agreement.

RESPONSIBLE OFFICIAL:
Oliver Orjiako, Director
Clark County Community Planning
PO Box 9810
Vancouver, WA. 98666-9810
July 6

413978

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature Judy Moody

DETERMINATION OF NON-SIGNIFICANCE

Description of Proposal: Coordinated Water System Plan 2011 Update

The Coordinated Water System Plan (CWSP) includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat. The plan was prepared to fulfill regulatory requirements prescribed in WAC 248-56, Public Water System Coordination Act. The CWSP serves as the Regional Supplement for Washington Dept of Health (DOH)-approved local water system plans, which are on file with the municipal water purveyors and DOH.

Proponent: *Clark County Community Planning*

Location of proposal, including street address: *Clark County, Washington*

Lead Agency: *Clark County, Washington*

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below.

Comments must be submitted by July 21, 2011.

Responsible Official: Oliver Orjiako
Position/title: Director
Address: **RE: SEPA Comments**
Clark County Community Planning
1300 Franklin Street; 3rd Floor
P.O. Box 9810
Vancouver, WA 98666-9810

Date: July 6, 2011 Signature: Oliver Orjiako

The staff contact person and telephone number for any questions on this review is Gary Albrecht, Planner II, (360) 397-2280 ext. 4318.

7-7-11

John, Doug, Gary and Oliver:

A footnote should probably be added to Appendix III-A of the Coordinated Water System Plan clarifying that the CWSP Update does not physically contain maps showing the location of well fields, water system interties, and other attributes of water supply and distribution systems. The footnote might point out that these maps, which are included in individual water system plans, are incorporated by reference; and that the local water system plans are available for review by contacting the municipal water purveyors (Battle Ground, Camas, Ridgefield, Vancouver and Washougal) and Clark Public Utilities Water Services. These water system plans are also on file with the Washington State Dept of Health, Office of Drinking Water. Incidentally, a list of the current water system interties appears in Section VIII, Exhibit VIII-2, page 66.

Rod O

From: Albrecht, Gary [mailto:Gary.Albrecht@clark.wa.gov]
Sent: Thursday, July 07, 2011 9:15 AM
To: John Karpinski
Cc: Rodney Orlando; DQuinn@clarkpud.com; Orjiako, Oliver
Subject: RE: Clark County - Water Plan Update -comments/request for documents

Hi John,
I have talked with Oliver Orjiako and Rod Orlando about your map requests and questions. Below please find our responses in RED.

Gary

From: Albrecht, Gary
Sent: Tuesday, July 05, 2011 8:08 AM
To: 'John Karpinski'
Cc: McCall, Marilee; 'Rodney Orlando'; 'DQuinn@clarkpud.com'; Orjiako, Oliver
Subject: RE: Clark County - Water Plan Update -comments/request for documents

Hi John,
Thank you for the preliminary comments.

Please contact Rod Orlando, the consultant working with CPU on this update. He can help with providing the information requested below.

Gary

From: John Karpinski [mailto:karpid@comcast.net]
Sent: Saturday, July 02, 2011 6:11 PM
To: McCall, Marilee; Albrecht, Gary; John Karpinski (home)
Subject: Clark County - Water Plan Update -comments/request for documents

Marilee/ Gary:

I have briefly reviewed the Clark County SEPA DNS- Coordinated Water System Plan Update - Comments due by July 21, 2011.

I have some questions, and would like some documents, please

These will help me to better comment by July 21, 2011.

Please accept these as my preliminary comments.

1) I would like some documents:

Where are the **map of the water area boundaries** as referred to in Appendix III-A Page 1 Appendix III-A Supplementary Provisions Public Water System Coordination Act?? The map that you are requesting are in each purveyor's water system plan. Please contact individual water utilities for these maps

Please send me a .pdf (or the like) of the following maps

- Compilation of future water service areas as identified in each purveyor's water system plan, including: A. **A map depicting existing and future service areas.** In Appendix III-A it states that this information can be found in each individual purveyor's water system plan.

To view existing water service areas go to.....
- http://gis.clark.wa.gov/imfmol/imf.jsp?site=MapsOnline

at the top of the page is a pick list for Current Map, select Service District Areas

Please click this link to view future service areas....
- **ftp://ftp.ci.vancouver.wa.us/Eng/Water/CWSP/Clark%20County%20Water%20Service%20Areas%20-%20CWSP%20FINAL.pdf**

- **Maps showing the location of well fields, water system interties and other attributes of water supply and distribution systems are contained in local water system plans**, which are on file with the individual water utilities and DOH.

Please contact individual water utilities for these maps.

- Establishment of minimum design standards applicable to water system improvements within the Critical Water Supply Service Area. **Maps of development classifications pertaining to fire flow as identified in each purveyor's water system plan.**

Please contact individual water utilities for these maps.

- **Identification of potential joint-use or shared water system facilities as outlined in each purveyor's water system plan, including:**
  A. A map of all potential joint-use or shared facilities, including interties (see local water system plans).

Please contact individual water utilities for these maps.

2) Question: What is the status for fulfilling the rest of the terms of the Public Water System Coordination Act?? See Appendix III-A

The status is that the Coordinated Water System Plan is intended to address area-wide concerns within Critical Water Supply Service Area, which are not ordinarily included in each utility's water system plan. The regional supplement is expected to contain, but not limited to, the following: (please see Appendix III-A (1. through 11.)

3) Question: Does the update change/lower rural water standards?? The summary Appendix II-A, page 3, referring to FPP 6.2.3

No.

4) Question: Shouldn't the Comprehensive Plan's designations factor in water availability and cost FIRST, rather than "planning" development into certain areas with no regard to how much it may cost to serve??

Clark County Comprehensive Growth Management Plan 2004-2024 Adopted September 2007 contains goals and policies about minimizing long-term public cost, and Appendix E page E-4 to E-11 discusses water systems and their costs to serve.

Thanks.

John K.

John S. Karpinski
2808 E. 8th Street
Vancouver, WA 98661
360.909.9163 cell
360.694.0283 home..best #
karpjd@comcast.net

On 7/1/2011 4:20 PM, McCall, Marilee wrote:

Attached to this e-mail is a SEPA notification from Clark County Community Planning.
The attachment consists of the following documents:
1) SEPA Distribution List.
2) SEPA Environmental Checklist
3) Draft CWSP Update Addenda
4) Draft CWSP Update Appendices
5) Draft CWSP Update Text

Maps associated with the update can be viewed at thebelow link:
ftp://ftp.ci.vancouver.wa.us/Eng/Water/CWSP/Clark%20County%20Water%20Service%20Areas%20-%20CWSP%20FINAL.pdf

Description:

The Coordinated Water System Plan (CWSP) includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system inter-ties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat.

The plan was prepared to fulfill regulatory requirements prescribed in WAC 248-56, Public Water System Coordination Act. The CWSP serves as the Regional Supplement for Washington Department of Health (DOH)-approved local water system plans, which are on file with the municipal water purveyors and DOH.

Comments on this project are due by 5 p.m. on July 21, 2011.

For additional information regarding this project, please contact the project case manager:
Gary Albrecht, Planner II
P.O. Box 9810
Vancouver WA 98660-9810
gary.albrecht@clark.wa.gov
360-397-2280 , extension 4318

Marilee McCall
Administrative Assistant
Clark County Community Planning
P.O. Box 9810 - Vancouver WA 98666
tel: 360.397.2280 ext. 4558
fax: 360.759.6762

Albrecht, Gary

From: Brad Windler [BradW@c-tran.org]
Sent: Thursday, July 14, 2011 4:43 PM
To: Albrecht, Gary
Subject: CWSP Update Comments

C-TRAN has no comments at this time

Brad Windler
Vanpool Coordinator/Senior Planner
C-TRAN
360-906-7460 office
360-906-7510 mobile
360-906-7345 fax
www.c-tran.com

8/30/2011

COWLITZ INDIAN TRIBE

Cultural Resources Department
P.O. Box 2547 1055 9th Ave. Suite C Longview, WA 98632
360.577.6962 577.6207 (f) www.cowlitz.org

INADVERTENT DISCOVERY LANGUAGE
[revised 080722]

In the event any archaeological or historic materials are encountered during project activity, work in the immediate area (initially allowing for a 100' buffer; this number may vary by circumstance) must stop and the following actions taken:

1. Implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; and
2. Take reasonable steps to ensure the confidentiality of the discovery site; and,
3. Take reasonable steps to restrict access to the site of discovery.

The project proponent will notify the concerned Tribes and all appropriate county, state, and federal agencies, including the Department of Archaeology and Historic Preservation. The agencies and Tribe(s) will discuss possible measures to remove or avoid cultural material, and will reach an agreement with the project proponent regarding actions to be taken and disposition of material.

If human remains are uncovered, appropriate law enforcement agencies shall be notified first, and the above steps followed. If the remains are determined to be Native, consultation with the affected Tribes will take place in order to mitigate the final disposition of said remains.

See the Revised Code of Washington, Chapter 27.53, "Archaeological Sites and Resources," for applicable state laws and statutes. See also Washington State Executive Order 05-05, "Archaeological and Cultural Resources." Additional state and federal law(s) may also apply.

Contact information:

dAVe burlingame
Director, Cultural Resources
360.577.6962
508.1677 cell
577.6207 fax
culture@cowlitz.org

Ed Arthur
Assistant Director, Cultural Resources
360.575.3314
508.6369 cell
577.6207 fax
earthur@cowlitz.org

proud past, promising future
CLARK COUNTY
WASHINGTON

June 30, 2011

Growth Management Services
Department of Commerce
PO Box 42525
906 Columbia St. SW
Olympia, WA 98504-8350

Attn: Review Team:

In accordance with the RCW 36.70A.106 Clark County notifies Department of Commerce of the intent to adopt amendments to its Clark County Coordinated Water System Plan.

The Clark County Planning Commission work session is scheduled for September 15th and the hearing is scheduled for October 20th. The Board of Clark County Commissioners work session and hearing is tentatively scheduled for November 1st and November 22nd, respectively. The planned date of adoption is January 1, 2012.

We are providing you an electronic copy of the proposed amendment relating to Clark County's Coordinated Water System Plan 2011 Update.

The Coordinated Water System Plan (CWSP) includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat. The plan was prepared to fulfill regulatory requirements prescribed in WAC 248-56, Public Water System Coordination Act. The CWSP serves as the Regional Supplement for Washington Dept of Health (DOH)-approved local water system plans, which are on file with the municipal water purveyors and DOH.

1300 Franklin Street • P.O. Box 9810 • Vancouver, WA 98666-9810 • tel: [360] 397-2280 • fax: [360] 759-6762 • www.clark.wa.gov

CLARK COUNTY
WASHINGTON
proud past, promising future

If you have any questions concerning these amendments, please call Gary Albrecht at (360) 397-2280 x4318.

Sincerely,

Gary Albrecht
Planner II

Enclosures:

Draft CWSP Update Text
Draft CWSP Update Appendices
Draft CWSP Update Addenda
Clark County Water Service Area Maps

1300 Franklin Street • P.O. Box 9810 • Vancouver, WA 98666-9810 • tel: [360] 397-2280 • fax: [360] 759-6762 • www.clark.wa.gov

STATE OF WASHINGTON
DEPARTMENT OF COMMERCE
1011 Plum Street SE • PO Box 42525 • Olympia, Washington 98504-2525 • (360) 725-4000
www.commerce.wa.gov

July 7, 2011

Gary Albrecht
Land Use Planner
Clark County
1300 Franklin Street
Post Office Box 9810
Vancouver, Washington 98660-9810

Dear Mr. Albrecht:

Thank you for sending the Washington State Department of Commerce (Commerce) the following materials as required under RCW 36.70A.106. Please keep this letter as documentation that you have met this procedural requirement.

County of Clark - Proposed Clark County consolidated water system plan. These materials were received on June 30, 2011 and processed with the Material ID # 17114.

We have forwarded a copy of this notice to other state agencies.

If this submitted material is an adopted amendment, then please keep this letter as documentation that you have met the procedural requirement under RCW 36.70A.106.

If you have submitted this material as a draft amendment, then final adoption may occur no earlier than sixty days following the date of receipt by Commerce. Please remember to submit the final adopted amendment to Commerce within ten days of adoption.

If you have any questions, please call me at 360.725.3056.

Sincerely,

Linda Weyl
for

Ike Nwankwo
Technical & Financial Assistance Manager
Growth Management Services

NOTICE OF PUBLIC HEARING
CLARK COUNTY PLANNING COMMISSION

NOTICE IS HEREBY GIVEN that the Clark County Planning Commission will conduct a public hearing on Thursday, **October 20, 2011 at 6:30 p.m.,** at the Clark County Public Services Center, Commissioners Hearing Room, 6th Floor, 1300 Franklin Street, Vancouver, WA, to consider the following items:

A. Description of Proposal: Clark County regulates development through the Unified Development Code, also known as Title 40. As part of the ongoing program to revise Title 40 known as the "Retooling Our Code" project, the following "Batch #4" code revisions and additions are listed below:

Item #	Subject	Title, Chapter, Section
1	Create a new code section containing standards for the Type I review of Neighborhood parks	40.260.157 – a proposed new section
2	Create a new code section to address the scope and review of Agricultural Stands and Markets	40.260.025– a proposed new section
3	Consider whether to reduce 50 foot buffering setbacks between structures and ag zoned property in the Rural and Resource zones	40.210.020 and 40.210.030
4	Create a new code section for Temporary Farmworker Housing to align the term and definition of temporary worker with state law. Allow temporary housing on Forest zoned lands to increase availability.	40.260.105 – a proposed new section
5	Revise certain county parking and loading standards, considering compatibility with the City of Vancouver's standards	40.340.010

Staff Contact: Jan Bazala (360) 397-2375, Ext. 4499 or e-mail at: jan.bazala@clark.wa.gov

B. CPZ2011-00016 COORDINATED WATER SYSTEM PLAN UPDATE

This proposal to update the Coordinated Water System Plan includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of

water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat.

The proposal is to Find the Clark County Coordinated Water System Plan is consistent with the County's Comprehensive Growth Management Plan and policies, and approve the Interlocal Agreement for Establishing Water Utility Service Boundaries.
Staff Contact: Gary Albrecht (360) 397-2280, Ext. 4318 or e-mail: gary.albrecht@clark.wa.gov

Staff recommendations to the Planning Commission will be available 14 days prior to the hearing dates listed above. For Batch 4, Retooling Our Code, the county has a dedicated web page with the code text changes at www.roc.clark.wa.gov

Contact Sonja Wiser (360) 397-2375, ext. 4105, Administrative Assistant to the Clark County Planning Commission, to receive an agenda and staff report for the meeting or email at: Sonja.wiser@clark.wa.gov

Anyone wishing to give testimony in regard to this matter should appear at the time and place stated above.

Approved as to Form only:

ANTHONY F. GOLIK
Prosecuting Attorney

By: _____
Chris Cook
Deputy Prosecuting Attorney

PLEASE PUBLISH: **Wednesday, October 5, 2011**

Please Bill:

Clark County Dev. Services
Attn: Sonja Wiser
Account No. 70270
Public Services Building
1300 Franklin Street, 3rd Floor
Vancouver, WA 98666-9810

TO: Clark County Board of Commissioners

FROM: Dick Deleissegues, Chair
Clark County Planning Commission

DATE: November 22, 2011

SUBJECT: Planning Commission Recommendation for CPZ2011-00016: COORDINATED WATER SYSTEM PLAN UPDATE

BACKGROUND

The 2011 update to the Coordinated Water System Plan (CWSP) has been prepared in response to the need for regular updates and to reflect land use changes completed during Growth Management Planning.

The Clark County Coordinated Water System Plan addresses interrelated policies affecting the six major municipal water providers. It designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat.

FINDINGS

Planning Commission has reviewed the updated CWSP and finds that it is consistent with the adopted 2007 Clark County Growth Management Plan.

According to RCW 36.70A.030, rural services may include public water systems that are delivered at an intensity usually found in rural areas. In order for rural services to be delivered at urban service levels they would need to be located with in an urban growth boundary. The CWSP does not move urban growth boundaries, or encourage rural water systems to be delivered at urban service levels.

RECOMMENDATION

The Planning Commission voted **7-0** to recommend APPROVAL of the proposal. The Planning Commission recommends that the Board of Clark County Commissioners APPROVE the following actions:

- Find the Clark County Coordinated Water System Plan (July 2011) is consistent with Clark County's Comprehensive Growth Management Plan and policies, and

- Approve the Interlocal Agreement for Establishing Water Utility Service Boundaries.
- Not approve the Fire Hydrant Intergovernmental Agreement

EXHIBITS

A. Clark County Coordinated Water System Plan (November 2011)
B. Appendices
C. Addenda

NOTICE OF PUBLIC HEARING

The Clark County Board of Commissioners will hold a public hearing on Tuesday, the **22nd day of November, 2011, at 10:00 a.m.** in the Commissioners' Hearing Room, 6th Floor, Public Service Center, 1300 Franklin Street, Vancouver, Washington to consider:

CPZ2011-00016 COORDINATED WATER SYSTEM PLAN UPDATE
This proposal to update the Coordinated Water System Plan includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat. The proposal is to find the Clark County Coordinated Water System Plan is consistent with the County's Comprehensive Growth Management Plan and policies, and approve the Interlocal Agreement for Establishing Water Utility Service Boundaries.

More information concerning this matter may be obtained by contacting Gary Albrecht, Community Planning, at (360) 397-2280, ext. 4318, or e-mail: gary.albrecht@clark.wa.gov.

Any person wishing to give testimony in this matter should appear at the time, date, and place above stated.

BOARD OF COUNTY COMMISSIONERS

Rebecca Tipton
Clerk of the Board

Approved as to Form Only
ANTHONY GOLIK
Prosecuting Attorney

By Christine M. Cook
Deputy Prosecuting Attorney

PUBLISH: November 7, 2011
c70265

NOTICE OF PUBLIC HEARING

The Clark County Board of Commissioners will hold a public hearing on **Tuesday, the 10th day of January, 2012, at 10:00 a.m.** in the Commissioners' Hearing Room, 6th Floor, Public Service Center, 1300 Franklin Street, Vancouver, Washington to consider:

CPZ2011-00016 COORDINATED WATER SYSTEM PLAN UPDATE
This proposal to update the Coordinated Water System Plan includes an array of interrelated policies affecting the six major municipal water providers within Clark County, Washington. The plan designates future water service areas for the principal water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat. The proposal is to find the Clark County Coordinated Water System Plan is consistent with the County's Comprehensive Growth Management Plan and policies, and approve the Interlocal Agreement for Establishing Water Utility Service Boundaries.

More information concerning this matter may be obtained by contacting Gary Albrecht, Community Planning, at (360) 397-2280, ext. 4318, or e-mail: gary.albrecht@clark.wa.gov.

Any person wishing to give testimony in this matter should appear at the time, date, and place above stated.

BOARD OF COUNTY COMMISSIONERS

Rebecca Tilton

Clerk of the Board

Approved as to Form Only
ANTHONY GOLIK
Prosecuting Attorney

By Christine M. Cook

Deputy Prosecuting Attorney

PUBLISH: December 26, 2011
c70265

STAFF REPORT

TO: Clark County Board of Commissioners
FROM: Oliver Orjiako, Director
Gary Albrecht, Planner II, AICP

DATE: January 10, 2012
SUBJECT: CPZ2011-00016: COORDINATED WATER SYSTEM PLAN UPDATE

BACKGROUND:

On November 22, 2011 the Board of Clark County Commissioners held a hearing to determine if the Clark County Coordinated Water System Plan is consistent with County's Comprehensive Growth Management Plan and policies, Approve the Interlocal Agreement for Establishing Water Utility Service Boundaries, and consider approving the Fire Hydrant Intergovernmental Agreement.

The Commissioners had the following concerns:

- Strong concern that farmers do not have adequate access to water rights and new farmers needing water rights on agriculture zoned land.
- Clark Public Utility service area seems rather large and hopes that does not prevent individual property owners from developing their lands by being on wells.
- Fire Hydrant Interlocal Agreement.

At the commissioner's request staff contacted Bill Zimmerman, owner of Bi-Zi Farms, to discuss how the County could help farmers attain affordable and accessible water. With input from Mr. Zimmerman, staff was able to add proposed language into the Coordinated Water System Plan.

Section IX, Water Supply, adds new text (Exhibit D) on the availability of affordable water to foster viable agricultural operations in Clark County. New text (Exhibit E) is also added on agricultural goals and policies to Appendix II-A, Clark County 20-Year Comprehensive Growth Management Plan Goals & Policies and the CWSP. If the Board of Clark County Commissioners approve the proposed text, it will be added to the Clark County Coordinated Water System Plan and sent to the Department of Health for final approval.

SUMMARY:

The county must complete two fundamental requirements as part of the approval process: find the CWSP is consistent with Clark County's Comprehensive Growth Management Plan and policies, and approve the revised water service area boundaries as identified in the interlocal agreement and map. The county has the option not to adopt or endorse the plan, and/or enter into the revised Fire Hydrant Intergovernmental Agreement, Exhibit F.

FINDINGS

Staff has reviewed the updated CWSP and finds that it is consistent with the adopted 2007 Clark County Growth Management Plan.

Staff also finds that according to RCW 36.70A.030, rural services may include public water systems that are delivered at an intensity usually found in rural areas. In order for rural services to be delivered at urban service levels they would need to be located with in an urban growth boundary. The CWSP does not move urban growth boundaries, or encourage rural water systems to be delivered at urban service levels.

RECOMMENDATION

Staff recommends that the Board of Clark County Commissioners:

- Find the Clark County Coordinated Water System Plan (July 2011) is consistent with Clark County's Comprehensive Growth Management Plan and policies, and
- Approve the Interlocal Agreement for Establishing Water Utility Service Boundaries.
- Approve the Fire Hydrant Intergovernmental Agreement

EXHIBITS

A. Clark County Coordinated Water System Plan (July 2011)
B. Appendices
C. Addenda
D. Updated text for CWSP
E. Updated text for Appendix
F. Addenda A, Fire Hydrant Interlocal Agreement

CLARK COUNTY
STAFF REPORT

DEPARTMENT/DIVISION:	Community Planning
DATE:	April 10, 2012
REQUEST:	To formally approve a resolution relating to the Coordinated Water System Plan and the associated Interlocal Agreement and Map.
CHECK ONE:	__x__ Consent _____ Routine

BACKGROUND: On January 10, the Board of County Commissioners approved the Coordinated Water System Plan. They found that the Coordinated Water System Plan is not inconsistent with the goals and policies within the Clark County Comprehensive Growth Management Plan. The Board also approved the Interlocal Agreement with Maps for Establishing Water Utility Service Boundaries.

These documents were sent to the Washington State Department of Health for final approval. The State has approved the Clark County Coordinated Water System Plan and the Interlocal Agreements with Maps for Establishing Water Utility Service Boundaries.

BUDGET AND POLICY IMPLICATIONS:

FISCAL IMPACTS: ☐ Yes (see Fiscal Impacts Attachment) ☒ No

ACTION REQUESTED: Staff is requesting that the Board of County Commissioners approve and sign the attached Resolution.

DISTRIBUTION: Please return both signed original contract documents to Community Planning. Please make one copy and send to Purchasing.

ATTACHMENTS:

Oliver Orjiako
Oliver Orjiako
Director of Community Planning

APPROVED: APRIL 17, 2012
CLARK COUNTY, WASHINGTON
BOARD OF COMMISSIONERS
SR 72-12

RESOLUTION NO. 2012-04-08

A RESOLUTION regarding the Coordinated Water System Plan.

WHEREAS, the Board, following a duly advertised public hearing, concludes that the Coordinated Water System Plan and the Interlocal Agreement for Establishing Water Utility Service Boundaries are in the public interest; now, therefore:

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY, STATE OF WASHINGTON, as follows:

Section 1. Findings. The Board finds that the Coordinated Water System Plan is not inconsistent with the goals and policies within the Clark County Comprehensive Growth Management Plan.

Section. 2. Approvals. The Board hereby approves the attached Interlocal Agreement for Establishing Water Utility Service Boundaries.

Section 3. Instructions to the Clerk. The Clerk to the Board shall:

(1) Transmit a copy of this Resolution to Washington State Department of Commerce within (10) days of its adoption, pursuant to RCW.36.70A.106.
(2) Record a copy of this Resolution with the Clark County Auditor.
(3) Cause notice of adoption of the Resolution to be published forthwith pursuant to RCW 36.70A.290.

ADOPTED this 17 day of April, 2012.

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

Tina Redline
Clerk to the Board
(a Deputy)

By: Marc Boldt, Chair

Approved as to Form Only
ANTHONY GOLIK
Prosecuting Attorney

By: _____
Steve Stuart, Commissioner

By Christopher Horne
Deputy Prosecuting Attorney

By: _____
Tom Mielke, Commissioner

City of Battle Ground

RESOLUTION NO. 11-12

A RESOLUTION ADOPTING THE 2011 CLARK COUNTY COORDINATED WATER SYSTEM PLAN; AUTHORIZING AN INTERLOCAL AGREEMENT FOR ADJUSTING OR CONFIRMING WATER SERVICE AREA BOUNDARIES; AND AUTHORIZING AN INTERLOCAL AGREEMENT PERTAINING TO EXTRATERRITORIAL FIRE HYDRANT SERVICES

WHEREAS, the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver and Washougal, the Town of Yacolt, Public Utility District No. 1 of Clark County, and Clark County (collectively the "Water Utility Coordinating Committee (WUCC)") manage aspects of land use, public health, or their respective water systems pursuant to an existing Coordinated Water System Plan and established water service boundaries; and

WHEREAS, the members of the WUCC have varying roles respectively in developing, reviewing, approving or complying with capital facilities and land use planning under the Growth Management Act, as adopted by the State of Washington and subsequently amended; and

WHEREAS, the Public Water System Coordination Act (under Chapter 70.116 RCW) and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service boundaries; and

WHEREAS, members of the WUCC have determined that is necessary to revise their existing Coordinated Water System Plan and water service boundaries; and

WHEREAS, in conjunction with their planned revision of the Coordinated Water System Plan and water service boundaries, but under separate agreement, the members of the WUCC also intend to establish their respective responsibilities regarding extraterritorial fire hydrant services.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Battle Ground, State of Washington, that:

1. The 2011 revised version of the Coordinated Water System Plan is hereby adopted by the City of Battle Ground; and

2. The attached Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved; and

3. The attached Fire Hydrant Interlocal Agreement is hereby approved.

ADOPTED IN OPEN MEETING THIS 17th DAY OF OCTOBER, 2011

Michael J. Ciraulo, Mayor

Attested By:

Claire Lidell, City Clerk

Approved as to form:

Brian H. Wolfe, City Attorney

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements*.

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date 10/31/11
John M. Williams, City Manager
City of Battle Ground

_____ Date _____
Mayor Scott Higgins
City of Camas

_____ Date _____
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date _____
Eric Holmes, City Manager
City of Vancouver

_____ Date _____
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____ Attest: _____
Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Rebecca Tilton
Clerk to the Board

Addendum B

City of Camas

CITY OF CAMAS
Public Works Department

October 10, 2011

Lori Wyrick
Clark Public Utilities
PO Box 8900
Vancouver, WA 98668

Dear Ms Wyrick:

Authorization was received by Camas City Council for Mayor Higgins to sign the *Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries* at the October 3, 2011, Council Meeting. The signed agreement is attached.

The minutes from the same meeting are also attached and reflect that Resolution 1222 was passed, finding the plan consistent with the GMA and local land use and that the plan was endorsed. The memorandum to city council is noted on page 5 of the minutes and the motions are on page 7.

Sincerely,

Eric Levison

Encl: Oct. 3, 2011 Council Meeting Minutes
Resolution 1222
Interlocal Agreement

Regular Council Meeting - 7:00 p.m.
October 3, 2011

CALL TO ORDER: Mayor Scott Higgins presided.

FLAG SALUTE:

COUNCIL:

Present: Anderson, Chaney, Dietzman, Hogan, Smith, and Turk.

Excused: Hazen.

STAFF MEMBERS: Berquist, Bourquin, Fox, Halverson, Lackey, Levison, MacPherson, and Swinhart.

PRESS: Heather Acheson, Camas-Washougal Post Record.

CONSENT AGENDA:

Mayor added Item "L" to the consent agenda, a request to ratify a real estate purchase and sale agreement between the City of Camas and Hambleton Brothers Lumber Company, Inc., and to authorize Mayor to sign the agreement for the purchase of a parcel of property adjacent to City Well #14 and west of Goot Park.

Mayor added an item under PUBLIC WORKS, as Item "C", Resolution No. 1222.

An executive session regarding potential litigation was added to the agenda by Mayor.

It was moved by Council member Smith, seconded by Council member Chaney to approve the Consent Agenda of October 3, 2011, as modified. The motion carried unanimously.

a. Approve minutes of the September 19, 2011, Camas City Council meeting, the work session minutes of September 19, 2011, and the September 26, 2011, Special Meeting minutes.
b. Approve claim checks 109894 to 109999 and 111055 to 111063 in the amount of $574,409.87 (five hundred seventy-four thousand, four hundred and nine dollars and eighty-seven cents) as approved by the Finance Committee.

Flexible Development to Allow for Greater Flexibility to Future Developments that Include Low-Impact Elements.

Fox responded to questions from Council.

Anderson thanked Fox for staff's work.

In response to Anderson's question, these applications do go through Design Review.

The public hearing was opened at 7:40 p.m.

Malia Sundby, 957 NW 6th, Camas
Sundby asked how the low impact areas would be maintained and staff responded.

Mayor closed the public hearing at 7:45 p.m.

It was moved by Dietzman and seconded by Turk to direct the city attorney to prepare an ordinance to adopt Camas Municipal Code Chapter 18.26, adding Chapter 18.26 Flexible Development and to prepare a resolution for the adoption of the Flexible Development Score Sheet.

The motion carried unanimously.

PUBLIC WORKS:

Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries Titled as Addendum B of the Clark County Coordinated Water System Plan Update, Draft July 2011.

Levison explained the purpose of the interlocal agreement for adjusting or confirming future water service area boundaries titled Addendum B of the Clark County Coordinated Water System Plan Update Draft dated July 2011.

Levison responded to questions from Council.

It was moved by Hogan and seconded by Smith to authorize the Mayor to sign an interlocal agreement for adjusting or confirming future water service area boundaries titled as Addendum B of the Clark County Coordinated Water System Update Draft dated July 2011.

The motion carried unanimously.

Endorsement of Clark County Coordinated Water System Plan Update Draft, July 2011.

It was moved by Anderson and seconded by Hogan to endorse the Clark County Coordinated Water System Plan Update Draft dated July 2011.

The motion carried unanimously.

Resolution 1222 Declaring the Clark

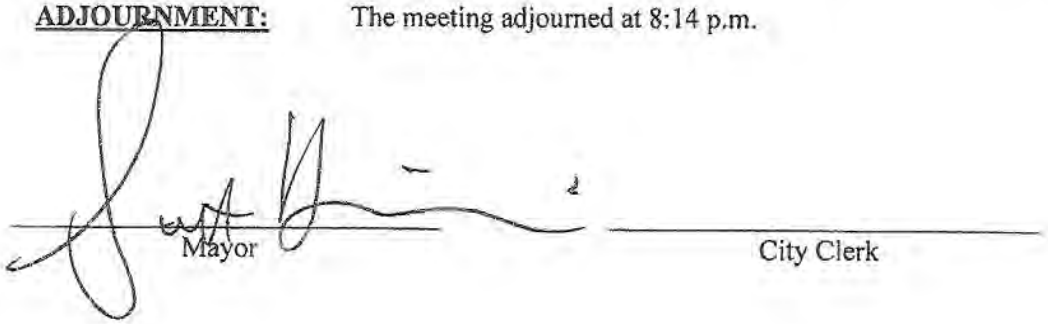
Levison explained the purpose of Resolution 1222 and noted that staff recommends approval.

County Coordinated Water System Plan Update to be Consistent with City of Camas Land Use and Growth Management Plans and Policies.	It was moved by Dietzman and seconded by Hogan that Resolution 1222 be read by title only. It was moved by Dietzman and seconded by Smith that Resolution 1222 declaring the Clark County Coordinated Water System Plan Update to be consistent with City of Camas land use and growth management plans and policies be adopted. The motion carried unanimously.

EXECUTIVE SESSION:

The meeting adjourned for potential litigation for an estimated 15 minutes. No further action occurred.

ADJOURNMENT: The meeting adjourned at 8:14 p.m.



Mayor

City Clerk

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements.*

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____
John M. Williams, City Manager
City of Battle Ground

_____ Date Oct 4, 2011
Mayor Scott Higgins
City of Camas

_____ Date _____
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date _____
Eric Holmes, City Manager
City of Vancouver

_____ Date _____
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____ Attest: _____
Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Rebecca Tilton
Clerk to the Board

RESOLUTION NO. 1222

A RESOLUTION declaring the Clark County Coordinated Water System Plan Update to be consistent with City of Camas land use and growth management plans and policies.

WHEREAS, the City of Camas and Clark County conduct Facilities and land use planning under the Growth Management Act (GMA), as adopted by the State of Washington; and

WHEREAS, a Clark County Coordinated Water System Plan Update has been developed with participation by the City of Camas in the development of the plan, along with Battle Ground, Ridgefield, Vancouver, Washougal, Clark Public Utilities, Clark County Planning Department, state agencies, and various stake holders; and

WHEREAS, the Clark County Coordinated Water System Plan Update will assist in facilitating the efficient planning and delivery of water service within Clark County and avoid unnecessary duplication of water services; and

WHEREAS, the City of Camas staff have reviewed the plan for consistency with Camas land use laws and the GMA plans and policy;

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

The Clark County Coordinate Water System Plan Update is hereby deemed to be consistent with City of Camas land use and growth management plans and policies.

ADOPTED by the Council of the City of Camas, and approved by the Mayor this 3rd day of October, 2011.

SIGNED: _____
Mayor

ATTEST: _____
Clerk

APPROVED as to form:

_____
City Attorney

Clark County Public Health

proud past, promising future
CLARK COUNTY
WASHINGTON

MEMORANDUM

TO: Board of Clark County Commissioners
FROM: Alan Melnick, MD, MPH, Health Officer
DATE: November 16, 2011
RE: Clark County Coordinated Water System Plan Update

On behalf of Clark County Public Health I am writing this memorandum to endorse the Clark County Coordinated Water System Plan (CWSP) update. The CWSP update represents a collaborative effort that will help to protect our drinking water resources and the public's health in Clark County.

In 1977 the Washington State Legislature enacted the Public Water System Coordination Act (PWSCA), RCW 70.116, to establish a procedure for state utilities and local government to coordinate planning and construction programs for water systems. The first CWSP was developed in 1983 by Clark County in response to the Clark County Commissioners declaring Clark County a Critical Water Supply Service Area in order to address problems associated with water utilities in several urbanizing areas. The PWSCA calls for a CWSP update every five years, and the current draft CWSP represents the first update in over a decade.

In January 2010, the Clark County Water Utility Coordinating Committee (WUCC) met to begin the update process. The WUCC is a comprehensive group that includes Clark County Community Planning; CCPH; Office of the Fire Marshal; Clark Public Utilities; Washington Department of Health; cities of Battleground, Camas, LaCenter, Ridgefield, Vancouver, and Washougal; and the Town of Yacolt. The WUCC developed an updated CWSP that includes an array of interrelated policies affecting the six major water purveyors. These policies will help guide future service areas, design and performance standards, and protect water resources.

When a new development is proposed requiring an adequate drinking water supply and distribution system due to its size, density or other characteristics, the CPSW update calls for permitting agencies to require the applicant to seek water service through a utility service review procedure that identifies the most appropriate service. This structure is designed to give the opportunity for service to the most appropriate provider. This will help curtail the proliferation of small poorly functioning water systems within unincorporated urban fringe areas that lack the technical expertise to meet federal and state health requirements.

The CWSP update is consistent with CCPH Drinking Water policies and supports our mission and strategic initiatives. Safe and reliable drinking water is paramount to public health and safety and the CWSP update is a critical element for our community. CCPH looks forward to continuing to work with our partners on the WUCC and will be happy to address any additional questions or comments.

Cc: Clark County Water Utility Coordinating Committee
Gary Albrecht, Clark County Community Planning

P.O. Box 9825 • Vancouver, WA 98666-8825 • tel: [360] 397-8428 • fax: [360] 397-8084 • www.clark.wa.gov

Clark Public Utilities

RESOLUTION NO. 6463

A RESOLUTION ADOPTING THE 2011 CLARK COUNTY COORDINATED WATER SYSTEM PLAN; AUTHORIZING AN INTERLOCAL AGREEMENT ADJUSTING CONFIRMING WATER SERVICE AREA BOUNDARIES; AND AUTHORIZING AN INTERLOCAL AGREEMENT PERTAINING TO EXTRATERRITORIAL FIRE HYDRANT SERVICES

WHEREAS, the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver and Washougal, the Town of Yacolt, Public Utility District No. 1 of Clark County, and Clark County (collectively the "Water Utility Coordinating Committee (WUCC)") manage aspects of land use, public health, or their respective water systems pursuant to an existing Coordinated Water System Plan and established water service boundaries; and

WHEREAS, the members of the WUCC have varying roles respectively in developing, reviewing, approving or complying with capital facilities and land use planning under the Growth Management Act, as adopted by the State of Washington and subsequently amended; and

WHEREAS, the Public Water System Coordination Act (under Chapter 70.116 RCW) and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service boundaries; and

WHEREAS, members of the WUCC have determined that is necessary to revise their existing Coordinated Water System Plan and water service boundaries; and

WHEREAS, in conjunction with their planned revision of the Coordinated Water System Plan and water service boundaries, but under separate agreement, the members of the WUCC also intend to establish their respective responsibilities regarding extraterritorial fire hydrant services.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of Public Utility District No. 1 of Clark County that:

1. The 2011 revised version of the Coordinated Water System Plan is hereby adopted by the District; and

2. The attached Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved; and

3. The attached Fire Hydrant Interlocal Agreement is hereby approved.

PASSED AND ADOPTED this 25th day of October, 2011.

President

ATTEST:

Secretary

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements*.

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____
John M. Williams, City Manager
City of Battle Ground

_____ Date _____
Mayor Scott Higgins
City of Camas

_____ Date 10/25/11
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date _____
Eric Holmes, City Manager
City of Vancouver

_____ Date _____
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____
Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Attest: _____
Rebecca Tilton
Clerk to the Board

City of La Center

RESOLUTION NO. 11-346

A RESOLUTION FINDING THE 2011 CLARK COUNTY COORDINATED WATER SYSTEM PLAN NOT INCONSISTENT WITH THE GOALS AND POLICIES OF THE CITY OF LA CENTER COMPREHENSIVE PLAN AND CAPITAL FACILITIES PLAN; AND AUTHORIZING AN INTERLOCAL AGREEMENT PERTAINING TO EXTRATERRITORIAL FIRE HYDRANT SERVICES

The La Center City Council makes the following findings:

WHEREAS, the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver and Washougal, the Town of Yacolt, Public Utility District No. 1 of Clark County, and Clark County (collectively the "Water Utility Coordinating Committee (WUCC)") manage aspects of land use, public health, or their respective water systems pursuant to an existing Coordinated Water System Plan and established water service boundaries; and

WHEREAS, the members of the WUCC have varying roles respectively in developing, reviewing, approving or complying with capital facilities and land use planning under the Growth Management Act, as adopted by the State of Washington and subsequently amended; and

WHEREAS, the City of La Center does not own or operate a water system as defined in the Coordinated Water System Plan but is required to be in compliance with the Growth Management Act; and

WHEREAS, the Public Water System Coordination Act (under Chapter 70.116 RCW) and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service boundaries; and

WHEREAS, members of the WUCC have determined that is necessary to revise their existing Coordinated Water System Plan and water service boundaries; and

WHEREAS, in conjunction with their planned revision of the Coordinated Water System Plan and water service boundaries, but under separate agreement, the members of the WUCC also intend to establish their respective responsibilities regarding extraterritorial fire hydrant services.

NOW THEREFORE, SEE IT RESOLVED, that, based on the foregoing findings, the City Council for the City of La Center hereby resolves as follows:

1. The 2011 revised version of the Coordinated Water System Plan is hereby found to be not inconsistent with the goals and policies of the City of La Center Comprehensive Plan and Capital Facilities Plan; and

2. The attached Fire Hydrant Interlocal Agreement is hereby approved by the City of La Center.

IT IS SO RESOLVED and passed this 14th day of September 2011, by a majority of the La Center City Council.

James Irish, Mayor of La Center

ATTEST:

Suzanne Levis, Finance Director/Clerk

APPROVED AS TO FORM:

Daniel Kearns, City Attorney

City of Ridgefield

RESOLUTION NO. 407

A RESOLUTION ADOPTING THE 2011 CLARK COUNTY COORDINATED WATER SYSTEM PLAN AND FINDING IT CONSISTENT WITH LOCAL LAND USE AND GROWTH MANAGEMENT POLICIES; AUTHORIZING AN INTERLOCAL AGREEMENT ADJUSTING THE CITY'S WATER SERVICE AREA BOUNDARIES; AND AUTHORIZING AN INTERLOCAL AGREEMENT PERTAINING TO EXTRATERRITORIAL FIRE HYDRANT SERVICES

WHEREAS, the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver and Washougal, the Town of Yacolt, Public Utility District No. 1 of Clark County, and Clark County (collectively the "Water Utility Coordinating Committee (WUCC)") manage aspects of land use, public health, or their respective water systems pursuant to an existing Coordinated Water System Plan and established water service boundaries; and

WHEREAS, the members of the WUCC have varying roles respectively in developing, reviewing, approving or complying with capital facilities and land use planning under the Growth Management Act, as adopted by the State of Washington and subsequently amended; and

WHEREAS, the Public Water System Coordination Act (under Chapter 70.116 RCW) and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service boundaries; and

WHEREAS, members of the WUCC have determined that is necessary to revise their existing Coordinated Water System Plan and water service boundaries; and

WHEREAS, the Coordinated Water System Plan was reviewed by the WUCC and determined to be consistent with local land use and growth management policies; and

WHEREAS, in conjunction with their planned revision of the Coordinated Water System Plan and water service boundaries, but under separate agreement, the members of the WUCC also intend to establish their respective responsibilities regarding extraterritorial fire hydrant services.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Ridgefield as follows:

1. The 2011 revised version of the Coordinated Water System Plan as included in Exhibit 1 is hereby adopted by the City of Ridgefield; and

2. The 2011 revised version of the Coordinated Water System as included in Exhibit 1 is hereby found to be consistent with local land use and growth management policies; and

3. The attached Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved and the City Council authorizes the City Manager to execute the Agreement on behalf of the City of Ridgefield; and

4. The attached Fire Hydrant Interlocal Agreement is hereby approved and the City Council authorizes the City Manager to execute the Agreement on behalf of the City of Ridgefield.

ADOPTED by the City Council of the City of Ridgefield at a regular meeting this 13th day of October, 2011.

CITY OF RIDGEFIELD

Ron Onslow, Mayor

ATTEST:

Kay Kammer
Director of Finance & Administration
City Clerk

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements*.

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____

John M. Williams, City Manager
City of Battle Ground

_____ Date _____

Mayor Scott Higgins
City of Camas

_____ Date _____

Wayne Nelson, General Manager
Clark Public Utilities

_____ Date 10/24/2011

Justin Clary, City Manager
City of Ridgefield

_____ Date _____

Eric Holmes, City Manager
City of Vancouver

_____ Date _____

Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____ Attest: _____

Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Rebecca Tilton
Clerk to the Board

City of Vancouver

12/19/11

RESOLUTION NO M-3757

A RESOLUTION confirming consistency of the 2011 Clark County Coordinated Water System Plan with local planning adopting the Coordinated Water System Plan, and authorizing an interlocal agreement adjusting water service area boundaries

WHEREAS the cities of Battle Ground Camas La Center Ridgefield Vancouver and Washougal, the Town of Yacolt Public Utility District No 1 of Clark County and Clark County (collectively the Water Utility Coordinating Committee (WUCC)) manage aspects of land use, public health, or their respective water systems pursuant to an existing Coordinated Water System Plan and established water service boundaries and

WHEREAS, the members of the WUCC have varying roles respectively in developing reviewing approving or complying with capital facilities and land use planning under the Growth Management Act as adopted by the State of Washington and subsequently amended and

WHEREAS, the Public Water System Coordination Act (under Chapter 70 116 RCW) and WAC 246 293-250 requires the development of a Coordinated Water System Plan including the establishment of future water service boundaries and

WHEREAS members of the WUCC have determined that it is necessary to revise their existing Coordinated Water System Plan and water service boundaries

NOW, THEREFORE

BE IT RESOLVED BY THE CITY OF VANCOUVER

Section 1 The 2011 revised version of the Clark County Coordinated Water System Plan is consistent with local land use and growth management plans and policies

Section 2 The 2011 revised version of the Clark County Coordinated Water System Plan is hereby adopted by the City

Section 3 The attached Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved

ADOPTED at a regular meeting of the City Council this 19th day of December, 2011

Timothy B Leavitt Mayor

Attest

R Lloyd Tyler City Clerk
By Carrie Lewellen Deputy City Clerk

Approved as to form

Ted H Gathe City Attorney

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements*.

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____
John M. Williams, City Manager
City of Battle Ground

_____ Date _____
Mayor Scott Higgins
City of Camas

_____ Date _____
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date 12-21-11
Eric Holmes, City Manager
City of Vancouver

_____ Date _____
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____ Attest: _____
Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Rebecca Tilton
Clerk to the Board

Addendum B

City of Washougal

Resolution No. 1040

A RESOLUTION adopting the revised 2011 Clark County Coordinated Water System Plan; authorizing an Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries; and authorizing a Fire Hydrant Interlocal Agreement pertaining to extraterritorial fire hydrant services.

WHEREAS, the Cities of Washougal, Camas, Battle Ground, La Center, Ridgefield and Vancouver, the Town of Yacolt, Public Utility District No. 1 of Clark County, and Clark County (hereinafter together referred to as "governing bodies") manage aspects of land use, public health, and their respective water systems pursuant to an existing Clark County Coordinated Water System Plan and have established water service boundaries;

AND WHEREAS, the governing bodies have varying roles in developing, reviewing, approving and/or complying with capital facilities and land use planning under the Growth Management Act, as adopted and amended by the State of Washington;

AND WHEREAS, the Public Water System Coordination Act under RCW 70.116 and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service boundaries;

AND WHEREAS, the governing bodies have determined that it is necessary to revise the existing Coordinated Water System Plan and water service boundaries;

AND WHEREAS, in conjunction with the revisions to the Coordinated Water System Plan and water service boundaries, but under separate agreement, the governing bodies also desire to establish their respective responsibilities regarding extraterritorial fire hydrant services.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF WASHOUGAL as follows:

Section I

That the revised 2011 Clark County Coordinated Water System Plan is hereby adopted.

Section II

That the Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries, attached hereto as Exhibit "A," is hereby approved.

Section III

That the Fire Hydrant Interlocal Agreement, attached hereto as Exhibit "B," is hereby approved.

PASSED by the Council of the City of Washougal at regular meeting on the 7th day of November, 2011.

City of Washougal, Washington

Mayor

ATTEST:

Finance Director / City Clerk

APPROVED AS TO FORM:

City Attorney

County Auditor, each copy shall constitute an agreement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements.*

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____
John M. Williams, City Manager
City of Battle Ground

_____ Date _____
Mayor Scott Higgins
City of Camas

_____ Date _____
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date _____
Eric Holmes, City Manager
City of Vancouver

_____ Date Oct. 17, 2011
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

_____ Attest: _____
Commissioner Tom Mielke, Chair
Clark County Board of Commissioners

Rebecca Tilton
Clerk to the Board

Town of Yacolt

Resolution #458

CLARK COUNTY COORDINATED WATER SYSTEM PLAN UPDATE

WHEREAS: In 1977, the Washington legislature enacted the Public Water System Coordination Act, which established a procedure for the state's water utilities to coordinate water system planning and construction activities. The initial Coordinated Water System Plan was prepared in 1983. Updates of the plan were completed in 1991 and 1999. The July 2011 update of the plan is currently under consideration.

WHEREAS: the Clark County Water Utility Coordinating Committee has been guiding the development of the Coordinated Water System Plan update. The committee is composed of technical and managerial staff with local municipalities including the major water utilities; Clark County Community Planning, Public Works, Public Health and Office of the Fire Marshal; and the Washington Dept of Health.

WHEREAS: the Coordinated Water System Plan includes an array of interrelated policies affecting the six major municipal water providers. The plan designates future water service areas for the principle water utilities; recommends water facility design and performance standards; sets forth a procedure for reviewing new developments requiring public water service and determining which water utility should provide service; establishes a satellite water system management program; encourages water system interties enabling backup water supplies and increasing the reliability of water service; promotes water conservation measures; and fosters drinking water supply development, while protecting water resources and fish habitat.

WHEREAS: All local municipalities in Clark County will review the Coordinated Water System Plan update and determine whether it is consistent with local land use policies and growth management plans, and consider endorsing the plan. The major water utilities will enter into a collective interlocal agreement adjusting or confirming water service area boundaries. The Clark County Planning Commission will review the plan for consistency with the county's growth management policies; and the Board of Commissioners will consider approving the water service area boundaries and other actions tantamount to endorsing the plan. Finally, the plan will be submitted to Washington Department of Health for approval. The target date for approval of the plan is between December 2011 and January 2012.

NOW THEREFORE BE IT RESOLVED THAT THE YACOLT TOWN COUNCIL:

1) Finds the July 2011 draft of the Clark County Coordinated Water System Plan Update to be consistent with Yacolt's land use and growth management plan and policies; and

2) Enter into the Fire Hydrant Intergovernmental Agreement.

ADOPTED BY THE TOWN COUNCIL OF THE TOWN OF YACOLT, WASHINGTON, AT A REGULAR MEETING THEREOF THIS 6TH DAY OF SEPTEMBER, 2011.

TOWN OF YACOLT

James Weldon

James Weldon, Mayor

ATTEST:

Cindy Marbut

Cindy Marbut, Town Clerk/Treasurer

Ayes: Robertson, Benge, Ayers, Hancock, Holy

Nays: ~~8~~

Absent: ~~8~~

Abstain: ~~8~~

Published: 9/14/2011

Effective Date: 9/14/2011

Coordinated Water System Plan Update 2011

Addenda

Addendum A

FIRE HYDRANT INTERGOVERNMENTAL AGREEMENT

BETWEEN

THE CITIES OF BATTLE GROUND, CAMAS, LA CENTER, RIDGEFIELD, VANCOUVER, WASHOUGAL; THE TOWN OF YACOLT; CLARK COUNTY; AND CLARK PUBLIC UTILITIES

THIS AGREEMENT, entered into by and between the CITIES OF BATTLE GROUND, CAMAS, LA CENTER, RIDGEFIELD, VANCOUVER, WASHOUGAL; THE TOWN OF YACOLT; CLARK COUNTY; and CLARK PUBLIC UTILITIES (collectively the "Parties"), WITNESS THAT:

WHEREAS, the Parties conduct capital facilities and land use planning under the Growth Management Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, Ch. 70.116 RCW Public Water System Coordination Act, and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of future water service area boundaries; and

WHEREAS, the Parties intend to revise the existing Coordinated Water System Plan; and

WHEREAS, in conjunction with the revision of the Coordinated Water System Plan, but under the provisions of this separate agreement, the Parties intend to establish their respective responsibilities and obligations regarding the supply and servicing of fire hydrants and related infrastructure (collectively "Fire Hydrants") within the other Parties' jurisdictional boundaries, for general fire protection purposes; and

WHEREAS, Fire Hydrants are currently provided and maintained, or will be provided and maintained in the future, by individual Parties ("Serving Municipality") within the boundaries of another Municipality ("Benefited Municipality"); and

WHEREAS, it is recognized that the Supreme Court has issued opinions on the obligations to maintain fire hydrants based on the facts in those cases.

NOW THEREFORE, in accordance with the Interlocal Cooperation Act (Ch. 39.34 RCW) and in consideration of covenants, conditions, performances, and promises hereinafter contained, the undersigned Parties hereto agree to the following:

I. Purpose

The purpose of this Agreement is to establish the Parties' respective responsibilities and obligations regarding the supply and servicing of fire hydrants and related infrastructure within the other Parties' jurisdictional boundaries.

II. Effective Date

This Agreement shall become effective upon the occurrence of both the approval of this Agreement by the individual Parties' governing bodies and the execution of this document by their authorized representatives.

III. Duration

This Agreement shall remain effective with regard to the individual Parties until terminated. Such termination shall be effective one (1) year after the Party provides written notice (to all the other Parties) of such intent to terminate their participation in this Agreement.

IV. Property

Nothing in this Agreement shall create or transfer any real or personal property interest amongst the Parties.

V. Administration

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be individually administered by the respective Parties.

VI. Scope

If a Benefited Municipality wants the Serving Municipality to supply and/or service Fire Hydrants, within the Benefited Municipality's territorial boundaries, without making direct payment to the Serving Municipality for such services, Fire Hydrants shall be

provided to the Benefited Municipality by the Serving Municipality directly or indirectly under the following conditions:

1) If the Serving Municipality currently provides general water services within the boundaries of the Benefited Municipality, and the Benefited Municipality does not provide potable water services, the Benefited Municipality shall not develop its own potable water system to compete with the Serving Municipality.

2) If the Serving Municipality currently provides general water services within the boundaries of the Benefited Municipality, and the Benefited Municipality also provides general water services within its territorial boundaries, the Benefited Municipality shall not offer competing potable water service to the Serving Municipality's existing water customers in that service area. This provision, however, does not prohibit the transfer of water customers by mutual agreement between the Parties.

3) The Benefited Municipality authorizes the Serving Municipality to occupy its right-of-way, for water utility purposes only as currently needed to maintain existing fire hydrants or such extensions as are requested by the Benefited Municipality to supply new development within the Benefitted Municipality. Such authorization is provided without cost or fee.

4) The Benefited Municipality shall not charge the Serving Municipality for its assistance (staff time) for the review and coordination of Capital Facility Plans, construction documents, Growth Management Plans, and water resource documents.

5) The Serving Municipality shall not be obligated to provide or maintain additional Fire Hydrants beyond the existing facilities currently maintained by the Serving Municipality or beyond agreed service areas. Service areas, if any, will be designated in a written document signed by both the Benefited Municipality and the Serving Municipality. Nothing in this Agreement obligates the Serving Municipality to provide general fire protection services within the Benefited Municipality's boundaries.

6) The Serving Municipality shall not assess a fee or other charge to the Benefited Municipality for providing Fire Hydrants, after the Effective Date of this Agreement, within the Benefited Municipality. The Parties recognize the mutual benefit and value of the exchange of services, access to right of way, and agreement not to compete, as noted above, and accept this exchange as fair and equitable compensation for these services.

VII. INTERPRETATION

This Agreement has been and shall be construed as having been made and delivered in the State of Washington and it is mutually agreed and understood by both Parties that this Agreement shall be governed by the laws of the State of Washington. Venue shall be Clark County, Washington.

VIII. AMENDMENTS/MODIFICATION

The provisions of this Agreement may be amended only upon the mutual consent of the Parties. No additions to, or alterations of, the terms of this Agreement shall be valid unless made in writing and formally approved and executed by the duly authorized agents of the Parties.

IX. SEVERABILITY

If any section or part of this Agreement is held by a court to be invalid, such action shall not affect the validity of any other part of this Agreement.

X. ENTIRE AGREEMENT

This Agreement contains all of the agreements of the Parties with respect to the subject matter covered or mentioned therein, and no prior Agreement shall be effective to the contrary.

XI. DOCUMENT FILING

The Parties agree that there shall be one (1) original of this Agreement procured and distributed for signature by the necessary officials of the Parties. Upon execution, this Agreement shall be retained by Clark Public Utilities and one copy shall be retained by each of the other Parties. Clark Public Utilities shall cause a copy of this Agreement to be recorded with the Clark County Auditor. Upon execution of the original and filing of a copy with the Clark County Auditor, each copy shall constitute an agreement binding upon all Parties.

IN WITNESS THEREOF, the undersigned Parties have caused this Agreement to be executed in their respective names by their duly authorized officers on the dates as set forth below.

_____ Date _____

John M. Williams, City Manager
City of Battle Ground

_____ Date _____

Mayor Scott Higgins
City of Camas

_____ Date 1-12-12

Commissioner Marc Boldt, Chair
Clark County Board of Commissioners

_____ Date _____

Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____

Mayor James T. Irish
City of La Center

_____ Date _____

Justin Clary, City Manager
City of Ridgefield

_____ Date _____

Eric Holmes, City Manager
City of Vancouver

_____ Date _____

Mayor Sean Guard
City of Washougal

_____ Date _____

Mayor James Weldon
Town of Yacolt

APPROVED AS TO FORM ONLY:

_____
Deputy Prosecuting Attorney

Addendum B

INTERLOCAL AGREEMENT FOR ADJUSTING OR CONFIRMING FUTURE WATER SERVICE AREA BOUNDARIES

BETWEEN

THE CITIES OF BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER AND WASHOUGAL, AND CLARK PUBLIC UTILITIES

THIS AGREEMENT, entered into by and between the CITIES OF BATTLE GROUND, CAMAS, RIDGEFIELD, VANCOUVER, WASHOUGAL and CLARK PUBLIC UTILITIES, (hereinafter referred to as the Water Purveyors), WITNESS THAT:

WHEREAS, Clark County and the city Water Purveyors conduct capital facilities and land use planning under the Growth Management Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, RCW 70.116 *Public Water System Coordination Act*, and WAC 246-293-250 require the development of a Coordinated Water System Plan, including the establishment of Future Water Service Area boundaries; and

WHEREAS, the designation of Future Water Service Area boundaries will help facilitate efficient planning and delivering of water services within Clark County, avoid unnecessary duplication of water services and foster water operation predictability for the Water Purveyors, Clark County and the residents served by public water systems; and

WHEREAS, the designation of Future Water Service Area boundaries will help assure that available water supply sources for the Water Purveyors will be utilized in an efficient manner.

NOW THEREFORE, in consideration of covenants, conditions, performances and promises hereinafter contained, the undersigned Water Purveyors hereto agree to the following:

I. PURPOSE

The purpose of this agreement is to adjust or confirm Future Water Service Area boundaries of the Water Purveyors that are parties to this agreement.

II. EFFECTIVE DATE

This Agreement shall become effective upon the occurrence of the approval of this Agreement by the individual Water Purveyors' governing bodies, execution of this document by their authorized representatives, and the approval of this Agreement by the Clark County Board of Commissioners.

III. DURATION

This Agreement shall remain effective with regard to the individual Water Purveyors until terminated. Such termination shall occur with the next update of the Coordinated Water System Plan.

IV. PROPERTY

Nothing in this Agreement shall create or transfer any interest in real or personal property among the Water Purveyors. In the event any adjustment of a Future Water Service Area boundary requires transfer of water facility assets from one Water Purveyor to another Water Purveyor, a separate written agreement shall address the transfer of such assets.

V. ADMINISTRATION

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be individually administered by the respective Water Purveyors, which shall each be individually responsible for financing its own actions pursuant to this Agreement.

VI. SCOPE

1. *Services Area Boundaries*. The maps identifying the Future Water Service Area boundaries dated July 2011 and attached to this Agreement as Exhibit A accurately identify the water systems' Future Water Service Areas, and there are no service conflicts with adjacent Water Purveyors.

2. *Boundary Streets*. Where streets or portions of streets serve as a Future Water Service Area boundary, both Water Purveyors may extend service within the street. The Water Purveyor that is located to the north and/or east of the portion of the street serving as a boundary shall also be entitled to extend service across the water service area boundary to properties abutting the street. Any other service extensions into adjacent Future Water Service Areas shall require written agreement of the involved Water Purveyors.

3. *Boundary Adjustments.* If a t some time in the future it is in the best interests of the undersigned Water Purveyors to make Future Water Service Area boundary adjustments, such modifications shall have the written concur rence of the involved Water Purveyors and Clark County , and shall be filed with Clark County GIS and Community Planning, and the Washington State Department of Health.

VII. INTERPRETATION

This Agreement has been and shall be construed as having been made and delivered in the State of Washington and it is mutu ally agreed and unde rstood by the Water Purveyors that this Agreement shall be governed by the laws of the State of Washington. Venue for any lawsuit arising from or related to this Agreement shall be the Superior Court of Clark County, Washington.

VIII. AMENDMENTS/MODIFICATION

The provisions of this Agreement may be amended only upon the mutual consent of the Water Purveyors. No amendments to the terms of this Agreement shall be valid unless made in writing and formally approved and exec uted by the duly authorized agents of the Water Purveyors and Clark County, and recorded with the Clark County Auditor.

IX. SEVERABILITY

If any section or part of this Agreement is he ld by a court to be invalid, such action shall not affect the validity of any other part of this Agreement.

X. ENTIRE AGREEMENT

This Agreement contains all of the agreemen ts of the Water Purveyors with respect to the subject matter covered or mentioned therei n, and no prior Ag reement shall be effective to the contrary.

XI. DOCUMENT FILING

The Water Purveyors agree that there shall be one (1) original of this Agreement procured and distributed for signature by the necessary officials of the Water Purveyors. Upon execution, this Agreement shall be retained by Clark Public Community Planning and one c opy shall be retained by each of the other Water Purveyors. Clark County Community Planning shall cause a copy of this Agreement to be recorded with the Clark County Auditor. Upon execut ion of the original and fili ng of a copy with the Clark

County Auditor, each copy shall constitu te an agre ement binding upon all Water Purveyors.

This agreement shall become effective once it is approved by the Clark County Board of Commissioners, as specified in WAC 246-293-250 Future *Water Service Area Agreements.*

This Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries is hereby approved:

_____ Date _____
John M. Williams, City Manager
City of Battle Ground

_____ Date _____
Mayor Scott Higgins
City of Camas

_____ Date _____
Wayne Nelson, General Manager
Clark Public Utilities

_____ Date _____
Justin Clary, City Manager
City of Ridgefield

_____ Date _____
Eric Holmes, City Manager
City of Vancouver

_____ Date _____
Mayor Sean Guard
City of Washougal

APPROVED BY THE CLARK COUNTY BOARD OF COMMISSIONERS

Marc Boldt Attest: Rebecca Tilton
Commissioner Marc Boldt, Chair Rebecca Tilton
Clark County Board of Commissioners Clerk to the Board

Resolution No. _____

Date: 1-10-12

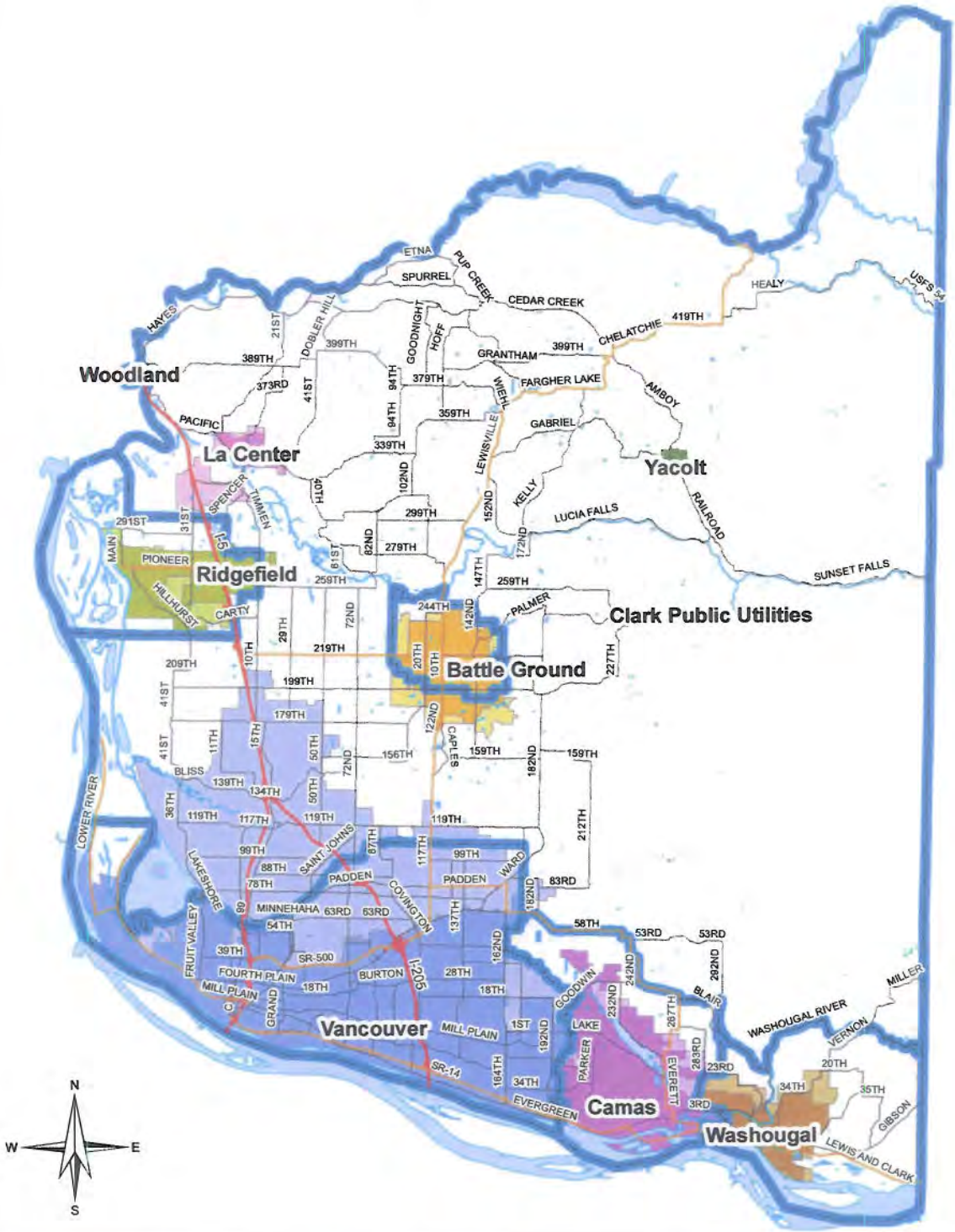
Deputy

Approved as to form:

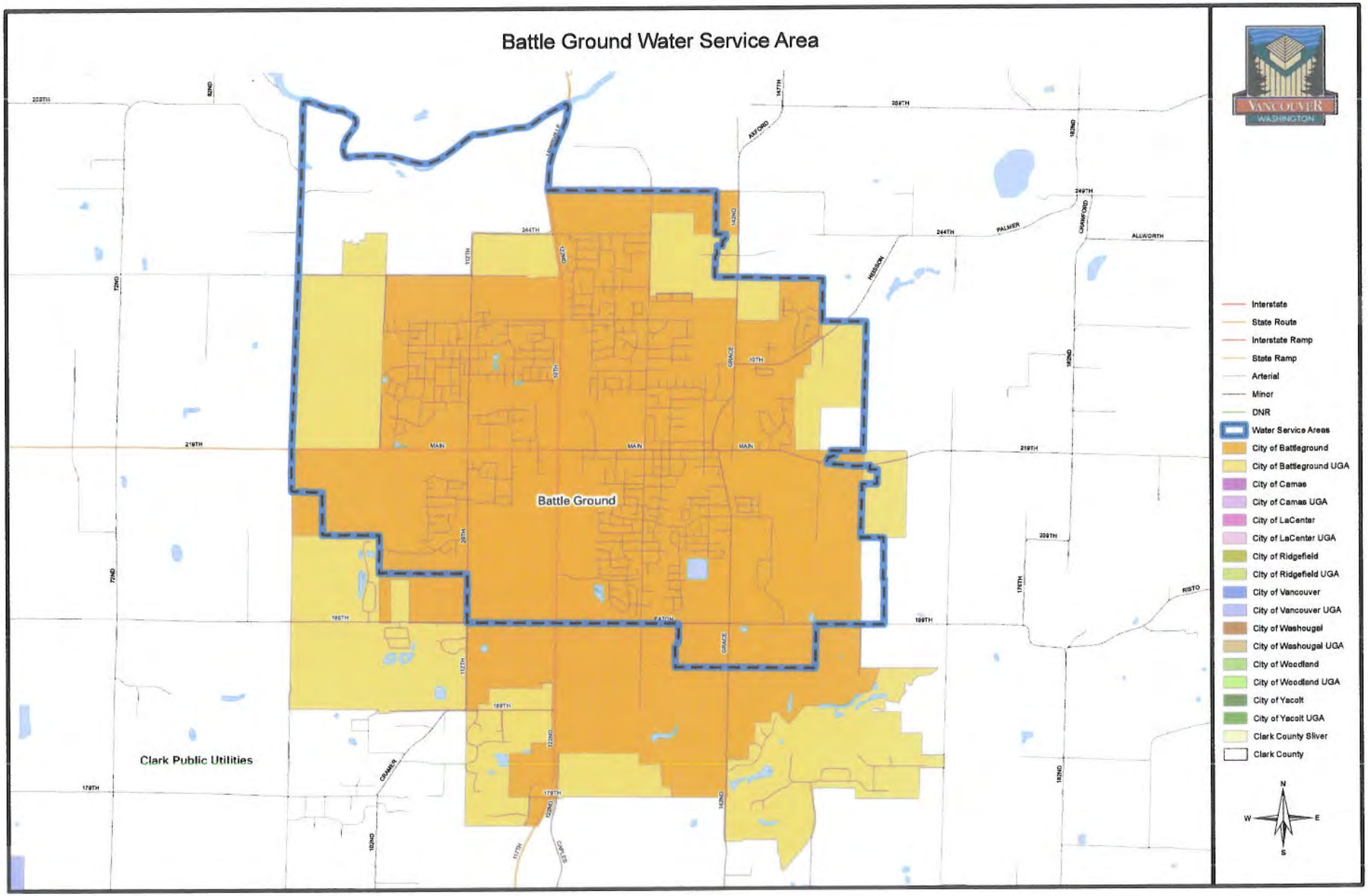
Christine Cook
Prosecuting Attorney

Future Water Service Area Boundary Maps

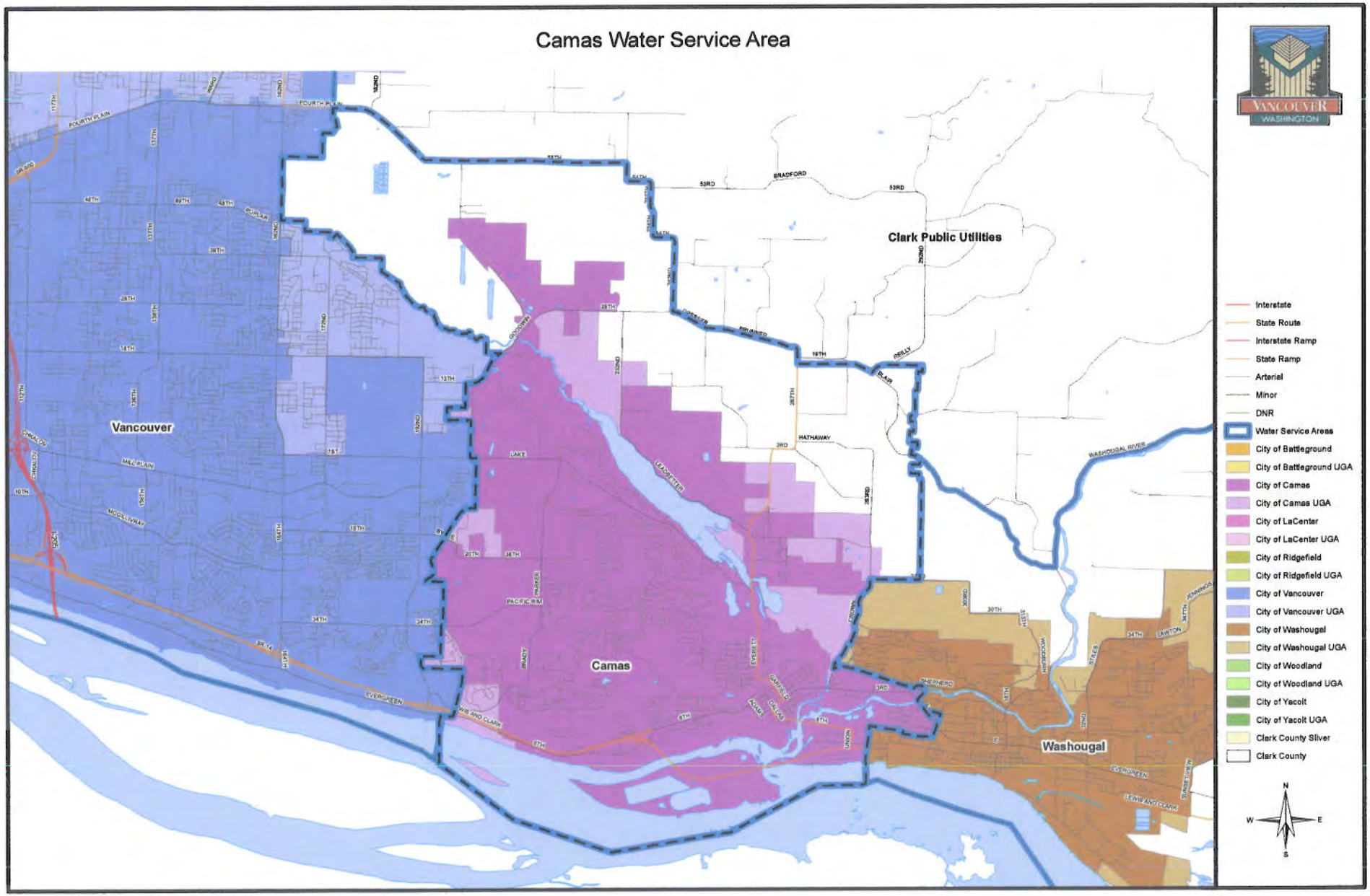
Clark County Water Service Areas



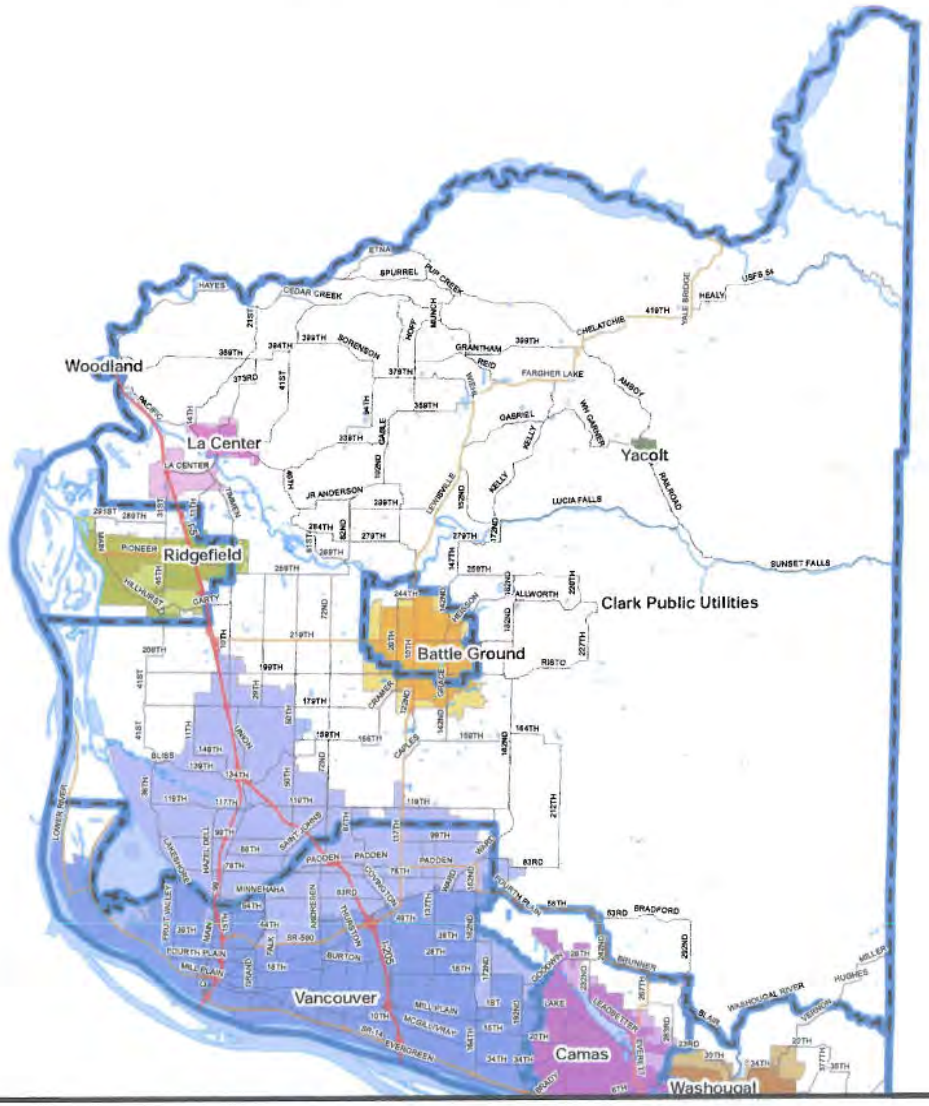
Battle Ground Water Service Area



Camas Water Service Area



Clark Public Utilities Water Service Area



- Interstate
- State Route
- Interstate Ramp
- State Ramp
- Arterial
- Water Service Areas
- City of Battleground
- City of Battleground UGA
- City of Camas
- City of Camas UGA
- City of LaCenter
- City of LaCenter UGA
- City of Ridgefield
- City of Ridgefield UGA
- City of Vancouver
- City of Vancouver UGA
- City of Washougal
- City of Washougal UGA
- City of Woodland
- City of Woodland UGA
- City of Yacolt
- City of Yacolt UGA
- Clark County Sliver
- Clark County

N
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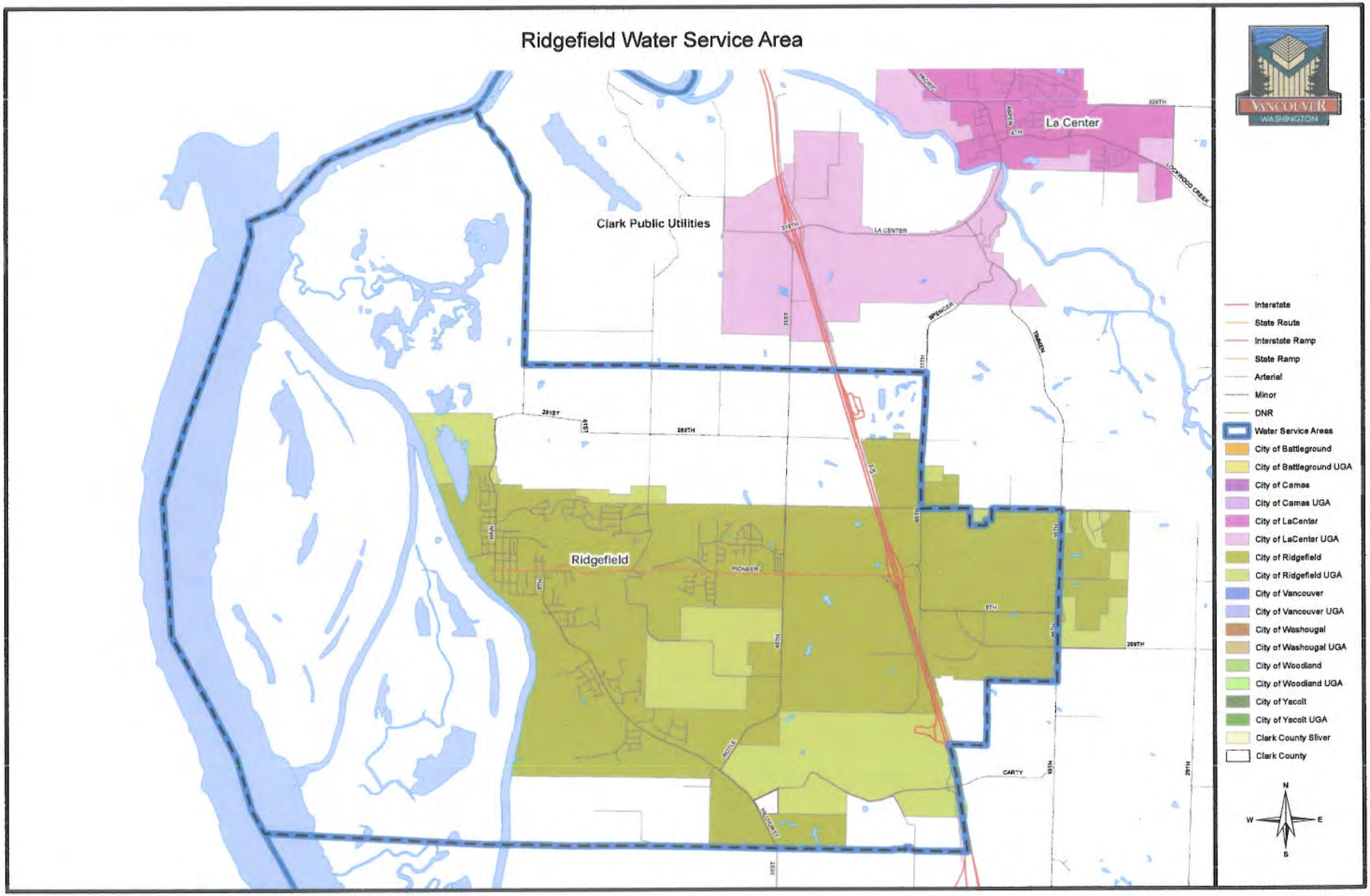
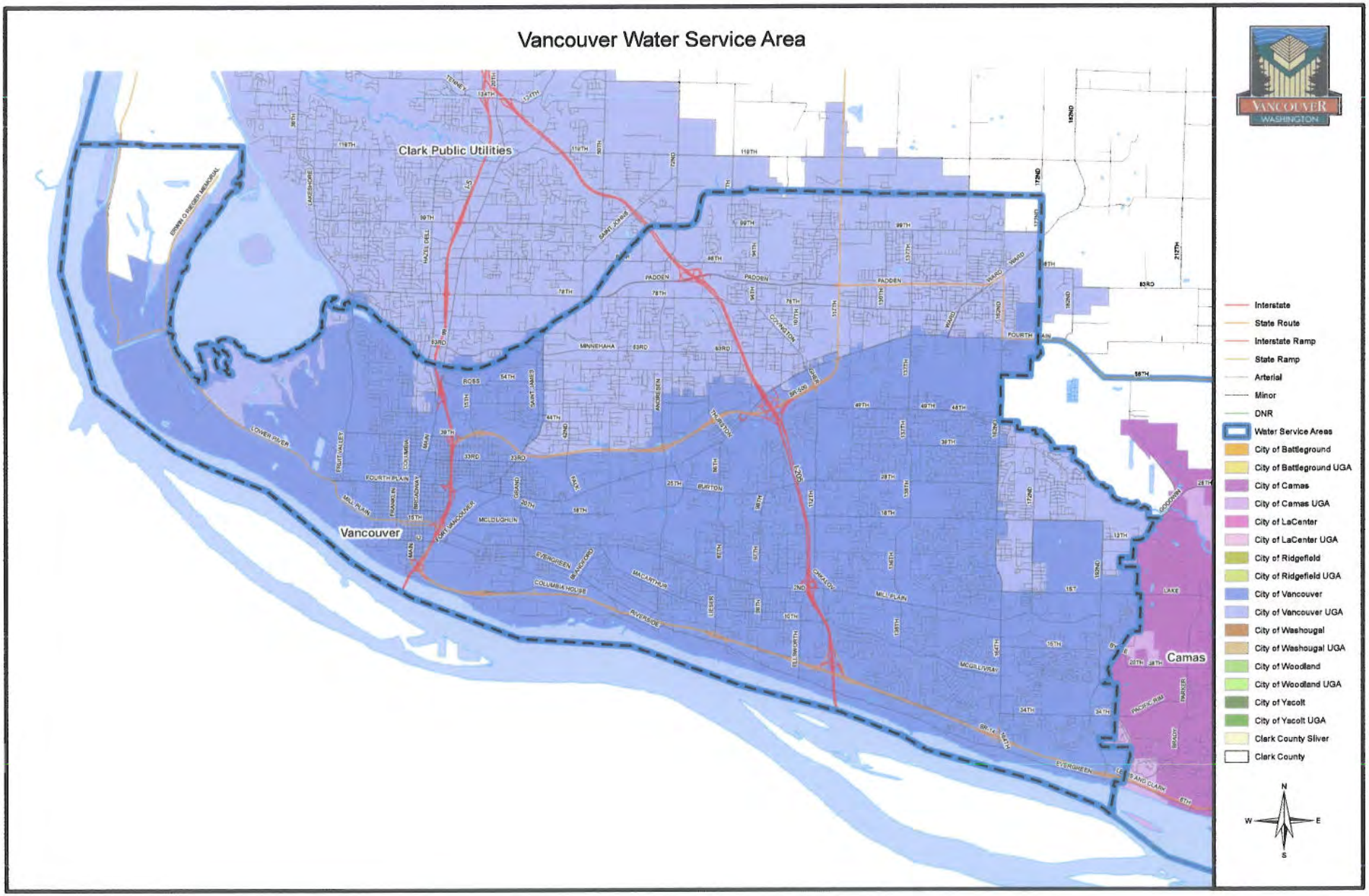
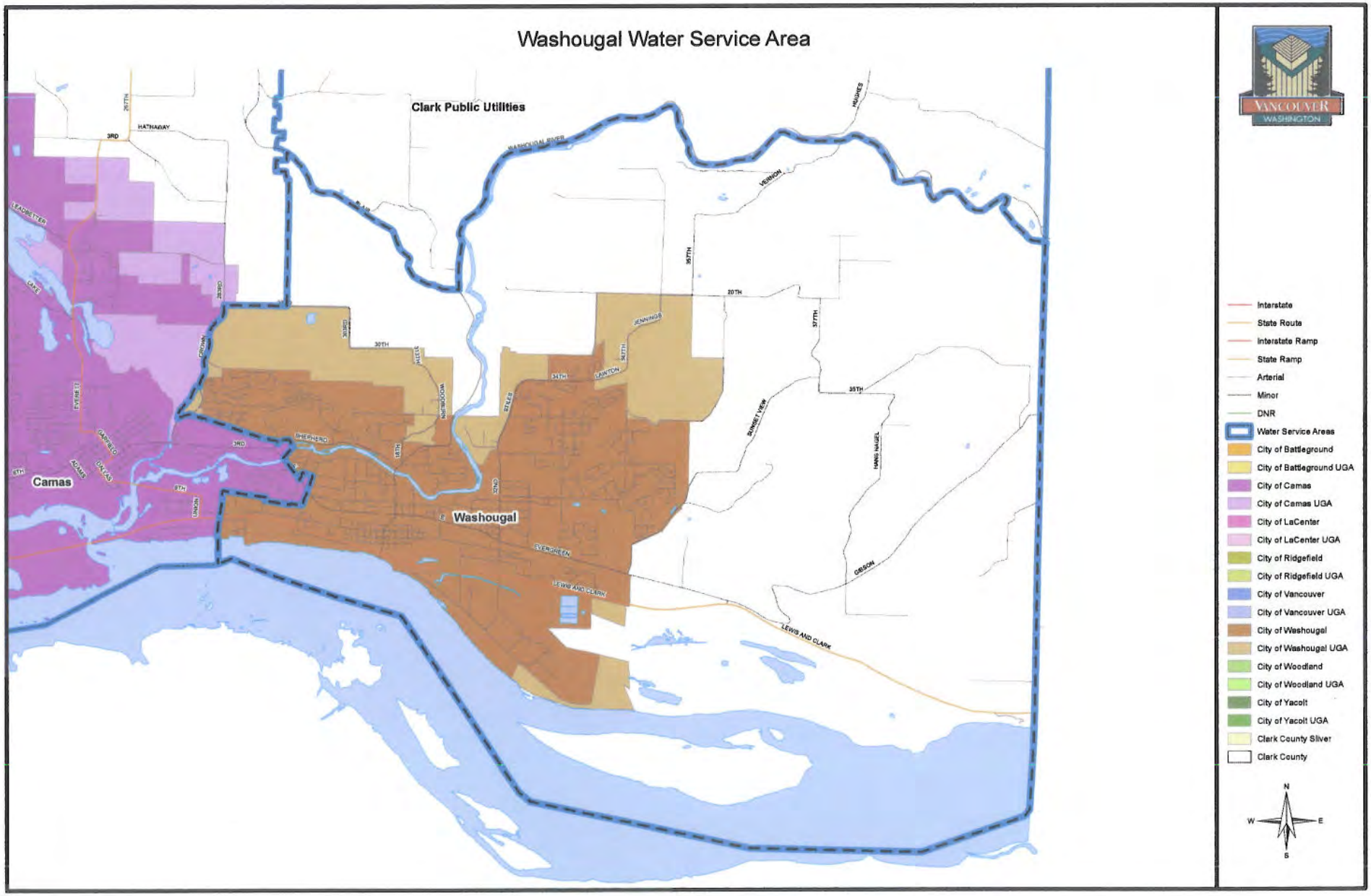
Ridgefield Water Service Area



Vancouver Water Service Area



Washougal Water Service Area



D Water Use Efficiency Policy

Clark Public Utilities

Water Use Efficiency Program

January 2008

Table of Contents

Introduction

In 2003, the Washington State Legislature passed Engrossed Second Substitute House Bill 1338, also known as the Municipal Water Law, to address the increasing demand on the state's water resources. The law calls for all municipal water suppliers to use water more efficiently in exchange for water right certainty in meeting future demand for the resource. The legislature directed the Washington Department of Health to adopt an enforceable water use efficiency program. The program, which became effective on January 22, 2007, is designed to ensure the long-term supply of drinking water, promote good stewardship of the water resources and ensure efficient operation and management of water systems.

The water use efficiency rule affects all municipal water suppliers, which includes all Group A community water systems with 15 or more residential connections and some non-community water systems that use water in a residential manner (RCW 90.03.015). Clark Public Utilities is a municipal water supplier and, therefore must develop a water use efficiency program, which is consistent with WAC 246-290-800(2), and integrate this program into its Water System Plan (WSP). The program must include water conservation goals and measures that will be undertaken to achieve these goals. It must provide for data collection and analysis intended to track water consumption and water loss from leaks in the system. The program must evaluate alternative rate structures and determine the feasibility of adopting a structure that will encourage water conservation. The following report, which generally conforms to the format suggested in the Water Use Efficiency Guidebook DOH Publication No. 331-375, describes Clark Public Utilities' Water Use Efficiency Program.

1. *General Description of Clark Public Utilities and its Water System*

Clark Public Utilities (Clark) is a customer owned utility providing electric and water service in Clark County, Washington. It is a municipal corporation organized under the laws of the state of Washington. It was formed by a vote of the people in 1938.

Clark's water utility began operating in 1951. At that time the water system was serving primarily the Hazel Dell area located immediately north of Vancouver. Over the years the utility's operation has expanded greatly within the county. Today the utility's water service area embraces over 200 square miles and includes urban, suburban and rural areas of the county, including two incorporated areas—the City of La Center and the Town of Yacolt.

Clark provides water service to approximately 80,330 people. It has 29,840 customer accounts or approximately 36,405 *equivalent residential units* (an ERU is assigned to each residential account, all other customer accounts are based upon the size of the service meter).

Clark obtains water exclusively from groundwater sources. The utility currently owns and operates 34 active wells with a total pumping capacity of 29 million gallons per day, 31 reservoirs, 52 booster stations and approximately 718 miles of water distribution lines. Weather and economic conditions are the primary determinates of water sales.

Single and multiple family residences represent over 90 percent of the utility's customers. The average residential customer consumes approximately 13,840 cubic feet or 103,520 gallons of water annually. Warm and dry weather usually results in high water sales to residential customers, while cool, wet weather results in lower sales to these customers.

Details about Clark's water system—e.g., water production capacity, seasonal variability in water consumption, water rights, water demand forecasts—are presented in the utilities Dept of Health-approved Water System Plan, which has been approved by the Washington State Dept of Health. The plan is scheduled to be updated in 2009.

2. *Existing Water Conservation Program*

Clark Public Utilities' existing water conservation program is described in its current Water System Plan. The overarching goal of the program is to promote efficient use of water resources. The program addresses supply- and demand-side conservation measures to advance water conservation.

Supply-Side Water Conservation Measures

Supply-side water conservation efforts are closely associated with the proper management of the water system. These conservation measures are continually refined. All sources of water and all service connections are metered. A state of the art telemetry system is employed to monitor the water system. Meters, water mains, supply wells, reservoirs, booster stations, pressure reducing valves and hydrants among other water facilities have been and continue to be regularly inspected, tested and maintained; and these and other

facilities are repaired and replaced as necessary. These and other conservation measures are continually refined.

As documented in Clark's 2003 Water System Plan, the cost of these supply-side system maintenance efforts averages about $250,000 per year. The amount of water saved by these efforts has been about 42 million gallons annually.

Demand-Side Water Conservation Measures

In 1992, Clark entered into an agreement with the Bonneville power administration to conduct a showerhead replacement program. The program was aimed at saving electrical power used to heat water but it also resulted in saving water. BPA provided funds to replace showerheads that emit high volumes of water with units designed to release low flows. Clark expanded the scope of this electric power and water conservation program, and extended it to assist all Clark County residents. In 1992 over half of the households in Clark County, which represented a population of approximately 100,000, took advantage of this program. Water savings were estimated to be about 77 MG/year from this program. The core elements of the program follow:

- Leak abatement—toilet and faucet leak detection, and water pressure examinations.

- Installation of low-flow showerheads, devices to reduce the amount of water used to flush toilets, and faucet aerators to reduce water flow.

- Dissemination of information on, e.g., landscaping and irrigation water conservation methods, household fixture leak detection, and household water and energy saving devices.

In 1993 the plumbing code changed to require low flow toilets and shower heads to be installed in all new houses.

Another demand-side water conservation effort focuses on educating customers and the general public about water conservation, with a particular emphasis on reducing the amount of water used during the peak demand summer period. Informational flyers are periodically mailed to utility customers with water bills. Utility employees are tasked to provide the public with information about conserving water. They respond to customer inquiries about water service matters and use the opportunity to suggest water conservation methods; staff

information booths at the annual Clark County Fair and the Home & Garden Idea Fair, and disseminate literature and respond to questions about water conservation matters; and lead students on tours of Clark's water operations center in Orchards and watershed restoration project sites in the Salmon Creek basin. Actions that may be taken to conserve water at home and surrounding landscaped areas are posted on Clark's website.

3. *Water Use Efficiency Goals*

Clark Public Utilities has long been mindful of the need to conserve water. An overarching, long-term water conservation goal expressed in Clark's Water System Plan is to foster a conservation consciousness or ethic among the residents of the county. One of the principal means by which this goal may be attained is to reduce the demand for water by the residential customers, which is the *customer class* that consumes about 90 percent of the water supplied to the system.

Clark has evaluated the results of past activities aimed at conserving water resources. It is the Utility's intent to discuss the following new goals with Clark Public Utilities Board of Commissioners during public meetings and have the goals adopted by the Board on or by January 22, 2008.

Supply-Side Water Conservation Goal

- Reduce annual leakage from the water distribution system to eight and one-half percent or less within six years.

Demand-Side Water Conservation Goal

- Reduce the average equivalent residential unit annual water consumption by a minimum of one percent within six years (approximately 41 million gallons).

4. *Existing & Future Water Use Efficiency Measures*

Clark is currently advancing the water conservation measures mandated under WAC 246-290-466 (1) (2) (3). Appropriately calibrated meters are in place at all water supply sources and service connections. Meter data is assembled in a database and queried to determine

trends in the consumption of water and generally account for the water in the system by comparing supply volume with service volume. Utility customers are continually encouraged to use water conservatively. The following is an overall outline of the existing and new measures that will be undertaken in an effort to achieve Clark's water use efficiency goals.

Supply-Side Water Conservation Goal: Reduce annual leakage from the water distribution system by eight and one-half percent or less within six years.

- Continue to hire contractors using the latest technology to detect mainline leaks.
- Improve recording/tracking of mainline flushing and new construction flushing.
- Record end line flushing and main/service leaks.
- Increase change-out of water meters exceeding 10 years of use.
- Test and re-calibrate supply well metering.
- Continue to work with and encourage the fire districts to meter or otherwise measure the amount of water used in training exercises, hydrant testing and fire fighting.
- Record water treatment backwash water that is discharged from water treatment facilities.
- Continue to replace deteriorating water mains.
- Continue to repair leaks found in the water system.
- Continue to conduct water distribution system audits. See section 6, *Distribution System Leakage Evaluation,* for information regarding the utility's water distribution system audits and leakage control efforts.
- Use newly adopted penalties for water theft without appropriate meter and connection.

Demand-Side Water Conservation Goal: Reduce the average equivalent residential unit annual water consumption by one percent within six years.

- Levy inclined block rate schedule to reduce summer demand for water consumed by all customer classes: single family, multi-family, commercial and public authority. This method of pricing involves applying a higher charge for water once the amount consumed exceeds certain thresholds, depending upon the size of the meter and the customer class. These new rates, which will become effective January 1, 2008, provide a financial incentive to reduce water demand, particularly during the peak summer period when the demand for water is most acute. See section 7, *Water Rate Structure Evaluation*, and the Clark's Inclined Block Water Rate Schedule, which is presented in the Appendices.

- Continue to post on water bills comparisons of current and past water consumption by billing period.

- Targeted marketing by send water conservation messages to customers who are high water consumers.

Other measures that currently appear too costly and time consuming to be implemented in the near term but may be re-examined and included in a future work program:

- Use of reclaimed water. See section 9, *Reclaimed Water Opportunities*

- Water conservation speaker bureaus.

- Paid advertising spots on radio, television, newspapers and periodicals promoting water conservation.

5. *Water Use Efficiency Public Education*

Informational flyers on water conservation are periodically mailed to utility customers with water bills. Educational topics include those identified in section 2, *Existing Conservation Program Demand-side Conservation Measures.*

Water utility employees are tasked to provide the public with information about conserving water. They respond to customer inquiries about water service matters and use the opportunity to suggest water conservation methods; staff information booths at the annual Clark County Fair and the Home & Garden Idea Fair, and disseminate literature and respond to questions about water conservation matters; and lead students on tours of the utility's

water operations center in Orchards and watershed restoration project sites in the Salmon Creek basin. Actions that may be taken to conserve water at home and surrounding landscaped areas are posted on Clark's website.

http://www.clarkpublicutilities.com/Residential/waterServices/waterConservation

6. *Distribution System Leakage Evaluation*

Clark accounts for water within its system by examining supply well and service meter data, and tracking the use of water for non-revenue producing purposes (e.g., water system maintenance and firefighting) and, thereby, determines how much water is lost from leaks in the water system and unauthorized use of water. Unaccounted for loss of water currently averages about nine percent annually. Clark will continue to conduct water audits and calculate the amount of water loss during a rolling three-year period, to determine whether the average percentage of water loss is above or below the 10 percent standard. If the average exceeds this standard Clark will adjust its leakage control action plan accordingly.

7. *Water Rate Structure Evaluation*

Clark had a flat water rate structure, i.e., a fixed rate for all classes of customers regardless of how much water they consumed. One-time service connection fees and system development charges are also assessed based upon the customer class and meter size, which enables the utility to recover some of the cost of providing water to its growing number of customers. However, even with the additional one-time charges, the flat rate applied to water consumed did not enable the utility to equitably recover the cost of providing water during the peak demand summer period, a time when water consumption by some residential customers is three times the annual average consumption by all customers. Moreover, the flat rate did not provide a sufficient incentive to conserve water.

The residential customer class accounts for approximately 77 percent of the water consumed. The average monthly residential water consumption is approximately 1,153 cubic feet. The average monthly production during the summer peak demand period is three times the winter average demand. In order to meet production for all customers, it costs the utility roughly 60 percent more to provide water during the summer demand months than the winter

months. The block rate was set to correspond closely to the average residential usage (1,200 cu. ft.) multiplied by the peaking factor (3) for summertime production. This data established the block usage of 3,600 cu. ft. per month for a residential customer or one ERU. Other than the residential customer class, each meter size was given an ERU multiplier based on the ratio between the area of the actual meter requested and the area of a 5/8" diameter meter, which was used as the base meter. The rate for water consumed over the block was given a multiplier of 60 percent over the current rate. Graphs entitled *Residential Customer Water Use Patterns* and *Water Consumption by Revenue Class* are presented in the Appendices.

Recognizing the drawbacks of the flat rate structure in recovering the cost of providing water to customers and its disincentive for customers to conserve water, Clark adopted an inclined block water rate that takes into account the customer class and meter size. It is a tiered rate that reflects the increased cost of supplying water to the system during the peak use summer period, when the demand for water is generally three times the average over the year. When a customer uses more than the amount of water allotted under its block, the rate increases by 60 percent—from $1.38 to $2.21. This new rate structure was adopted by the Clark Public Utilities Board of Commissions on October 23, 2007, and it will become effective January 1, 2008. Clark's *Inclining Block Water Rate Schedule* is presented in the Appendices.

8. *Projected Water Savings Estimate*

The per capita use of water has declined by approximately 13 percent since the inception of Clark's water conservation program in 1993. In the 1993 Water System Plan the gallons per capita day (gpcd) used for demand projections was 128 gpcd. In 2006 the average daily demand was 111 gpcd for the residential customer class. Existing and future conservation measures, including the new inclined block water rate, are likely to further reduce peak daily and seasonal demand for water. The new rate structure is expected to result in a reduction in water demand, especially during the summer peak demand period.

It is difficult to predict the success of Clark's water conservation strategy, as many unforeseen circumstances may arise in Clark's large, rapidly urbanizing service area. It is hoped that the inclined block water rates will result in an additional water savings of approximately 120 million gallons per year, bringing the total annual water savings as a result of Clark's conservation program to approximately 160 million gallons annually within six years.

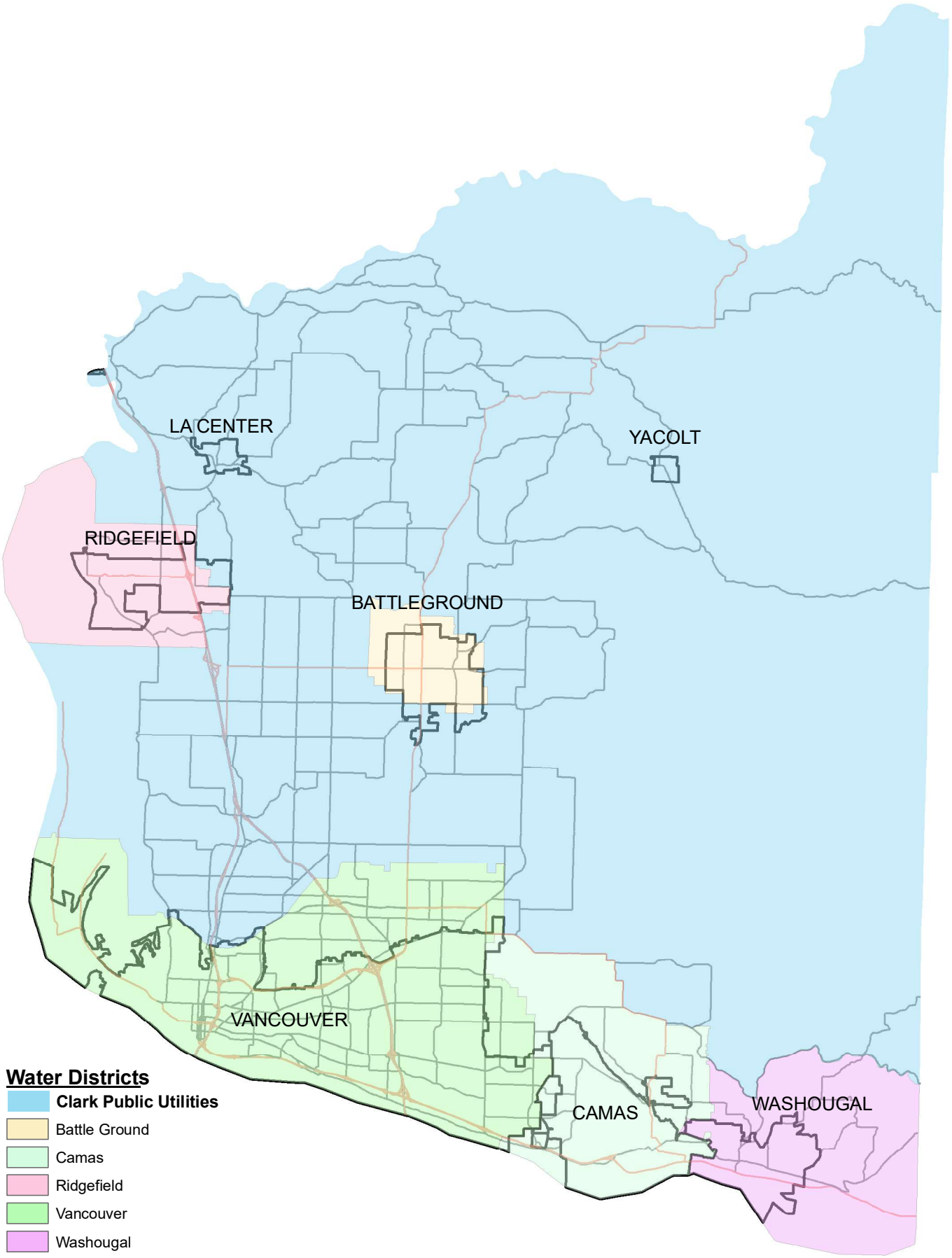
9. *Reclaimed Water Opportunities*

Clark continues to explore water reuse opportunities, particularly those involving reclaiming high quality effluent from upgraded wastewater treatment facilities, consistent with WAC 246-290-100 (4) (f) (vii). However, it is currently very costly to upgrade wastewater treatment facilities and continuously monitor treatment processes, in order to meet the stringent environmental standards necessary to secure permits to reuse water discharged from these facilities.

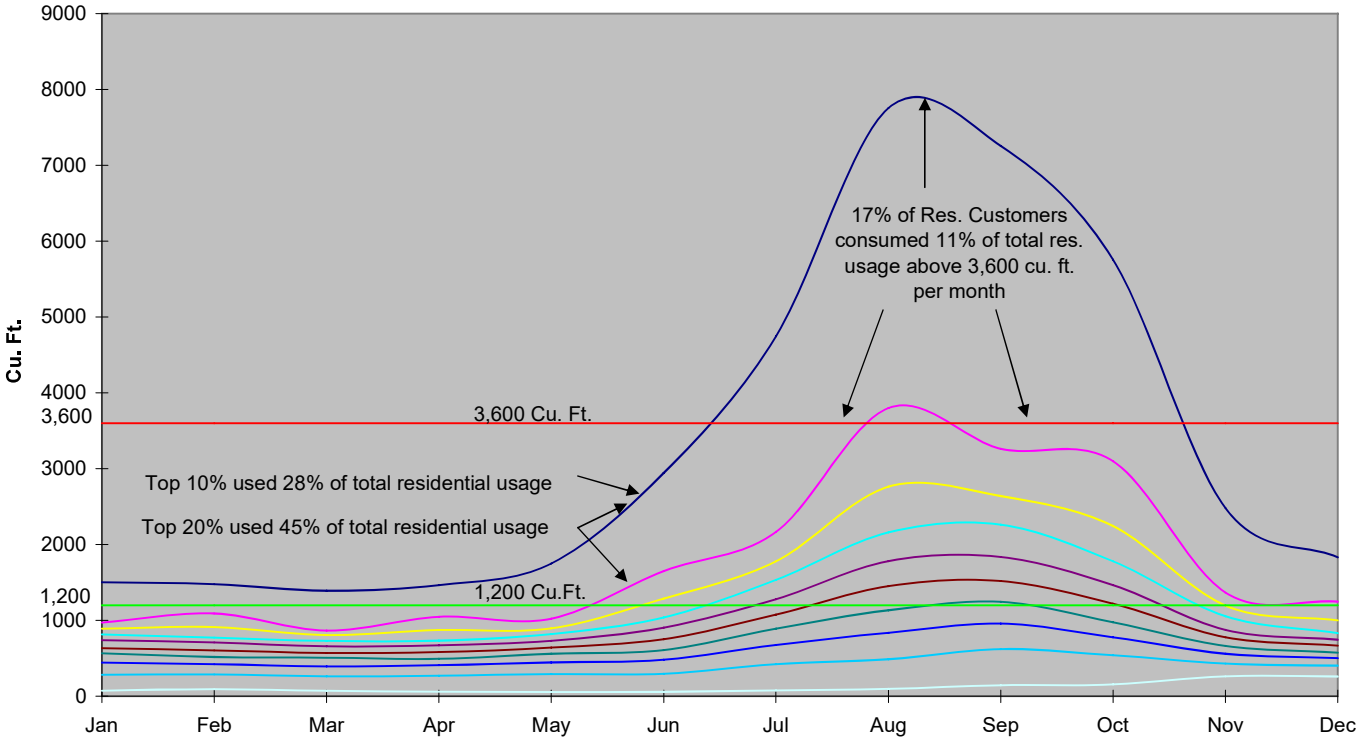
10. Water Use Efficiency Program Evaluation

Clark Public Utilities will complete Performance Report DOH Form No. 331-376 annually, which is presented in the Appendices. The report will include information about how much water has been produced, how much has been lost through leaks in the water systems and the status of achieving the water savings targets embedded in the water use efficiency goals. The report will be submitted to the Washington State Dept of Health by July 1 of each year. Progress toward meeting Clark's Water Use Efficiency Goals will also be provided to our customers in the annual Consumer Confidence Report mailed by July 1st of each year.

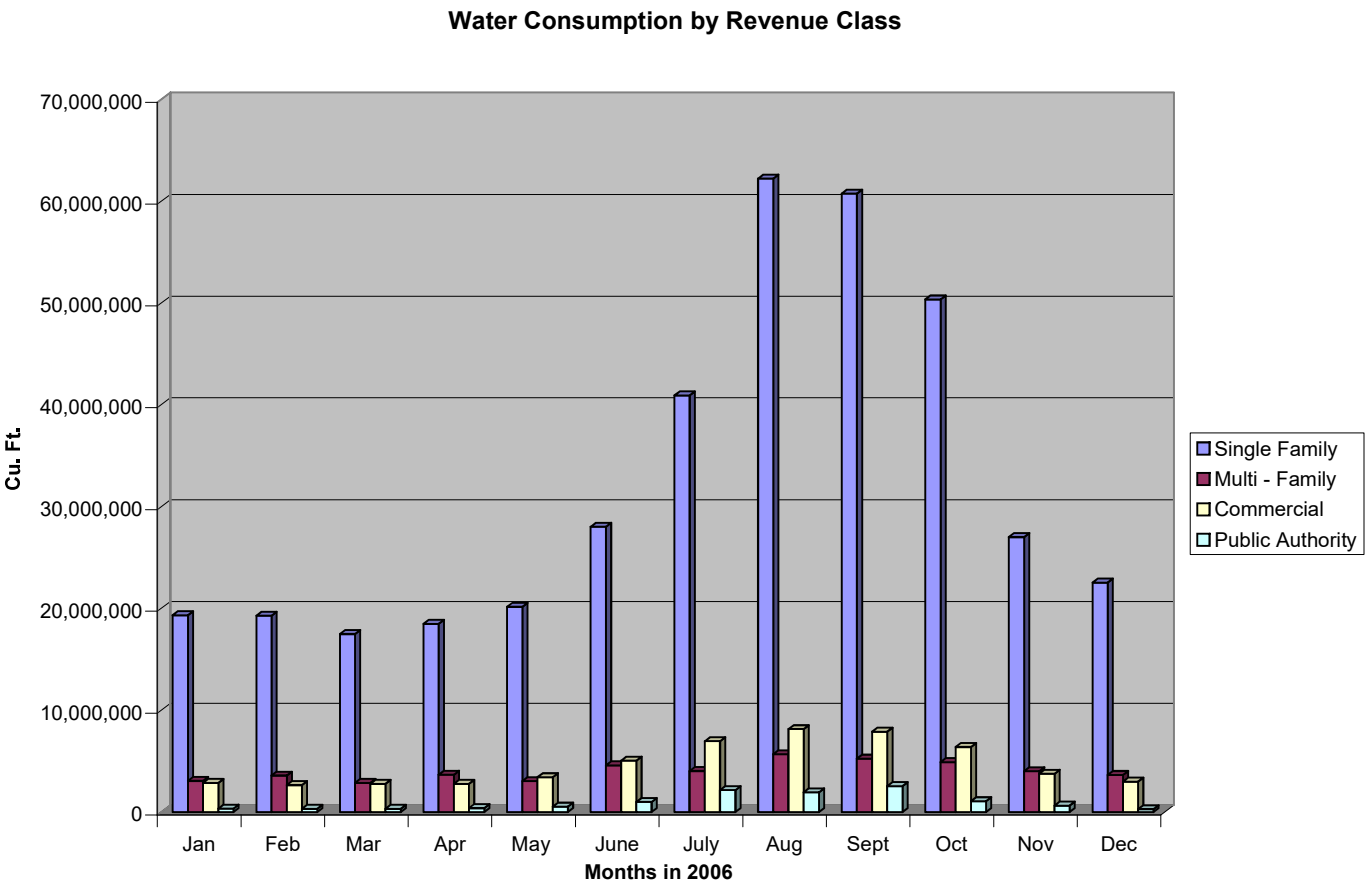
Clark County Water Service Areas



2006 Residential Annual Average Usage Based On Percentage For All Meters -
10% increments represent sets of 2792 Customers from highest to lowest usage



Sets of 2,792 customers from highest to lowest usage


Water Consumption by Revenue Class
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
Cu. Ft.
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Oct
Nov
Dec
Months in 2006
Single Family
Multi - Family
Commercial
Public Authority

Clark Public Utilities Inclined Block Water Rate Schedule

Residential

Schedule	Revenue class	Base Block	Multiplier	Tiered break point
51	1	3600	1	3,600
52	1	3600	2.5	9,000
55	1	3600	5	18,000

Multi-family

Schedule	Revenue class	Base Block	Multiplier	Tiered break point
53	11	3600	1	3,600
54	11	3600	2.5	9,000
55	11	3600	5	18,000
56	11	3600	10	36,000
57	11	3600	23	82,800
58	11	3600	41	147,600
59	11	3600	92	331,200

Commercial

Schedule	Revenue class	Base Block	Multiplier	Tiered break point
53	3	3600	1	3,600
54	3	3600	2.5	9,000
55	3	3600	5	18,000
56	3	3600	10	36,000
57	3	3600	23	82,800
58	3	3600	41	147,600
59	3	3600	92	331,200

Public Authority

Schedule	Revenue class	Base Block	Multiplier	Tiered break point
53	3	3600	1	3,600
54	3	3600	2.5	9,000
55	3	3600	5	18,000
56	3	3600	10	36,000
57	3	3600	23	82,800
58	3	3600	41	147,600
59	3	3600	92	331,200

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

Annual Water Use Efficiency Performance Report Form

Please refer to the *Getting Started – Water Use Efficiency Guidebook*, DOH Pub. 331-375, for help in filling out this form.

General System Information:

System Name:

System ID #:

County:

Your Name:

Your Title:

Your Phone Number: ( ) -

Today's Date:

Production and Distribution System Leakage Information:

12-Month Performance Reporting Period:

/ to / (Month/Year)

Distribution System Leakage Summary:	
Total Water Produced and Purchased – Annual Volume	☐ millions of gallons* ☐ gallons*
Distribution System Leakage – Volume	☐ millions of gallons* ☐ gallons*
Distribution System Leakage – Percent	%

**Report volume in millions of gallons or gallons: 1 cubic foot = 7.48 gallons*

DSL = [(TP - AC) / TP] x 100

Percent of Distribution System Leakage (DSL)
Total Water Produced and Purchased (TP)
Authorized Consumption (AC)

Goal Setting Information:

Date of Public Forum: (Month/ Date/Year)
Note: Goals must be established through a public process.

Has goal been changed since last performance report? ☐ Yes ☐ No

In the following section, provide a narrative on progress in reaching your goals. Include the following information:

1. Identify water savings goals.
2. Identify the time schedule for achieving goals.
3. Describe progress made toward achieving goals, such as:
   - Estimate how much water you have saved.
   - Report progress toward meeting goals within your established timeframe.
   - If you are not on track to reach your goals, identify any adjustments or changes to your WUE measures.
   - Include any other information that helps you tell your story.

Note: If you cannot complete electronically, attach separate pages with general system information at the top.

Meter Installation Information:

Is your system fully metered? ☐ Yes ☐ No

If yes, / (Month/Year) If no, complete the rest of this section.

Date for completing installation on all existing connections and interties:

/ (Month/Year) Due by January 22, 2017

Describe your progress in metering and any efforts taken to minimize leakage:

Note: If you cannot complete electronically, attach separate pages with general system information at the top.

Return this completed form to:

E-mail: wue@doh.wa.gov
Mail: WUE Program, Office of Drinking Water
PO Box 47822, Olympia, WA 98504-7822
FAX: (360) 236-2252

For more information, contact a regional planner:

Eastern Regional Office – Spokane – Main Office: 509-456-3115
Southwest Regional Office – Tumwater – Main Office: 360-236-3030
Northwest Regional Office – Kent – Main Office: 253-395-6750

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

Date Submitted: 6/4/2019

Water Use Efficiency
Annual Performance Report - 2018

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *John Roth*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2018* To *12/31/2018*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*4,469,862,474* gallons
Authorized Consumption (AC) – Annual Volume	*4,156,741,776* gallons
Distribution System Leakage – Annual Volume TP – AC	*313,120,698* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*7.0 %*
3-year annual average	*7.4 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

The WUE program will be updated as part of the Water System Plan Update in 2020

Additional Information Regarding Supply and Demand Side WUE Efforts

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

The WUE program will be updated as part of the Water System Plan Update in 2020

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

Date Submitted: 3/13/2018

Water Use Efficiency
Annual Performance Report - 2017

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *John Roth*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2017* To *12/31/2017*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*4,223,181,373* gallons
Authorized Consumption (AC) – Annual Volume	*3,873,235,486* gallons
Distribution System Leakage – Annual Volume TP – AC	*349,945,887* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*8.3 %*
3-year annual average	*8.2 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

Reduce average residential annual water consumption by 1% has been achieved. There has been a steady and general trend downward in average annual residential use. The Clark PUD is due for A goal update. Ideally a goal update would occur simultaneously with a Water System Plan Update.

Additional Information Regarding Supply and Demand Side WUE Efforts

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

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

Date Submitted: 6/21/2017

Water Use Efficiency
Annual Performance Report - 2016

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *John Roth*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2016* To *12/31/2016*

Incomplete or missing data for the year? *No*

If yes, explain:

Water metering data is complied from (3) sources. Billing information is used to compile customer consumption records and a log is kept for water use for operational purposes such as but not limited to online analyzers, flushing or tank cleaning. Production data is complied from historical SCADA records and monthly production reports. These information sources are compared as closely as practical and the information herein is as accurate as records allow.

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*3,848,126,937* gallons
Authorized Consumption (AC) – Annual Volume	*3,581,664,016* gallons
Distribution System Leakage – Annual Volume TP – AC	*266,462,921* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*6.9 %*
3-year annual average	*9.1 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

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

Date Submitted: 6/6/2016

Water Use Efficiency
Annual Performance Report - 2015

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *John Roth*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2015* To *12/31/2015*

Incomplete or missing data for the year? *No*

If yes, explain:

Records show excellent levels of data. A long time employee of the utility recently retired and though the records are excellent some of the context has been lost. The Clark Public Utilities System and the systems' operated by Clark Public Utilities share the same databases, spreadsheets and billing system. This added level of complexity when identifying customers and pairing them with the corresponding water system is as accurate as possible.

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*4,151,332,608* gallons
Authorized Consumption (AC) – Annual Volume	*3,757,781,478* gallons
Distribution System Leakage – Annual Volume TP – AC	*393,551,130* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*9.5 %*
3-year annual average	*8.9 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

Reduce the ave equivalent unit annual water consumption by a minimum of 1% within six years (2013). Goals will be updated concurrently with water system planning update.

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

Date Submitted: 6/14/2015

Water Use Efficiency
Annual Performance Report - 2014

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *Steve Prather*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2014* To *12/31/2014*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*3,830,541,100* gallons
Authorized Consumption (AC) – Annual Volume	*3,418,012,400* gallons
Distribution System Leakage – Annual Volume TP – AC	*412,528,700* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*10.8 %*
3-year annual average	*8.5 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

In 2014 the demand side use increased approximately 4% above 2013. The summer of 2014 was warmer and dryer than 2013 resulting in more outdoor water use. In addition, approximately 400 new connections were added plus the city of Battle Ground purchased 21,715,000 gallons during the summer. The tiered rate structure established in 2008 and modified in 2009 by Clark Pubic Utilities' Board continues to be effective in reducing customer usage.

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

Date Submitted: 6/24/2014

Water Use Efficiency
Annual Performance Report - 2013

WS Name: CLARK PUBLIC UTILITIES Water System ID# : 13333 WS County: CLARK

Report submitted by: *Steve Prather*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2013* To *01/01/2014*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*3,558,946,500* gallons
Authorized Consumption (AC) – Annual Volume	*3,335,854,550* gallons
Distribution System Leakage – Annual Volume TP – AC	*223,091,950* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*6.3 %*
3-year annual average	*8.0 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *12/23/2008* Has goal been changed since last performance report? *No*

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

WUE Goals:

Customer Goal (Demand Side):

Reduce the ave equivalent residential unit annual water consumption by a minimum of 1% within six years (2013).

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

In 2013 the demand side use was reduced by 1.6% or 54.7 million gallons from 2012 demand. The demand side goal has been acheived for the last 3 years. The teired rate structure adopted by the Clark Public Utilitie's Board of Commissioners has been the primary driving force as well as efforts to inform water custormers of the importance of water conservation.

Additional Information Regarding Supply and Demand Side WUE Efforts

E 2021 Water Rate Schedules

TABLE OF CONTENTS

RATE SCHEDULES FOR WATER SERVICE

PUBLIC UTILITY DISTRICT NO. 1 OF CLARK COUNTY

REVENUE CLASS 1

WATER SYSTEM

RESIDENTIAL SERVICE

APPLICABILITY

This revenue class applies to all single-family residences and single-family mobile homes.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
51 (A or A/B Meter)	5/8" x ¾" or ¾"	$ 9.00	0 – 1,800	1,801 – 3,600	Over 3,600
52 (B Meter)	1"	$16.10	0 – 4,500	4,501 – 9,000	Over 9,000
55 (C Meter)	1 ½"	$36.00	0 – 9,000	9,001 – 18,000	Over 18,000

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for nonessential household purposes.

REVENUE CLASS 11

WATER SYSTEM

RESIDENTIAL SERVICE
MULTIPLE FAMILY

APPLICABILITY

This rate class applies to all multiple family units of two or more units including apartments and mobile home courts.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE AND VOLUME PER BLOCK

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
53 (A or A/B Meter)	5/8" x ¾" or ¾"	$ 9.00	0 – 1,800	1,801 – 3,600	Over 3,600
54 (B Meter)	1"	$ 16.10	0 – 4,500	4,501 – 9,000	Over 9,000
55 (C Meter)	1 ½"	$ 36.00	0 – 9,000	9,001 – 18,000	Over 18,000
56 (D Meter)	2"	$ 64.15	0 – 18,000	18,001 – 36,000	Over 36,000
57 (E Meter)	3"	$ 144.00	0 – 41,400	41,401 – 82,800	Over 82,800
58 (F Meter)	4"	$ 256.05	0 – 73,800	73,801 – 147,600	Over 147,600
59 (G Meter)	6"	$ 572.80	0 – 165,600	165,601 – 331,200	Over 331,200
60 (H Meter)	8"	$1018.15	0 – 295,200	295,201 – 590,400	Over 590,400

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for any nonessential household purposes.

REVENUE CLASS 3

WATER SYSTEM

COMMERCIAL SERVICE

APPLICABILITY

This revenue class applies to all nonresidential service not otherwise specifically classified.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE AND VOLUME PER BLOCK

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
53 (A or A/B Meter)	5/8" x ¾" or ¾"	$ 9.00	0 – 1,800	1,801 – 3,600	Over 3,600
54 (B Meter)	1"	$ 16.10	0 – 4,500	4,501 – 9,000	Over 9,000
55 (C Meter)	1 ½"	$ 36.00	0 – 9,000	9,001 – 18,000	Over 18,000
56 (D Meter)	2"	$ 64.15	0 – 18,000	18,001 – 36,000	Over 36,000
57 (E Meter)	3"	$ 144.00	0 – 41,400	41,401 – 82,800	Over 82,800
58 (F Meter)	4"	$ 256.05	0 – 73,800	73,801 – 147,600	Over 147,600
59 (G Meter)	6"	$ 572.80	0 – 165,600	165,601 – 331,200	Over 331,200
60 (H Meter)	8"	$1018.15	0 – 295,200	295,201 – 590,400	Over 590,400

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for any nonessential household purposes.

REVENUE CLASS 0

WATER SYSTEM

PUBLIC AUTHORITIES SERVICE

APPLICABILITY

This revenue class applies to schools, municipalities, political subdivisions, or agencies of county, state, or federal governments.

MONTHLY CHARGE

The sum of the basic charge per meter and the volume charge for water used.

MONTHLY VOLUME CHARGE

$1.85 per 100 cubic feet (ccf) – Block 1
$2.40 per 100 cubic feet (ccf) – Block 2
$2.95 per 100 cubic feet (ccf) – Block 3

These rates will be applied on a daily basis using a 30-day average.

MONTHLY BASIC CHARGE AND VOLUME PER BLOCK

Schedule (Suffix)	Meter	Basic Charge	Block 1 (Cubic Feet)	Block 2 (Cubic Feet)	Block 3 (Cubic Feet)
53 (A or A/B Meter)	5/8" x ¾" or ¾"	$ 9.00	0 – 1,800	1,801 – 3,600	Over 3,600
54 (B Meter)	1"	$ 16.10	0 – 4,500	4,501 – 9,000	Over 9,000
55 (C Meter)	1 ½"	$ 36.00	0 – 9,000	9,001 – 18,000	Over 18,000
56 (D Meter)	2"	$ 64.15	0 – 18,000	18,001 – 36,000	Over 36,000
57 (E Meter)	3"	$ 144.00	0 – 41,400	41,401 – 82,800	Over 82,800
58 (F Meter)	4"	$ 256.05	0 – 73,800	73,801 – 147,600	Over 147,600
59 (G Meter)	6"	$ 572.80	0 – 165,600	165,601 – 331,200	Over 331,200
60 (H Meter)	8"	$1018.15	0 – 295,200	295,201 – 590,400	Over 590,400

TERMS OF SERVICE

Service under this rate is subject to the District's general terms and conditions for water service. The District reserves the right to regulate at all times the hours when customers will be permitted to use District water for any nonessential household purposes.

REVENUE CLASS 5

WATER SYSTEM

OTHER PUBLIC AUTHORITIES

SPECIAL CONTRACTS

APPLICABILITY

This revenue class applies to governmental agencies having special contractual arrangements with the District for net billing of water supplied applicable only to public authorities.

MONTHLY RATE VOLUME CHARGE

Net billing rate reflecting the net cost of service

TERMS OF SERVICE

Service under this rate is subject to the District's special contracts and agreements with the governmental agencies.

REVENUE CLASS 2

WATER SYSTEM

PRIVATE FIRE HYDRANTS

APPLICABILITY

This revenue class applies to private fire hydrants used to meet private fire protection.

MONTHLY RATE VOLUME CHARGE

$25.50 PER PRIVATE HYDRANT

TERMS OF SERVICE

Service will be made available only at locations on water mains of not less than six inches in diameter. The private fire hydrants shall be subject to approval by Clark Public Utilities, and in any event, shall meet all fire flow requirements of the appropriate regulatory agencies. The District's general terms and conditions for water service shall apply.

FEE SCHEDULES FOR WATER SERVICE

PUBLIC UTILITY DISTRICT NO. 1 OF CLARK COUNTY

Schedule of Fees and Charges

WATER

SERVICE INSTALLATION FEES

Service Size	Fee
Up to 1"	$2,200
1 ½" and larger	Time and Materials

Customers requesting services larger than one inch will be billed for time and material costs for the installation of the service.

METER SET FEES

Meter Size	Fee	
5/8" x ¾" or ¾"	$ 175	
1"	$ 225	
1 ½	$ 6302"	$1,225
3"	$1,870	
4"	$3,385	
6"	$4,055	
8"	$5,985	

For meters 1 ½" and larger the meter set fee is payable at the time of application for water service.

SYSTEM DEVELOPMENT CHARGE

Meter Size	Fee
5/8" x ¾"	$ 2,900
¾"	$ 4,170
1"	$ 7,430
1 ½"	$ 16,710
2"	$ 29,690
3"	$ 66,810
4"	$ 118,790
6"	$ 267,270
8"	$ 475,130

For meters 1 ½" and larger the System Development Charge is payable at the time of application for water service.

IV. MISCELLANEOUS FEES

Unauthorized Connection or Unauthorized Use: $350 administrative charge plus actual time, materials and usage

Temporary Water Service (Hydrant) $75 installation

$4 per day

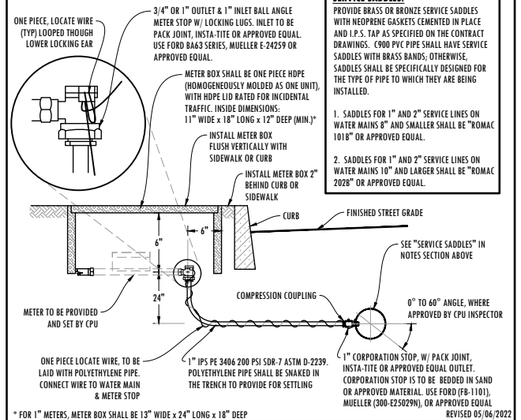
$1.85 per 100 cubic feet usage

F Construction Standards

REVISED 05/06/2022

NOTES:

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE LATEST EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. A WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK.
3. WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
5. A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
6. LOCATE WIRE SHALL BE COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
7. METER BOX ASSEMBLIES SHALL BE ARMORCAST, RAVEN, DFW OR APPROVED EQUAL.
8. NO CONNECTIONS WILL BE ALLOWED TO AN EXISTING SERVICE PRIOR TO AN APPROVED PURITY TEST. PURITY TEST SHALL PRECEDE PRESSURE TEST.
9. STUB SERVICES SHALL BE PRESSURE TESTED WITH THE MAIN LINE AND BE CAPABLE OF WITH-STANDING THE MAINS TEST PRESSURE.
10. WATER METER BOX SHALL BE PLACED IN NON-PAVED AREAS, OUT OF CONFLICT WITH DRIVEWAYS, LANDSCAPING AND OTHER UTILITIES.
11. ALL COMPRESSION FITTINGS TO HAVE STAINLESS STEEL INSERTS.



SERVICE SADDLES:
PROVIDE BRASS OR BRONZE SERVICE SADDLES WITH NEOPRENE GASKETS CEMENTED IN PLACE AND I.P.S. TAP AS SPECIFIED ON THE CONTRACT DRAWINGS. C900 PVC PIPE SHALL HAVE SERVICE SADDLES WITH BRASS BANDS; OTHERWISE, SADDLES SHALL BE SPECIFICALLY DESIGNED FOR THE TYPE OF PIPE TO WHICH THEY ARE BEING INSTALLED.

1. SADDLES FOR 1" AND 2" SERVICE LINES ON WATER MAINS 8" AND SMALLER SHALL BE "ROMAC 1018" OR APPROVED EQUAL.

2. SADDLES FOR 1" AND 2" SERVICE LINES ON WATER MAINS 10" AND LARGER SHALL BE "ROMAC 2028" OR APPROVED EQUAL.

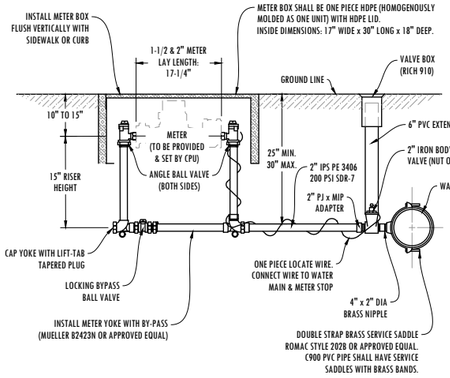
* FOR 1" METERS, METER BOX SHALL BE 13" WIDE x 24" LONG x 18" DEEP

REVISED 05/06/2022

FILE NAME		STANDARD 1" WATER SERVICE WITH 5/8", 3/4" OR 1" WATER METER	Clark Public Utilities
1W			
SHEET	1 OF 1	STANDARD DETAILS	

NOTES:

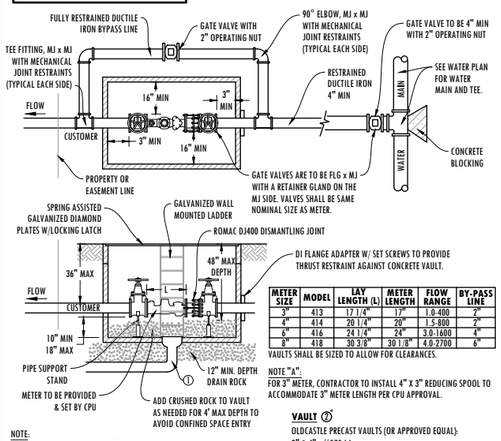
1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE LATEST EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. A WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK.
3. WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
5. A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
6. LOCATE WIRE SHALL BE COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
7. NO CONNECTIONS WILL BE ALLOWED TO AN EXISTING SERVICE PRIOR TO AN APPROVED PURITY TEST. PURITY TEST SHALL PRECEDE PRESSURE TEST.
8. STUB SERVICES SHALL BE PRESSURE TESTED WITH THE MAIN LINE AND BE CAPABLE OF WITH-STANDING THE MAINS TEST PRESSURE.
9. ALL COMPRESSION FITTINGS TO HAVE STAINLESS STEEL INSERTS.



REVISED 04/17/2020

FILE NAME		2" WATER SERVICE WITH 1-1/2" OR 2" WATER METER	Clark Public Utilities
2W			
SHEET	1 OF 1	STANDARD DETAILS	

ALL METERS SHALL BE INSTALLED BY CLARK PUBLIC UTILITIES



METER SIZE	MODEL	LAY LENGTH (L)	METER LENGTH	FLOW RANGE	BY-PASS LINE
3"	413	17 1/4"	17"	1.0-400	2"
4"	414	20 1/4"	20"	1.5-800	2"
6"	416	24 1/4"	24"	3.0-1600	4"
8"	418	30 3/8"	30 1/8"	4.0-2700	6"

VAULTS SHALL BE SIZED TO ALLOW FOR CLEARANCES.

NOTE "A":
FOR 3" METER, CONTRACTOR TO INSTALL 4" X 3" REDUCING SPOOL TO ACCOMMODATE 3" METER LENGTH PER CPU APPROVAL.

NOTE:
1. ALL JOINTS SHALL BE RESTRAINED FROM THE MAIN LINE TEE TO PROVIDE FOR METER REMOVAL. PIPE MATERIAL SHALL BE DI.
2. PRIOR TO METER INSTALLATION, GATE VALVES SHALL BE ALIGNED & SPACED W/ RIGID SPOOL (DRILLED WITH HOLES SO AS NOT TO ALLOW WATER PASSAGE). CONTACT CPU WATER UTILITY FOR DISTANCE BETWEEN METER GATE VALVES PRIOR TO INSTALLATION. (360-992-8022)
3. TEN PIPE DIAMETERS OF STRAIGHT PIPE REQ'D. IN & OUT OF METER.
4. INSTALL VAULT IN SOFT-SCAPE AREA, VERTICALLY FLUSH WITH CURB OR SIDEWALK.
5. IF VAULT MUST BE LOCATED IN A WALKING AREA, A NON-SKID TRAFFIC RATED LID SHALL BE REQUIRED.

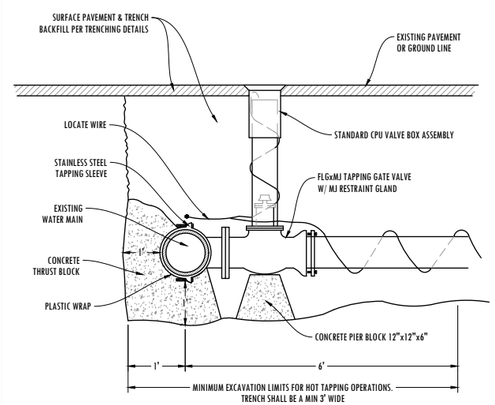
VAULT ②
OLDCASTLE PRECAST VAULTS (OR APPROVED EQUAL).
3" & 4": #575-LA
6" & 8": #676-WA

① A 4-INCH DRAIN LINE SHALL BE EXTENDED TO AN APPROVED DRAINAGE OUTLET. IN LOCATIONS W/ NO FEASIBLE DRAINAGE SYSTEM, DRAIN MAY BE CONNECTED TO A CPU APPROVED DRYWELL SYSTEM.

② VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION

REVISED 07/30/2020

FILE NAME		3", 4", 6" AND 8" STANDARD METER INSTALLATION DETAILS	Clark Public Utilities
3W			
SHEET	1 OF 1	STANDARD DETAILS	

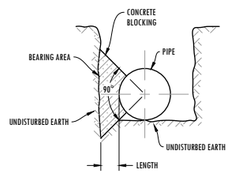


NOTES:

1. LAYOUT AND TAP LOCATION SHALL BE APPROVED BY THE CPU INSPECTOR PRIOR TO EXCAVATING. CONTACT THE CPU INSPECTOR 2 DAYS IN ADVANCE PRIOR TO SCHEDULING THE HOT TAP.
2. HOT TAPS MAY ONLY BE DONE BY A CPU APPROVED TAPPING CONTRACTOR
3. THE CPU INSPECTOR SHALL BE AT THE WORKSITE DURING TAPPING OPERATIONS.
4. THRUST BLOCK SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL. USE PLASTIC OR OTHER PROTECTIVE MATERIAL BETWEEN PIPE/FITTINGS AND THRUST BLOCK.
5. TRENCH EXCAVATIONS OVER 4' WILL REQUIRE SHORING OR OTHER MEASURES CONSISTENT WITH APPLICABLE LOCAL, STATE OR FEDERAL SAFETY CODES.

REVISED 04/17/2020

FILE NAME		STANDARD HOT TAP	Clark Public Utilities
4W			
SHEET	1 OF 1	STANDARD DETAILS	



THRUST BLOCK NOTES:

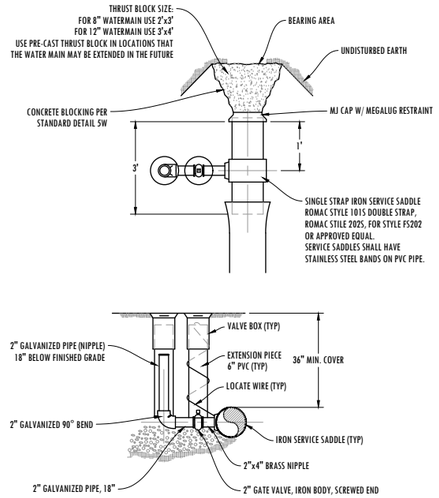
1. CAST IN PLACE BLOCKING SHALL BE POURED WITHOUT DIRECT CONTACT TO THE PIPE OR FITTINGS.
2. PROTECTIVE MATERIAL SUCH AS PLASTIC OR APPROVED EQUAL SHALL BE PLACED BETWEEN THE CONCRETE AND PIPE OR FITTING.
3. BLOCKING SHALL BE DESIGNED FOR STATIC PRESSURE OF 200 PSI OR 1.5 TIMES THE WORKING PRESSURE, WHICHEVER IS GREATER.
4. CAST IN PLACE BLOCKING SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL WITH MINIMUM BEARING PRESSURE OF 2,000 LB/SQ.FT.
5. CONCRETE FOR ALL BLOCKING SHALL HAVE A 28-DAY MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI.
6. CONCRETE BLOCKING FOR VERTICAL BENDS SHALL REQUIRE SITE SPECIFIC ENGINEERING DESIGN.
7. LAYOUT TO BE APPROVED BY THE INSPECTOR PRIOR TO AND AFTER CONCRETE PLACEMENT.
8. ALL THRUST BLOCKS SHALL BE PLACED IN CENTER OF TEE OR BEND.
9. THESE DETAILS IN NO WAY LIMIT THE SIZE OR LOCATION OF ADDITIONAL BLOCKING WHEN REQUESTED BY THE UTILITY.
10. THRUST BLOCKS ON WATER MAINS AND FITTINGS 12" OR LARGER SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER AND APPROVED BY CLARK PUBLIC UTILITIES PRIOR TO CONSTRUCTION.

PIPE SIZE	HORIZ. FITTINGS (BENDS)	BEARING AREA (SF)	MINIMUM BLOCK SIZE (FT.)	MINIMUM LENGTH OF BLOCKING (FT.-IN.)
4"	TEE	1.9	1.5' x 1.5'	0'-6"
	90°	2.7	2.0' x 2.0'	0'-6"
	45°	1.4	1.5' x 1.5'	0'-6"
	22-1/2°	0.7	1.5' x 1.5'	0'-6"
6"	TEE	2.8	2.0' x 2.0'	0'-6"
	90°	4.0	2.0' x 2.0'	0'-6"
	45°	2.2	1.5' x 1.5'	0'-6"
	22-1/2°	1.1	1.5' x 1.5'	0'-6"
	11-1/4°	0.8	1.5' x 1.5'	0'-6"
8"	TEE	5.0	2.0' x 3.0'	0'-8"
	90°	7.1	3.0' x 4.0'	0'-8"
	45°	3.8	2.0' x 2.0'	0'-6"
	22-1/2°	2.0	1.5' x 1.5'	0'-6"
	11-1/4°	1.5	1.5' x 1.5'	0'-6"
10"	TEE	7.9	3.0' x 4.0'	0'-8"
	90°	11.1	3.0' x 4.0'	0'-8"
	45°	6.0	3.0' x 4.0'	0'-8"
	22-1/2°	3.1	2.0' x 2.0'	0'-6"
	11-1/4°	2.3	2.0' x 2.0'	0'-6"
12"	TEE	11.3	3.0' x 4.0'	0'-8"
	90°	16.0	4.0' x 4.0'	1'-0"
	45°	8.7	3.0' x 4.0'	0'-8"
	22-1/2°	4.4	2.0' x 3.0'	0'-8"
	11-1/4°	3.3	2.0' x 2.0'	0'-6"

TABLE ASSUMES SOIL BEARING OF 2,000 LB/SQ.FT AND DESIGN WORKING PRESSURE OF 200 PSI

REVISED 04/17/2020

FILE NAME		THRUST BLOCK	Clark Public Utilities
5W			
SHEET	1 OF 1	STANDARD DETAILS	



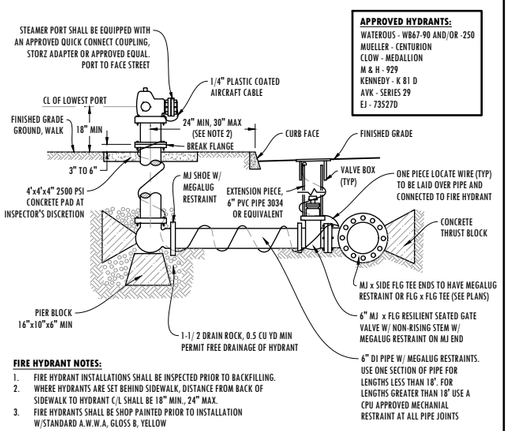
REVISED 04/17/2020

FILE NAME		STANDARD END BLOW-OFF ASSEMBLY	Clark Public Utilities
6W			
SHEET	1 OF 1	STANDARD DETAILS	

NOTES:

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE 2000 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. A CPU WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK.
3. WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO(2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
5. LOCATE WIRE SHALL BE NON-COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
6. FIRE HYDRANT INSTALLATIONS SHALL BE INSPECTED PRIOR TO BACKFILLING.
7. WHERE HYDRANTS ARE SET BEHIND SIDEWALK, DISTANCE FROM BACK OF SIDEWALK TO HYDRANT C/L SHALL BE 18" MIN., 24" MAX.
8. FIRE HYDRANTS SHALL BE SHOP PAINTED PRIOR TO INSTALLATION W/STANDARD A.W.W.A, GLOSS B, YELLOW

APPROVED HYDRANTS:
WATEROUS - WB67-90 AND/OR -250
MUELLER - CENTURION
CLOW - MEDALLION
M & H - 929
KENNEDY - K 81 D
AVK - SERIES 29
EJ - 73527D



FIRE HYDRANT NOTES:

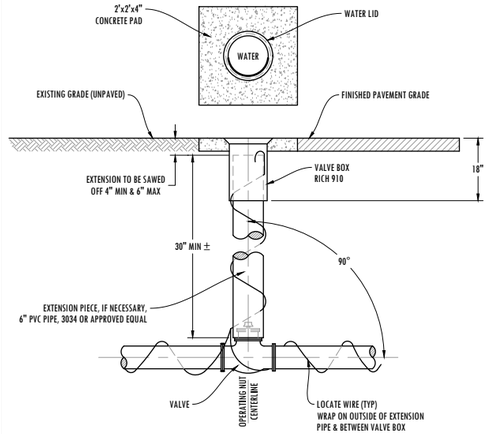
1. FIRE HYDRANT INSTALLATIONS SHALL BE INSPECTED PRIOR TO BACKFILLING.
2. WHERE HYDRANTS ARE SET BEHIND SIDEWALK, DISTANCE FROM BACK OF SIDEWALK TO HYDRANT C/L SHALL BE 18" MIN., 24" MAX.
3. FIRE HYDRANTS SHALL BE SHOP PAINTED PRIOR TO INSTALLATION W/STANDARD A.W.W.A, GLOSS B, YELLOW

REVISED 04/17/2020

FILE NAME		STANDARD FIRE HYDRANT ASSEMBLY	Clark Public Utilities
7W			
SHEET	1 OF 1	STANDARD DETAILS	

NOTES:

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE 2000 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. LOCATE WIRE SHALL BE NON-COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.



REVISED 04/17/2020

FILE NAME		STANDARD VALVE BOX ASSEMBLY	Clark Public Utilities
8W			
SHEET	1 OF 1	STANDARD DETAILS	

REVISED 05/06/2022

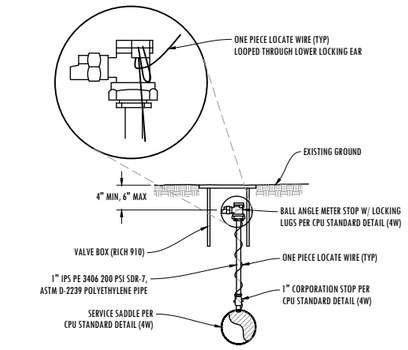
Clark Public Utilities

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 TN's the Law!
811 Or contact local UTILITIES NOTIFICATION CENTER

FILE NAME	CPU W-SD	WATER MAIN INSTALLATION STANDARD DETAILS	SHEET 1 OF 4

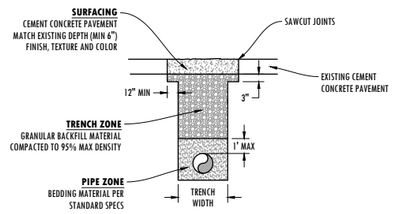
NOTES:

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE 2000 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. A WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK.
3. WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
5. A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
6. LOCATE WIRE SHALL BE NON-COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
7. NO CONNECTIONS WILL BE ALLOWED TO AN EXISTING SERVICE PRIOR TO AN APPROVED PURITY TEST. PURITY TEST SHALL PRECEDE PRESSURE TEST.
8. STUB SERVICES SHALL BE PRESSURE TESTED WITH THE MAIN LINE AND BE CAPABLE OF WITH-STANDING THE MAINS TEST PRESSURE.
9. ALL COMPRESSION FITTINGS TO HAVE STAINLESS STEEL INSERTS.



REVISED 04/17/2020

FILE NAME		STANDARD MANUAL AIR RELEASE VALVE	Clark Public Utilities
9W			
SHEET	1 OF 1	STANDARD DETAILS	

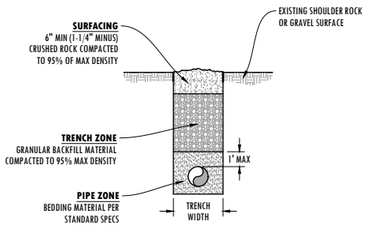


TRENCHING NOTES:

1. SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
2. NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
3. TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
4. IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		CEMENT CONCRETE PAVEMENT TYPE 'E' RESTORATION	Clark Public Utilities
10W			
SHEET	1 OF 1	STANDARD DETAILS	



TRENCHING NOTES:

1. SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
2. NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
3. TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
4. IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

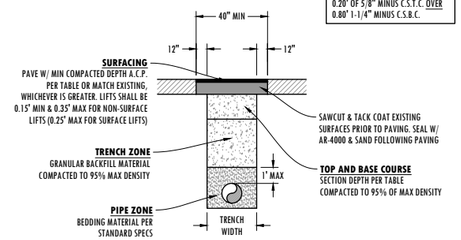
REVISED 04/17/2020

FILE NAME		ROADWAY SHOULDERS, GRAVEL SURFACE TYPE 'B' RESTORATION	Clark Public Utilities
11W			
SHEET	1 OF 1	STANDARD DETAILS	

TYPE 'C' PAVEMENT SECTION

TYPE 'C-1' (COLLECTOR OR ARTERIAL)
0.50' A.C.P. OVER
0.80' OF 1-1/4" MINUS C.S.B.C.

TYPE 'C-2' (RESIDENTIAL)
0.35' A.C.P. OVER
0.20' OF 5/8" MINUS C.S.T.C. OVER
0.80' 1-1/4" MINUS C.S.B.C.

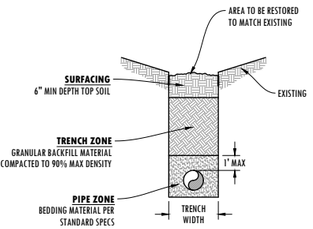


TRENCHING NOTES:

1. SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
2. NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
3. TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
4. IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		ASPHALT CONCRETE PAVEMENT TYPE 'C1' & 'C2' RESTORATION	Clark Public Utilities
12W			
SHEET	1 OF 1	STANDARD DETAILS	

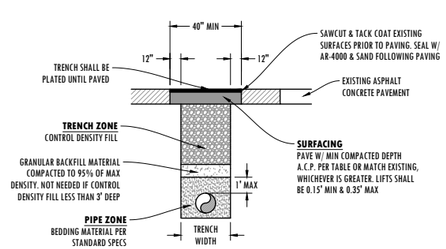


TRENCHING NOTES:

1. SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
2. NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
3. TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
4. IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		NATIVE BACKFILL OUSTSIDE ROADWAY TYPE 'A' RESTORATION	Clark Public Utilities
13W			
SHEET	1 OF 1	STANDARD DETAILS	

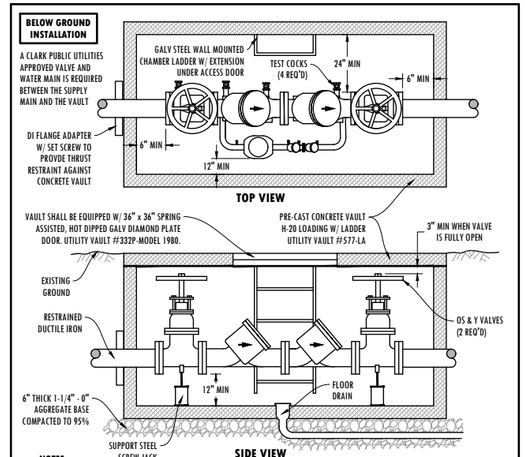


TRENCHING NOTES:

1. SEE CLARK COUNTY OR WSDOT UTILITY PERMIT, WHICHEVER IS APPLICABLE, FOR ADDITIONAL TRENCH BACKFILL AND SURFACING REQUIREMENTS.
2. NATIVE MATERIALS MAY BE SUBSTITUTED FOR IMPORTED GRANULAR MATERIAL PROVIDING IT IS PRE-APPROVED BY THE COUNTY ENGINEER OR AUTHORIZED REPRESENTATIVE.
3. TRENCH EXCAVATION, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH SECTION 7-10 OF THE MOST CURRENT STANDARD SPECIFICATIONS. BED PIPE PER SUBSECTION 7-10.3(9) OF THE STANDARD SPECIFICATIONS.
4. IN THE TRENCH ZONE, USE METHOD C COMPACTION PER SECTION 2-03.3(14).

REVISED 04/17/2020

FILE NAME		CONTROL DENSITY FILL - ASPHALT CONCRETE PAVEMENT TYPE 'D' RESTORATION	Clark Public Utilities
14W			
SHEET	1 OF 1	STANDARD DETAILS	

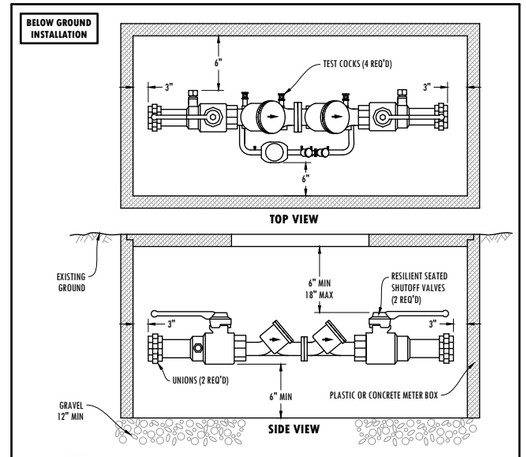


NOTES:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
4. THE D.C.V.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
5. ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
6. FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
7. GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER TITE GROUT.
8. ALL VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
9. VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
10. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
11. THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME		STANDARD DCDA (DOUBLE CHECK DETECTOR ASSEMBLY) 2-1/2" & LARGER	Clark Public Utilities
15W			
SHEET	1 OF 1	STANDARD DETAILS	



NOTES:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
4. DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
7. MUST BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
9. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
10. MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME		STANDARD DCDA (DOUBLE CHECK DETECTOR ASSEMBLY) 2" & SMALLER	Clark Public Utilities
16W			
SHEET	1 OF 1	STANDARD DETAILS	

REVISED 05/06/2022

Clark Public Utilities

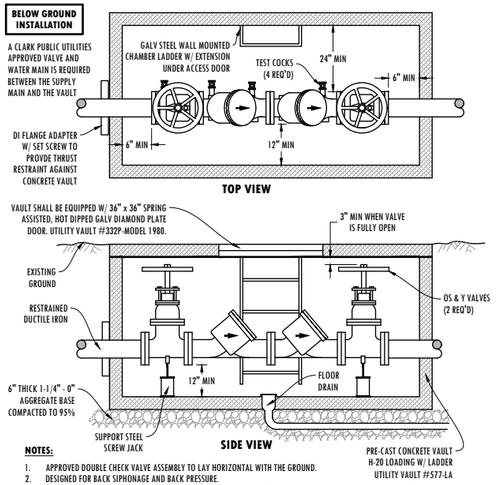
CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 TFI Hm Low" PACIFIC NORTHWEST UTILITIES NOTIFICATION CENTER

WATER MAIN INSTALLATION — STANDARD DETAILS

FILE NAME	CPU W-SD	SHEET	2 OF 4

REVISED 05/06/2022

BELOW GROUND INSTALLATION



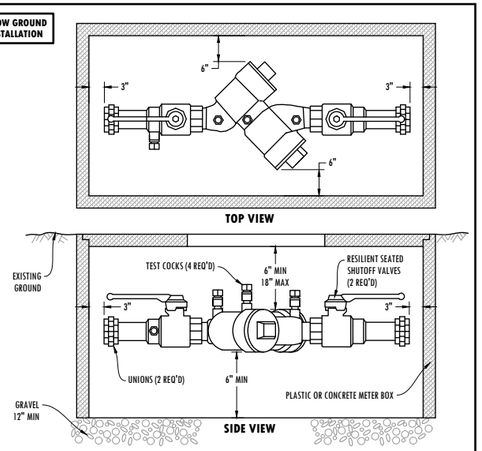
NOTES:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
4. THE D.C.V.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
5. ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
6. FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
7. GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER-TITE GROUT.
8. ALL VAULTS SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
9. VAULTS SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
10. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
11. THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD DCVA (DOUBLE CHECK VALVE ASSEMBLY) 2-1/2" & LARGER	Clark Public Utilities
17W		
SHEET 1 OF 1	STANDARD DETAILS	

BELOW GROUND INSTALLATION



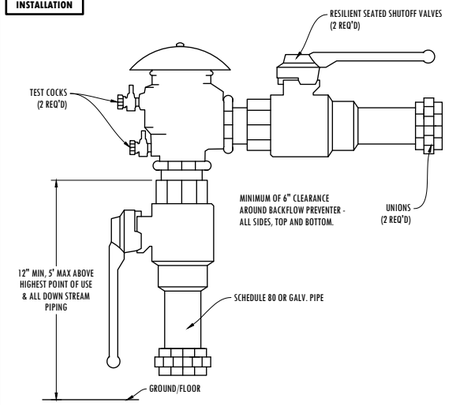
NOTES:

1. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
4. DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
7. MUST BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
9. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
10. MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD DCVA (DOUBLE CHECK VALVE ASSEMBLY) 2" & SMALLER	Clark Public Utilities
18W		
SHEET 1 OF 1	STANDARD DETAILS	

ABOVE GROUND INSTALLATION

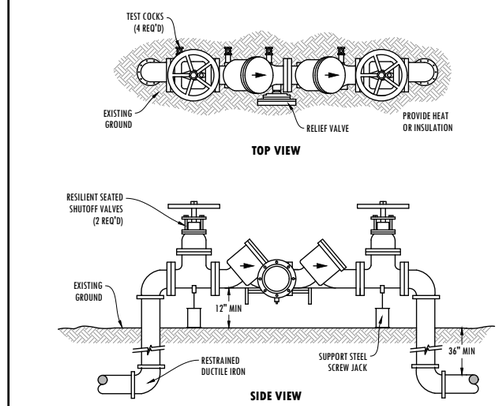


1. APPROVED PRESSURE VALVE BREAKER ASSEMBLY MUST BE INSTALLED VERTICALLY, 12" MIN TO 5' MAX ABOVE THE HIGHEST POINT OF USE AND ALL DOWNSTREAM PIPING.
2. DESIGNED FOR BACK SIPHONAGE ONLY, NOT BACK PRESSURE.
3. DISINFECT, PRESSURE TEST AND THOROUGHLY FLOSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
4. IF A PVBA IS INSTALLED INDOORS, CONSIDERATION MUST BE GIVEN TO WATER LEAKAGE IF THE BACKFLOW PREVENTER FAILS (EXCESSIVE WATER SPILLAGE).
5. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
6. THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
7. A PLUMBING PERMIT IS REQ'D. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
8. MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD PVBA (PRESSURE VACUUM BREAKER ASSEMBLY) 2" & SMALLER	Clark Public Utilities
19W		
SHEET 1 OF 1	STANDARD DETAILS	

ABOVE GROUND INSTALLATION



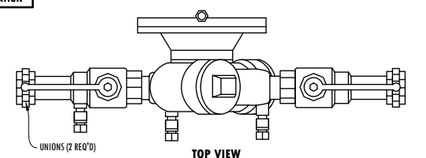
NOTES:

1. APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
4. THE R.P.B.A. MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
5. ALL PIPE, VALVE, AND FITTING JOINTS, FROM THE SUPPLY MAIN, SHALL BE RESTRAINED.
6. FIRE DEPT. CONNECTION SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
7. GROUT PIPE ENTRANCE AND EXIT, IN VAULT, WITH WATER-TITE GROUT.
8. THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.

REVISED 04/17/2020

FILE NAME	STANDARD RPBA (REDUCED PRESSURE BACKFLOW ASSEMBLY) 2-1/2" & LARGER	Clark Public Utilities
20W		
SHEET 1 OF 1	STANDARD DETAILS	

ABOVE GROUND INSTALLATION



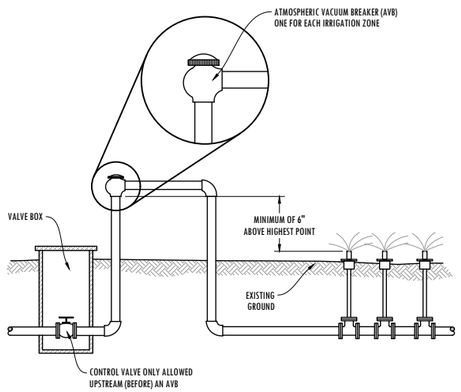
NOTES:

1. APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY TO BE INSTALLED ABOVE GROUND WITH MINIMUM CLEARANCES.
2. DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
3. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
4. DISINFECT, PRESSURE TEST AND THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
6. MUST BE PROTECTED FROM FREEZING CONDITIONS.
7. THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
8. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT YOUR LOCAL PLUMBING PERMIT CENTER.
9. MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO CLARK PUBLIC UTILITIES WATER SERVICES.
10. ABOVE GROUND INSTALLATION REQUIRED.

REVISED 04/17/2020

FILE NAME	STANDARD RPBA (REDUCED PRESSURE BACKFLOW ASSEMBLY) 2" & SMALLER	Clark Public Utilities
21W		
SHEET 1 OF 1	STANDARD DETAILS	

ABOVE GROUND INSTALLATION

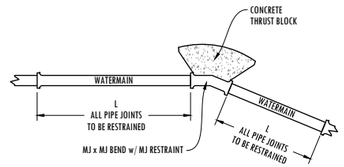


NOTES:

1. ONE AVB IS REQUIRED ON EACH IRRIGATION ZONE. NO CONTROL VALVES ALLOWED DOWNSTREAM (AFTER) AND AVB.
2. EACH AVB MUST BE INSTALLED A MINIMUM OF 6" ABOVE THE HIGHEST POINT OF WATER IN THE ZONE IT SERVES.
3. NO CHEMICAL FERTILIZER MAY BE INTRODUCED INTO AN IRRIGATION SYSTEM EQUIPPED WITH AN AVB.
4. NO PUMPS, AIR FITTINGS OR BACK PRESSURE SOURCE IS ALLOWED ON THE DOWNSTREAM SIDE (AFTER) AN AVB.
5. MUST BE PROTECTED FROM FREEZING.

REVISED 04/17/2020

FILE NAME	STANDARD AVB (ATMOSPHERIC VACUUM BREAKER)	Clark Public Utilities
22W		
SHEET 1 OF 1	STANDARD DETAILS	



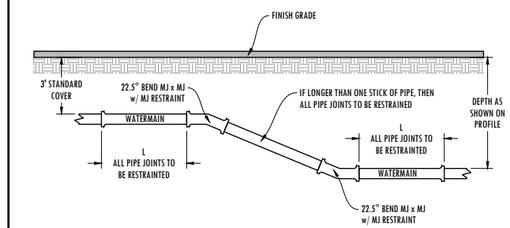
PVC PIPE				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4° BEND	10'	10'	10'	10'
22-1/2° BEND	10'	10'	10'	12'
45° BEND	10'	13'	20'	24'
90° BEND	24'	32'	45'	60'

DIP PIPE (WITHOUT POLY BAG ENCASEMENT)				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4° BEND	10'	10'	10'	10'
22-1/2° BEND	10'	10'	10'	10'
45° BEND	10'	11'	15'	20'
90° BEND	19'	26'	36'	46'

NOTE: THESE ARE THE MINIMUM PIPE RESTRAINT LENGTHS UNLESS STATED OTHERWISE ON THE PLANS

REVISED 04/17/2020

FILE NAME	HORIZONTAL BEND WATER MAIN INSTALLATION DETAIL	Clark Public Utilities
23W		
SHEET 1 OF 1	STANDARD DETAILS	



NOTE:
CALL CPU INSPECTOR TO BE ON-SITE TO OBSERVE. TRENCH BOTTOM SUBGRADE MUST BE FIRM AND UNDISTURBED.
PIPE BEDDING (5/8"-0: AGG BASE) SHALL BE A MINIMUM OF 6" EACH SIDE AND TOP AND BOTTOM OF PIPE COMPACTED.

PVC & DIP (WITHOUT POLY BAG ENCASEMENT)				
FITTING	6" DIA PIPE L	8" DIA PIPE L	12" DIA PIPE L	16" DIA PIPE L
11-1/4° BEND	10'	10'	12'	14'
22-1/2° BEND	12'	15'	21'	27'

NOTE: THESE ARE THE MINIMUM PIPE RESTRAINT LENGTHS UNLESS STATED OTHERWISE ON THE PLANS

REVISED 04/17/2020

FILE NAME	VERTICAL FITTING WATER MAIN INSTALLATION DETAIL	Clark Public Utilities
24W		
SHEET 1 OF 1	STANDARD DETAILS	

Clark Public Utilities

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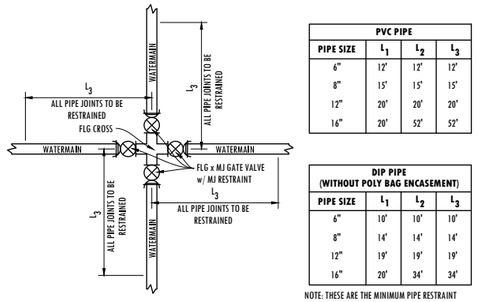
Pacific Northwest One-Call Center NOTIFICATION CENTER

WATER MAIN INSTALLATION — STANDARD DETAILS

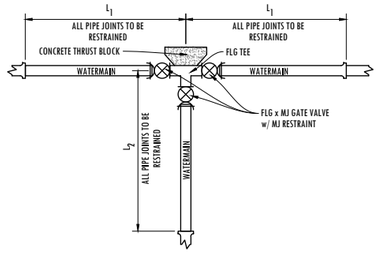
FILE NAME: **CPU W-SD** — SHEET 3 OF 4



PVC PIPE			
PIPE SIZE	L_1	L_2	L_3
6"	12'	12'	12'
8"	15'	15'	15'
12"	20'	20'	20'
16"	20'	52'	52'

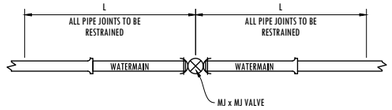
DIP PIPE (WITHOUT POLY BAG ENCASEMENT)			
PIPE SIZE	L_1	L_2	L_3
6"	10'	10'	10'
8"	14'	14'	14'
12"	19'	19'	19'
16"	20'	34'	34'

NOTE: THESE ARE THE MINIMUM PIPE RESTRAINT LENGTHS UNLESS STATED OTHERWISE ON THE PLANS



REVISED 05/15/2020

FILE NAME	TYPICAL FITTING & VALVE INSTALLATION DETAIL	Clark Public Utilities
25W		
SHEET 1 OF 1	STANDARD DETAILS	



PVC PIPE		
PIPE SIZE	L_1	L_2
6"	60'	30'
8"	80'	40'
12"	110'	55'
16"	140'	70'

DIP PIPE (WITHOUT POLY BAG ENCASEMENT)		
PIPE SIZE	L_1	L_2
6"	40'	20'
8"	50'	25'
12"	70'	35'
16"	90'	45'

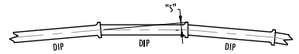
L_1: REQUIRED LENGTH WHEN PIPE JOINT RESTRAINT IS ONLY EFFECTIVE IN TENSION (SUCH AS FIELD-LOK GASKETS OR OTHER SIMILAR RESTRAINT SYSTEMS)

L_2: REQUIRED LENGTH WHEN PIPE JOINT RESTRAINT IS ONLY EFFECTIVE IN BOTH TENSION AND COMPRESSION (SUCH AS A MJ SLEEVE WITH MJ RESTRAINT OR A PROPRIETARY INTEGRAL BELL & SPIGOT RESTRAINT SYSTEM).

REVISED 04/17/2020

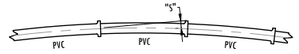
FILE NAME	TYPICAL IN-LINE VALVE INSTALLATION DETAIL	Clark Public Utilities
26W		
SHEET 1 OF 1	STANDARD DETAILS	

ALLOWABLE DIP JOINT DEFLECTION			
PIPE SIZE	ALLOWABLE DEFLECTION ANGLE	ALLOWABLE OFFSET "S"	
		PIPE L=18'	PIPE L=20'
6"	3°	11"	12"
8"	3°	11"	12"
12"	3°	11"	12"



NOTE: DEFLECTIONS IN ALIGNMENT FOR DIP SHALL BE MADE BY DEFLECTING THE PIPE JOINTS PER THE ATTACHED DEFLECTION TABLE

ALLOWABLE PVC PIPE BENDING		
PIPE SIZE	ALLOWABLE MINIMUM BENDING RADIUS	ALLOWABLE OFFSET "S"
6"	200'	12"
8"	250'	9.5"
12"	350'	7"
NO BENDING OF PVC PIPE ALLOWED FOR PIPE LARGER THAN 12" DIAMETER		



NOTE: DEFLECTIONS IN ALIGNMENT FOR PVC PIPE SHALL BE MADE BY BENDING THE PIPE AND NOT DEFLECTING PIPE JOINTS

REVISED 04/17/2020

FILE NAME	DUCTILE PIPE DEFLECTION & PVC PIPE BEND DETAIL	Clark Public Utilities
27W		
SHEET 1 OF 1	STANDARD DETAILS	

1. PIPE FITTINGS SHALL BE GRAY-IRON OR DUCTILE IRON AND SHALL CONFORM TO AWWA STANDARD C110. DUCTILE IRON (COMPACT) FITTINGS CONFORMING TO AWWA STANDARD C153 MAY BE SUBSTITUTED IN LIEU OF AWWA C110 FITTINGS FOR FITTING SIZES 3-INCHES THROUGH 24-INCHES IN DIAMETER. FITTINGS SHALL BE MECHANICAL JOINT OR FLANGED AS REQUIRED AND SHOWN ON THE PLANS.
2. DUCTILE IRON AND GREY IRON MECHANICAL JOINT FITTINGS SHALL BE PRESSURE RATED FOR 350 PSI. DUCTILE IRON AND GREY IRON FLANGED JOINT FITTINGS SHALL BE PRESSURE RATED FOR 250 PSI.
3. FITTINGS SHALL BE MORTAR LINED AND SEAL COATED.
4. BELOW GROUND USE FLANGE ADAPTERS - THE FLANGE ADAPTER TO CONNECT PLAIN END PVC PIPE OR DIP TO FLANGED FITTINGS SHALL BE A DUCTILE IRON FITTING CONFORMING TO ANSI/AWWA C153/A21.53. FITTING SHALL BE MECHANICAL JOINT ON ONE END AND FLANGED ON THE OPPOSITE END.
5. DUCTILE IRON AND GREY IRON SOLID SLEEVES SHALL BE OF THE LONG BODY DESIGN AND BOTH ENDS MECHANICAL JOINT.
6. GASKETS FOR FLANGED JOINTS SHALL BE 1/8" THICK, FULL FACED WITH AT LEAST (3) BULB TYPE RIBS MOLDED INTO BOTH FACES.
7. MECHANICAL JOINT GASKETS SHALL BE STANDARD STYRENE BUTADIENE RUBBER (SBR) GASKETS
8. BOLTS AND NUTS SHALL BE CARBON STEEL AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 OR ASTM A193 GRADE B7 WITH ASTM A194 GRADE 2H HEAVY HEX NUTS.
9. GATE VALVES (4" TO 8") - GATE VALVES FOR BURIED SERVICE SHALL BE THE RESILIENT-SEAT TYPE, WITH AN IRON BODY, NON-RISING STEM, BOLTED BONNET, LEFT OPENING AND SHALL CONFORM TO AWWA STANDARD C509 AND C515. THE WEDGE SHALL BE TOTALLY ENCAPSULATED WITH RUBBER. ALL GATE VALVES SHALL BE RATED AT 250 PSI FOR AWWA SERVICE. THE INTERIOR AND EXTERIOR SHALL BE FUSION-BONDED EPOXY AND ALL COATINGS AND/OR LININGS SHALL CONFORM TO AWWA STANDARD C550 AND SHALL BE SUITABLE FOR POTABLE WATER SERVICE AND NSF CERTIFIED.
10. BUTTERFLY VALVES (10" AND LARGER) - BUTTERFLY VALVES SHALL BE SHORT BODY CLASS 250 VALVES CONFORMING TO THE REQUIREMENTS OF AWWA STANDARD C504. BUTTERFLY VALVES SHALL BE RUBBER SEATED AND TIGHT CLOSING. VALVE BODIES SHALL BE HIGH STRENGTH CAST IRON OR HIGH STRENGTH DUCTILE IRON. VALVE INTERIOR AND EXTERIOR SURFACES SHALL BE COATED WITH EPOXY IN ACCORDANCE WITH AWWA C504 AND SHALL BE SUITABLE FOR POTABLE WATER SERVICE AND NSF 61 CERTIFIED.

REVISED 04/17/2020

FILE NAME	FITTING & VALVE SPECIFICATIONS	Clark Public Utilities
0-FV		
SHEET 1 OF 1	STANDARD DETAILS	

GENERAL INSTALLATION NOTES:

1. INSTALL WATER MAIN WITH 3.0 FEET OF MINIMUM COVER UNLESS OTHERWISE NOTED. DEPTH MAY INCREASE AT UTILITY AND CULVERT CROSSINGS.
2. LOCATE WIRE SHALL BE COATED (BLUE INSULATED), NO. 14 GA. SOFT DRAWN SOLID COPPER. USE WATERPROOF CONNECTORS AT ALL WIRE SPLICES.
3. NEW AND REPAIRED WATER MAINS SHALL BE DISINFECTED PER AWWA C651 PRIOR TO BEING PLACED INTO SERVICE. CONNECTION TO AN EXISTING WATER MAIN MAY ONLY BE DONE AFTER PROPER DISINFECTION, TESTING, FLUSHING AND APPROVAL BY CPU.
4. WHENEVER A PIPE IS CUT AND NOT RECONNECTED, THE CUT ENDS SHALL BE CAPPED OR PLUGGED, AS DIRECTED BY THE CPU INSPECTOR.
5. ALL WATER SERVICES, BLOW-OFF ASSEMBLIES, AIR RELEASE VALVES, FIRE HYDRANT ASSEMBLIES, VALVE BOXES AND THRUST BLOCKING SHALL BE INSTALLED PER THE STANDARD SPECIFICATIONS AND DETAILS.
6. WATER MAINS BEING INSTALLED NEAR TELEPHONE/CABLE COMMUNICATIONS SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
7. WATER MAINS BEING INSTALLED NEAR UNDERGROUND ELECTRICAL LINES SHALL HAVE A MINIMUM 60" HORIZONTAL AND 6" VERTICAL CLEARANCE.
8. REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWER LINES SHALL BE AS FOLLOWS:

   HORIZONTAL SEPARATIONS (PARALLEL)
   A MINIMUM SEPARATION OF TEN (10) FEET (MEASURED EDGE TO EDGE) BETWEEN SANITARY SEWER LINES AND WATER LINES SHALL BE MAINTAINED WHENEVER POSSIBLE. WHEN CONDITIONS PREVENT THE MINIMUM TEN (10) FOOT HORIZONTAL SEPARATION THE ENGINEER SHALL BE NOTIFIED.

   VERTICAL SEPARATION (PERPENDICULAR)
   WATER LINES CROSSING SANITARY SEWER LINES SHALL BE LAID ABOVE THE SEWER LINES TO PROVIDE A SEPARATION OF AT LEAST 18" BETWEEN THE INVERT OF THE WATER PIPE AND THE CROWN OF THE SANITARY SEWER PIPE. A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING AND SHALL BE THE LONGEST STANDARD LENGTH AVAILABLE FROM THE MANUFACTURER.
9. THE CONTRACTOR SHALL USE CONSTRUCTION METHODS THAT PROTECT THE PIPE INTERIORS, FITTINGS AND VALVES AGAINST CONTAMINATION.
10. ANY PIPE, FITTINGS OR VALVES THAT CANNOT BE DISINFECTED WITH THE MAIN LINE BY CHLORINE FOR 24 HOURS SHALL HAVE THE INTERIORS SWABBED WITH A 1% HYPOCHLORITE SOLUTION BEFORE INSTALLATION.
11. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AT ALL TEES, BENDS, DEAD ENDS AND WHERE INDICATED ON THE PLANS.
12. ALL MJ FITTINGS SHALL BE RESTRAINED USING MJ MECHANICAL RESTRAINT FOLLOWER GLANDS APPROPRIATE FOR THE PIPE MATERIAL.
13. 6" WATER PIPE LEADING TO FIRE HYDRANTS SHALL BE DIP AND SHALL BE ONE CONTINUOUS PIECE OF PIPE. IF THE RUN IS LONGER THAN ONE PIECE OF PIPE, THEN ALL PIPE JOINTS SHALL BE MECHANICALLY RESTRAINED WITH "FIELD-LOK" GASKETS OR OTHER CPU APPROVED RESTRAINTS.

REVISED 04/17/2020

FILE NAME	GENERAL INSTALLATION NOTES	Clark Public Utilities
0-GI		
SHEET 1 OF 1	STANDARD DETAILS	

GENERAL NOTES:

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE MOST CURRENT EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
2. A CPU WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO WORKING DAYS PRIOR TO COMMENCING WORK.
3. WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
4. VALVE SHALL BE 2" SQUARE OPERATING NUT OR AS SPECIFIED ON PLANS.
5. THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-424-5555).
6. ONLY TAPPING COMPANIES APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
7. ACTUAL ROAD ALIGNMENTS MAY VARY FROM RIGHT-OF-WAY INDICATED. THE CONTRACTOR SHALL VERIFY THE PROPOSED PIPE ALIGNMENT AND REPORT DIFFERENCES TO THE CPU INSPECTOR. ALL ALIGNMENT CHANGES MUST BE APPROVED BY THE CPU INSPECTOR PRIOR TO INSTALLATION.
8. DRIVEWAYS DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION. REFER TO PLAN FOR APPROXIMATE LOCATIONS AND TYPES.
9. CONTRACTOR SHALL VERIFY EXISTING UTILITY CULVERTS, CONDUITS AND LINE LOCATION PRIOR TO CONSTRUCTION. DUE TO FIELD CONDITIONS, THE CONTRACTOR SHALL FIELD ADJUST THE VERTICAL AND HORIZONTAL ALIGNMENT OF THE WATER MAIN TO CLEAR THE UTILITY IN CONFLICT AND PROVIDE THE MIN. 3.0 FEET OF COVER AS APPROVED BY THE CPU INSPECTOR. ALL CULVERTS WHICH ARE DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS.
10. FENCES DISTURBED BY CONSTRUCTION SHALL BE RESTORED OR REPLACED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION.
11. CONTRACTOR SHALL VERIFY EXISTING SIGN AND MAILBOX LOCATIONS PRIOR TO CONSTRUCTION. SIGNS & MAILBOXES THAT ARE DISTURBED BY CONSTRUCTION SHALL BE RELOCATED BACK FROM EDGE OF PAVEMENT, 1.0 FEET CLEAR OF WATER MAIN. ANY SIGNS OR MAILBOXES DAMAGED SHALL BE REPAIRED OR REPLACED AS PER THE SPECIFICATIONS.
12. THE LOCATIONS OF ALL EXISTING UTILITIES ARE FOR INFORMATIONAL PURPOSES ONLY. MANY LOCATIONS ARE PER SCHEMATIC RECORD DRAWINGS. THE CURRENT AND EXACT LOCATIONS OF FACILITIES MUST BE VERIFIED PRIOR TO CONSTRUCTION. THE CONTRACTOR PERFORMING THE WORK SHALL COMPLY WITH THE PROVISIONS OF FACILITIES AT LEAST 48 BUSINESS DAY HOURS PRIOR TO EXCAVATION. CALL 1-800-553-4344 FOR UTILITY LOCATE SERVICE.
13. THE WATER FACILITIES SHALL BECOME THE PROPERTY OF CLARK PUBLIC UTILITIES AFTER A SATISFACTORY BACTERIA AND PRESSURE TEST HAVE BEEN PERFORMED BY THE UTILITY. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO A ONE YEAR WARRANTY, COMMENCING AT ACCEPTANCE OF FINAL TESTING. REPLACEMENT AND/OR REPAIRS OF DEFECTIVE MATERIALS SHALL BE THE DEVELOPERS/OWNERS RESPONSIBILITY.
14. WHEN ASBESTOS CONCRETE PIPE IS ENCOUNTERED, THE CONTRACTOR SHALL SUPPLY WORKERS WHO ARE CERTIFIED TO WORK ON ASBESTOS CONCRETE PIPE.
15. THE CONTRACTOR SHALL TRANSFER AND/OR ABANDON EXISTING SERVICES AS DIRECTED BY THE INSPECTOR.
16. THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED AT A MINIMUM OF 200 PSI OR 1.5 TIMES THE WORKING PRESSURE, WHICHEVER IS GREATER. THE TEST WILL BE PERFORMED BY THE CLARK PUBLIC UTILITIES INSPECTOR. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED.
17. THE INSTALLED WATER MAIN SHALL BE THOROUGHLY DISINFECTED AND FLUSHED IN ACCORDANCE WITH THE CLARK PUBLIC UTILITIES STANDARDS AND REQUIREMENTS. ONLY CLARK PUBLIC UTILITIES EMPLOYEES ARE PERMITTED TO FILL AND FLUSH THE WATER MAIN. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED. IN AREAS WHERE THE DE-CHLORINATION OF FLUSHED WATER IS NOT POSSIBLE, THE CONTRACTOR SHALL PROVIDE WATER TRUCKS TO FLUSH INTO.
18. PRIOR TO ACCEPTING THE SYSTEM OR ALLOWING THE MAIN TO BE PUT IN SERVICE, A WATER SAMPLE SHALL BE TAKEN BY THE CLARK PUBLIC UTILITIES INSPECTOR AND A TEST PERFORMED BY AN ACCREDITED LAB TO INSURE NO HAZARD EXISTS.

REVISED 04/17/2020

FILE NAME	GENERAL NOTES	Clark Public Utilities
0-GN		
SHEET 1 OF 1	STANDARD DETAILS	

MECHANICAL JOINT RESTRAINT SPECIFICATIONS

1. MECHANICAL JOINT RESTRAINT SHALL BE ACCOMPLISHED BY A RESTRAINT DEVICE CONSISTING OF A FOLLOWER GLAND UTILIZING MULTIPLE GRIPPING WEDGES. GLAND BODY AND WEDGES SHALL BE DUCTILE IRON AND EPOXY COATED.
2. T-BOLTS AND NUTS SHALL BE HIGH STRENGTH LOW ALLOY STEEL T-BOLTS AND STEEL SHALL MEET AWWA C111 COMPOSITION SPECIFICATIONS.
3. RESTRAINT GLAND SHALL UTILIZE A STANDARD MECHANICAL JOINT GASKET.
4. THE FOLLOWING IS THE APPROVED LIST OF RESTRAINED JOINT SYSTEMS FOR MECHANICAL JOINTS AND DIP:
   - 4.1 "ROMAGRIP", ROMAC INDUSTRIES.
   - 4.2 "SERIES 1000 TUFGRIP", TYLER UNION.
   - 4.3 "MEGALUG", EBAA IRON, INC.
   - 4.4 APPROVED EQUIVALENT
5. THE FOLLOWING IS THE APPROVED LIST OF RESTRAINED JOINT SYSTEMS FOR MECHANICAL JOINTS AND PVC:
   - 5.1 "ROMAGRIP FOR PVC", ROMAC INDUSTRIES.
   - 5.2 "SERIES 2000 FOR PVC TUFGRIP", TYLER UNION.
   - 5.3 "MEGALUG SERIES 2000 PV", EBAA IRON, INC.
   - 5.4 APPROVED EQUIVALENT

DUCTILE IRON PIPE RESTRAINED JOINT SPECIFICATIONS

1. PIPE JOINT RESTRAINT FOR DIP SHALL BE ACCOMPLISHED WITH A PIPE BELL/SPIGOT INTEGRAL LOCK MECHANISM.
2. AS AN ALTERNATIVE AND WHERE ALLOWED BY CLARK PUBLIC UTILITIES, A BOLTLESS RESTRAINING GASKETS FOR DIP TYTON JOINT STYLE PIPE MAY BE USED. THE RESTRAINT GASKET SHALL BE A BOLTLESS GASKET WITH INTEGRAL RESTRAINING SYSTEM UTILIZING STAINLESS STEEL PARTS AND SHALL BE PRESSURE RATED FOR 350 PSI. THE GASKETS SHALL BE IN CONFORMANCE WITH ANSI/AWWA C111/A21.11 AND CERTIFIED TO NSF/ANSI 6. THE FOLLOWING IS THE APPROVED LIST OF DIP PIPE JOINT RESTRAINED GASKET SYSTEMS:
   - 2.1 "FIELD LOK 350 GASKET", U.S. PIPE AND FOUNDRY CO.
   - 2.2 "GRIPPER GASKET", GRIPPER GASKET LLC.
   - 2.3 APPROVED EQUIVALENT

PVC PIPE RESTRAINED JOINT SPECIFICATIONS

1. PVC PIPE JOINT RESTRAINT FOR MAY BE ACCOMPLISHED BY UTILIZING A PROPRIETARY PVC PIPE WHICH UTILIZES A PIPE BELL/SPIGOT INTEGRAL JOINT RESTRAINT MECHANISM. THE FOLLOWING IS THE APPROVED LIST OF PROPRIETARY PVC C-900 PIPE JOINT RESTRAINED SYSTEMS:
   - 1.1 "EAGLE LOC 900", JM EAGLE
   - 1.2 "CERTA-LOK C900/RJ", CERTAINTEED
   - 1.3 "DIAMOND LOK-21", DIAMOND PLASTICS INC.
   - 1.4 "RIEBERLOK" GASKET
   - 1.4 APPROVED EQUIVALENT
2. AS AN ALTERNATIVE, PVC PIPE MAY BE COUPLED TO CREATE A RESTRAINED JOINT BY UTILIZING A GREY IRON OR DUCTILE IRON MECHANICAL JOINT LONG PATTERN SLEEVE WITH A RESTRAINT FOLLOWER GLAND UTILIZING MULTIPLE GRIPPING WEDGES.

REVISED 04/17/2020

FILE NAME	MECHANICAL JOINT & PIPE JOINT RESTRAINT SPECIFICATIONS	Clark Public Utilities
0-MJ		
SHEET 1 OF 1	STANDARD DETAILS	

EXISTING WATER SERVICES:

THE CONTRACTOR SHALL TRANSFER, MOVE AND/OR ABANDON EXISTING WATER SERVICES AS DIRECTED BY THE CLARK PUBLIC UTILITIES INSPECTOR.

1. EXISTING WATER SERVICES TO BE ABANDONED SHALL BE EXCAVATED TO THE CORP. STOP AT THE WATER MAIN AND THE CORP STOP SHALL BE CLOSED. THE METER BOX SHALL BE REMOVED AND THE WATER SERVICE LINE CAN BE ABANDONED IN PLACE. THE EXISTING METER SHALL BE RETURNED TO CLARK PUBLIC UTILITIES WATER DEPT. ROAD REPAIR SHALL BE AS REQUIRED BY THE CLARK COUNTY RIGHT OF WAY PERMIT REQUIREMENTS.
2. WHEN AN EXISTING WATER SERVICE IS TO BE MOVED, THE CONTRACTOR SHALL EXPOSE A PORTION OF THE EXISTING WATER SERVICE SO THAT THE CLARK PUBLIC UTILITIES INSPECTOR CAN EVALUATE THE MATERIAL SIZE AND CONDITION OF THE EXISTING WATER SERVICE LINE.

THE INSPECTOR WILL DETERMINE WHETHER THE WATER SERVICE LINE CAN BE EXTENDED OR SHORTENED. IF THE INSPECTOR DETERMINES THE EXISTING WATER SERVICE LINE IS SUBSTANDARD, THEN A NEW POLYETHYLENE (PE) SERVICE LINE SHALL BE INSTALLED FROM THE WATER MAIN (MINIMUM SIZE 1" DIA).

ALL EXISTING WATER SERVICE LINES THAT ARE LESS THAN 1" DIAMETER SHALL BE CONSIDERED SUBSTANDARD AND SHALL BE REPLACED WITH A NEW 1", 1-1/2", OR 2" WATER SERVICE LINE PER CLARK PUBLIC UTILITIES STANDARDS.

MAIN LINE PIPE MATERIAL:

UNLESS OTHERWISE STATED ON THE PLAN, ALL MAIN LINE PIPE SHALL BE EITHER DUCTILE IRON PIPE (DIP), POLYVINYL CHLORIDE PIPE (PVC) OR HIGH-DENSITY POLYETHYLENE PIPE (HDPE). ALL PIPE SHALL BE SUITABLE FOR POTABLE WATER SERVICE IN ACCORDANCE WITH ANSI/NSF 61 STANDARDS.

A. DUCTILE IRON PIPE SHALL CONFORM TO ANSI A21.51 OR AWWA C151. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS. ALL DUCTILE IRON PIPE SHALL BE GAUGED FOR DIP 12" DIAMETER AND SMALLER. UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, 3"-12" PIPE SHALL BE PRESSURE CLASS 350 AND PIPE SIZES GREATER THAN 12" DIAMETER SHALL BE THICKNESS CLASS 52.

B. POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (4"-30"). USE UN-PLASTICIZED PVC PLASTIC PIPE WITH INTEGRAL BELL AND SPIGOT JOINTS. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS. PIPE SHALL MEET THE REQUIREMENTS OF DR 18, UNLESS OTHERWISE NOTED ON THE DRAWING. UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, 4"-12" PIPE SHALL MEET THE REQUIREMENTS OF AWWA C900 AND 14"-30" PIPE SHALL MEET THE REQUIREMENTS OF AWWA C905.

C. HIGH-DENSITY POLYETHYLENE PIPE (HDPE) SHALL BE BLACK WITH A MINIMUM OF TWO EQUALLY SPACED BLUE COLORED STRIPES EXTRUDED INTO THE OUTER SHELL IN CONFORMANCE WITH THE UNIFORM COLOR CODE (UCC). UNLESS OTHERWISE NOTED ON THE DRAWINGS, PIPE SHALL BE IRON PIPE SIZE (IPS) AND HAVE A WALL-THICKNESS DIMENSION RATIO (DR) OF 9. SMALL DIAMETER PIPE (3/4"-3"), SHALL CONFORM TO ANSI/AWWA C901 AND LARGE DIAMETER PIPE (4"-65") PIPE SHALL CONFORM TO ANSI/AWWA C906.

REVISED 04/17/2020

FILE NAME	MAIN LINE PIPE MATERIAL & EXISTING WATER SERVICE NOTES	Clark Public Utilities
0-PM		
SHEET 1 OF 1	STANDARD DETAILS	

REVISED 05/06/2022

Clark Public Utilities

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Pacific Northwest One-Call Center NOTIFICATION CENTER

WATER MAIN INSTALLATION

STANDARD DETAILS

FILE NAME	CPU W-SD	SHEET	4 OF 4

G Clark County Fire Flow Requirements

15.12.9000 Appendices adopted.

Appendices B, E, F, and G of the IFC are adopted, with the following amendments:

SECTION B101

GENERAL

B101. Scope. Fire flow requirements shall be determined by the Fire Marshal. The procedure for determining fire flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix.

SECTION B102
DEFINITIONS

B102. Definitions. For the purpose of Appendix B, certain terms are defined as follows:

"FIRE AREA". The floor area, in square feet, used to determine the required fire flow.

"FIRE FLOW". The flow rate of a water supply, measured at 20 psi (137.9kPa) residual pressure, that is available for fire fighting.

"ADEQUATE PUBLIC WATER SYSTEM". A water system that meets Washington State requirements of a public water system and provides minimum fire flow as required by the Fire Marshal.

SECTION B103
MODIFICATIONS

B103.1 Decreases. Fire-flow requirements may be modified downward by the Fire Marshal for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. Fire-flow may be modified upward by the Fire Marshal where conditions indicate an unusual susceptibility to group fires or conflagrations. An upward modification shall not be more than twice that required for the building under consideration.

SECTION B104
FIRE AREA

B104.1 General. The fire area shall be the total floor area of all floor areas within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in this section.

B104.2 Area separation. Portions of buildings which are separated by one or more four-hour fire walls constructed in accordance with the Building Code, without openings and provided with a 30-inch (762 mm) parapet, are allowed to be constructed as separate fire areas.

B104.3 Type IA and Type I-B. Construction. The fire area of buildings constructed of Type IA and Type I-B construction shall be the area of the three largest successive floors.

SECTION B105
FIRE FLOW REQUIREMENTS FOR BUILDINGS

B105.1 General. Applicants for building permits shall present proof of available fire flow in the form of a letter which states that the purveyor can supply the required amount of fire flow for the required duration.

B105.2 One and two family dwellings. The minimum fire flow and flow duration requirements for one and two-family dwellings having a fire area in excess of 3,600 square feet (344.5 m^2) shall not be less than that specified in Table B105.1(2). Table B105.1(1) is not adopted.

EXCEPTIONS:

1. A reduction in required fire flow of 75 percent, as approved by the Fire Marshal is allowed when the building is provided with an approved automatic sprinkler system.

2. Remodels or additions to legally existing one and two family dwellings where the added square footage does not exceed 60% of the square footage of the original structure.

B105.2.1 Urban Areas. As a requirement of residential subdivision or short subdivision, the minimum fire flow requirements for one and two family dwellings within an urban growth boundary shall be 1,000 gallons (3,785 L) per minute supplied for sixty (60) minutes duration.

B105.2.2 Rural Areas. As a requirement of residential subdivision or short subdivision, the minimum fire flow requirements for one and two family dwellings outside of an urban growth boundary shall be 500 gallons (1,895 L) per minute supplied for thirty (30) minutes duration. Fire flow requirements for those areas identified as Wildland Urban Interface/Intermix by CCC 15.13.030 shall be provided in accordance with CCC 15.12.917.

B105.2.3 Main Extensions. When development occurs within an urban growth boundary or within 1,000 feet or an adequate public water system outside of an urban growth boundary water mains shall be extended to and throughout the development site for the purposes of supplying the required fire flow.

EXCEPTION: Where a short subdivision occurs outside of an urban growth boundary that involves not more than two lots in its entirety and is located within 1,000 feet of an adequate public water system water main extensions may not be required if in the opinion of the Fire Marshal and the fire district chief the level of fire fighting capability will not be impaired.

B105.2.4 Fire Hydrants on Main Extensions. When water mains are extended from an existing public water system capable of supplying all or a portion of the required fire flow, fire hydrants shall be installed throughout the development site in accordance with Section 508.5.

B105.2.5 Where the public water system is incapable of supplying a minimum of 100 gallons (379 L) per minute for 30 minutes duration fire hydrants may be omitted subject to the provisions of subsection (e) below.

B105.2.6 Satellite Water Systems. Satellite water systems capable of supplying all or a portion of the required fire flow for the required duration may be approved. Such systems shall be provided with fire hydrants and mains in accordance with Section 508.5.

B105.2.7 Where a satellite water system is incapable of supplying a minimum of 100 gallons (379 L) per minute for 30 minutes duration fire hydrants may be omitted subject to the provisions of subsection B105.10.

B105.2.8 When satellite water systems are developed on an interim basis they shall be connected to the surrounding or extending public water system immediately upon the system's availability.

B105.2.9 Methods of Achieving Required Flows. Fire flow requirements may be satisfied or reduced according to Table B105.2.9. Where fire flow is not provided in the full amount by a public water system the side and rear setbacks for all buildings shall be increased to thirty (30) feet.

TABLE B105.2.9
PROVISIONS FOR SUPPLYING REQUIRED FIRE FLOW

Method	Credit/Reduction
Extension of an existing Public Water System capable of supplying at least 100 gpm for 30 minutes-rural areas or 60 minutes-urban area.	Quantity actually supplied.
Development of a Satellite or Interim Satellite Water System capable of supplying at least 100 gpm for 30 minutes.	Quantity actually supplied.
Automatic Fire Sprinkler System.	75% reduction of required fire flow.
Fire District Tanker Credit.	250 gallon per minute fire flow credit.
Class A or B or other Noncombustible Roof Covering and creation of a 30 foot defensible space in accordance with Clark County Code Section 14.05.501.4.	250 gallon per minute fire flow credit.
Increased defensible space.	Credit proportional to the increase not to exceed 325 gallons per minute total fire flow credit due to the creation of defensible spaces.

In the case where a local fire district has no tanker credit alternate water supplies may be approved subject to the concurrence of the Fire Marshal and the local fire chief provided that the total credit for such alternate supply does not exceed 125 gallons per minute of fire flow.

B105.2.10 Future Provisions. Where an extended public or satellite water system is incapable of supplying at least 100 gpm for 30 minutes duration fire hydrants may be omitted provided that an agreement acceptable to the fire marshal exists whereby the fire hydrants will be installed at such time as the system is capable of supplying fire flow in excess of 100 gallons per minute.

B105.3 Buildings other than one and two family dwellings. The minimum fire flow and flow duration for buildings other than one and two family dwellings shall be as specified in Table B-105.1(2). Table B105(2) is not adopted.

EXCEPTION: 1. A reduction in fire flow of up to seventy-five percent (75%) as approved by the Fire Marshal, is allowed when the building is provided with an approved automatic sprinkler system. The resulting fire flow shall not be less than 1,000 gallons per minute (3,785 L/min.).

TABLE B105.1(2)
MINIMUM REQUIRED FIRE FLOW AND FLOW DURATION FOR BUILDINGS

FIRE FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIB[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0 – 16,000	0 – 8,000	0 – 6,000	0 – 4,000	0 – 2,000	1,000	2
16,001 – 19,300	8,001 – 10,200	6,001 – 7,100	4,001 – 4,900	2,001 – 2,900	1,250	2
19,301 – 22,700	8,001 – 12,700	7,101 – 8,200	4,901 – 5,900	2,901 – 3,600	1,500	2
(Remainder of table is as stated in International Fire Code)						

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of Construction are based on the International Building Code.

b. Measured at 20 psi.

(Sec. 58 of Ord. 1985-05-28; amended by Sec. 29 of Ord. 1990-02-01; amended by Sec. 15 of Ord. 1990-10-46; amended by Sec. 29 of Ord. 1996-02-02; amended by Sec. 1 (Exh. A) of Ord. 2004-06-05; amended by Sec. 42 of Ord. 2007-06-19; amended by Sec. 1 of Ord. 2008-06-02; amended by Sec. 28 of Ord. 2016-07-02)

Compile Chapter

H Water Quality Monitoring Plan

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

Water Quality Monitoring Schedule

System: CLARK PUBLIC UTILITIES
PWS ID: 13333 X
Region: SOUTHWEST
Contact: John T Roth
Group: A - Comm
County: CLARK
SMA ID: 102
SMA Name: CLARK PUBLIC UTILITIES

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023
Coliform Monitoring Population	110665	110665	110665	110665	110665	110665	110665	110665	110665	110665	110665	110665
Number of Routine Samples Required	100	100	100	100	100	100	100	100	100	100	100	100

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Water Quality Monitoring Schedule

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Lead and Copper	50	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jul 2022***	
Asbestos	0	Jan 2020 - Dec 2028	waiver - 9 year			
Total Trihalomethane (THM)	2	Jan 2022 - Mar 2022	reduced - quarterly	01/20/2022		
Total Trihalomethane (THM)	2	Apr 2022 - Jun 2022	reduced - quarterly	01/20/2022	***May 2022***	
Total Trihalomethane (THM)	2	Jul 2022 - Sep 2022	reduced - quarterly	01/20/2022	***Aug 2022***	
Total Trihalomethane (THM)	2	Oct 2022 - Dec 2022	reduced - quarterly	01/20/2022	***Nov 2022***	
Halo-Acetic Acids (HAA5)	2	Jan 2022 - Mar 2022	reduced - quarterly	01/20/2022		
Halo-Acetic Acids (HAA5)	2	Apr 2022 - Jun 2022	reduced - quarterly	01/20/2022	***May 2022***	
Halo-Acetic Acids (HAA5)	2	Jul 2022 - Sep 2022	reduced - quarterly	01/20/2022	***Aug 2022***	
Halo-Acetic Acids (HAA5)	2	Oct 2022 - Dec 2022	reduced - quarterly	01/20/2022	***Nov 2022***	

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:
- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S05 *WELL #5 AAD500 HAZ SO5* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	08/02/2021	***Aug 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S05 *WELL #5 AAD500 HAZ SO5* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/17/2013	***Jun 2022***	
Volatile Organics (VOC)	1	Jan 2022 - Dec 2022	R&C - 1 year	08/02/2021	***Sep 2022***	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/17/2013	***Jun 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/14/2003		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***	

Source S07 *WELL #7 AAD497 HAZ SO7* *Well* *Use - Seasonal* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	10/12/2015	***Jul 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/15/2009	Jul 2028	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	06/30/2010	Jul 2025	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/15/2009	***Jul 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/15/2009		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/15/2009	***May 2020***	***Past Due***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/15/2009	***May 2020***	***Past Due***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S09 *WELL #9 AAD499 HAZ SO9* *Well* *Use - Seasonal* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	10/13/2009	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	10/13/2009	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2022 - Dec 2022	R&C - 1 year	10/13/2009	***Oct 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	12/12/1996	***Jul 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	12/12/1996	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Radium 228	1	Jan 2022 - Mar 2022	initial - quarterly	10/13/2009	***Mar 2022***

Source S10 *WELL #10 AAF412 HAZ S10* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	08/10/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/01/2018	Aug 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/01/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/21/2009	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S15	*WELL #15 AAF415 HAZ S15*	*Well*	*Use - Seasonal*	*Susceptility - High*		
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	08/02/2021	***Jul 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	08/02/2021		
Volatile Organics (VOC)	1	Jan 2020 - Dec 2022	standard - 3 year	08/02/2021		
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/02/2021		
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	10/03/2010		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/02/2021		
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/02/2021		

Source S17	*WELL #17 AAF417 HAZ S17*	*Well*	*Use - Permanent*	*Susceptility - High*		
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/26/2011	***Apr 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	07/15/2008	***Jun 2022***	
Volatile Organics (VOC)	1	Jan 2022 - Dec 2022	R&C - 1 year	07/10/2013	***May 2022***	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/29/2010	***Jul 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	09/29/2010		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	10/03/2010	***May 2020***	***Past Due***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	10/03/2010	***May 2020***	***Past Due***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S20	*WELL #19 AFP638 HAZ S20*	*Well*	*Use - Permanent*	*Susceptility - High*		
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	11/19/2015	***Mar 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	08/26/2014	Aug 2023	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/26/2014	***Feb 2022***	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/10/2013	***Jul 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/14/2003		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2022	standard - 3 year	11/19/2015	***May 2020***	***Past Due***
Radium 228	1	Jan 2020 - Dec 2022	standard - 3 year	11/19/2015	***May 2020***	***Past Due***

Source S21	*WELL #16 AAF416 HAZ S21*	*Well*	*Use - Permanent*	*Susceptility - Moderate*		
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/28/2021	***Jul 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/06/2020		
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/07/2017	Jul 2023	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/28/2018		
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/15/2009		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***	

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S22 *WELL #20 AAF420 HAZ S22* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/01/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/28/2018	Aug 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/17/2013	***Jun 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/14/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***

Source S24 *WELL #22 AAF422 HAZ S24* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/17/2013	***Jun 2022***
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jun 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/07/2017	Jul 2023
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/17/2013	***Jun 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/16/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S25	*WELL #23 AAF423 HAZ S25*	*Well*	*Use - Permanent*	*Susceptility - Moderate*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/28/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/22/2013	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/01/2018	Aug 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/01/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/15/2009	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***

Source S26	*WELL #24 AAF424 HAZ S26*	*Well*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/28/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	08/10/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/01/2018	Aug 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/01/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/20/2009	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S27 *WELL #25 AAF425 HAZ S27* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	12/03/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/12/2016	***Jul 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/28/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/21/2009	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Source S28 *WELL #27 AAI679 HAZ S28* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/01/2020	
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	06/01/2020	
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	06/01/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/28/2018	Aug 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/24/2013	***Jul 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/14/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S29 *WELL #29 AAF501 HAZ S29* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/22/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/01/2013	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/10/2020	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	05/21/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	09/20/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Source S30 *WELL #30 ABV300 HAZ S30* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/22/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	09/12/2017	Sep 2026
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	09/18/2018	Sep 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/18/2013	***Jun 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/15/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/14/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/14/2016	***Sep 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S31 *WELL #31 ABV297 HAZ S31* *Well* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	08/10/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	09/18/2018	Sep 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	05/20/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/15/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Source S33 *WELL #104 AAF404 HOC S04* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	05/16/2019	***Mar 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	08/29/2011	Jul 2025
Arsenic	1	Jan 2020 - Dec 2022	standard - 3 year	05/16/2019	***May 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	10/27/2014	***Feb 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/02/2013	***Jul 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/15/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S34 *WELL #105 AAF405 HOC S05* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/30/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/22/2013	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	06/25/2020	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	04/03/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	08/04/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Source S35 *WELL #106 AAF406 HOC S06* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/23/2013	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	05/05/2020	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	12/10/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	08/04/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S36 *WELL #108 AAF407 HOC S07* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/30/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	09/02/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2022	standard - 3 year	09/05/2019	***Sep 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/28/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	10/03/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	06/25/2020	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	06/25/2020	

Source S41 *WELL #28 AAF459 MG S04* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	08/10/2020	***Mar 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/23/2013	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/10/2020	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/22/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	08/16/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S43 *WELL #26 ABE251 MG S06* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/29/2021	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	09/14/2016	***Sep 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/13/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/14/2003	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/14/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/14/2016	***Sep 2022***

Source S49 *WELL #21 AFP639 SALMON CRK* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/10/2013	***Jul 2022***
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	09/17/2019	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/07/2017	Jul 2023
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/28/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/20/2009	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S50 *WELL #33 AEJ476* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jun 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/29/2021		
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/24/2016	***Aug 2022***	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	05/20/2019		
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	11/01/2010		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***	

Source S51 *WELL #8.2 AFE652* *Well* *Use - Permanent* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	09/20/2010	***Jul 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	07/21/2009	***Jul 2022***	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2022	standard - 3 year	07/21/2009	***Aug 2020***	***Past Due***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	03/09/2004	***Aug 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	03/09/2004		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/21/2009	***May 2020***	***Past Due***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/19/2011	***May 2020***	***Past Due***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S52 *WELL#34 AFR920* *Well* *Use - Seasonal* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due	
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	09/05/2019	***Jul 2022***	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	09/26/2012	Jul 2028	
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jul 2022***	
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jul 2022***	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/22/2019	Jul 2025	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/01/2013	***Jul 2022***	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	07/03/2001		
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year			
Gross Alpha	1	Jan 2020 - Dec 2022	standard - 3 year	09/14/2016	***May 2020***	***Past Due***
Radium 228	1	Jan 2020 - Dec 2022	standard - 3 year	09/14/2016	***May 2020***	***Past Due***

Source S53 *WELL #32 AFR834* *Well* *Use - Seasonal* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/29/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/01/2013	Jul 2028
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/12/2016	Jul 2025
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/18/2013	***Jun 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	02/05/2002	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S54 *WELL #15.1 APN083* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/10/2013	***Jul 2022***
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jul 2022***
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	07/22/2019	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/10/2020	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/22/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	09/16/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2017	Aug 2023
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2017	Aug 2023

Source S55 *WELL #13.1 AKW138* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/27/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	06/17/2013	***Jun 2022***
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	09/05/2019	***Jun 2022***
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	09/05/2019	***Jun 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	07/07/2017	Jul 2023
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	06/17/2013	***Jun 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	04/21/2004	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S55	*WELL #13.1 AKW138*	*Well*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/28/2016	***Sep 2022***

Source S56	*WELL #35 ABF374*	*Well*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	07/20/2021	***Jul 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/01/2013	***Jul 2022***
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	08/29/2019	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	08/24/2016	***Aug 2022***
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	08/28/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	11/21/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/24/2016	***Aug 2022***

Source S57	*WELL #110.1 AKM821*	*Well*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/30/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/22/2013	***Jul 2022***
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	07/23/2019	***Jul 2022***
Manganese	1	Jan 2020 - Dec 2022	standard - 3 year	07/23/2019	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S57	*WELL #110.1 AKM821*	*Well*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	06/30/2021	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	07/23/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	09/20/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	08/30/2016	***Aug 2022***
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	08/30/2016	***Aug 2022***

Source S60	*South Lake WF (S58 & S59)*	*Well Field*	*Use - Permanent*	*Susceptility - Low*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	08/02/2021	***Aug 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	12/17/2014	***Jun 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	09/18/2018	Sep 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	04/02/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	12/17/2014	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year	12/17/2014	
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	04/02/2019	Apr 2025
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	04/02/2019	Apr 2025

Source S63	*Well #111 Si Ellen ABY234*	*Well*	*Use - Seasonal*	*Susceptility - High*	
Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/30/2021	***Jul 2022***

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S63 *Well #111 Si Ellen ABY234* *Well* *Use - Seasonal* *Susceptility - High*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	12/03/2020	***Jul 2022***
Volatile Organics (VOC)	1	Jan 2020 - Dec 2022	standard - 3 year	10/12/2020	
Herbicides	1	Jan 2020 - Dec 2028	waiver - 9 year	12/28/2017	Jul 2028
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	12/28/2017	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year	07/27/2017	
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	12/28/2017	Dec 2023
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	12/28/2017	Dec 2023

Source S65 *Paradise Point* *Well Field* *Use - Permanent* *Susceptility - Moderate*

Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	06/22/2021	***Jun 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2022	standard - 3 year	01/23/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2022	standard - 3 year	01/23/2020	
Herbicides	1	Jan 2020 - Dec 2028	waiver - 9 year	01/23/2020	***Aug 2022***
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	01/23/2020	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year	01/23/2020	
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	02/25/2021	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	02/25/2021	

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	*Due Date*
Measure chlorine residuals and submit monthly reports if your system uses continuous chlorination:	monthly
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2022
Submit CCR certification form to ODW (Community systems only):	10/01/2022
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2022
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Southwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Sophia Petro: (360) 236-3046 or sophia.petro@doh.wa.gov
For questions regarding DBPs:	Regina Grimm, p.e.: (360) 236-3035 or regina.grimm@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Southwest Office: (360) 236-3030 or SWRO.Coli@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

I Water Quality Regulations

Potential Drinking Water Quality Regulatory Changes

Introduction

The USEPA regulates drinking water quality through standards developed under the Safe Drinking Water Act. Current regulatory limits are discussed in the Attached Appendix A. In the United States, the Safe Drinking Water Act provides an overall regulatory framework for assuring the safety of drinking water. The Environmental Protection Agency is responsible for the development of national drinking water regulations and the implementation of these regulations.

As it was last amended in 1996, the SDWA established a scientific, risk-based process for identifying, assessing, and managing health risks from contaminants in drinking water. Since 1975, EPA has developed 18 major drinking water regulations addressing 91 different contaminants.
In 2010 EPA announced a new Drinking Water Strategy that will regulate groups of contaminants and utilize several other principles to increase coordination and collaboration among EPA and states as well as among federal statutes.

The regulatory process has multiple steps and takes several years to complete. The overall process is depicted in Figure 1. Because this process is well defined, we have a pretty good idea of what to expect for future regulations.

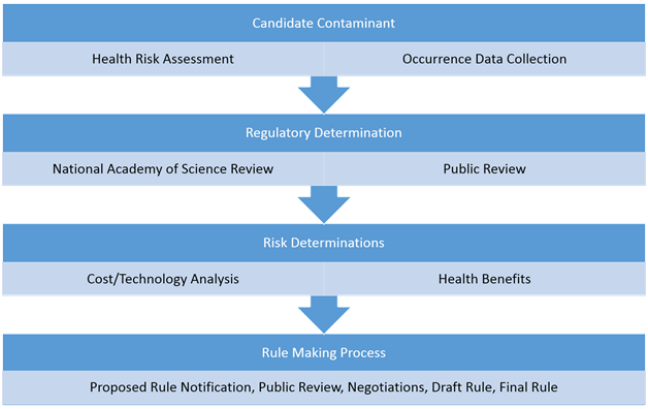


Figure 1 – Overview of Regulatory Process

Recent Regulatory Changes

Lead and Copper Rule (LCR): In December 2020, the EPA's revised Lead and Copper Rule (LCRR) was finalized with the aim to better protect children and communities from the risks of lead exposure by better protecting children at schools and childcare facilities, getting the lead out of our nation's drinking water, and empowering communities through information. Improvements under the new rule include:

- Using science-based testing protocols to find more sources of lead in drinking water.
- Establishing a trigger level to jumpstart mitigation earlier and in more communities.
- Driving more and complete lead service line replacements.
- For the first time, requiring testing in schools and childcare facilities.
- Requiring water systems to identify and make public the locations of lead service lines

Potential Regulatory Changes

EPA is moving forward with regulation of contaminant groups. EPA announced in February 2011 that carcinogenic VOCs would be the first group to be regulated as part of its new drinking water strategy to regulate contaminants as groups instead of individually. Another likely candidate for a rule proposal will be nitrosamines, but EPA is awaiting the final data from UCMR 2 before moving forward with regulation of the group nitrosamines.

Near-Term Regulatory Changes (within 3 Years)

Fluoride: On January 7, 2011, the U.S. Department of Health and Human Services (HHS) issued a news release with a draft recommendation for optimized community water fluoridation. HHS proposed to change the optimized fluoride concentration from a range of 0.7 to 1.2 mg/L to a single numerical value of 0.7 mg/L. Also on January 7, 2011, the EPA released two health-related documents for a potential future revision of the fluoride MCL: a dose-response study on non-cancer effects and an exposure and relative source contribution study. These scientific assessments will also guide EPA in making a determination of whether to lower the maximum amount of fluoride allowed in drinking water, which is set to prevent adverse health effects. EPA MCL for fluoride of 4 mg/L remains unchanged.

EPA's schedule for potentially revising the fluoride MCL is not clear at this time, but after the decision is made that the MCL should be revised it typically takes three to four years to propose a new standard and finalize the regulation.

Storage tanks: EPA has been under some pressure to "do something" on storage tanks since the 2008 Salmonella outbreak in Alamosa, Colo. EPA held a public meeting in October 2014 to hear different stakeholder's perspectives on tank inspection and cleaning (79 FR 52647). EPA is currently evaluating data and information to determine whether a regulation, guidance, or something else is needed on storage tanks.

Legionella: EPA is planning to issue guidance on treatment options for Legionella in 2015. Some water systems that serve large facilities, as well as state primacy agencies, have had to contend with Legionella outbreaks over the past few years. So over the past few years, some facilities have installed secondary disinfection systems for water quality issues within their premise plumbing. These facilities now become

public water systems with the installation of these systems and face all of the monitoring and operator certification requirements.

Cyanotoxins: Cyanotoxins gotten a higher priority in the regulatory arena, given the water quality problems in Toledo, Ohio, in August 2014. In 2015 EPA issued a public health advisory for several Cyanotoxins with separate levels for adults and infants/toddlers. Implementation of the health advisories varies from State to State. This advisory issuance may have the effect of bypassing the long regulatory process if states require issuance of do-not-drink or do-not-use orders when cyanotoxins are found above the advisory levels. States are beginning to implement their own regulations for cyanotoxins ahead of the Federal government.

Perfluorinated Compounds: EPA established a health advisory for drinking water of 70 parts per trillion (ppt) for PFOS and PFOA, two commonly found Perfluorinated compounds. When both compounds are found in the water the combined health advisory is also 70 ppt. States are establishing their own regulations for these compounds ahead of the Federal Government.

Medium Range Regulatory Changes (3-5 Years)

Perchlorate: In the February 11, 2011, Federal Register notice, the EPA stated that perchlorate would be federally regulated under the SDWA based on data indicating risks associated with perchlorate exposure. This reversed the EPA's previous decision in October 2008 to refrain from implementing a national drinking water regulation for perchlorate. The decision in 2011 to regulate perchlorate did not impose any requirements on public water systems but initiated a process to establish a national primary drinking water regulation (NPDWR). The EPA's Science Advisory Board (SAB) issued a draft report on September 5, 2012, on the approaches to derive a MCLG for perchlorate. EPA is expected to propose an MCL by late 2014 or early 2015.

Chlorinated Volatile Organic Chemicals (cVOCs): In February 2011 EPA announced that cVOCs would be the first contaminant group to be regulated as part of the agency's new Drinking Water Strategy, which would regulate groups of contaminants rather than individual contaminants. EPA indicated that the group rule would contain as many as 16 compounds, including eight currently regulated cVOCs and up to eight from the Contaminant Candidate List. EPA is considering a potentially complicated "risk cup" approach for cVOCs. This "risk cup" approach would be based on the relative risk of each cVOC and the mixture of cVOCs in each water would result in variable standards for each cVOC between systems.

For this first group, EPA is considering eight currently regulated VOCs as well as eight VOCs from CCL 3 summarized in Table 1.

The EPA has not given exact details of how the carcinogenic VOC regulation would be implemented. One potential regulatory option might be to lower both of the MCLs for trichloroethylene (TCE) and tetrachloroethylene (PCE). Some associated risk reduction could be assumed for the eight carcinogenic CCL 3 VOCs that are also removed to some degree by the lower TCE and PCE MCLs. EPA has already assessed the potential effects of lowering the TCE and PCE MCLs from 5 mg/L to 2.5, 1.0, and 0.5 mg/L.

TABLE 1
VOCs Considered for Group Contaminant Monitoring

Currently Regulated VOCs		VOCs from CCL 3	
Benzene	Dichloromethane	Aniline	Nitrobenzene
Carbon tetrachloride	Tetrachloroethylene (PCE)	Benzyl chloride	Oxirane methyl
1,2-dichloroethane	Trichloroethylene (TCE)	1,3-butadiene	1,2,3-trichloropropane
1,2-dichloropropane	Vinyl chloride	1,1-dichloroethane	Urethane

Strontium: On October 20, 2014, EPA published the Preliminary Third Regulatory Determinations (79 FR 62716). EPA made one positive preliminary determination for strontium. It is expected to be finalized by the end of 2015. Strontium has some significant health effects issues that need to be resolved before the Agency moves forward with a proposed and/or final strontium regulation. If the Agency continues to move forward with a strontium, then EPA has to propose the strontium regulation 24 months the final determination, and then publish the final regulation 18 months after the proposal maybe in 2019.

Longer Term Regulatory Changes (5-10 years)

The Environmental Protection Agency (EPA) issued the Draft Fourth Contaminant Candidate List (CCL4) on February 2, 2015 (80 FR 6076). The Draft CCL4 listed 100 chemicals or groups and 12 microbial contaminants, including manganese. EPA made a negative regulatory determination for manganese in 2003 (68 FR 42898) but added it to the Draft CCL4 due to new health effects data that showed some potential neurological effects. The Draft CCL4 list is shown in Table 1. Usually only 1 or two compounds on a CCL would get a regulatory determination to create a standard. Based on health effects research completed to date, leading candidates for regulatory determinations are:

Arsenic: EPA has updated the health assessments for arsenic but has continued to revise them after brief public review periods. The arsenic re-assessment initially showed the cancer rates were significantly higher than those used in the 1991 Arsenic Rule. There is no current schedule for the finalization of the health risk assessment.

Radon: The EPA proposed regulations on November 2, 1999, to reduce the public health risks from radon. The public comment period was open until February 4, 2000. A final rule was expected in 2011 but has yet to be proposed. The proposed standards would apply to community water systems that regularly serve 25 or more people and that use groundwater or mixed groundwater and surface water sources. The risk of radon from air is greater than the risk from water. Therefore, the EPA is encouraging states to develop enhanced programs to address health risks from radon in indoor air through multimedia mitigation (MMM) programs. If a state adopts a MMM program, individual water systems must reduce radon levels in drinking water to 4,000 picocuries per liter (pCi/L). If a state does not adopt, or create its own MMM program, systems would be required to reduce radon in drinking water to 300 pCi/L, or to develop individual local MMM programs and reduce levels in drinking water to 4,000 pCi/L.

Nitrate: While EPA has not made a formal announcement, it appears that in acknowledgment of an ongoing nutrient problem it may be considering a reduction of the current nitrate MCL of 10 mg/L as nitrogen.

Nitrosamines: Another potential contaminant group is nitrogenous DBPs, such as N-nitrosodimethylamine (NDMA) and other nitrosamines. NDMA is an emerging drinking water contaminant that is of interest to the environmental community because of its miscibility with water, as well as its carcinogenicity and toxicity. NDMA is also an unintended byproduct of the chlorination of wastewater and drinking water at treatment plants that use chloramines for disinfection.

Although NDMA is listed as a priority pollutant by the EPA, no federal MCL has been established for drinking water. The California Department of Public Health (CDPH), usually a leader in environmental issues, has established the levels shown in Table 2.

TABLE 2
California Department of Public Health Nitrogenous DBP Levels

Nitrosamine	10^{-6} Cancer Risk Level (ng/L)	Notification Level[a] (ng/L)	Response Level[b] (ng/L)
N-Nitrosodiethylamine (NDEA)[c]	1	10	100
N-Nitrosodimethylamine (NDMA)[c,d]	3	10	300
N-Nitrosodi-n-propylamine (NDPA)[c]	5	10	500
N-Nitrosodi-n-butylamine (NDBA)[c]	3	--	--
N-Nitrosomethylethylamine (NMEA)[c]	1.5	--	--
N-Nitrosomorpholine (NMOR)	5	--	--
N-Nitrosopiperidine (NPIP)	3.5	--	--
N-Nitrosopyrrolidine (NPYR)[c]	15	--	--

[a] Notification levels for NDEA, NDMA, and NDPA are established at 10 ng/L, somewhat above the cancer risk level, to take into account the very low detection limits and their potential presence in association with drinking water treatment. Notification levels are health-based advisory levels established by CDPH for chemicals in drinking water that lack MCLs. When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply.

[b] Level at which CDPH recommends removing the source from service. This corresponds to a 10^{-4} cancer risk.

[c] Chemical is on EPA UCMR 2.

[d] Office of Environmental Health Hazard Assessment's (OEHHA) public health goal (PHG) for NDMA is established at the 10^{-6} risk level.

NDMA can be minimized by reducing precursors, such as organic nitrogen and the chemical compound DMA. Enhanced coagulation, GAC adsorption, and biological filtration all have demonstrated effective

organic nitrogen removal. Additionally, some cationic polymers contain DMA, a known precursor to NDMA. By selecting polymers that do not contain DMA, NDMA formation from polymer addition can be avoided. NDMA can also be managed by minimizing the time between chlorine and ammonia addition in chloramination. NDMA can be removed after formation by very high doses of UV, but managing NDMA formation in the treatment process is a more cost-effective approach. The most likely impacts of a future NDMA or nitrosamine regulation would be to utilize only DMA-free polymers.

Gaseous Chlorine: Drinking water and wastewater utilities are currently exempt from Chemical Facility Security Anti-Terrorism Standards (CFATS). In November 2009, the House of Representatives passed the *Continuing Chemical Facilities Antiterrorism Security Act of 2010* (H.R. 2868), which would eliminate this exemption. One provision of H.R. 2868 would have required utilities in the high-risk tiers to assess "inherently safer technologies" (ISTs) and then possibly be subject to a state mandate to implement these technologies. This bill specified that EPA would determine a utility's risk tier classification; however, the methodology used to arrive at this classification was not described. The House Bill would have placed the final decision on which materials (primarily disinfectants) or processes a water utility may use with state primacy agencies. This issue is expected to arise again at some point in the future.

In March 2011, the *Full Implementation of the Chemical Facility Anti-Terrorism Standards Act* (H.R. 908) was introduced in the House of Representatives. In its current form, H.R. 908 extends the existing authority (the Department of Homeland Security Appropriations Act, 2007) until October 4, 2018. At the time of the scheduled legislative markup, the American Water Works Association (AWWA) and other drinking water associations sent a joint letter to the committee "urging that chemical security for water systems not be added to H.R. 908 but be considered separately at an appropriate time" (AWWA May 2011). This bill was sent to the House for consideration in May 2011 and has not yet passed the House.

Chromium VI: On January 12, 2011, EPA issued a news release with guidance for enhanced monitoring of hexavalent chromium, or chromium VI (Cr-VI), in addition to the currently required monitoring for total chromium. In the guidance, EPA strongly encourages utilities to conduct Cr-VI sampling at treatment plants (raw and finished) and in the distribution system but did not provide any risk context for the sampling if Cr-VI was detected or provide any risk communication guidance.

EPA said that the timeline for proceeding with a regulatory standard for Cr-VI would not begin until the peer review of EPA's Integrated Risk Information System (IRIS) assessment of the chemical is complete. The EPA continues to evaluate the Cr-VI risk assessment, with no definitive scheduling for Cr-VI rule making, so the regulatory decision would be at least 5 to 10 years away.

Cr-VI is the stable form of chromium in water. Data presented at the 2001 Water Quality Technology Conference demonstrated that parallel measurements of Cr-VI and total chromium showed most samples to be essentially 100 percent Cr-VI. Total chromium levels in finished water of the BCWTP as presented in the 2012 Consumer Confidence Report were at non-detect levels. However, sampling results in January and May of 2011 produced detectable levels of total chromium.

Compounds of Emerging Concern: In 2005, EPA began studying environmental contamination by pharmaceuticals, detergents, natural and synthetic hormones, and other chemicals. These contaminants are commonly referred to collectively as compounds of emerging concern (CECs) and are shown in Table 3.

An additional regulatory concern in the next decade will be endocrine disrupting compounds (EDCs) and microconstituents. EDCs and pharmaceutical and personal care product (PPCP) pollutants have been

found in trace concentrations (usually less than 0.1 ng/L) in waters of the United States. Data on these chemicals in finished water is still sparse, but there is widening public concern about the effects of these contaminants based upon recently published analytical results from various drinking water supply sources. In addition, several organic microconstituents have been found in the effluent of wastewater treatment facilities. Reporting on these contaminants by news organizations exerts additional pressure for utilities to evaluate the treatment process and whether action is required to reduce or remove these compounds.

As of 2011, the UCMR 3 and CCL 3 are the best location for information on how EPA is starting to gather information on these compounds and the potential for regulatory action. Though a good source of information, the UCMR 3 and CCL 3 represent the start of the regulatory process and regulatory decisions are still 5 to 10 years away.

Multi-barrier treatment approaches are being utilized in the water systems that are taking a proactive approach toward the treatment of CECs, including EDCs, pharmaceuticals, detergents, natural and synthetic hormones, and other chemicals. The multi-barrier treatment approach includes riverbank filtration (RBF), ultra-violet advanced oxidation process (UV-AOP), and granular activated carbon (GAC) adsorption.

Table3. Draft Contaminant Candidate List 4: Microbial Contaminants

Pathogens	
Adenovirus	Hepatitis A virus
Caliciviruses	Legionella pneumophila
Campylobacter jejuni	Mycobacterium avium
Enterovirus	Naegleria fowleri
Escherichia coli (0157)	Salmonella enterica
Helicobacter pylori	Shigella sonnei
Chemical Contaminants	
Common name--Registry name	
1,1,1,2-Tetrachloroethane	Halon 1011 (bromochloromethane)
1,1-Dichloroethane	HCFC-22
1,2,3-Trichloropropane	Hexane
1,3-Butadiene	Hydrazine
1,4-Dioxane	Manganese
17 alpha-Estradiol	Mestranol
1-Butanol	Methamidophos
2-Methoxyethanol	Methanol
2-Propen-1-ol	Methyl bromide (Bromomethane)
3-Hydroxycarbofuran	Methyl tertiary butyl ether (MTBE)
4,4'-Methylenedianiline	Metolachlor
Acephate	Metolachlor ethanesulfonic acid (ESA)
Acetaldehyde	Metolachlor oxanilic acid (OA)
Acetamide	Molinate
Acetochlor	Molybdenum
Acetochlor ethanesulfonic acid (ESA	Nitrobenzene
Acetochlor oxanilic acid (OA)	Nitroglycerin
Acrolein	N-Methyl-2-pyrrolidone
Alachlor ethanesulfonic acid (ESA)	N-nitrosodiethylamine (NDEA)
Alachlor oxanilic acid (OA)	N-nitrosodimethylamine (NDMA)
Alpha-Hexachlorocyclohexane	N-nitroso-di-n-propylamine (NDPA)
Aniline	N-Nitrosodiphenylamine
Bensulide	N-nitrosopyrrolidine (NPYR)
Benzyl chloride	Nonylphenol
Butylated hydroxyanisole	Norethindrone (19-Norethisterone)
Captan	n-Propylbenzene
Chlorate	o-Toluidine
Chloromethane (Methyl chloride)	Oxirane, methyl-
Clethodim	Oxydemeton-methyl
Cobalt	Oxyfluorfen
Cumene hydroperoxide	Perfluorooctane sulfonic acid (PFOS)
Cyanotoxins	Perfluorooctanoic acid (PFOA)
Dicrotophos	Permethrin
Dimethipin	Profenofos
Disulfoton	Quinoline
Diuron	RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)
Equilenin	sec-Butylbenzene
Equilin	Tebuconazole
Erythromycin	Tebufenozide.
Estradiol (17-beta estradiol)	Tellurium
Estriol	Thiodicarb
Estrone	Thiophanate-methyl
Ethinyl Estradiol (17-alpha Ethinyl Estradiol)	Toluene diisocyanate
Ethoprop	Tribufos
Ethylene glycol	Triethylamine
Ethylene oxide	Triphenyltin hydroxide (TPTH)
Ethylene thiourea	Urethane
Fenamiphos	Vanadium
Formaldehyde	Vinclozolin
Germanium	Ziram

Appendix A. Drinking Water Regulations

USEPA regulates public health protection in drinking water supplies through regulations developed under the framework of the Safe Drinking Water Act and the Safe Drinking Water Act Reauthorization. Many of these regulations apply to public water systems using groundwater as a supply. Table A-1 provides a summary of regulations that apply to groundwater systems and that could result in treatment of groundwater. Full texts of the regulations can be found at http://www.epa.gov/safewater/regs.html.

Table A-1: Current USEPA Drinking Water Regulations

Regulation	Key Provisions	Potential Treatment Implications
Groundwater Rule	• Periodic sanitary surveys to evaluate system components and identify significant deficiencies. • Triggered source water monitoring if no virus inactivation provided. • Corrective action for significant deficiencies and raw water fecal coliform detection. • Compliance monitoring to ensure 4-log viral inactivation treatment provisions established for vulnerable systems.	• Disinfection and contact time for viral inactivation for vulnerable systems.
Stage 2 Disinfection By-Products Rule	• Requires systems to identify and monitor for two classes of disinfection by products; total trihalomethanes (TTHM) and five haloacetic acids (HAA5) at sites in the distribution system likely to have the highest levels. • Establishes maximum contaminant levels for TTHM and HAA5 at each location tested.	• Reduction of disinfection by product levels.
Long-Term 2 Enhanced Surface Water Treatment Rule	• Surface water and groundwater under the influence of surface water must provide treatment for cryptosporidium.	• Disinfection and/or filtration for cryptosporidium.
Filter Backwash Rule	• Surface waters and groundwater under the influence of surface water and using filtration with recycling of backwash water must conduct recycling in a manner that meets regulatory standards.	• Potential process changes for recycling of backwash water.
Arsenic Rule	• Established a maximum contaminant level (MCL) and a maximum contaminant level goal (MCLG) for arsenic.	• Treatment to remove arsenic in excess of MCL.
Radionuclide Rule	• Established MCLs and MCLGs for combined radium-226/-228, (adjusted) gross alpha, beta particle and photon radioactivity, and uranium.	• Treatment for combined radium 226/228, adjusted gross alpha, beta particle and photon radioactivity above MCLs.
Lead and Copper Rule	• Established action levels for lead and copper in at-risk customer tap samples. New AL tiers in 2021 revised rule (2021) • Requires systems to monitor WQ at taps in buildings with LSLs if available and at all elementary schools and childcare facilities, new sample collection procedure and monitoring frequency dependent on AL (2020) • New LSR replacement requirements when AL exceeds 15 ppb (2020)	• Corrosion control treatment (CCT) study, implementation, or optimization for lead and copper dependent on the AL exceeded (2020)
National Primary Drinking Water Standards	• Established MCLs and some treatment techniques (TT) for several synthetic organic chemicals (SOC), volatile organic chemicals	• Treatment for a variety of compounds if MCLs or action levels are exceeded.

Commented [DM1]: I added on to these sections prior to turning on Track Changes

Table A-1: Current USEPA Drinking Water Regulations

Regulation	Key Provisions	Potential Treatment Implications
	(VOC), inorganic chemicals (IOC), physical parameters and microbial contaminants.	• See following section for individual compounds, and levels requiring treatment.
National Secondary Drinking Water Standards	• Established secondary MCLs (SMCL) for several inorganic, and physical properties of water.	• Requirements vary by State, but are generally viewed as guidelines for drinking water quality

The USEPA is required to periodically review these regulations and revise them if necessary to maintain or improve the same level of public health protection originally regulated. For example, when the Arsenic Rule was made final in 2001, USEPA stated that the health effects information for the rule was incomplete and that when it was available the agency would review the health effects information. In 2005, the Science Advisory Board for the USEPA reviewed new health effects information for this rule and made recommendations for lower MCLs. The USEPA is currently reviewing the regulations and incorporating the cost and benefit analysis and the ability of existing technology to treat to lower levels.

In addition, the USEPA adds new contaminants to the list of Primary Drinking Water Standards. In 2005, the USEPA provided a contaminant candidate list (CCL2) that included 8 additional microbial and 42 additional chemicals for possible regulation under the Safe Drinking Water Act. In 2008 USEPA published the CCL3 which includes 104 chemicals or chemical groups and 12 microbiological contaminants.

In 2010, USEPA proposed revisions to the 1989 Total Coliform Rule. The proposed revisions to the TCR will:

- Require public water systems that are vulnerable to microbial contamination to identify and fix problems, and
- Establish criteria for systems to qualify for and stay on reduced monitoring, thereby providing incentives for improved water system operation.

Current Primary and Secondary Drinking Water Standards

There are currently drinking water quality standards for 95 contaminants, including 9 microbials, 8 disinfection by-products and residuals, 18 inorganics (including lead and copper), 53 organics and 7 radiologic contaminants. These standards either; have established MCLs, or treatment techniques, and are summarized below.

Microbial Contaminants – Coliform Bacteria: Microbial contaminants are regulated for surface and groundwater systems under three separate regulatory mechanisms:

1. All surface and groundwater systems are routinely tested for total coliform and if present for fecal coliform and *E. Coli*

2. Groundwater systems subject to the Groundwater Rule provisions have sanitary surveys conducted periodically, monitor for coliform and if significant deficiencies or source water fecal coliform are found may need to disinfect for 4-log (99.99% virus removal)

3. Surface water and groundwater supplies listed as Groundwater Under the Influence of Surface water must meet the provisions of the Surface Water Treatment Rule and its successors; Interim Enhanced Surface Water Treatment Rule, Filter Backwash Rule, Long Term 1 Enhanced Surface Water Treatment Rule and Long Term 2 Enhanced Surface Water Treatment Rule

Coliform: The presence of total coliforms indicates potential problems with microbial water quality and triggers testing for fecal coliform and *E. Coli*. Fecal coliforms and E. Coli are bacterial contaminants whose presence indicates that the water may be contaminated with human or animal wastes, and urgent action is required to protect health including advising water users to boil drinking water or use alternate supplies. Microbes in these water supplies can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

In February 2013, the USEPA passed the Revised Total Coliform Rule (RTCR). The RTCR establishes a maximum contaminant level (MCL) for E. coli and uses E. coli and total coliforms to initiate a "find and fix" approach to address fecal contamination that could enter the distribution system. It requires public water systems (PWSs) to perform assessments to identify sanitary defects and subsequently take action to correct them.

Pathogenic organisms: Regulations of specific disease causing (pathogenic) microbial organisms including *Cryptosporidium, Giardia lamblia*, enteric viruses and *Legionella* are usually associated with water systems that use surface water supplies, however, groundwater that is under the influence of surface water may also contain these contaminants. Requirements for microbial contaminants of these pathogenic organisms can also include indicators of microbial contamination including heterotrophic plate count bacteria (HPC), and turbidity.

Pathogenic organisms in drinking water can cause a host of water-borne diseases in humans (see Table A-2). These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Table A-2: Microbial Contaminants

Contaminant	MCL/mg/L	Potential Health Effects	Potential Sources
Giardia Lamblia	TT[1]	Gastrointestinal disease	Human and animal fecal wastes
Cryptosporidium	TT	Gastrointestinal disease	Human and animal fecal wastes
Legionella	TT	Legionnaires disease	Natural waters, can grow in water heating systems
Heterotrophic plate count (HPC)	TT	Indicates water quality, effectiveness of disinfection treatment	Naturally occurring bacteria
Turbidity	PS[2]	Interferes with disinfection, indicator of filtration treatment performance	Particulate matter from soil runoff
Viruses	TT	Gastrointestinal disease	Human fecal wastes
Total coliforms	<5% positive[3]	General indicator of the presence of pathogens	Bacteria naturally present in the environment, human and animal fecal wastes
Fecal coliforms	Confirmed	More specific indicator of the presence of	Human and animal fecal wastes,

Table A-2: Microbial Contaminants

Contaminant	MCL/mg/L	Potential Health Effects	Potential Sources
	presence	pathogens	some natural environmental sources
E. Coli	Confirmed presence	Most specific indicator of the presence of pathogens	Human and animal fecal wastes

[1] Treatment Technique

[2] Performance Standard

[3] For systems collecting less than 40 samples per month the limit for compliance is no more than 1 sample per month

Surface water and groundwater systems under the influence (GUI) of surface water must provide a total level of treatment to remove/inactivate 99.9% (3-log) of *Giardia lamblia*, and to remove/inactivate 99.99% (4-log) of viruses. These systems must also remove or inactivate *cryptosporidium.* The treatment requirements for *cryptosporidium* vary based on whether or not the supply is filtered and on how much cryptosporidium is found in source water monitoring. Filtered water systems that recycle spent filter backwash water or other waste flows must return those flows through all treatment processes in the filtration plant.

Compliance with the regulations for surface water and GUI systems can be achieved by:

- Meeting filtration and disinfection treatment meeting performance standards for surface water systems,
- Meeting disinfection and "natural filtration" standards along with wellhead or source water protection,
- Meeting disinfection treatment standards and exception criteria to remain unfiltered.

Criteria for surface water systems to remain unfiltered have been applied in some cases to GUI sources. The criteria to remain unfiltered include source water quality criteria, site specific criteria, performance, and monitoring measures. Unfiltered criteria are summarized in Table A-3.

Table A-3: Criteria for Surface Water Supplies to Remain Unfiltered (has been applied to groundwater supplies in some cases)

Criteria	Requirements
Water Quality	• Less than or equal to 100 total coliform bacteria per 100 ml in 90% of samples collected for a running 6-month period, or • Less than or equal to 20 fecal coliform bacteria per 100 ml in 90% of samples collected for a running 6-month period • No turbidity exceedence of 5 NTU
Site Specific	• 99.9% (3-log) *Giardia* inactivation • 99.99% (4-log) enteric virus inactivation • 99% (2-log) or 99.9% (3-log) *cryptosporidium* inactivation depending on source water quality
Performance	• Meet daily disinfection performance standards for virus, *Giardia* and *cryptosporidium* inactivation • Maintain an approved watershed control program • Provide a minimum disinfectant residual of 0.2 mg/L at the entry point to the distribution system • Maintain distribution disinfectant residuals in 95% of distribution system samples collected monthly • Provide reliable backup equipment • Have an annual sanitary survey with no source water quality, disinfection treatment, or watershed control deficiencies

	• Comply with total coliform and disinfection by-products standards • Have no history of water-borne disease outbreaks • Complete disinfection profiling and benchmarking
Monitoring	• Continuous or 4 hour turbidity sampling. • Source water coliform sampling on any day when source water exceeds 1 NTU • Continuous recording of disinfectant residual at entry to distribution system • Calculate CTs daily

Disinfectants and Disinfection By-Products

Disinfection by-product regulations are intended to protect public health by limiting the exposure of people to chemical disinfectant residuals and chemical by-products of disinfection treatment that result from disinfection treatment practices. Disinfection treatment used to kill microorganisms in drinking water can react with naturally occurring organic and inorganic matter in water to form disinfection by-products. A treatment balance is required to apply levels of disinfection treatment needed to kill pathogenic microorganisms while limiting the levels of disinfection by-products produced. The disinfection by-products currently regulated are total trihalomethanes (TTHMs) and five haloacetic acids (HAA5). Table A.4 includes the regulatory standards for disinfection byproducts and maximum residual levels for disinfectants.

Table A.4: Disinfectant Residuals and Disinfection By-Products

Contaminant	MCL (mg/L)	Potential Health Effects	Common Sources in Drinking Water
Bromate	0.010	Cancer	Ozone reaction with natural bromide in water.
Bromodichloromethane	See TTHMs	Cancer; liver, kidney and reproductive effects	Chlorine reaction with natural organic matter.
Bromoform	See TTHMs	Cancer; nervous system, liver and kidney effects	Chlorine reaction with natural organic matter.
Chlorite	1.0	Oxidative effects to red blood cells	Chlorine dioxide by-product.
Chloroform	See TTHMs	Caner; liver, kidney, reproductive effects	Chlorine reaction with natural organic matter.
Dibromochloromethane	See TTHMs	Nervous system, liver, kidney, reproductive effects	D Chlorine reaction with natural organic matter.
Dichloroacetic acid	See HAA5	Cancer; reproductive, developmental effects	Chlorine reaction with natural organic matter.
Dibromoacetic acid	See HAA5	Cancer; reproductive, developmental effects	Chlorine reaction with natural organic matter.
Haloacetic acids (HAA5)[1]	0.060	Cancer and other effects	Drinking water chlorination by-products
Monochloroacetic acid	See HAA5	Cancer; reproductive, developmental effects	Chlorine reaction with natural organic matter.
Monobromoacetic acid	See HAA5	Cancer; reproductive, developmental effects	Chlorine reaction with natural organic matter.
Trichloroacetic acid	See HAA5	Liver, kidney, spleen, developmental effects	Drinking water chlorination by-product
Total Trihalomethanes (TTHMs)[2]	0.080	Liver, kidney, central nervous system effects, increased risk of cancer	Drinking water chlorination by-products
Total Organic Carbon (TOC)	TT (if source water exceeds 2.0 mg/L)	None, used as a surrogate for DBP formation potential	Natural organic materials present in surface waters
Chlorine	4.0 MRL[3]	Reproductive and developmental effects	Added to water as a disinfectant
Chloramine	4.0 MRL	Reproductive and developmental effects	Added to water as a disinfectant
Chlorine Dioxide	0.8 MRL	Reproductive and developmental effects	Added to water as a disinfectant

[1] Sum of the concentrations of mono-, di-, and trichloroacetic acids and mono-and dibromoacetic acids
[2] Sum of the concentrations of chloroform, bromoform, dibromochloromethane and bromodichloromethane
[3] Maximum residual level

To comply with the disinfection and disinfection by-product regulations, systems must optimize treatment processes to reduce disinfectant residuals and disinfection by-products. Monitoring is conducted at locations identified as the probable locations with the highest disinfection by products in the distribution system. Each location's locational running annual average (LRAA) must be below the MCLs for disinfection by products. Disinfection by-products can be reduced by removing compounds that react with disinfectants and by limiting the residual levels and amount of time the disinfectants are in contact with water. Alternative disinfectants such as chlorine dioxide, ozone, ultraviolet light (UV) or chloramines can reduce TTHM and HAA5 levels while still achieving inactivation of pathogenic organisms. UV, however, is not very effective at disinfecting viruses.

Lead and Copper Regulations

Lead and copper levels are regulated at the customer's tap, unlike other regulations for public water supplies. Treatment technique requirements are used to control lead and copper in drinking water. Sources are primarily from corrosion of plumbing and plumbing fixtures in homes and buildings. Lead comes from lead solder and brass fixtures, and copper comes from copper tubing and brass fixtures. A major revision to the LCR was finalized in December of 2020. The major highlights of the revised rule are included herein. The majority of the revisions apply only to lead, while the rules for copper largely remain unchanged.

Commented [AG2]: If not using added section above, define LCR here.

Lead Health Effects: Infants and young children are typically more vulnerable to lead in drinking water than the general population. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. The USEPA considers lead a probable human carcinogen.

Copper Health Effects: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short period of time could experience severe gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease cannot tolerate copper in their system and should consult their health care provider.

Sample Site and Collection Requirements: Systems (or Utilities) must now prioritize testing all tap samples from homes with lead service lines (LSLs) where available. If a system does not contain LSLs, then it must prioritize testing homes with other leaded plumbing regardless of when it was built. For homes with known LSLs, it is now required for samples to be collected as the fifth liter out of the tap after a minimum stagnation of 6 hours, whereas samples from sites without LSLs maintain the first-liter sampling protocol. All samples must be collected in wide-mouth bottles. Sampling protocols are now prohibited from faucet aerator removal/cleaning

and pre-stagnation flushing prior to sample collection. All elementary schools and primary care facilities must be tested for lead levels under the revised LCR.

Action and Trigger Levels: In each sampling round, 90 percent of samples from homes (P90 level) must have lead levels less than or equal to the action level (AL) of 15 µg/L, and copper levels less than or equal to the AL of 1.3 mg/L. If an AL is triggered for a system with no corrosion control treatment (CCT), then the system is required to implement CCT. If the system has CCT already, then it must re-optimize its CCT process. The most frequent monitoring is required when the AL is triggered, while reduced frequency monitoring is required for lower levels.

In the revised LCR, a lead trigger level (TL) occurs with 10<P90<15 µg/L. At this TL, a system must conduct a corrosion control study if it does not have CCT; if the system has CCT, it must re-optimize its CCT process.

LSL Inventory and Replacement: All water systems are now required to complete and maintain an LSL inventory that is publicly available.

If a water system triggers the AL, it must replace 3 percent of its LSLs per year, without a delay period, for at least two years, and can no longer test out of this requirement. States decide the LSL replacement requirements for systems that trigger the TL.

If an individual sampling site exceeds the lead AL, then the system is now required to engage in a "find-and-fix" process to identify causes of the elevated levels as well as potentially take actions to reduce the levels.

Corrosion Control Guidance: A variety of treatment alternatives are available to reduce lead and copper levels. Their application depends on whether or not lead and copper are found in the source water or originate from materials in the distribution system and customer's plumbing. Most often, corrosion control strategies are employed to meet lead and copper regulatory requirements. USEPA has recently revised recommendations for corrosion control optimization, however, new information points to the importance of oxidation-reduction potential conditions in the distribution system at controlling lead levels.

The USEPA issued guidance on Optimized Corrosion Control Treatment for the Lead and Copper Rule (LCR) in 2016. The guidance addresses:

- Recommended options to optimize corrosion control treatment dependent on finished water quality parameters.
- How to determine when corrosion control is optimized and what are the acceptable ranges for water quality parameters.
- Sample site selection criteria.
- Sampling issues such as the potential removal of aerators and the acceptable stagnation period.
- Lead service line replacement, partial or otherwise.

Inorganic Contaminants

Regulation of inorganic chemical includes certain metals and minerals in drinking water, both naturally occurring and resulting from agricultural or industrial use. Inorganic contaminants most often come from the source of water supply but can also enter water from contact with materials used for pipes and storage tanks. A new and more stringent drinking water standard was recently established for arsenic, and inorganic chemical. Other existing inorganic chemical levels have been regulated for more than 30 years.

For most inorganic contaminants, health concerns are related to long-term or even lifetime exposures (see Table A-5). Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations over years of exposure. Nitrate and nitrite can seriously affect infants in short-term exposures by interfering with the transfer of oxygen from the lungs to the bloodstream. Infants below the age of six months who drink water containing nitrate or nitrite in excess of the MCLs could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

To comply with the inorganic chemical MCLs, water systems must meet the established maximum contaminant levels shown in Table 1-5. Systems that exceed one or more MCLs must either install water treatment systems or develop alternate sources of water.

A variety of water treatment processes are available for reducing levels of specific inorganic contaminants in drinking water, including ion exchange and reverse osmosis.

Table A-5: Inorganic Contaminants

Contaminant	MCL/mg/L (or as noted)	Potential Health Effects	Common Sources in Drinking Water
Antimony	0.006	Blood cholesterol increase, blood sugar decrease	Discharge from petroleum refineries, fire retardants, ceramics, electronics, solder
Arsenic	0.010	Skin damage, circulatory system effects, increased cancer risk	Erosion of natural deposits of volcanic rocks, runoff from orchards, runoff from glass and electronics production wastes
Asbestos	7 million fibers per liter[1] (>10 um fiber size)	Increased risk of developing benign intestinal polyps	Erosion of natural geologic deposits, decay of asbestos-cement water pipes
Barium	2	Increase in blood pressure	Discharge of drilling wastes, discharge from metal refineries, erosion of natural deposits
Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories, discharge from electrical, aerospace and defense industries
Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes, erosion of natural deposits, discharge from metal refineries, runoff from waste batteries and paints
Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pump mills, erosion of natural deposits
Copper	1.3[2] (TT)	Gastrointestinal distress, people with Wilson's Disease cannot tolerate copper	Plumbing materials
Cyanide	0.2	Thyroid, nervous system damage	Discharge from steel/metal factories, discharge from plastic and fertilizer factories
Fluoride	4[3]	Bone disease, mottled teeth	Erosion of natural deposits, discharge from fertilizer and aluminum industries, drinking water additive promoting strong teeth
Lead	0.015[2] (TT)	Physical and mental development, kidney function, increase in blood	Plumbing and distribution system materials

Table A-5: Inorganic Contaminants

Contaminant	MCL/mg/L (or as noted)	Potential Health Effects	Common Sources in Drinking Water
		pressure, probable human carcinogen	
Mercury (total inorganic)	0.002	Kidney damage	Erosion of natural deposits, discharges from refineries and factories, runoff from landfills, runoff from cropland
Nitrate (as N)	10	Methemoglobinemia ("blue baby syndrome") in infants below the age of six months	Runoff from fertilizer use, leaching from septic tank/drain fields, erosion of natural deposits
Nitrite	1	Methemoglobinemia ("blue baby syndrome") in infants below the age of six months	Runoff from fertilizer use, leaching from septic tank/drain fields, erosion of natural deposits (rapidly converted to nitrate)
Selenium	0.05	Hair and nail loss, numbness in fingers and toes, circulatory problems	Discharge from petroleum and metal refineries, erosion of natural deposits, discharge from mines
Thallium	0.002	Air loss, blood changes, and kidney, lever, intestinal effects	Leaching from ore processing sites, discharge from electronics, pharmaceutical products and glass factories

[1] Greater that 10 micron fiber size
[2] less than 90% of samples in targeted sampling
[3] A secondary standard for fluoride is set at 2.0 mg/L

Organic Chemicals

The purpose of regulating these compounds is to control levels of organic contaminants based on their individual health effects. Organic contaminants are most often associated with industrial or agricultural activities that affect sources of drinking water supply. Major types of organic contaminants are Volatile Organic Chemicals (VOCs) and Synthetic Organic Chemicals (SOCs). These include industrial and commercial solvents and chemicals, and pesticides used in agriculture and landscaping. Organic contaminants can also enter drinking water from materials in contact with the water such as pipes, valves, and paints and coatings used inside water storage tanks. For organic contaminants, health concerns are related to long-term or even lifetime exposures to low levels of contaminant (see Table A-6).

Groundwater systems must meet the established maximum contaminant levels. Water supplies that exceed one or more MCLs must either install treatment systems or develop alternate sources of water. A variety of water treatment processes are available for reducing levels of specific organic contaminants in drinking water, including activated carbon, advance oxidation and ozonation.

Table A-6: Organic Contaminants

Contaminant	MCL/mg/L (or as noted)	Potential Health Effects	Common Sources in Drinking Water
Acrylamide	TT[1]	Central nervous system and blood effects, increased risk of cancer	Added to water during water and sewage treatment
Alachlor	0.002	Eye, liver, kidney, spleen effects, anemia, increased risk of cancer	Runoff from herbicides used on row crops
Atrazine	0.003	Cardiovascular and reproductive effects	Runoff from herbicides used on row crops
Benzene	0.005	Decreased blood platelets, anemia, increased risk of cancer	Discharge from factories, leaching from landfills and gas storage tanks
Benzo(a)pyrene	0.0002	Reproductive difficulties and increased	Leaching form linings of water storage tanks

Table A-6: Organic Contaminants

Contaminant	MCL/mg/L (or as noted)	Potential Health Effects	Common Sources in Drinking Water
		risk of cancer	and water pipes
Carbofuran	0.04	Blood, nervous system, and reproductive system effects	Leaching of soil fumigant used on rice and alfalfa
Carbon tetrachloride	0.005	Liver effects and increased risk of cancer	Discharge form chemical plants and other industrial activities
Chlordane	0.002	Liver and nervous system effects, increased risk of cancer	Residue of banned termiticide
Chlorobenzene	0.1	Kidney and liver effects	Discharge from chemical and agricultural chemical factories
2,4-D	0.07	Liver, adrenal glad, and kidney damage	Runoff from herbicides used on row crops
Dalapon	0.2	Minor kidney effects	Runoff from herbicides used on rights of way
Dibromo-chloropropane (DBCP)	0.0002	Reproductive difficulties and increased risk of cancer	Runoff from soil fumigant used on soybeans, cotton, pineapples, orchards
o-Dichlorobenzene	0.6	Liver, kidney, circulatory system damage	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	Liver, kidney, spleen damage, anemia, blood effects	Discharge from industrial chemical factories
1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories
1,1-Dichloroethylene	0.007	Liver damage	Discharge from industrial chemical factories
cis 1,2-Dichloroethylene	0.07	Liver damage	Discharge from industrial chemical factories
Trans 1,2-Dichloroethylene	0.1	Liver damage	Discharge from industrial chemical factories
Dichloromethane (methylene chloride)	0.005	Liver damage and increased risk of cancer	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories
Di(2-ethylhexyl) adipate	0.4	General toxic and reproductive effects	Discharge from chemical factories
Di(2-ethylhexyl) phathalate	0.006	Liver effects, reproductive difficulties, increased risk of cancer	Discharge from chemical and rubber factories
Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	3×10^{-8}	Reproductive difficulties and increased risk of cancer	Emissions from waste incineration and other combustion, discharge from chemical factories
Diquat	0.02	Cataracts	Runoff from herbicide use
Endothall	0.1	Stomach, intestine effects	Runoff from herbicide use
Endrin	0.002	Liver damage	Residue of banned insecticide
Epichlorohydrin	TT[1]	Stomach effects and increased risk of cancer	Discharge from industrial chemical factories, impurity in some water treatment chemicals
Ethylbenzene	0.7	Liver, kidney damage	Discharge from petroleum refineries
Ethylene dibromide	0.00005	Liver, stomach, kidney, reproductive system effects, and increased risk of cancer	Discharge form petroleum refineries
Glyphosate	0.7	Kidney, reproductive system effects	Runoff from herbicide use
Heptachlor	0.004	Liver damage, increased risk of cancer	Residue of banned termiticide
Heptachlor epozide	0.0002	Liver damage, increased risk of cancer	Breakdown of heptachlor
Hexachlorobenzene	0.001	Liver, kidney, reproductive system effects, and increased risk of cancer	Discharge from metal refineries and agricultural chemical factories
Hexachloro-cyclopentadiene	0.05	Kidney, stomach damage	Runoff/leaching form insecticide used on lumber, gardens, cattle

Table A-6: Organic Contaminants

Contaminant	MCL/mg/L (or as noted)	Potential Health Effects	Common Sources in Drinking Water
Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetable, alfalfa, livestock
Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, tomatoes
Pentachlorophenol	0.001	Liver and kidney effect, increased risk of cancer	Discharge from wood preserving operations
Picloram	0.5	Liver damage	Herbicide runoff
Polychlorinated biphenyls (PCBs)	0.0005	Skin, thymus gland, reproductive system, and nervous system effects, immune deficiencies, increased risk of cancer	Runoff from landfills, discharge of waste chemicals
Simazene	0.004	Blood effects	Herbicide runoff
Styrene	0.1	Liver, kidney, circulatory system damage	Discharge from rubber and plastic factories, leaching from landfills
Tetrachloroethylene	0.005	Liver damage and increased risk of cancer	Discharge from factories and dry cleaning
Toluene	1	Liver, kidney, nervous system effects	Discharge form petroleum refineries
Toxaphene	0.003	Kidney, lover, thyroid effects, increased risk of cancer	Runoff/leaching from insecticide used on cattle, cotton
2,4,5-TP (Silvex)	0.05	Liver damage	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	Adrenal gland changes	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.2	Liver, nervous system, circulatory system effects	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.005	Kidney, liver, immune system damage	Discharge from industrial chemical factories
Trichloroethylene	0.005	Liver damage and increased risk of cancer	Discharge from metal degreasing sites and other factories
Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipe, discharge from plastics factories
Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories, discharge from chemical factories

1 Treatment technique requirement (limit dosage of polymer treatment chemicals)

Radiologic Contaminants

Radiologic contaminants are regulated to limit exposure to radioactive contaminants in drinking water (see Table A-7). These contaminants are both natural and man-made. Rules were recently revised to include a new MCL for uranium, and to clarify and modify monitoring requirements.

Health effects from radionuclide compounds are primarily increased cancer risk from long-term exposure. If a water supply exceeds the MCLs for radionuclides, the system must either install treatment or develop alternate water sources. There are a variety of treatment processes used to reduce radiologic contaminants, including adsorption, ion exchange and reverse osmosis.

Table A-7 - Radiologic Contaminants

Contaminant	MCL	Potential Health Effects	Common Sources in Drinking Water
Gross alpha	15 pCi/L	Increased risk of cancer	Erosion of natural deposits
Beta and photon emitters[1]	4 mrem/yr	Increased risk of cancer	Decay of natural and man-made deposits

Table A-7 - Radiologic Contaminants

Contaminant	MCL	Potential Health Effects	Common Sources in Drinking Water
Combined Radium 226 & 228[3]	5 pCi/L	Increased risk of cancer	Erosion of natural deposits
Uranium	30 ug/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits

[1] Sampling required only if designated by the Department – Gross beta + photon emitters not to exceed 4 millirems per year
[2] Measured separately

Secondary Standards

Secondary drinking water regulations are non-mandatory water quality standards that have been set for 15 contaminants. These standards are not federally enforced for these "secondary maximum contaminant levels. They are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. Exceeding SMCLs may also result in cosmetic or technical impacts. The SMCLs are not set based on health effects risk.

Aesthetic Effects: Aesthetic effects include tastes, odors and color. Aluminum, chloride, copper, foaming agents, iron, manganese, pH, sulfate, threshold odor number, total dissolved solids and zinc standards all were set, in part, because of taste and odor or color impacts.

Cosmetic Effects: Skin discoloration is a cosmetic effect related to silver ingestion. This effect, called argyria, does not impair body function. Silver is used as an antibacterial agent in many home water treatment devices. Tooth discoloration and/or pitting are caused by excess fluoride exposures during the formative period prior to eruption of the teeth in children. The secondary standard of 2.0 mg/L is intended as a guideline for an upper boundary level in areas which have high levels of *naturally occurring* fluoride. It is *not* intended as a substitute for the lower concentrations (0.7 to 1.2 mg/L) which have been recommended for systems which *add* fluoride to their water. The level of the SMCL was set based upon a balancing of the beneficial effects of protection from tooth decay and the undesirable effects of excessive exposures leading to discoloration.

Technical Effects: Corrosivity, and staining related to corrosion, may affect the aesthetic quality of water and can have significant economic implications. Other effects of corrosive water, such as the corrosion of iron and copper, may stain household fixtures, and impart objectionable metallic taste and red or blue-green color to the water supply. High levels of copper in chlorinated water can stain hair green. Corrosion of distribution system pipes can reduce water flow. Mineral deposits can build up on the insides of hot water pipes, boilers, and heat exchangers, restricting or even blocking water flow. A variety of treatment technologies are available to treat these secondary contaminants

Table A-8: Secondary Maximum Contaminant Levels

Contaminant	Secondary MCL	Noticeable Effects above the Secondary MCL	Sources in Drinking Water
Aluminum	0.05 to 0.2 mg/L	Colored water	Natural or man made contamination.
Chloride	250 mg/L	salty taste	Natural or man made

Table A-8: Secondary Maximum Contaminant Levels

Contaminant	Secondary MCL	Noticeable Effects above the Secondary MCL	Sources in Drinking Water
			contamination. Sea water intrusion
Color	15 color units	visible tint	Natural organic matter. Some inorganics such as iron or manganese.
Copper	1.0 mg/L	Metallic taste; blue-green staining	Natural contaminant. Plumbing materials.
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining	Decaying organic matter.
Fluoride	2.0 mg/L	Tooth discoloration	Natural or man made contamination.
Foaming agents	0.5 mg/L	Frothy, cloudy; bitter taste; odor	Natural or man made contamination.
Iron	0.3 mg/L	Rusty color; sediment; metallic taste; reddish or orange staining	Natural mineral deposits.
Manganese	0.05 mg/L	Black to brown color; black staining; bitter metallic taste	Natural mineral deposits.
Odor	3 TON (threshold odor number)	"rotten-egg", musty or chemical smell	Decaying organic matter.
pH	6.5 - 8.5	*low pH:* bitter metallic taste; corrosion *high pH:* slippery feel; soda taste; deposits	Natural mineral or decaying organic matter.
Silver	0.1 mg/L	skin discoloration; graying of the white part of the eye	Natural or man made contamination.
Sulfate	250 mg/L	salty taste	Natural mineral contaminant.
Total Dissolved Solids (TDS)	500 mg/L	hardness; deposits; colored water; staining; salty taste	Natural mineral contaminants.
Zinc	5 mg/L	Metallic taste	Natural or man made contamination.

Unregulated Contaminant Monitoring Rule

The purpose of the Unregulated Contaminant Monitoring Rule (UCMR) program is to regularly have public water systems monitor and collect occurrence data for unregulated contaminants that are known to be present in drinking water systems. The EPA uses the Contaminant Candidate List (CCL) as the primary source for selecting contaminants for the UCMR program. The CCL is a list of contaminants that are not regulated but may need to be regulated in the future.

The EPA generally divides unregulated contaminant monitoring into three types of monitoring, or "lists," as shown in Table A-10. Contaminants for which analytical method technologies are well established are included in the "Assessment Monitoring" list, the largest in scope of the three UCMR monitoring lists or tiers. Under UCMR 3 Assessment Monitoring, twenty "List 1" contaminants will be monitored to assess national occurrence in drinking water; total chromium will be monitored in conjunction with Assessment Monitoring.

The "Screening Survey" list is the second tier of UCMR and is referred to as "List 2". List 2 contaminants are those with analytical methods that have generally been more recently developed and employ technologies that are not as widely used or laboratory capacity may be

insufficient to conduct the larger scale Assessment Monitoring. Under the UCMR 3 Screening Survey, seven "List 2" contaminants will be monitored.

The third list is reserved for a selected set of 800 systems that serve fewer than 1,000 retail customers and that do not disinfect. The third list is referred to as the "Pre-Screen Testing," or "List 3." List 3 contains contaminants with very new or specialized analytical methods. Under UCMR 3, two viruses and the associated pathogen indicators have been placed on "List 3".

TABLE A-10
List of Unregulated Contaminant Monitoring Rule 3 Contaminants

List 1, Assessment Monitoring			
1,4-dioxane	1,2,3-trichloropropane	1,3-butadiene	1,1-dichloroethane
molybdenum	cobalt	chloromethane	bromochloromethane
bromomethane	chlorodifluoromethane	vanadium	strontium
chromium-6	chlorate	Perfluorobutane sulfonic acid (PFBS)a	Perfluorononanoic acid (PFNA)a
Perfluoroheptanoic acid (PFHpA)[a]	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonic acid (PFHxS)[a]	Perfluorooctanoic acid (PFOA)
List 2, Screening Survey			
17-β-estradiol	17-α-ethynylestradiol (ethinyl estradiol)	estrone	4-androstene-3,17-dione
estriol	equilin	testosterone	
List 3, Pre-Screen Testing			
enteroviruses		noroviruses	

[a] Six chemicals included in UCMR 3 that are not part of CCL 3.

Potential Future Drinking Water Regulations

This section summarizes activity, through May 2014, related to potential future drinking water regulations for the following:

- Compounds of Emerging Concern
- Contaminant Candidate List 3
- Contaminant Group Regulation
- Gaseous Chlorine
- Chromium VI
- *Cryptosporidium* Analytical Changes
- Fluoride
- Nitrate
- Perchlorate
- Radon

For each of the items listed above, a brief summary of the proposal is provided along with the regulatory timeline (if known and as reported in May 2104) and a brief summary of the potential impacts. This information is also summarized in Table A-11.

TABLE A-11
Potential Future Drinking Water Regulatory Impacts

Potential Future Drinking Water Regulation	Anticipated Date of Regulation	Capital Improvement Project Impact	Operational Impact
Compounds of Emerging Concern	2016-2021	Unknown	Unknown
Contaminants on the CCL 3	2013[a]	Unknown	Unknown
Contaminant Grouping: VOCs	Unknown[b]	Minimal	Minimal
Contaminant Grouping: Nitrosamines	Unknown	Unknown	Unknown
Gaseous Chlorine	Unknown	No	Not likely
Chromium VI	Unknown	Unknown	Unknown
Cryptosporidium Analytical Changes	2016	Unknown	Unknown
Fluoride	2015[c]	Not likely	Minimal
Nitrate	Unknown	Not likely	Minimal
Perchlorate	Late 2014	Not likely	Minimal
Radon	Unknown	Not likely	Minimal

[a] Regulatory determination for at least five contaminants.

[b] EPA announced intent to regulate carcinogenic VOCs as a group on February 2, 2011, in testimony before the Senate Environment and Public Works Committee. No schedule announced for proposing standard and finalizing regulation.

[c] EPA's schedule for potentially revising the fluoride MCL is not clear at this time. Anticipated regulatory date based on a decision to revise the MCL in 2011 with four years to propose and finalize the regulation.

[d] EPA's announced schedule for proposed revisions to the Lead and Copper Rule is 2013. Anticipated regulatory date based on 18 months to finalize the regulation after announcement of the proposed revisions.

REFERENCES

1. USEPA Code of Federal Regulations, Title 40, Part 141, National Primary Drinking Water Regulations
2. USEPA Code of Federal Regulations, Title 40, Part 143, National Secondary Drinking Water Regulations

J Hydraulic Model Technical Memorandum

Technical Memorandum

Date:	May 06, 2021
Project:	20-0025
To:	Clark Public Utilities
From:	Murraysmith
Re:	Water Model Calibration

Background

As part of the Water System Plan, the model will be verified through an update to the calibration of the model. Calibration is an important step in developing a valid computer model. The goal of the steady state calibration is to match model and field pressures and flows within a specified level of confidence. Confidence in the model reduces risk in deficiency and improvement analysis related to system-wide master planning and localized development impacts.

During the calibration, pipeline friction coefficients can be adjusted within standard ranges based on pipe age and material until model results match field tests for pressure and fire flow within a specified tolerance. Additionally, the calibration assists in identifying areas where operational settings may need adjustment within the model to match the actual system operations. To get a drop in pressure and "stress" the system, it is preferable to do the flow testing during peak periods, if feasible.

Testing Locations

The field testing program for the Utility involves pressure and flow measurements. A total of 63 test locations have been identified for calibration testing, as shown in **Figure 1**. Test locations have been chosen so that where possible, multiple tests are taken in each pressure zone. Local conditions are not known, and problems can arise with hydrants and valves or there may not be adequate drainage for hydrant flow. If field conditions make a test location impossible or impractical, a new location should be selected that is close to the original location and hydraulically connected within the same pressure zone. Additional consideration should be given to pipe size and dead-end piping, so any new locations have properties as similar to the proposed location as possible. In some pressure zones, small piping may cause pressure drops when flowing hydrants. If an area has known low pressure issues it is recommended that only a pressure reading is taken. Any changes in test location should be documented (marked on a map and written in data collection log) to ensure that test results are accurately represented in the model during the calibration process.

Boundary Conditions

In addition to flow and pressure data collected at the hydrants, system boundary conditions are required to calibrate the model. To accurately represent system conditions during flow testing, SCADA information for all facilities will be used in the model to represent system conditions during testing including water levels in reservoirs, booster pump status and flow rates, and valve status and flow rates (as available). SCADA information should be recorded and provided at time intervals small enough to show the testing, typically one or five-minute increments. If SCADA is not available at facilities a person should be at the station to manually record information for facilities that are anticipated to contribute flow during the testing period.

Testing Process

Equipment

One crew of 2-4 people (if possible, the same people for the duration of testing) with the appropriate vehicle and equipment will be required to conduct the pressure and flow tests. All fire flow test equipment should be calibrated before field use. Flowed hydrants make considerable noise and the two hydrants may not be in direct line of sight of one another, so radios or phones are a good idea for communicating between the operator at the pressure hydrant and the operators at the flowed hydrants. A list of field equipment includes:

Equipment List

- 2 manually read pressure gauges
- 2 pitot gauges or pitot diffusers
- Radios/phones for communication between pressure and flow hydrant
- Spray paint for marking pressure and flow hydrants (optional)
- Map of test locations (Provided by Murraysmith)
- Forms to record pressure and flow measurements (Provided by Murraysmith)
- Sand bags for flow tests (as needed)
- Safety equipment including cones for traffic control
- Equipment necessary for accessing and opening all hydrants/valve vaults

Procedure

Flow tests will be conducted using at least two adjacent hydrants. One hydrant is used to measure pressure and at least one other hydrant is opened to create a pressure drop in the system. The testing process is as follows:

1. The “pressure hydrant” is tapped and a static pressure is measured and recorded.
2. The flow hydrant is opened and flowed until the pressure at the “pressure hydrant” stabilizes at a lower level. Typically, it is recommended that enough flow should be going through the flow hydrant for approximately a 10 psi pressure drop to be realized at the

"pressure hydrant." More than one flow hydrant may be required to obtain the 10 psi pressure drop. If the test is near a facility, the 10 psi may not be realized. If necessary, select a second flow hydrant near the pressure and first flow hydrants. Flow measurements will need to be recorded at all flow hydrants. Residual pressure can fluctuate so it is important to take the reading once it has "settled" which may take a few minutes. If the pressure reading continues to fluctuate, record a couple of values. The length of time required to flow the hydrant(s) can vary based on system response time and SCADA data transmittal increments. It can be up to five minutes and the hydrant should be flowed until the 10 psi drop in the "pressure hydrant" is experienced and the pressure at the "pressure hydrant" stabilizes, typically indicating the system has responded to the additional demand and a response can be captured in SCADA (through tank level, PRV or booster flow).

3. A pitot gauge, with or without a diffuser (based on flow location), will be used at the "flow hydrant" to measure the discharge pressure (or flow) of the "flowing hydrant" once the residual pressure is measured at the "pressure hydrant." If possible, the gauge should be directly connected to the hydrant, without the use of a hose.
4. The pitot gauge reading at the "flowing hydrant" and the residual pressure measured at the "pressure hydrant" should be recorded along with the time of the test and other information on the data collection form.

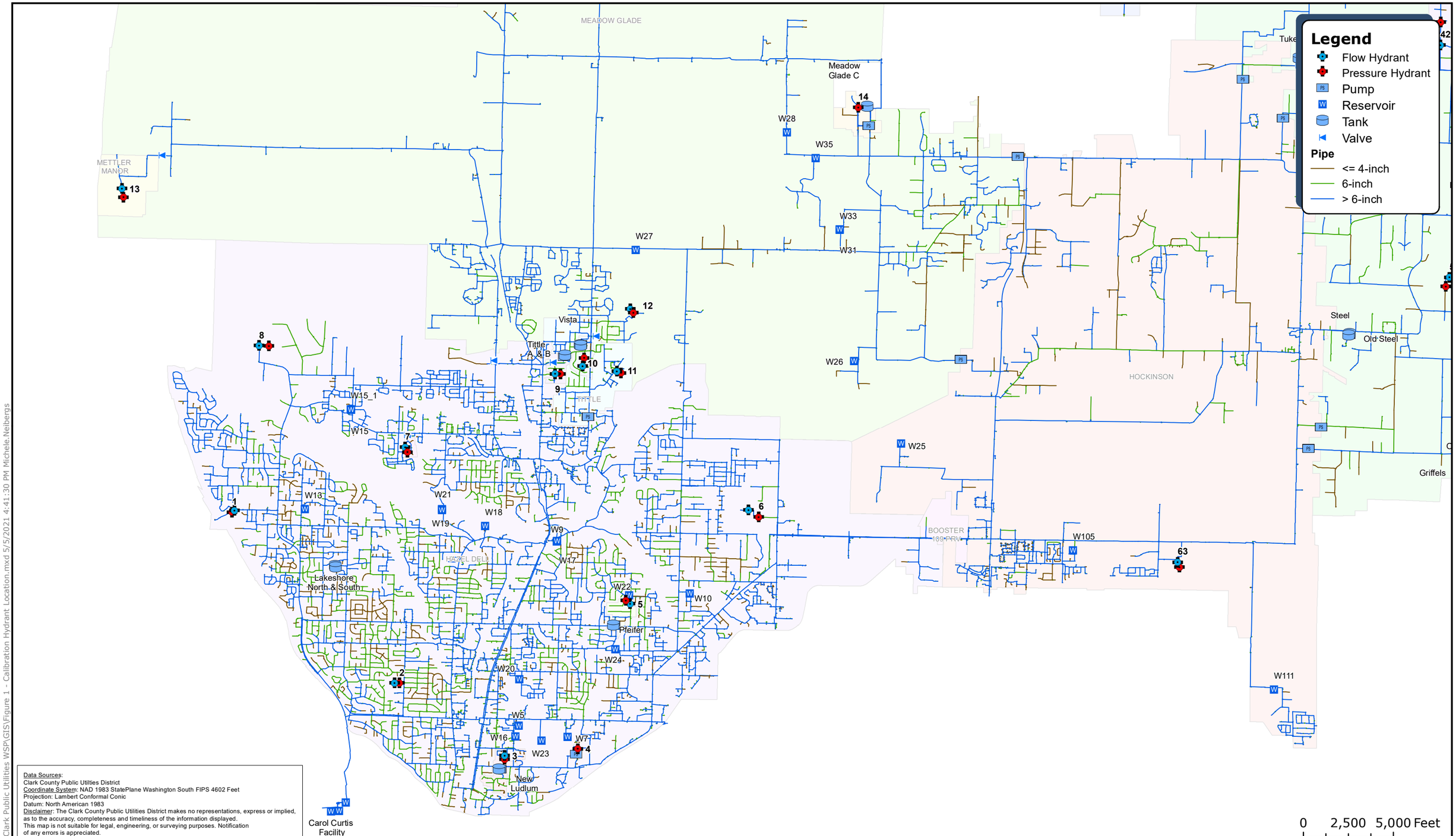
The pressure measurement from the pitot gauge or pitot diffuser is translated into a flow rate using a standard formula that is dependent on the hydrant outlet geometry (orifice diameter) and typical discharge coefficients. The size of the orifice and any non-typical outlet geometry at a flow hydrant should be measured and noted. If a flow hydrant orifice shows signs of excessive corrosion or damage, this should also be noted. A form for recording test pressures and notes is provided at the end of this memo.

To prevent water hammer and potential system damage during field testing, care should be taken to open and close the hydrants slowly. Another concern when flowing hydrants is ensuring the flowed water does not cause erosion or flood homes or businesses. Sand bags may be needed to divert water into storm drains. A diffuser can also be used to divert water to appropriate drainages. It is advisable for Utility staff to review or visit each proposed flow location prior to field testing to evaluate the risks of flooding and mark the hydrants involved in testing. If time does not permit visiting the locations in advance, flow test locations may need to be changed in the field and any changes should be indicated. It is important to keep the pressure and flow hydrant adjacent if possible and that both hydrants are in the same pressure zone.

Model Calibration: Hydrant & Pressure Data Collection										
Test Number	Pressure Zone	Date of Test	Start of Test Time	End of Test Time	Flow Hydrant		Pressure Hydrant			Notes
					Hydrant ID	Flow Rate (gpm) OR Pressure (psi)	Hydrant ID	Static Pressure (psi)	Residual Pressure (psi)	
1	HAZEL DELL				FH-7631		FH-1071			
2	HAZEL DELL				FH-2510		FH-2284			
3	LUDLUM				FH-6257		FH-6258			
4	SOUTHVIEW TERRACE				STATIC ONLY	-	FH-6220			
5	BOOSTER #6				FH-418		FH-7031			
6	HAZEL DELL				FH-2260		FH-6732			
7	EDGETREE CONDOS				FH-850		FH-1005			
8	HAZEL DELL				FH-2358		FH-2359			
9	VISTA PRV				FH-764		FH-748			
10	TITTLE BOOSTER				FH-191		FH-211			
11	TITTLE				FH-2087		FH-6782			
12	MEADOW GLADE				FH-1631		FH-1628			
13	METTLER MANOR				FH-7580		FH-7581			
14	MEADOW GLADE BOOSTER				STATIC ONLY	-	FH-1749			
15	MEADOW GLADE				FH-7201		FH-2739			
16	LOCKWOOD				FH-6883		FH-6884			
17	LA CENTER				FH-7720		FH-7719			
18	15TH AVE				FH-1603		FH-1604			
19	UPPER LA CENTER				FH-6006		FH-6008			
20	LA CENTER				FH-1997		FH-7757			
21	UPPER LA CENTER				FH-6853		FH-6854			

Model Calibration: Hydrant & Pressure Data Collection										
Test Number	Pressure Zone	Date of Test	Start of Test Time	End of Test Time	Flow Hydrant		Pressure Hydrant			Notes
					Hydrant ID	Flow Rate (gpm) OR Pressure (psi)	Hydrant ID	Static Pressure (psi)	Residual Pressure (psi)	
22	LOWER TAYLOR VALLEY				STATIC ONLY	-	FH-6857			
23	TAYLOR VALLEY				FH-2337		FH-2338			
24	GABLE AVE				FH-3084		FH-3083			
25	82ND AVE				FH-6897		FH-6013			
26					STATIC ONLY	-	FH-6896			
27	GRIFFELS				FH-1230		FH-1353			
28	UPPER VALLEY VIEW				FH-1220		FH-1221			
29	GRIFFELS				FH-1538		FH-2873			
30	GRIFFELS				FH-1537		FH-6396			
31	LOWER EARLY DAWN				STATIC ONLY	-	FH-6471			
32	NORDEEN				FH-7279		FH-7280			
33	KELLY				FH-1315		FH-2408			
34	GRIFFELS				FH-3089		FH-7649			
35	COLE WITTER				FH-6969		FH-6970			
36	RIVERBEND				FH-2689		FH-7020			
37	SPRING HILL				STATIC ONLY	-	FH-1597			
38	ARMSTRONG				FH-7000		FH-2103			
39	DOVE CREEK				FH-1551		FH-6882			
40	DUBLIN				FH-1154		FH-1155			
41	HOCKINSON				FH-6397		FH-7292			
42	BLACKHAWK				FH-969		FH-1200			

Model Calibration: Hydrant & Pressure Data Collection										
Test Number	Pressure Zone	Date of Test	Start of Test Time	End of Test Time	Flow Hydrant		Pressure Hydrant			Notes
					Hydrant ID	Flow Rate (gpm) OR Pressure (psi)	Hydrant ID	Static Pressure (psi)	Residual Pressure (psi)	
43	OSMAN				FH-1435		FH-1436			
44	BERRY				FH-570		FH-2334			
45	ALVA				FH-2259		FH-1665			
46	ARMSTRONG				FH-676		FH-675			
47	SKYLINE				STATIC ONLY	-	FH-6951			
48	BERLIN				FH-7330		FH-485			
49	ALPINE HEIGHTS				FH-7329		FH-2164			
50	VERNERSBERG				FH-1834		FH-1434			
51	FINN HILL				FH-578		FH-6336			
52	BIG EAST				FH-2193		FH-2194			
53	GRIFFELS				FH-1369		FH-1370			
54	147TH ST				STATIC ONLY	-	FH-1497			
55	ECHO RIDGE				FH-1058		FH-6934			
56	BONANZA				FH-943		FH-942			
57	RAWSON UPPER ROAD				FH-2970		FH-2971			
58	SUMMER HILLS				FH-1713		FH-1714			
59	HOCKINSON HIGHLAND				FH-1717		FH-1715			
60	SUMMER HILLS 2				FH-2046		FH-2045			
61	SUMMER HILLS 1				FH-6925		FH-6926			
62	RAWSON				FH-6931		FH-6930			
63	HOCKINSON				FH-6745		FH-6746			



I:\BOI_Projects\20\0025 - Clark Public Utilities WSP\GIS\Figure 1 - Calibration Hydrant Location.mxd 5/5/2021 4:41:30 PM Michele.Nelbergs

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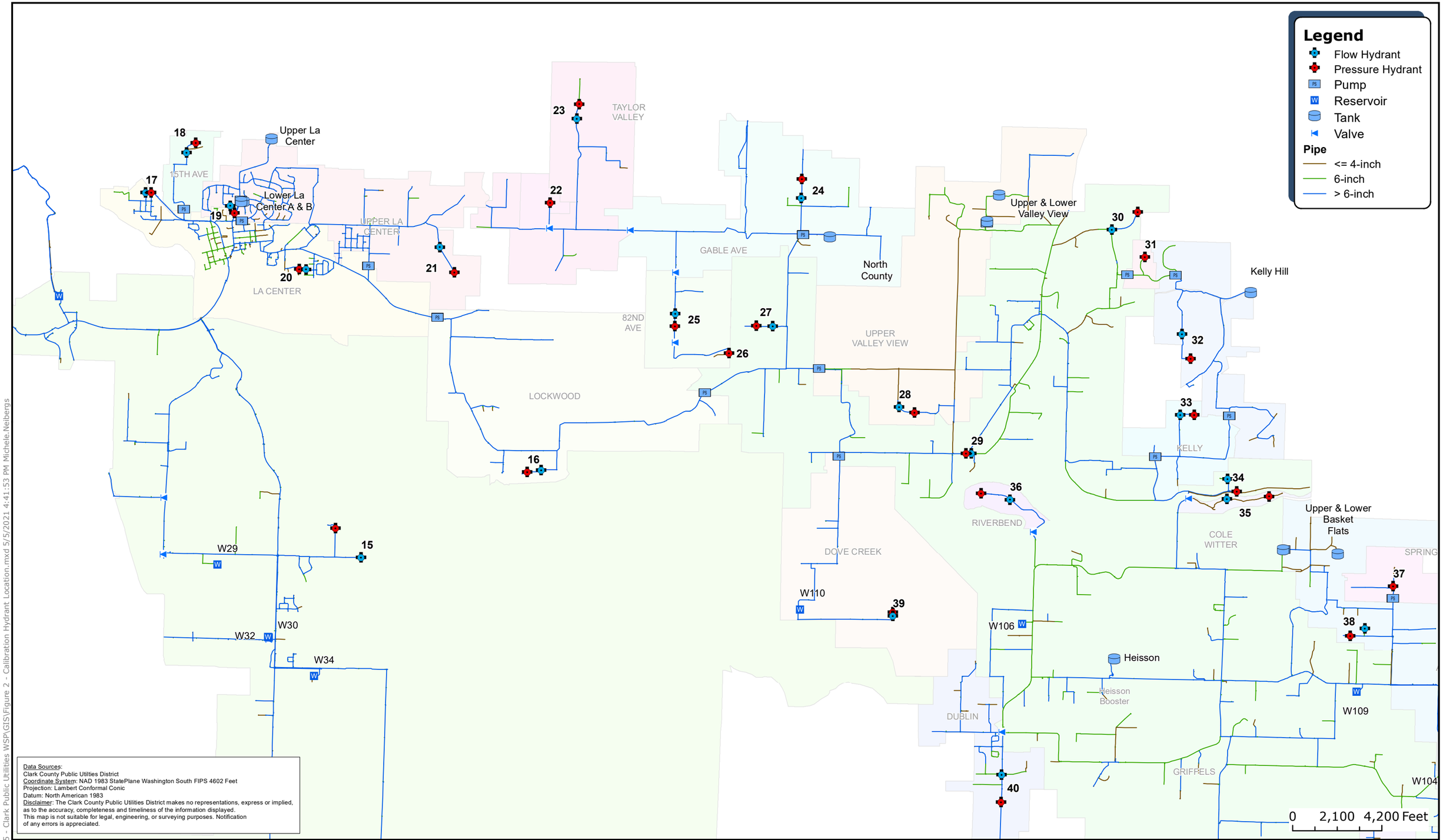
Clark Public Utilities

Clark Public Utilties District
Water System Plan

Figure 1
Calibration Testing Locations

May 2021

20-0025



Data Sources:
Clark County Public Utilities District
Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Disclaimer: The Clark County Public Utilities District makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed.
This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

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Clark Public Utilities

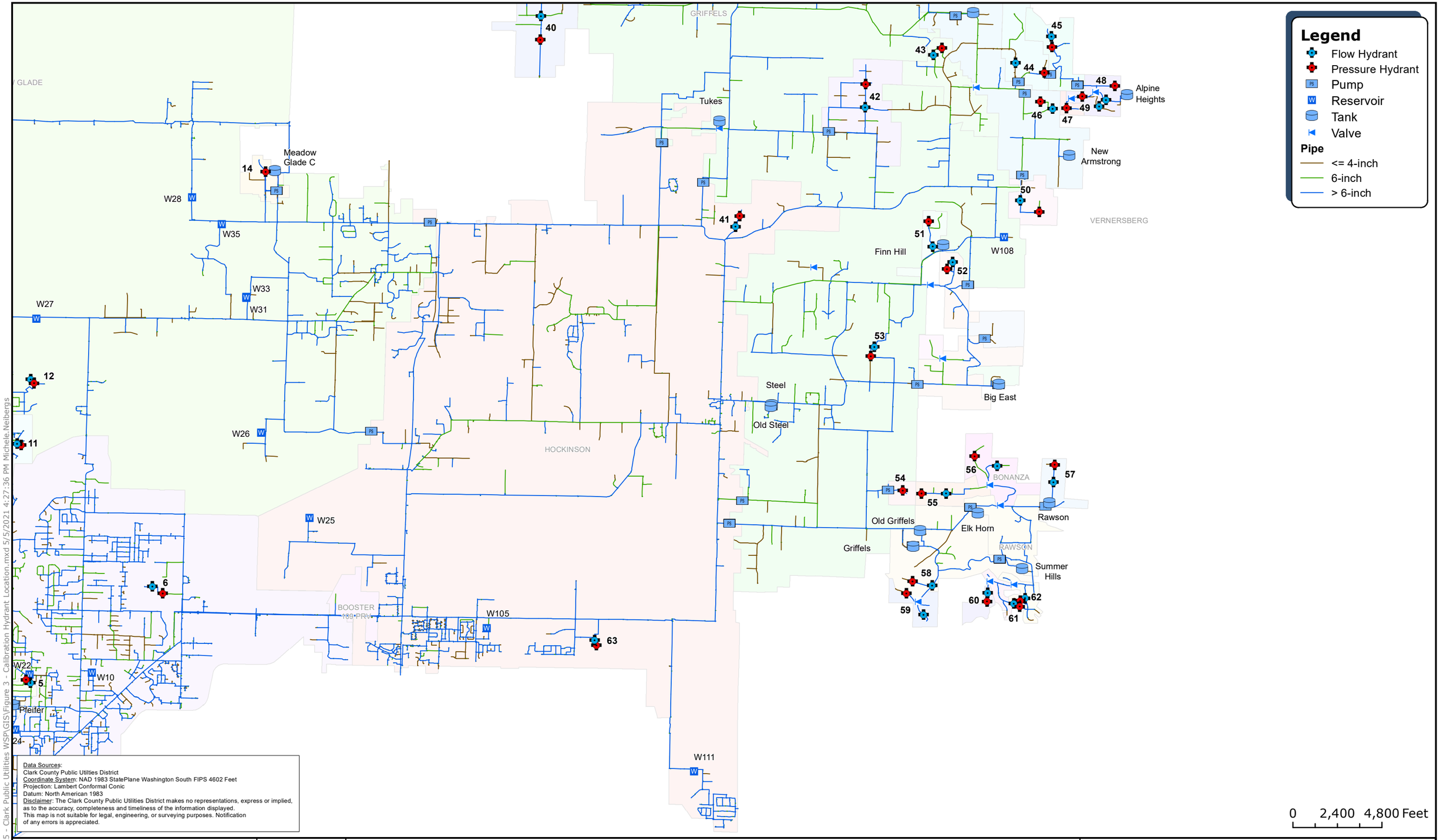
Clark Public Utilties District
Water System Plan

Figure 2
Calibration Testing Locations

May 2021

20-0025

I:\BOI_Projects\20\0025 - Clark Public Utilities WSP\GIS\Figure 2 - Calibration Hydrant Location.mxd 5/5/2021 4:41:53 PM Michele.Nelbergs



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Clark Public Utilities

Clark Public Utilties District
Water System Plan

Figure 3
Calibration Testing Locations

May 2021

20-0025

I:\BOI_Projects\20\0025 - Clark Public Utilities WSP\GIS\Figure 3 - Calibration Hydrant Location.mxd 5/5/2021 4:27:36 PM Michele.Nelbergs

B3.Suction	CCW2.Pressure	R1.Level	F1.HiPress
B3.Pressure	CCW2.Flow	R1.HGL	F1.LoPress
B3.Flow	CCW2.Aux	R2.Level	F2.HiPress
B3.Pmp1or2Aux	CCW3.Pressure	R2.HGL	F2.LoPress
B4.Suction	CCW3.Flow	R3.Level	F3.HiPress
B4.Pressure	CCW3.Aux	R3.HGL	F3.LoPress
B4.Flow	CCW4.Pressure	R4.Level	F4.HiPress
B4A.Suction	CCW4.Flow	R4.HGL	F4.LoPress
B4A.Pressure	CCW4.Aux	R5.Level	F5.HiPress
B4A.Flow	PPW1.Pressure	R5.HGL	F5.LoPress
B4A.Pmp1or2Aux	PPW1.Flow	R6.Level	F6.HiPress
B4B.Suction	PPW1.Aux	R6.HGL	F6.LoPress
B4B.Pressure	PPW4.Pressure	R7.Level	F7.HiPress
B4B.Flow	PPW4.Flow	R7.HGL	F7.LoPress
B4B.Pmp1or2Aux	PPW4.Aux	R8.Level	F8.HiPress
B6.Suction	W5.Pressure	R8.HGL	F8.LoPress
B6.Pressure	W5.Flow	R9.Level	F9.HiPress
B6.Flow	W5.Aux	R9.HGL	F9.LoPress
B6.Pmp1or2Aux	W7.Pressure	R10.Level	
B8.Suction	W7.Flow	R10.HGL	
B8.Pressure	W7.Aux	R11.Level	
B8.Flow	W8.Pressure	R11.HGL	
B8.Pmp1or2Aux	W8.Flow	R12.Level	
B9.Suction	W8.Aux	R12.HGL	
B9.Pressure	W9.Pressure	R13.Level	
B9.Flow	W9.Flow	R13.HGL	
B9.Pmp1or2Aux	W9.Aux	R14.Level	
B10.Suction	W10.Pressure	R14.HGL	
B10.Pressure	W10.Flow	R15.Level	
B10.Flow	W10.Aux	R15.HGL	
B10.Pmp1or2Aux	W104.Pressure	R16.Level	
B101.Suction	W104.Flow	R16.HGL	
B101.Pressure	W104.Aux	R17.Level	
B101.Flow	W105.Pressure	R17.HGL	
B101.Pmp1or2Aux	W105.Flow	R18.Level	
B102.Suction	W105.Aux	R18.HGL	
B102.Pressure	W106.Pressure	R19.Level	
B102.Flow	W106.Flow	R19.HGL	
B102.Pmp1or2Aux	W106.Aux	R20.Level	
B104.Suction	W108.Pressure	R20.HGL	
B104.Pressure	W108.Flow	R21.Level	
B104.Flow	W108.Aux	R21.HGL	
B104.Pmp1or2Aux	W110.Pressure	R22.Level	
B105.Suction	W110.Flow	R22.HGL	
B105.Pressure	W110.Aux	R23.Level	
B105.Flow	W111.Pressure	R23.HGL	
B105.Pmp1or2Aux	W111.Flow	R24.Level	

B109.Suction
B109.Pressure
B109.Flow
B109.Pmp1or2Aux
B11.Suction
B11.Pressure
B11.Flow
B11.Pmp1or2Aux
B110.Suction
B110.Pressure
B110.Flow
B110.Pmp1or2Aux
B113.Suction
B113.Pressure
B113.Flow
B113.Pmp1or2Aux
B114.Suction
B114.Pressure
B114.Flow
B114.Pmp1or2Aux
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B117.Pressure
B117.Flow
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B118.Suction
B118.Pressure
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B119.Flow
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B122.Flow
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B123.Pmp1or2Aux
B124.Suction
B124.Pressure
B124.Flow
W111.Aux
W13.Pressure
W13.Flow
W13.Aux
W15.Pressure
W15.Flow
W15.Aux
W15_1.Pressure
W15_1.Flow
W15_1.Aux
W16.Pressure
W16.Flow
W16.Aux
W17.Pressure
W17.Flow
W17.Aux
W19.Pressure
W19.Flow
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W21.Flow
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W26.Pressure
W26.Flow
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W27.Pressure
W27.Flow
W27.Aux
W28.Pressure
W28.Flow
W28.Aux
W29.Pressure
W29.Flow
W29.Aux
W30.Pressure
R24.HGL
R25.Level
R25.HGL
R26.Level
R26.HGL
R27.Level
R27.HGL
R28.Level
R28.HGL
R29.Level
R29.HGL
R31.Level
R31.HGL
R32.Level
R32.HGL
R33.Level
R33.HGL
R34.Level
R34.HGL

B124.Pmp1or2Aux
B125.Suction
B125.Pressure
B125.Flow
B125.Pmp1or2Aux
B126.Suction
B126.Pressure
B126.Flow
B126.Pmp1or2Aux
B127.Suction
B127.Pressure
B127.Flow
B127.Pmp1or2Aux
B129.Suction
B129.Pressure
B129.Flow
B129.Pmp1or2Aux
B130.Suction
B130.Pressure
B130.Flow
B130.Pmp1or2Aux
B131.Suction
B131.Pressure
B131.Flow
B131.Pmp1or2Aux
B132.Suction
B132.Pressure
B132.Flow
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B137.Flow
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B138.Suction
B138.Pressure
W30.Flow
W30.Aux
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W31.Aux
W32.Pressure
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W33.Pressure
W33.Flow
W33.Aux
W34.Pressure
W34.Flow
W34.Aux
W35.Pressure
W35.Flow
W35.Aux

B138.Flow
B138.Pmp1or2Aux
B139.Suction
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B153.Flow
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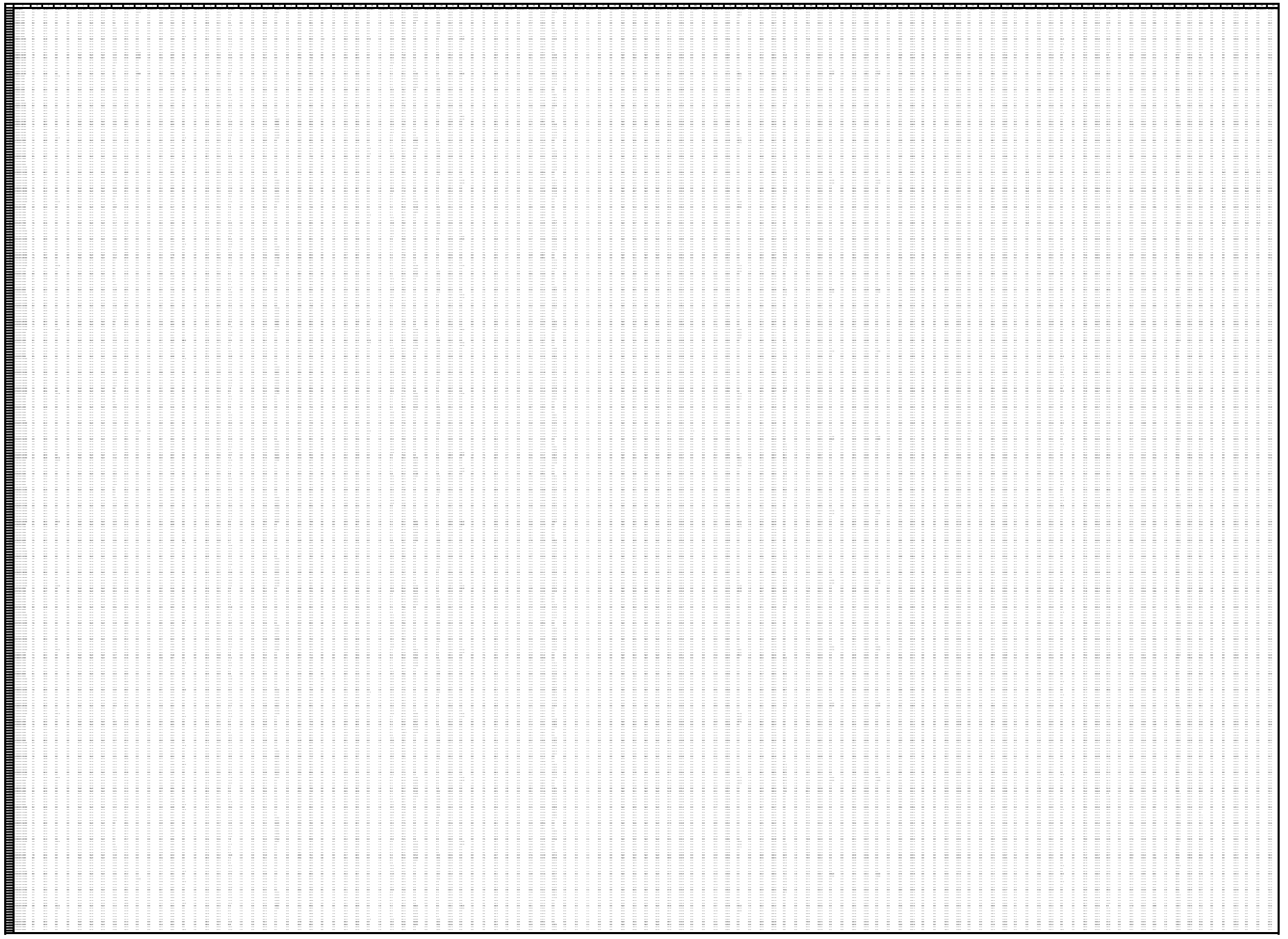

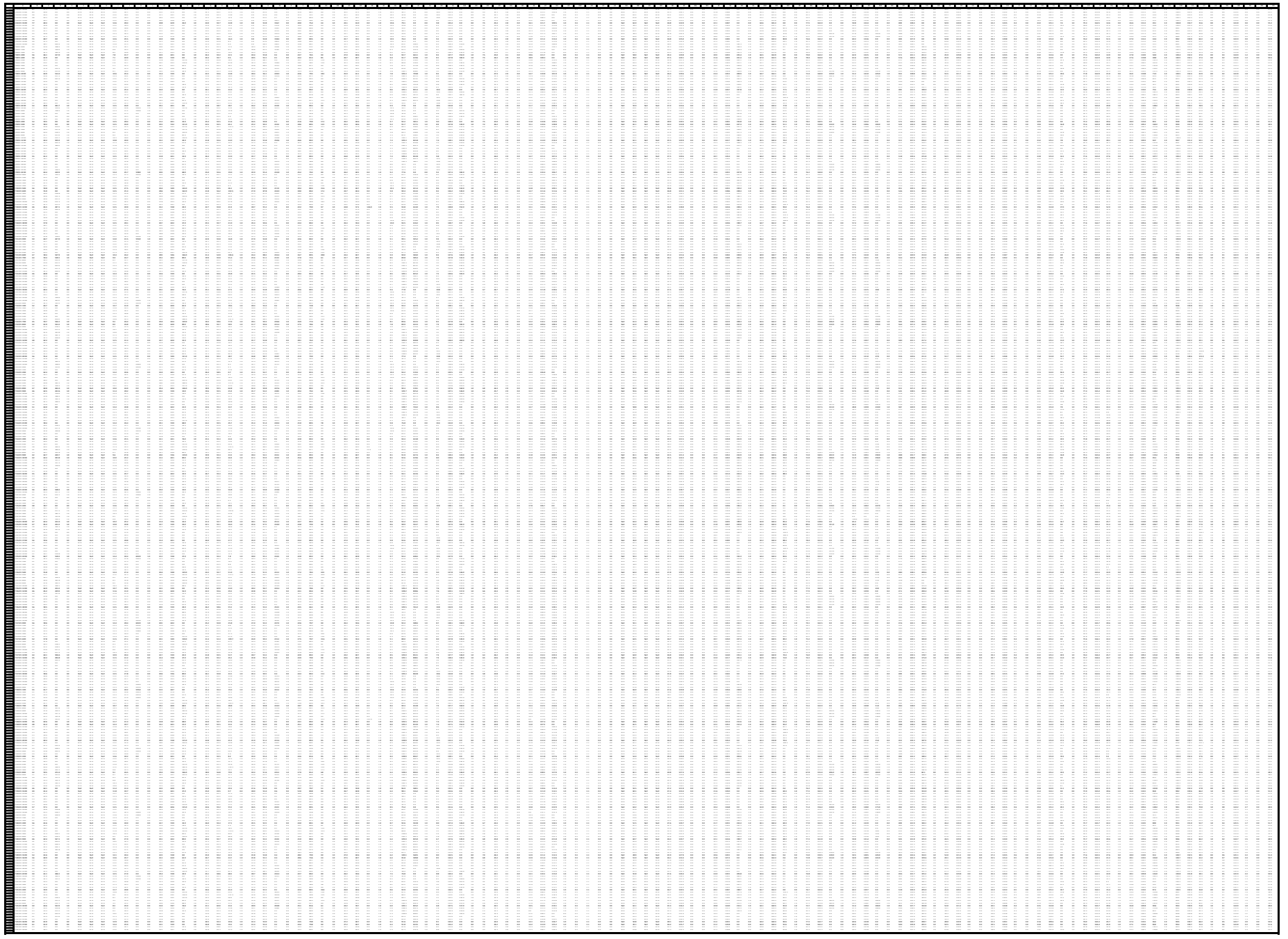

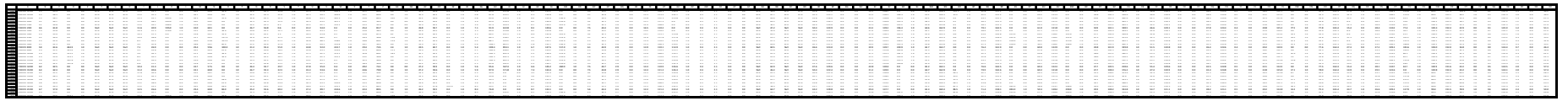

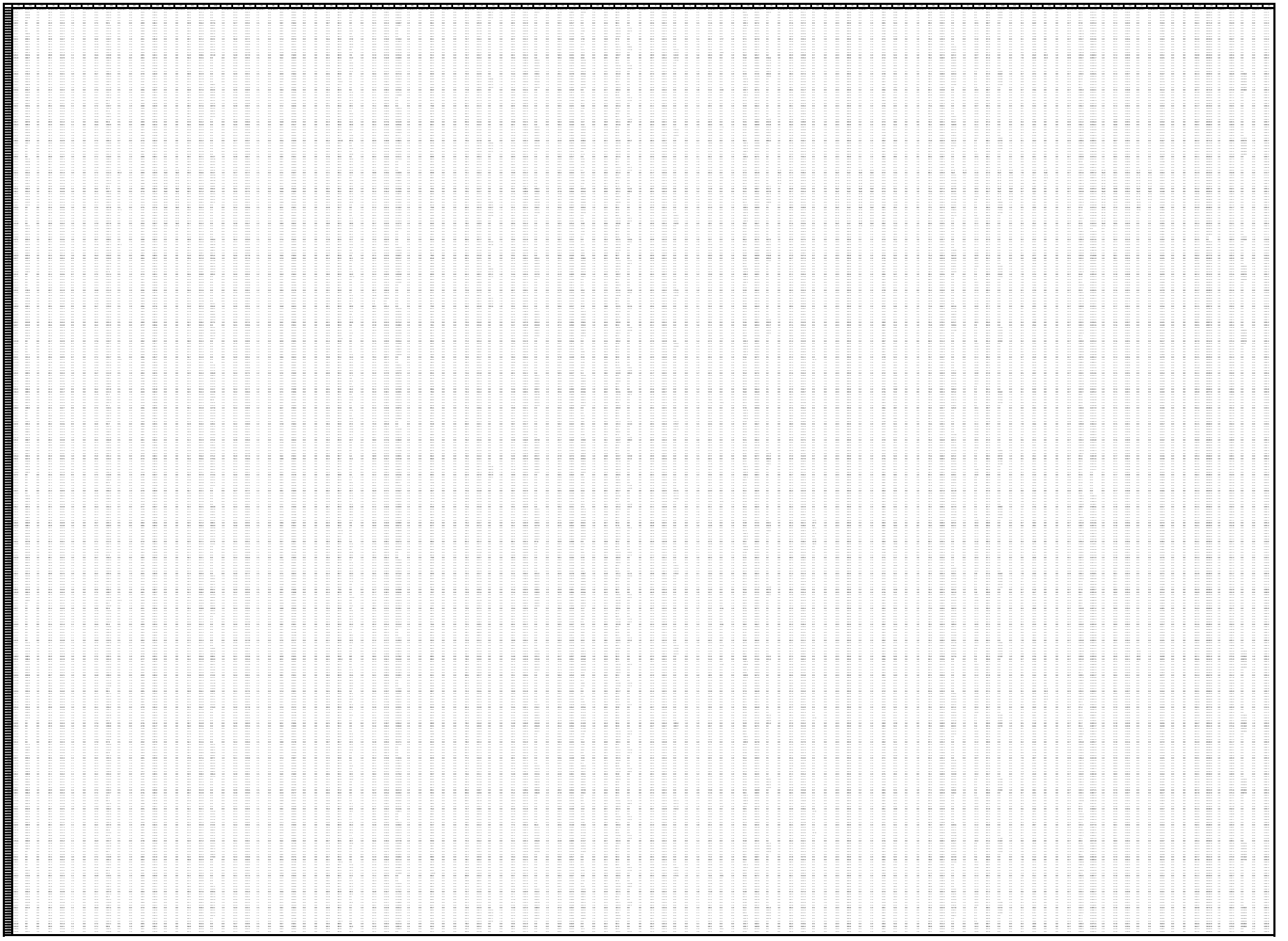

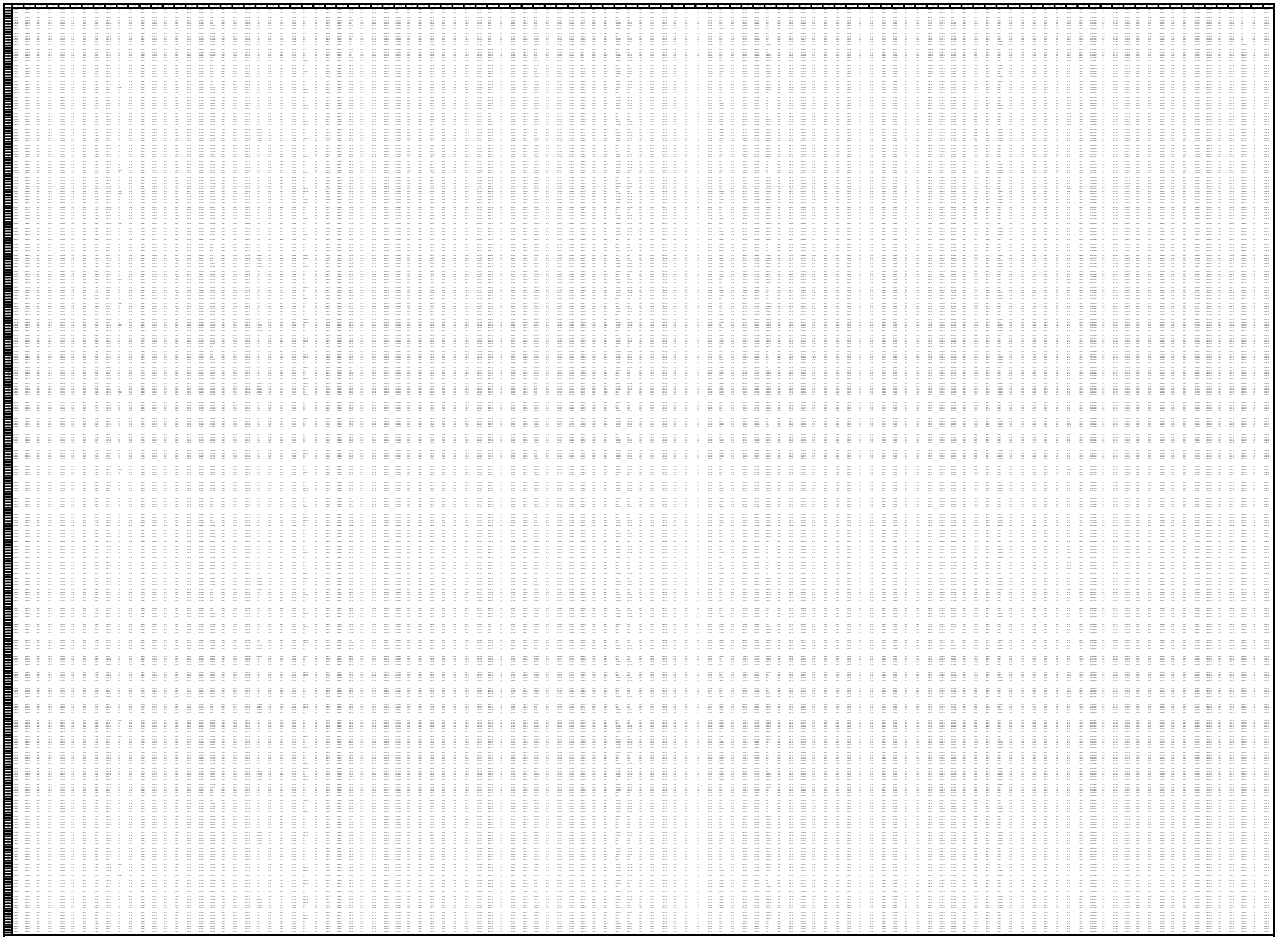

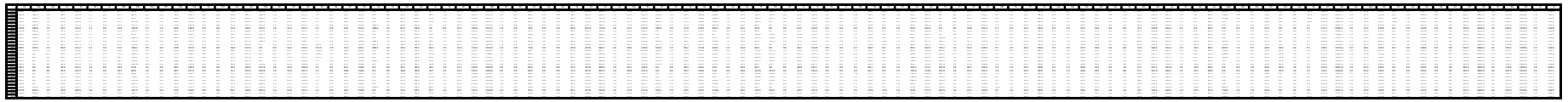

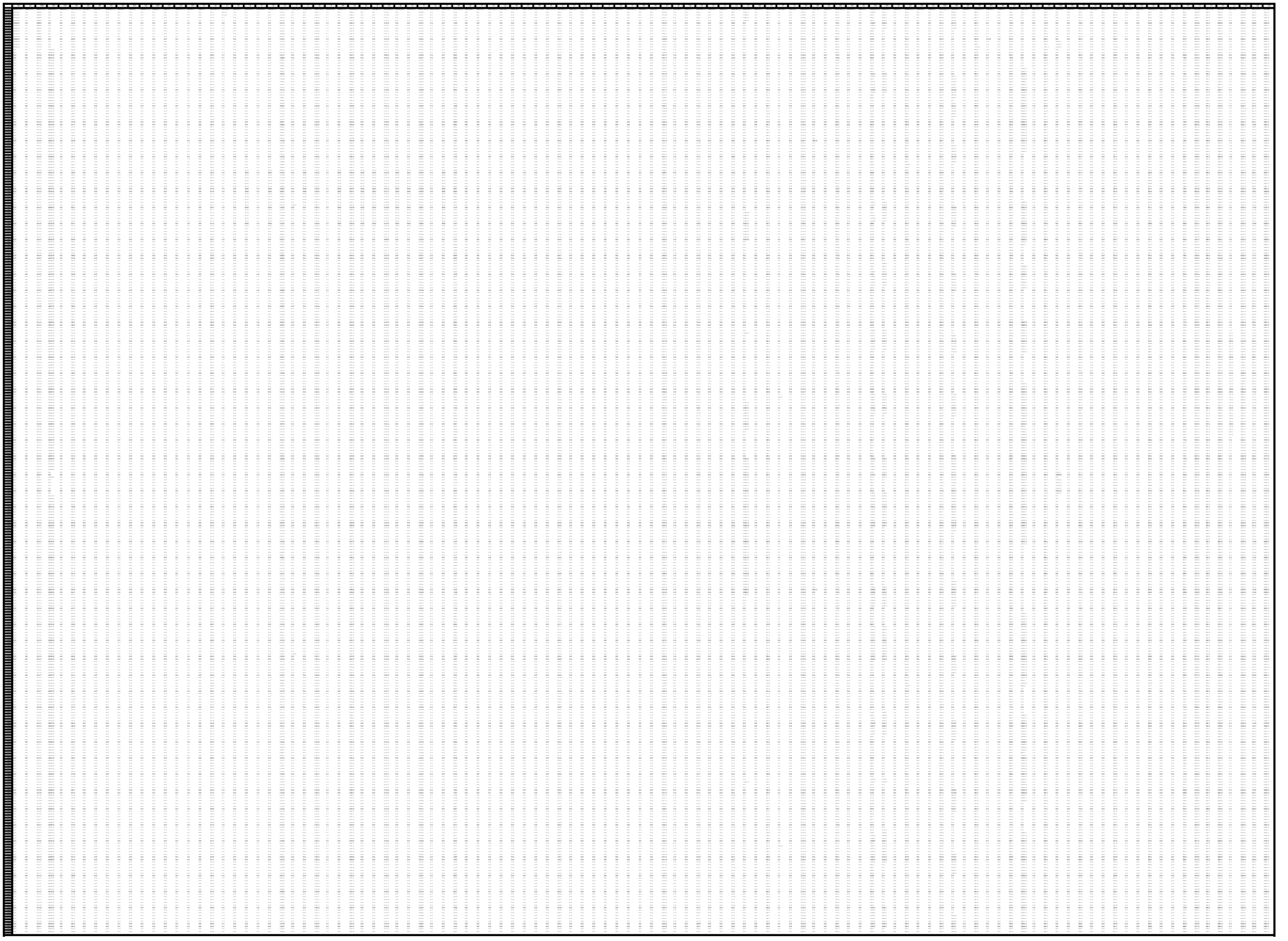

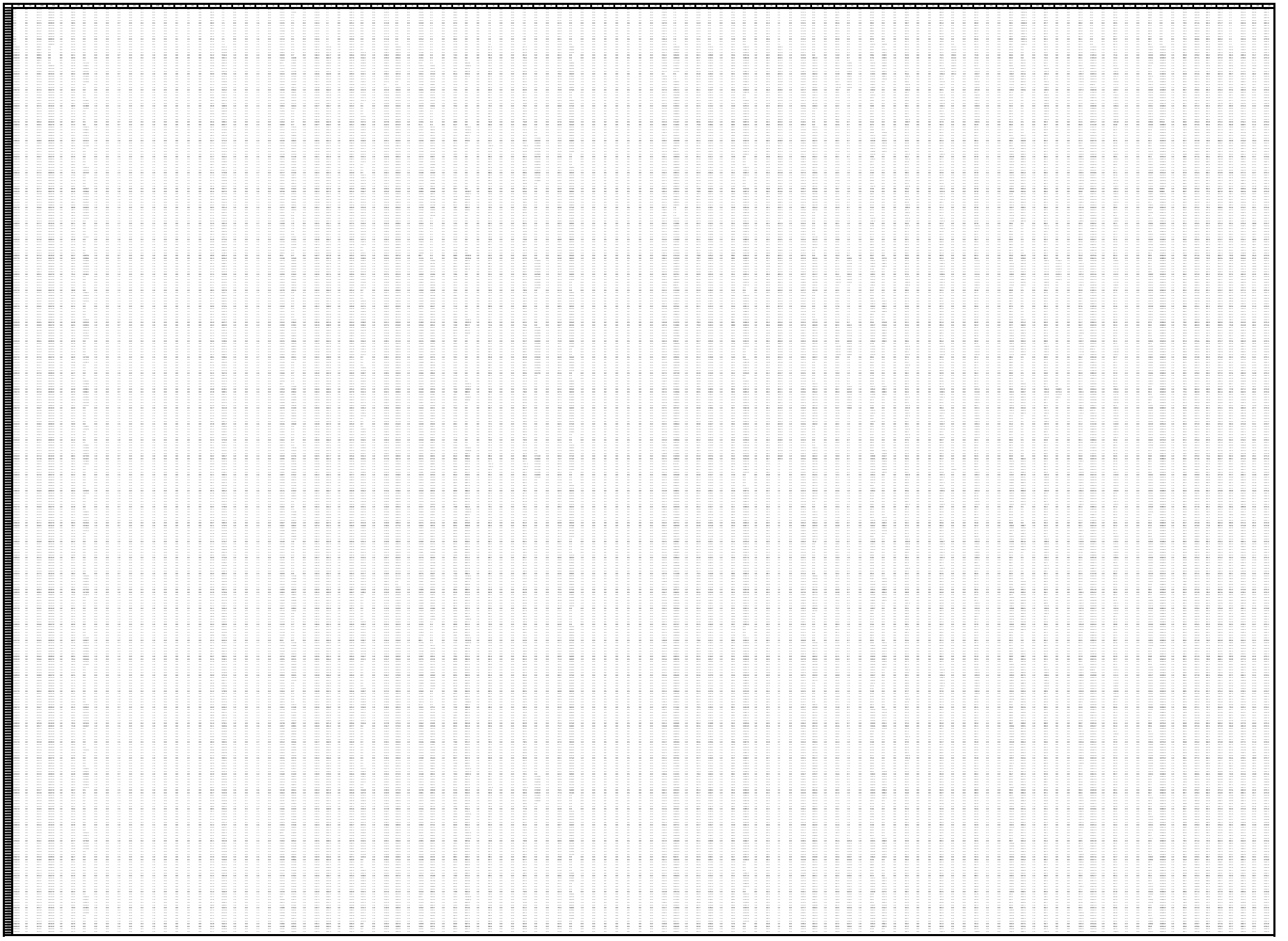

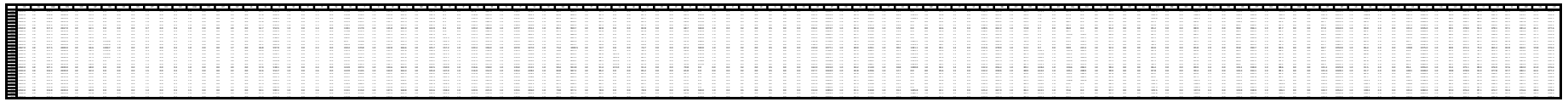

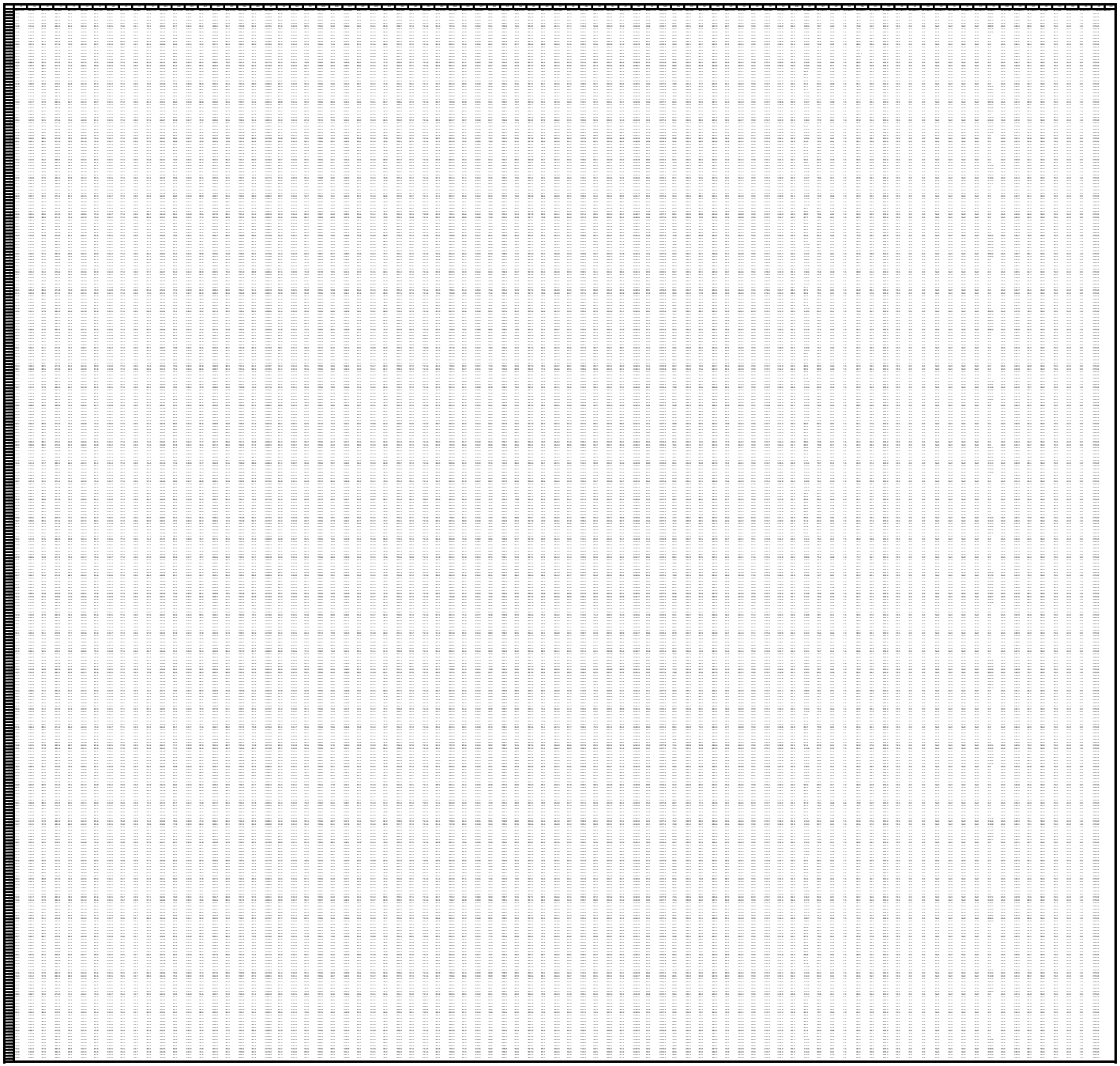

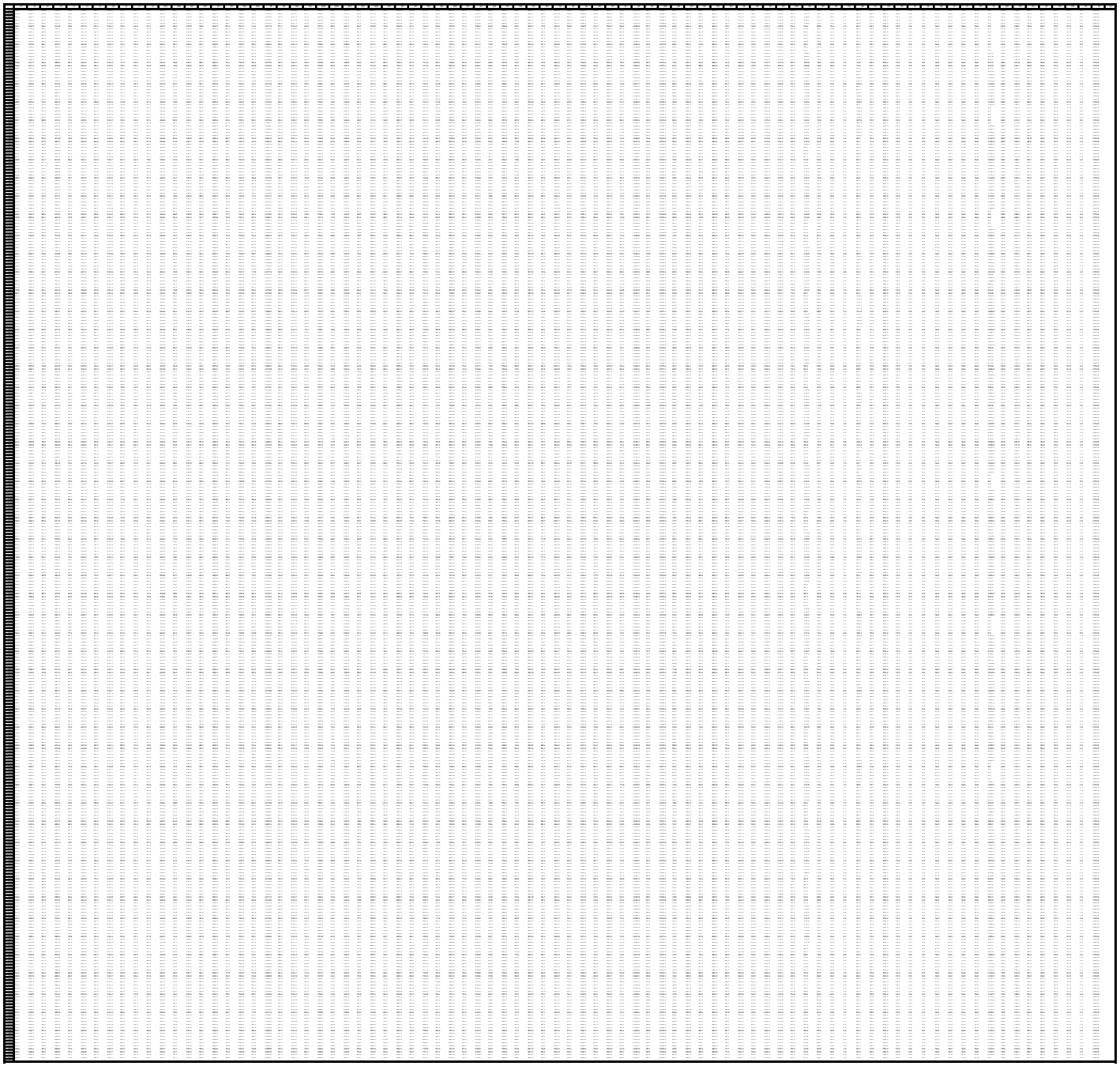

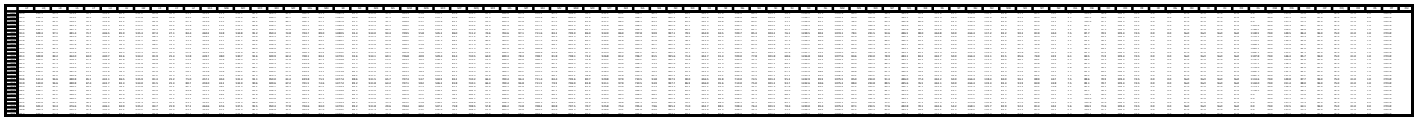

K Wellhead Protection Plan

Draft

Clark Public Utilities
2021 Wellhead Protection Plan Update

2021

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1.0 Executive Summary

Clark Public Utilities (CPU) has updated its wellhead protection plan (WHP) for 32 supply wells located throughout Clark County. The purpose of the plan is to help prevent CPU's water-supply sources from becoming contaminated and to develop contingency and emergency response procedures in case one or more sources are lost because of contamination. The plan meets the requirements of Washington Administrative Code (WAC) 246-290.135 (4). Work for this project included:

- Characterizing the hydrogeology of Clark County, identifying aquifers that supply water to CPU wells, and identifying aquitards that protect water supplies from near-surface contamination.
- Characterizing the quality of groundwater from CPU's wells.
- Delineating WHP capture zones for each supply well.
- Inventorying confirmed and existing sources of contamination, particularly those that lie within the capture zones, and evaluating the risks associated with these contaminant sources.
- Developing a contingency plan to provide water supplies in case or more wells are impacted by contamination
- Developing an emergency response plan for spills that might affect the well sources.
- Designing implementation strategies to educate the public and manage the contaminant sources in CPU's service area.

The findings and recommendations of this work are discussed below.

1.1 Findings

CPU currently uses 32 wells to supply water to 63,736 customers. Thirteen of these wells produce water from shallow aquifers, sixteen produce water from a deeper aquifer system, and three produce water from bedrock aquifers. Yields from these wells range from less than 250 gallons per minute (gpm) to 1,600 gpm. The lowest yields are obtained from wells completed in bedrock aquifers.

1.1.1 Hydrogeology and Existing Water Quality

The major hydrogeologic units in the area include sediments deposited by modern rivers and by the ancient Columbia River. The primary aquifers in the region include the Recent Alluvial, Upper Troutdale, and Glacial Outwash Aquifers, which form the shallow system, and the Lower Troutdale and Sand and Gravel Aquifers (SGA), which form the deep system. Fractured bedrock aquifers also yield small quantities of water to wells. The SGA is typically overlain by the fine-

grained sediments of the Lower Confining Unit and, in some areas, the Upper Confining Unit. These two aquitards limit the movement of contaminants to the SGA from the surface and overlying aquifers. Consequently, wells completed in this unit are better protected from the threat of contamination.

Groundwater generally flows to the west-southwest in Clark County, discharging to features such as Salmon Creek and the East Fork of the Lewis River after traveling laterally from the upland areas, where much of the recharge occurs. The Columbia River serves as a discharge point for the deeper SGA system.

In general, the quality of groundwater from CPU's wells is good. Prior to 1995, volatile organic compounds (VOCs) were detected at low levels in a few shallow supply wells along Salmon Creek; however, no VOCs have been detected since then. These detections may have been related to service work at one of the wells.

Iron and manganese levels are typically are higher in the deeper aquifers than in the shallow aquifers. Within the Upper Troutdale and Pleistocene Alluvial Aquifers, iron and manganese levels tend to be higher in the southwest part of the County, following the direction of regional groundwater flow. CPU currently removes iron and manganese at several supply wells (Wells 15, 21, and 110) via a pyrolusite-media treatment system.

1.1.2 Wellhead Delineations

Wellhead delineations for CPU's supply wells were prepared using analytical modeling and hydrogeologic mapping techniques. These delineations represent the extent of the capture zone (recharge area) for each well under average pumping conditions. The capture zones for the shallow supply sources (Wells 9, 17, 18, and 19) are the most extensive and cover commercial and industrial zoned areas.

1.1.3 Contaminant Inventory

A range of contaminant sources was inventoried using a Geographic Information Systems (GIS) approach. These sources include underground storage tanks (USTs) and many sites listed under the Resource Conservation and Recovery Act (RCRA), the State Model Toxics Control Act (MTCA), and Federal site lists.

The results of this analysis indicated many confirmed sources of contamination in the study area. Most of these are related to leaking underground storage tanks (LUSTs). In addition, many "non-leaking" USTs were identified in the study area. They comprise potential sources of contamination. Because they are ubiquitous, the USTs and LUSTs present the most significant threat to groundwater quality in CPU's service area.

RCRA generators pose another significant risk to groundwater because they handle and store hazardous wastes. A number of RCRA generators were identified as violators, indicating that a release has occurred at these facilities in the past:

- Commercial Repair and Machine Works, 11614 NE Highway 99
- Electronic Specialty Corp., 14511 NE 13th
- C Wells & Company, 1509 NE 106th Street
- International Composites Corp., 14413 NE 10th Avenue
- Boomsnub/BOC Gases Superfund Site, 4715 NE 78th Street
- Permalume Plastics, 5015 NE 78th Street

Of these reported releases, only those at Boomsnub/BOC Gases and Permalume Plastics are currently known to have affected environmental media.

Other potential sources of contamination include transportation-related spills along I-5, I-205, Highway 99, SR-502 and SR-503, although no such spills have been documented to date.

1.1.4 Wellhead Susceptibility

The results of this analysis indicate that the following wells are most susceptible to contamination because of their shallow depth and proximity to existing and potential contaminant sources:

- Wells 9, 17, 18, and 19, which lie along the Highway 99 commercial/industrial corridor
- Wells 5, 7, and 23, lie near confirmed sources of contamination that include the Boomsnub/BOC Superfund site

Wells 14, 20, 25 through 31, 33, 105, 106 and 110 have the lowest risk for contamination because of their depth and distance to known and/or potential contaminant sources. These wells are protected by the Lower Confining Unit and other fine-grained sediments.

1.1.5 Source-Loss Analysis

A source-loss analysis completed for CPU's wells indicates that the Utility has the ability to manage both short and long-term losses to the system. The system would be most impacted if well 401 were contaminated, because it would need to be treated immediately. Other wells could be replaced from the remaining sources of supply.

1.2 Recommendations

The following recommendations are based on the results of work completed for WHP planning. These implementation strategies focus on public education, contaminant source management, monitoring, data management, and land use and regulatory controls. Wellhead protection can also be effected by coordination with other regional agencies and by emergency response and contingency planning, as discussed below.

1.2.1 Public Education and Technical Assistance

Strategies for public education include developing school programs and other educational materials such as the Annual Water Quality Report. Educational materials should also be developed for facility owners in WHPAs to convey the importance of proper waste handling and disposal. In addition, technical assistance for small businesses within designated WHPAs should be increased.

1.2.2 Contaminant Source Management

Businesses within designated WHPAs should be inventoried to assess potential contaminant sources and waste handling practices. USTs that were not identified through this study should also be inventoried, including residential home heating oil USTs. Other strategies for managing possible contaminant sources include Encouraging residents to connect to sewer systems where possible and reviewing stormwater management practices to identify areas of concern for groundwater quality. CPU should request and/or encourage the cooperation of agencies such as Ecology and the Southwest Washington Health Department (SWWHD).

It is important that the sources of VOCs at CPU's Monitoring Wells MW-5 and MW-7 be identified. CPU should encourage Ecology's involvement in this endeavor and assist where appropriate.

1.2.3 Monitoring and Data Management

Water-quality and other data that could assist in wellhead protection should be collected via cooperative programs with Clark County, other local purveyors such as the Cities of Battle Ground, Vancouver, and Camas and SWWHD. Existing programs should be reviewed. Data obtained through such programs should be integrated into CPU's water-quality database.

Several changes would benefit CPU's current WHP monitoring program. Monitoring wells located in high-risk areas should be sampled quarterly for analysis of VOCs, chromium, and nitrate. These wells include:

- CPU-2
- CPU-3S, -3D
- CPU-4S, -4D
- CPU-5S, -5D
- CPU-7S (annual for VOCs unless detected), -7D
- CPU-10
- The Garrison and Bennett wells

Other CPU monitoring wells should be sampled annually for VOCs and semiannually for nitrates (CPU-9S, -9D; CPU-6; and CPU-8). Two additional wells (the "Zinda" monitoring wells) should be sampled semiannually for VOCs.

Inorganic constituents (other than chromium and nitrate) should be dropped from the analyte list.

1.2.4 Land Use and Regulatory Controls

Strategies related to land-use and regulatory controls include encouraging and supporting County ordinances related to wellhead protection and water quality, including Clark County's Critical Aquifer Recharge Areas (CARA) ordinance (Chapter 13.70) and Clark County's Water Quality ordinance (Chapter 13.26A).

1.2.5 Regional Coordination

CPU may want to coordinate with other purveyors in Clark County to coordinate WHP planning activities and water-supply planning and development issues such as contingency planning and expansion of interties.

1.2.6 Planning Strategies

Developing strategies for emergency response and contingency planning is essential to wellhead protection. Such strategies include notifying emergency response organizations on the location of WHPAs, establishing communication protocols with first-responders, and preparing a contingency plan that covers short- and long-term responses if one or more sources is lost. In addition, CPU should consider completing a hydraulic assessment of the distribution system to ensure that the contingency plans adequately address major losses of supply or storage capacity.

Long-term strategies should focus on developing new deep supply wells to replace existing shallow wells (Wells 9, 17, 18, and 19), which are at a high risk of contamination. Supplies from the new deep wells would be better protected from potential land-use impacts. CPU should negotiate with Ecology to transfer water rights from the existing wells to the new wells.

2.0 Introduction

In 1991 and 2000, a preliminary data assessment was conducted by Pacific Groundwater Group (PGG) and Economic and Engineering Services (EES) to provide a basis for Clark Public Utilities' (CPU's) wellhead protection (WHP) program. The investigation focused on about 55 square miles in the Hazel Dell area; this area was selected based on land-use practices and on the locations of major water-supply sources. Work for this preliminary assessment included:

- Characterizing the hydrogeology and land use practices of the County
- Evaluating aquifer vulnerability in the vicinity of each supply well
- Calculating capture zones and travel times for each supply well
- Identifying which water-supply sources were most vulnerable to water-quality impacts
- Identifying data gaps and designing a work plan to address them
- Assessing the hydraulic interaction between groundwater and surface water systems
- Developing a monitoring plan for high-risk areas

Based on the results of that assessment, a work plan was designed to evaluate how vulnerable CPU's water-supply sources were to contamination. In accordance with the 1991 work plan, 14 monitoring wells were installed at eight sites, and a monitoring network was established. The *Salmon Creek Wellhead Protection Program* (EES and PGG, 1994) report incorporated the results of the 1991 work plan.

2.1 Scope

This report updates information presented in the 1994 WHP report. It focuses on a larger study area and includes supply wells that were either installed or purchased after 1994. These wells include Wells 8.2, 28, 29, 30, 31, 33, and 401.

In accordance with DOH requirements (WDOH, 1995), CPU has completed and submitted a well-head susceptibility form for all its water supply sources.

2.2 Study and Focus Areas

The WHP study area is shown on **Figure 1**. It covers most of Clark County, and includes the drainage basins of Salmon Creek and the East Fork Lewis River, as well as the communities of Yacolt, Ridgefield, La Center, Battle Ground, Chelatchie, Amboy, Brush Prairie, Hockinson, and Meadow Glade. It is bounded on the north by the Lewis River. CPU's supply wells lie within the boundaries of

the study area. The major population center is Hazel Dell, a rapidly urbanizing area north of Vancouver.

The hydrogeologic characterization for this WHP study focused on the study area shown on **Figure 1**. The characterization involved assessing the hydrogeology of the area, evaluating trends in water quality, and identifying groundwater flow patterns. However, land use and aquifer vulnerability were evaluated more extensively within three "Focus Areas" that were defined based on the locations of CPU's supply wells. These Focus Areas, which are shown on **Figure 1**, include:

- The ***Hazel Dell Focus Area***. This area includes CPU Wells 4, 5, 7, 8.2, 9, 17 through 28, 31, 33, and 105. The most urban of the three Focus Areas, it covers a portion of the lower Salmon Creek basin and includes the Highway 99, I-5, and I-205 corridors.

- The ***Upper Salmon Creek–East Fork Lewis River Focus Area***, which is referred to as the "SCLR" Focus Area in this report. This area includes CPU Wells 25 through 33, and 104 through 110. It covers portions of the Upper Salmon Creek drainage basin and the East Fork Lewis River drainage basin.

- The ***Chelatchie Focus Area***. This area includes only CPU Well 401 and lies in Chelatchie Prairie of north Clark County.

2.2.1 Climate

Clark County has a marine warm-temperate climate, with relatively warm, dry summers, and typically mild, rainy winters. Approximately 75 percent of the total annual precipitation in Clark County occurs during the months of October through March (Mundorff, 1964). The remaining 25 percent of the total annual precipitation occurs from April through September. Average annual precipitation at Battle Ground, which lies in the central part of the study area, is about 51.8 inches for the 50-year period from 1949 through 1999. Average annual precipitation at Vancouver, Washington, located several miles south of the study area, is about 37.3 inches for the 71-year period from 1849 through 1868, 1888 through 1892, and 1898 through 1955 (Mundorff, 1964).

2.2.2 Surface Water

Prominent surface-water features in the study area include Salmon Creek and its tributaries, along with the East Fork of the Lewis River, Chelatchie and Cedar Creeks, Burnt Bridge Creek, Vancouver Lake, and Klineline Pond. In addition, the study area is bounded on its north side by the North Fork of the Lewis River, another major surface-water drainage.

Salmon Creek is one of the principal surface-water drainages in the study area. It drains approximately 90 square miles and has its headwaters in the eastern foothills of Clark County. Salmon

Creek discharges into the Lake River, which in turn discharges to the Columbia River near Ridgefield.

The East Fork of the Lewis River flows west from its headwaters near Cougar Rock in the Gifford-Pinchot National Forest to its confluence with the North Fork of the Lewis River in La Center. It drains about 212 square miles, most of which lies in Clark County (Hutton, 1995).

Chelatchie Creek drains Chelatchie Prairie. It originates in the uplands about 1 mile north of the community of Chelatchie and flows into the Cedar River near Amboy which in turn discharges to the North Fork of the Lewis River.

2.3 Water Supply Sources

CPU depends entirely on local groundwater resources to meet the water demands of approximately 63,736 municipal and industrial customers in the study area at 23,961 connections (WDOH, 1998). To meet these demands, groundwater is withdrawn at an average rate of about 5,600 gpm (8.1 mgd) from 32 water-supply wells. Peak production rates are on the order of 13,000 gpm or about 18.7 mgd. The locations of these supply wells are shown on **Figure 1**. Construction details and other pertinent data for these wells are presented on **Table 1**. Individual well capacities range from 250 to 1,600 gpm.

3.0 Hydrogeologic Framework

3.1 Regional Geology

The geology of Clark County is commonly divided into older rocks and younger sediments, which are semi consolidated or unconsolidated. The older rocks crop out in the foothills and mountains in the north and east portions of the study area. They occur at depths greater than 1,500 feet in the southwestern portions of the study area, where down warping formed a basin in which sediments were deposited. The sediments crop out on terraces and plains, which cover about two-thirds of the study area and contain the principal aquifers. The sedimentary units, from youngest to oldest, consist of:

- Recent floodplain alluvium
- Pleistocene alluvial deposits
- Glacial drift
- Troutdale formation

These units are described below and shown on Hydrogeologic Cross-Sections A-A' and B-B', which are presented in **Figures 2** and **3**. The locations of the cross-sections are shown on **Figure 1**.

In addition to the sedimentary units and the older rocks, the study area contains Pleistocene glacial drift and Pliocene lava flows. These units are described below in Sections 3.1.1.2 and 3.1.1.4, respectively.

Table 2 shows the relationship between each of the units discussed below. It also indicates how the nomenclature for many of these units varies and the various researchers have correlated them.

3.1.1 Recent Floodplain Alluvium

Alluvial deposits occur locally in the study area, along the rivers and streams. They include:

- Alluvial fans and associated deposits along tributaries and rivers
- Terrace deposits
- Recent alluvium

The alluvial fans, terraces, and basin-fill deposits were deposited by tributaries of the Columbia River downstream from the Gorge. These sediments interfinger with the Pleistocene alluvium of the ancestral Columbia River.

3.1.1.1 Alluvial Fans and Associated Deposits

The alluvial fans are coarse and gravelly in the terraces and at their apexes but grade to fine sands and silts at their margins. The largest fans occur in the vicinities of Battle Ground and Proebstel.

3.1.1.2 Terraces

Terraces occur along the stream channels upstream of the fans. Terraces north of Battle Ground along the East Fork of the Lewis River are generally much coarser than the alluvial fans, comprising very coarse gravel in a sandy matrix.

3.1.1.3 Floodplain Alluvium

The Recent alluvium is generally confined to floodplains and low terraces along many of the County's rivers and creeks. It forms a thin veneer over the Troutdale formation and Pleistocene alluvial deposits. The alluvium ranges in texture from medium-fine sand and silt along the Co-

lumbia River near Vancouver to coarse sand and gravel along the lower portions of Salmon Creek and the East Fork of the Lewis River.

3.1.2 Glacial Drift

Glacial drift was deposited during the Pleistocene when glaciers advanced from the Cascade Mountains into the northeastern portion of the study area, where it covers about 110 square miles. It commonly occurs as till up to about 40 feet thick, mantling the Troutdale formation. Additionally, several valleys and structural basins in the study area contain glacial outwash consisting of sand, gravel, and laminated silt. This outwash may be several hundred feet thick in the vicinities of Yacolt and Chelatchie Plain. Glacial drift does not occur within the Salmon Creek basin.

3.1.3 Pleistocene Alluvial Deposits

The ancestral Columbia River deposited Pleistocene alluvium as a great deltaic fan emanating from the Columbia River Gorge. The alluvium was deposited because of catastrophic flood events of the Columbia River during the Pleistocene age. Also known as the Missoula flood deposits, the alluvium is exposed on broad plains and terraces in the southwestern part of Clark County. It covers about a third of the study area. The deposits generally consist of coarse-textured sand, gravel, and cobbles near the mouth of the Columbia Gorge in the southeast and along the Columbia River near Vancouver. In areas farther from the Columbia River, at the outer edges of the delta, the deposits grade to textures of fine sand, silt, and clay. They are thickest deposits in the ancestral channel of the Columbia River, near Vancouver. Wells in the ancestral channel penetrate as much as 340 feet of the deposits. Outside of the channel, on the surrounding broad plains, the deposits are as much as 150 feet thick. The Pleistocene alluvium dips gently to the southwest.

3.1.4 Boring Lava

The Boring Lava consists of fine-grained, vesicular basalt of Pliocene and early Pleistocene ages. The lava generally overlies the Troutdale formation, although evidence suggests simultaneous deposition. It crops out near Battle Ground and in the Camas and Washougal areas.

3.1.5 Troutdale Formation

The Troutdale formation underlies the Pleistocene Alluvial Deposits and comprises unconsolidated and semi consolidated clay, silt, sand, and gravel. The unit crops out in several locations:

- The northwest portion of the study area.
- A band several miles wide extending from Washougal to Battle Ground.
- Along several major rivers.
- As "windows" through the overlying sediments in localized areas between Salmon Creek and the East Fork of the Lewis River. These "windows" occur because the unit is gently folded.

The Troutdale formation contains three coarse-grained units—the Upper Troutdale, the Lower Troutdale, and a deeper sand and gravel unit—which are separated by finer-grained confining units. Their geologic characteristics are discussed below. The coarse-grained units form aquifers, which are discussed in Section 3.1.2.

3.1.5.1 Upper Troutdale

The upper 100 to 300 feet of the Troutdale formation is known as the Upper Troutdale. It consists of gravel in a matrix of coarse sand and includes sand lenses and stringers. The unit is often cemented. The Upper Troutdale covers most of Clark County and appears to be continuous. It is thickest in the southern part of the study area.

3.1.5.2 Upper Confining Unit

The Upper Confining Unit consists of fine sand, silt, and clay. It typically ranges from 20 to 50 feet in thickness and separates the Upper and Lower Troutdale in most places in the study area.

3.1.5.3 Lower Troutdale

The Lower Troutdale consists mostly of fine sand. It is exposed in the southeast portion of the county (Swanson, 1991). The unit was identified at several CPU well locations in the Salmon Creek basin, where its texture consists of predominantly of fine sand and with silty clay lenses (Carr, 1985). The unit is typically 30 to 60 feet thick in the Salmon Creek basin. The Lower Troutdale is not continuous—it is penetrated by some, but not all, CPU wells.

3.1.5.4 Lower Confining Unit

The Lower Confining Unit consists of fine sand, silt, and clay. It typically ranges from 50 to several hundred feet or more in thickness and separates the Lower Troutdale and the Sand and Gravel in most places in the study area.

3.1.5.5 Sand and Gravel (SGA)

A deep sand and gravel unit (the "SGA") lies beneath the Lower Confining Unit. It has been identified along the Sandy River in Oregon, at the City of Portland wellfield, at Ellsworth Springs, at Vancouver's Well Station 7, and at the Vancouver fish hatchery. Logs for deep wells in the Meadow Glade and Pioneer vicinities indicate that the SGA probably extends continuously from the Portland wellfield to the East Fork of the Lewis River **(Figure 2)**. The unit consists predominantly of fine- and fine-to-medium sand, with lenses of silty sand and clay. It contains local sand and gravel horizons. This unit is typically coarser around the Portland wellfield and fines northerly, reflecting differences in the depositional environment. It is typically 100 to 250 feet in thick in the Meadow Glade and Orchards vicinities but exceeds 400 feet in thickness in the Pioneer area. A 1,000-foot well owned by Philbrook (03N/ 02E-30C) penetrates layered sandstone and fine-grained materials that may correlate to this unit. CPU Wells 8.2, 29, 30, 31, and 33 may also be completed in this unit.

3.1.5.6 Undifferentiated Fine-Grained Unit

Undifferentiated fine-grained sediments underlie the SGA. These sediments consist mostly of silt and clay. The depth of these sediments is unknown since only a few borings penetrate them. This unit overlies older bedrock unit.

3.1.5.7 Bedrock

Older bedrock crops out in the foothills and mountains in eastern and northern portions of the County and underlie the sedimentary deposits in the southwestern portion. The rocks range from Miocene to Eocene age. They are primarily igneous in origin and include andesite, basalt, granodiorite, pyroclastics (breccia, tuff, and agglomerate), conglomerate, and shale. The rocks are generally hard and compact because of Miocene deformation. Fractures, joints, and fault openings have largely been closed by secondary mineralization.

3.2 Principal Aquifers

The principal sources of groundwater supplies in the study area are the Pleistocene Alluvial Aquifer, the Upper Troutdale Aquifer, the Lower Troutdale Aquifer, and the SGA. The recent floodplain alluvium and glacial outwash also form productive aquifers in places. The Boring Lava and

bedrock deposits may also contain aquifers; however, their extent is limited and yields are typically small.

In this report, the Alluvial, Glacial Outwash, and Upper Troutdale Aquifers will be collectively referred to as the "shallow aquifers" and the Lower Troutdale, SGA, and bedrock aquifers will be referred to as the "deep aquifers."

3.2.1 Recent Alluvial Aquifer

The Recent Alluvium contains a highly productive aquifer at shallow depths along streams. This aquifer communicates hydraulically with Salmon Creek and other streams. Two of CPU's most productive wells (Wells 18 and 19) are completed in this aquifer **(Table 1)**. Well yields in the unit are relatively high, ranging between 500 and 1,000 gpm.

3.2.2 Glacial Outwash Aquifers

Glacial outwash forms aquifers in parts of the study area outside of the Salmon Creek basin. This outwash may be several hundred feet thick in the vicinities of Yacolt and Chelatchie Plain. CPU Well 401 is completed in this aquifer **(Table 1)**.

3.2.3 Pleistocene Alluvial Aquifer

The Pleistocene alluvial deposits form a highly permeable, productive aquifer in the southern part of the study area, where they are coarse grained and where saturated thicknesses are adequate. Public and industrial supply wells near Camas and Vancouver, which lie to the south of the study area, often yield more than 1,000 gpm. Elsewhere, the deposits are fine grained and the aquifer is used solely for domestic purposes. In many areas, only the lower few feet of the deposits are saturated and well yields are small.

3.2.4 Aquifers in the Troutdale Formation

The Troutdale Formation contains three aquifers:

- The Upper Troutdale Aquifer
- The Lower Troutdale Aquifer
- The SGA

These are the principal aquifers in the study area. The Upper Confining Unit separates the Upper and Lower Troutdale Aquifers and the Lower Confining Unit separates the Lower Troutdale Aquifer and the SGA.

The Upper and Lower Troutdale Aquifers supply most of the groundwater in the Salmon Creek basin and the northern portions of the County. The SGA supplies water in the southern portion of the County near the Columbia River and to a few CPU wells in the Salmon Creek basin **(Table 1)**.

3.2.4.1 Upper Troutdale Aquifer

The Upper Troutdale forms what has historically served as the most productive and important aquifer in the study area. The base of the aquifer lies between 50 above and 75 feet below mean sea level (msl) in the Hazel Dell vicinity and at higher elevations farther east, since the formation dips to the southwest. Despite its cementation, the Upper Troutdale Aquifer is conductive enough to produce high well yields. Many of the CPU's production wells draw from this aquifer, including Wells 4, 5, 7, 9, 10, 15, 17, 22, 23, and 27 **(Table 1)**. The highest yields occur within the southwestern portions of the watershed, near 78th Street, where wells may yield 500 to 1,000 gpm of water.

3.2.4.2 Lower Troutdale Aquifer

The Lower Troutdale forms an aquifer that supplies many CPU wells, including Wells 14, 16.1, 20, 21, 24, 25, 26, 28, 105, 106, and 110 **(Table 1)**. Yields vary considerably, ranging from 300 to 1,000 gpm.

3.2.4.3 Sand and Gravel Aquifer (SGA)

The SGA supplies water in the southern portion of the County near the Columbia River as well as several deep wells in the Salmon Creek basin. Well yields for the SGA are high, typically ranging from 500 to over 1,500 gpm. CPU Wells 8.2, 29, 30, 31, and 33 yield water from this aquifer **(Table 1)**

3.2.5 Bedrock Aquifers

The older bedrock units are generally considered poor aquifers because their permeability is low. Small domestic yields can be obtained in many areas where wells are advanced to suitable depths to intercept fractures. Reasonable yields are possible where joints and fractures are

abundant and unobstructed but such yields are not commonly obtained or expected. CPU Wells 104, 108, and 109 are completed in fractured bedrock aquifers **(Table 1)**.

The Boring Lava also forms a minor aquifer that can be productive within vesicular, scoriaceous interflow zones and pyroclastic deposits.

3.3 Groundwater Flow

Groundwater in the study area occurs under unconfined, semiconfined, and confined conditions. Unconfined conditions are observed in shallow aquifers such as the Pleistocene Alluvium, Recent Alluvium, and Glacial Outwash. Semiconfined conditions occur in the cemented portions of the Upper Troutdale Aquifer, and confined conditions occur in the Lower Troutdale Aquifer and the SGA.

3.3.1 Shallow Aquifers

Groundwater flow patterns in the shallow aquifers are reasonably well defined because water level data are relatively abundant. Regional groundwater elevations range from 400 feet msl in the eastern portion of the study area (along the foothills) to near sea level in the lower Salmon Creek Valley. Water-level contours for the Upper Troutdale are presented in **Figure 4**; these contours are based on recent studies by the USGS (M^{c}Farland and Morgan, 1996). The illustration shows that groundwater in the aquifer generally flows from east to west. A large portion of this flow moves towards Salmon Creek and its tributaries, which function as discharge points. Local groundwater flow patterns are influenced by production wells where pumping creates cones of depression that intercept nearby groundwater flow. A groundwater divide occurs in the study area. This divide generally coincides with the surface water (topographic) divide, except in the northwest portion of the watershed, where it is north of the surface water divide.

3.3.2 Deep Aquifers

Water levels and groundwater flow within the Lower Troutdale Aquifer, SGA, and Bedrock Aquifer systems are not well defined given the relatively small number of wells that are completed in these zones. Groundwater elevations within most of the deeper wells are typically less than 75 feet msl. Groundwater movement is again generally from east to west in the study area. It is influenced by regional drainage features such as the Columbia River and the lower potions of the East Fork of the Lewis River.

4.0 Water Quality

This section provides an overview of the results of water quality sampling completed to date as part of previous investigations (including WHP plans) for CPU.

4.1 Monitoring Network

Monitoring the quality of groundwater provides a basis for assessing threats to drinking water supplies. Under its current wellhead protection program, CPU samples water from a network of 16 monitoring wells:

- MW-2
- MW-3S and MW-3D
- MW-4S and MW-4D
- MW-5S and MW-5D
- MW-6
- MW-7S and MW-7D
- MW-8
- MW-9S and MW-9D
- MW-10
- The Bennett and Garrison wells

Other wells have been sampled periodically in the past or used for water level monitoring, particularly in vicinity of the Boomsnub/BOC Gases Superfund site.

CPU also collects samples from 32 supply wells. The monitoring program is designed to provide an early warning of contamination.

4.1.1 Monitoring Wells

Construction details and other information for the monitoring wells are listed in **Table 3**. Their locations, which are shown on **Figure 5**, are based on results of the preliminary aquifer-vulnerability assessment and the capture-zone analysis completed for the 1991 Work Plan (PGG, 1994). The wells monitor groundwater quality in the shallow aquifers (the Pleistocene Alluvial and the Upper Troutdale Aquifers). Water levels are monitoring in both the shallow and deep aquifers.

All of the monitoring wells lie within the Hazel Dell Focus Area, near two areas of interest:

- The Boomsnub/BOC Gases facilities, which comprise a Superfund site
- The Highway 99 corridor, which is the center of the commercial district in Hazel Dell

The Boomsnub/BOC Gases site is of particular concern because the chromium and VOC contamination originating from these facilities threatens CPU's groundwater supplies in the Upper Troutdale Aquifer.

4.1.2 Supply Wells

CPU also samples water from 32 supply wells to ensure compliance with Washington Department of Health drinking water requirements **(Table 1)**.

4.2 Constituents

Samples are collected from the monitoring wells for analysis of nitrate, inorganic compounds, and VOCs. These parameters were selected to detect impacts from fertilizers, on-site septic systems, and industrial spills. Water is sampled quarterly for nitrate, annually for VOCs, and biannually for inorganic compounds.

Samples are collected annually from the supply wells for analysis of a suite of physical parameters, inorganic constituents (including nitrate), radionucleides, and organic compounds. Bacterial samples are also obtained from supply wells and analyzed monthly. CPU's water-supply monitoring activities exceed State requirements.

Trends in the concentrations of nitrates, VOCs, and inorganic compounds (IOUs) are discussed below. These trends have been characterized through historical monitoring. The discussion that follows applies to the entire study area rather than specific Focus Areas.

4.2.1 Nitrates

In 1990, CPU conducted a County wide sampling program for private wells. Trough this study, CPU was able to sample over 4,200 wells for nitrate levels. The study indicated that nitrate concentrations are generally between 1 and 5 mg-N/L in groundwater in the Salmon Creek basin. **Figure 6** shows the distribution of nitrate throughout the County. Concentrations tend to increase down gradient, because nitrate is carried downgradient by groundwater. They also increase because the density of the population served by domestic wells is greater in downgradient areas. Nitrate levels in excess of the MCL were measured in 18 of the private wells.

Temporal trends in nitrate concentrations have been assessed using data from CPU's WHP monitoring network. These trends are discussed below.

4.2.1.1 Monitoring Wells

Figure 7 shows nitrate concentrations at several representative monitoring wells in the Hazel Dell area. At each location except the Bennett well, samples are collected from both a shallow and a deep completion. The shallow wells are generally screened in the Pleistocene Alluvial Aquifer and the deep wells are screened in the Upper Troutdale, with two exceptions:

- MW-5S and -5D are both completed in the Upper Troutdale
- MW-9S and -9D are both completed in the Pleistocene Alluvium.

In general, nitrate concentrations are higher in the shallow wells than in the deep ones because the shallow aquifers are more directly impacted from land-use activities at the surface. However, the opposite is true at monitoring Wells MW-7 and MW-9, which lie just north of Salmon Creek near I-5. The difference is likely related to the difference in recharge areas for the two well-completion depths.

Nitrate trends have remained relatively constant over time in most CPU monitoring wells except at MW-3S, MW-4S, and MW-5S. At MW-3S and MW-4S, concentrations of nitrate decreased from about 4.5 mg-N/L in 1995 to less than 2 mg-N/L in 1999. At MW-5S, nitrate concentrations have increased from 3.3 mg-N/L in 1993 to over 6 mg-N/L in 1999, the highest level of nitrate measured in any of the monitoring wells. Well MW-5S is located west of I-5 within an area of high-density residential development. The primary source of nitrate would be from lawn fertilizers.

4.2.1.2 Supply Wells

Most CPU supply wells have nitrate concentrations that are below the detection limit of 0.2 mg-N/L. In addition, results for all wells are consistently less than the MCL of 10 mg-N/L. **Figure 8** shows nitrate trends over time for selected CPU supply wells with concentrations over 1 mg-N/L. Well 8, which is completed in the Upper Troutdale Aquifer, has the highest concentration. The plot indicates that nitrate concentrations increased substantially from 1972 to 1985 and stabilized at approximately 6 mg-N/L after 1987. CPU recently abandoned Well 8 and constructed a new replacement well (8.2) at the site. Well 8.2 is completed in the SGA.

Wells 18 and 19 are CPU's shallowest wells. Nitrate concentrations are slightly elevated in Well 19 but very low in Well 18. Data for Well 9 shows a slightly increasing nitrate trend, although concentrations are relatively low.

4.2.2 VOCs

VOCs have been detected in monitoring Wells MW-5S and MW-7D, and in the Bennett and Grimm#2 wells, which are immediately downgradient from the Boomsnub/BOC Gases Superfund site. These detections are discussed below. Although VOCs have not been detected in any CPU supply wells recently, they were detected years ago in several supply wells in the Hazel Dell Focus Area. These detections, which were significantly lower than State MCLs, are also discussed below.

4.2.2.1 Monitoring Wells

4.2.2.1.1 Wells MW-5S and MW-7D

Figure 9 is a plot that shows perchloroethene (PCE) and trichloroethane (TCA) concentrations over time in Wells MW-5S and MW-7D. MW-5S and MW-7D are located west of I-5, in the WHPAs for supply Wells 17, 18, 19, and 21. The figure shows that concentrations of both of PCE and TCA have increased over time. These chlorinated solvents are toxic, mobile, and persistent in groundwater. PCE is a degreaser and is commonly used for dry-cleaning. TCA is a breakdown product of trichloroethene (TCE). Groundwater in MW-7D is also relatively high in nitrate **(Figure 7)**.

The local groundwater flow direction at MW-5S is towards the west-northwest, indicating that the PCE source lies east-southeast of the well, perhaps along the Highway 99 business corridor. The local groundwater flow direction at MW-7D is towards the southwest, indicating that the source of TCA and nitrate lie northeast of the well, perhaps near the I-5/I-205 interchange. Detections of VOCs and high nitrate are more typical of shallow rather than deep groundwater systems when there is a nearby contaminant source at the surface. Consequently, the transport path from ground surface to MW-7D must be relatively short since it allows near-surface groundwater to enter a deep aquifer.

It is strongly recommended that the source of these contaminants be identified so that appropriate remedial actions can be taken before water supplies are impacted.

4.2.2.1.2 Bennett and Grimm#2 Wells

CPU regularly samples several monitoring wells near the Boomsnub/BOC Gases Superfund site, which is discussed in Section 5.2.3.1.1, as part of its wellhead protection program. This site is located in Hazel Dell, along NE 78th Street. Two monitoring wells—Bennett and Grimm#2—have been impacted by the Superfund site. The Bennett well is a private well located southwest and downgradient of the site. It is completed in the Upper Troutdale Aquifer. The Grimm#2 well, located near the Bennett well, is also completed in Upper Troutdale.

Figure 10 shows time-series data for four VOCs that have been detected in the Bennett well. It indicates that TCE concentrations increased from about 2.5 ug/L in 1993 to approximately 6.2 ug/L in early 1999. Three other VOCs have also increased slightly since monitoring began in 1993. MCLs for these VOCs are as follows:

- TCE: 5ug/L
- 1,1,1-TCA: 200 ug/L
- 1,1-DCE: 7 ug/l
- cis-1,2-DCE: none

Very low concentrations of TCE (1.2, 0.3, and 0.8 ug/l) were also detected in Grimm#2 well from 1994 to 1996. Water-quality sampling was discontinued at the Grimm#2 site in January 1996 because of access problems. In 1997 and 1998, the EPA installed two monitoring wells in the Upper Troutdale upgradient of the Bennett and Grimm#2 wells. Groundwater at both monitoring wells contains VOCs levels that resemble those detected at the Bennett well.

The VOC pathway into the Upper Troutdale Aquifer is currently unknown. One possibility is a natural breach in the low permeability aquitard that separates the Upper Troutdale from the overlying Pleistocene Alluvial Aquifer. Alternatively, VOCs could have entered the Upper Troutdale through an artificial breach of the aquitard. Such a breach could be caused by a well with a poor seal or no seal at all, a condition that would create a direct conduit between the two aquifers. Several such wells lie within the contaminant plume in the Pleistocene Alluvial Aquifer.

4.2.2.2 Supply Wells

VOCs were detected in Wells 5, 9, 17, and 19 in 1989 at concentrations that were significantly lower than State MCLs. These wells are located within the Hazel Dell Focus Area and are completed in shallow aquifers (the Pleistocene Deposits and Upper Troutdale). Most of the detections occurred at Well 17. The contaminants included TCE, TCA, PCE, and a few other solvents. None of the solvents was detected again after a few months. The hits in Wells 9 and 17 (which lie a few feet from each other in the Upper Troutdale) may have been related to service work that occurred at Well 17. The cause of the detections at the other wells is unknown but the contamination appears to have been localized.

Very low levels of VOCs were also detected in 1994 and 1995 at Well 17 but not at Well 9. These hits may be due to lab contamination. Their actual source is unknown.

No VOCs have been detected in any CPU supply wells since 1995.

4.2.3 Inorganic Compounds

CPU monitors for several inorganic compounds, including iron and manganese, and chromium. In addition, coliform samples are routinely collected at CPU supply wells to meet WDOH requirements. Although coliform has been detected at a few supply wells, the detections have not been a concern because CPU chlorinates water from all its supply wells. Consequently, coliform is not an issue for wellhead protection and is not discussed herein.

4.2.3.1 Iron and Manganese

Iron and manganese, which frequently exceed established MCLs in the study area, occur naturally in groundwater. Elevated levels of these metals are not typically associated with human activities and therefore are not addressed through wellhead protection. CPU now uses the ATEC™ (pyrolusite media) treatment system to remove iron and manganese at Wells 21 and 110 and to remove manganese at Well 15.

Iron and manganese levels are typically higher in the deeper aquifers (the Lower Troutdale and the SGA) than in the shallow aquifers.

4.2.3.2 Chromium

Chromium in groundwater can originate from natural mineral deposits. Other typical sources of chromium include the textile, tanning, and leather industries. However, elevated levels of chromium in the Hazel Dell Focus Area are a result of a release at the Boomsnub-Pacific Northwest Plating facility. The historical MCL for chromium was 0.05 mg/L, based on health effects associated with the digestive system, liver, kidney and skin. This MCL was increased to 0.1 mg/L under Phase II of the SDWA.

Chromium concentrations in the Pleistocene Alluvial Aquifer have historically exceeded 20,000 ug/L at and near the Boomsnub facility, although concentrations have decreased because of remedial activities at the site. The maximum concentration in May 1998 was 6,300 ug/L. Chromium has also been detected at several Upper Troutdale monitoring wells in the Boomsnub vicinity but concentrations have been significantly below the MCL of 100 ug/L. It is unknown whether the concentrations exceed natural background levels in groundwater.

4.2.3.3 GWI Constituents

CPU has collected samples from Wells 18 and 19 to assess whether groundwater from these wells is under the direct influence of surface water. The wells are completed at relatively shallow depths along Salmon Creek. The samples for the groundwater-under-the-influence (GWI) assessment were collected weekly from December 3, 1997, through October 15, 1998, and analyzed for temperature, conductivity, and turbidity. Nearby surface-water samples were

also collected from Salmon Creek. The results for the first 6 months of sampling at Well 19 were submitted to the Washington Department of Health (DOH), where they were evaluated using WQHYDRO software. The results of DOH's analysis were inconclusive. Temperature and conductivity varied significantly between seasons but turbidity did not. Furthermore, temperature and turbidity results for groundwater and surface water did not correlate well.

In light of DOH's inconclusive analysis, CPU was required to proceed with microscopic particulate analyses (MPA). The results of MPA analyses for samples collected in March 2000 indicate a low relative risk factor for Wells 18 and 19. However, further MPA sampling will be conducted in May 2000 to verify that groundwater from these wells is not under the influence of surface water.

DOH exempted Clark County from monitoring for pesticides and herbicides under its GWI requirements. This additional monitoring is often required in agricultural areas where irrigation returns are large enough to impact groundwater.

5.0 WPHA Delineations

This section documents methods used to delineate the wellhead protection areas (WHPAs) and presents the results of the analysis. The delineations are based in part on work completed for the *Salmon Creek Wellhead Protection Program* (PGG, 1994). As part of that study, capture zones were delineated for 19 supply wells in the Hazel Dell vicinity. This current investigation updates some of the earlier delineations and adds delineations for Group A water-supply sources that CPU has brought on line since 1994. These additional sources include Wells 8.2, 28 through 31, 33, 104 through 106, 107 through 110, and 401.

Time-related "capture zones" were estimated for each CPU supply well. A capture zone is the area that supplies groundwater recharge to a pumping well—in other words, its "zone of contribution." In natural systems, capture zones are not circular but elongated, with most capture occurring from areas that lie upgradient of the wellhead. Each capture zone has a stagnation point—the maximum "point of capture" downgradient of the wellhead. A time-related capture zone is the area that supplies groundwater recharge to a pumping well within a specified period. The capture zone encompasses portions of the aquifer that surround the well.

Time-related capture zones provide a basis for developing monitoring plans, land-use inventories, and data collection plans. They are used in conjunction with the results of the aquifer vulnerability assessment.

5.1 Capture-Zone Analysis

Capture zones for 1-, 5-, and 10-year times-of-travel for each of CPU's supply wells were delineated using either hydrogeologic mapping or a two-dimensional analytical model approach. These methods are described below. The capture zones for the three Focus Areas are illustrated on **Figures 11, 12, and 13**, respectively.

5.1.1 Hydrogeologic Mapping

Hydrogeologic mapping considers geologic features, aquifer boundaries, flow directions and gradients in defining the capture zone of a well.

For this study, hydrogeologic mapping was used for Wells 9, 17, 18, and 19, which lie within the Hazel Dell Focus Area along Salmon Creek. These wells are completed in shallow, unconfined aquifers in the Recent Floodplain Alluvium and the Upper Troutdale **(Table 1)**. Analytical modeling could not be used to assess capture zones and travel times for these sources because it assumes a uniform flow field, a condition that is not met. The calculated fixed-radius approach was also not appropriate for these wells because:

- They receive convergent flow from the surrounding upland areas.

- They may be locally recharged by natural stream leakage, as well as recharge from Salmon Creek that is induced associated by pumping. Stream gaging data (Carr, 1985) indicate significant leakage to groundwater in the reach between Corbin Road and Klineline Pond. Leakage is highest during the winter and is relatively small to nonexistent during the summer.

Because Salmon Creek may provide water to Wells 9, 17, 18, and 19, the recharge area that contributes to the creek upstream of the wells should also be considered in developing wellhead-protection management strategies.

The capture zone or upland recharge area for the Salmon Creek wells is bounded by two sets of flow lines, which are depicted north and south of the creek on **Figure 11**. The downstream flow lines terminate at Well 19 and the upstream flow line terminates just upstream of Wells 9 and 17. Travel times were calculated using a one-dimensional Darcy-velocity analysis along these two flow lines, with the following equation:

$$v = Ki\textit{n}$$

Where:

v = Darcy velocity
K = Hydraulic conductivity
i = Hydraulic gradient
n = Aquifer porosity

Travel-time distances were then calculated using the following equation:

$$d = v \cdot dt$$

Where:

d = Distance traveled by a conservative groundwater tracer particle

dt = Travel time

The input parameters for these wells were as follows:

- A hydraulic conductivity of 80 ft/day, which corresponds to a transmissivity of 30,000 gpd/ft and an effective aquifer thickness of 50 feet
- A hydraulic gradient of 0.01, as estimated from the water-level contours shown on **Figure 4**.
- A porosity of 0.20 (assumed based on aquifer lithology).

5.1.2 Two-Dimensional Analytical Modeling

A two-dimensional analytical model was used to assess capture zones for all CPU wells except those along Salmon Creek (Wells 9, 17, 18, and 19). The Washington State Wellhead Protection Program recommends analytical models for wells in hydrogeologic settings where a non-circular capture zone is likely, where the well is susceptible to contaminants, or where it is not easily replaced if lost to contamination.

The WHPA delineations were completed using *RESQC,* an analytical modeling package developed by the EPA (EPA, 1991), or *Quickflow*, an analytical model developed by Geraghty & Miller (1991). These analytical models assume steady-state conditions where flow rates, pumping stresses, and head gradients are in continuous equilibrium. In their simplest form, the models can be used to simulate a confined aquifer that has an infinite aerial extent, a uniform head gradient, and a uniform transmissivity. More complex forms of the models can be used to simulate unconfined and semi-confined conditions, where downward leakage occurs through an overlying confining layer.

5.1.2.1 Input Parameters

Input to the models included the following parameters:

- Pumping rate
- Transmissivity
- Aquifer thickness
- Hydraulic gradient and flow direction
- Aquifer porosity

5.1.2.1.1 Pumping Rates

Pumping rates for the supply wells were estimated in one of two ways. Historical pumping data were used for wells that have operated for several years. For newer wells that lack sufficient historical data, average pumping rates were estimated as 40 percent of the installed capacity of the pump, which assumes a peaking factor of 2.5. Average rates of pumping were modeled because the analysis considers groundwater flow over a period of 1 to 10 years.

5.1.2.1.2 Aquifer Transmissivities

Aquifer transmissivity values were generally estimated from pumping test data. In cases where test data were not available, such as at Wells 4, 15, and 104, transmissivity was estimated in one of two ways:

- For wells completed in the Upper Troutdale, the specific capacity of the well in gpm/ft was multiplied by an empirical factor of 2,000. To better approximate the bulk transmissivity of the aquifer rather than the transmissivity at a discrete point, the estimates were grouped by five values: 8,000 gpd/ft; 15,000 gpd/ft, 30,000 gpd/ft; 35,000 gpd/ft; and 40,000 gpd/ft.

- For wells completed in the Lower Troutdale and SGA, transmissivity values were based on the estimated thickness of the aquifer and a hydraulic conductivity of 87 ft/ day, a value based on extensive testing (PGG, 1993).

5.1.2.1.3 Aquifer Thicknesses

Aquifer thicknesses were estimated from drillers and/or lithologic logs and hydrogeologic cross-sections. The estimates generally include all significant water-bearing media encountered in the well while drilling through the aquifer.

5.1.2.1.4 Hydraulic Gradients

Hydraulic gradients and groundwater flow directions for the Upper Troutdale Aquifer are based on a water-level contour map that was developed by the USGS for the Portland Basin Study (McFarland and Morgan, 1996). These contours, which are presented in **Figure 4**, are based on water level measurements collected by the USGS in 1988 and 1989. The map resembles one developed by Mundorff (1964).

Since reliable water level data for the Lower Troutdale Aquifer and SGA are limited, water-level contour maps have not been developed for these systems. However, water levels, groundwater flow directions, and hydraulic gradients for the deeper aquifer systems were defined by the USGS (Morgan and McFarland, 1996) as part of a numerical groundwater flow model it developed for the Portland Basin. The simulated potentiometric contours for "Layer 4" of the USGS model were used as a basis for estimating the hydraulic gradients and groundwater flow directions that were input to the analytical WHPA models. Wells 104 and 108 lie just east of the area covered by the USGS groundwater flow model. Groundwater flow directions and hydraulic gradients for these sites were extrapolated from closest contours defined by the model.

The hydraulic gradients estimated using the USGS model layer have some limitations. The USGS' deeper water-level contours are consistently higher than the observed water levels in many deep wells. This bias produces higher model gradients than those observed in the field, resulting in capture zones that are narrower than those obtained with lower hydraulic gradients.

The City of Portland is currently developing a new groundwater flow model of the Portland basin, a model that will be better calibrated to the deep aquifers. Final revisions to this model should be completed by the end of the year. It may be prudent to use the water-level data from

the revised Portland basin model to re-render the deep capture zones once these new data are available.

5.1.2.1.5 Aquifer Porosity

A constant aquifer porosity of 0.20 was used for the entire modeling analysis.

5.1.2.2 Results

The results of the capture-zone analysis are shown on **Figures 11 and 12**. The capture zones for many of the modeled wells have a large length-to-width ratio because their pumping rates are relatively low, and/or because transmissivities and hydraulic gradients at the wells are relatively high. The orientation of the capture zone is controlled by local groundwater-flow directions. To account for the uncertainty in the groundwater flow directions, the capture zones were expanded for these wells by rotating them through a 45-degree angle. This procedure widens the capture zone with increasing distance from the well. This technique was used at Wells 104, 106, 108, and 109.

5.1.2.2.1 Wells With Combined Model Run

Separate model runs were performed for most supply wells. Some wells, however, were combined into a single model run because they are close to one another and are completed in the same aquifer:

- Wells 5, 7, and 23 (Upper Troutdale)
- Wells 10 and 22 (Upper Troutdale)
- Wells 14, 16, 20, and 24 (Lower Troutdale)
- Wells 29 and 30 (SGA)
- Wells 31 and 33 (SGA)

Hydraulic gradients and groundwater flow directions are relatively uniform within each area where a combined analysis was performed. A constant transmissivity value was assumed for each area. For the Upper Troutdale Aquifer, bulk estimates of average transmissivity were applied for each area. For the Lower Troutdale aquifer and SGA, the modeled transmissivity was based on average values obtained from pumping tests of the wells.

Theoretically, a well's capture zone should not extend beyond a groundwater divide. However, the analytical models used in the analysis assume a uniform flow field or only one ambient groundwater flow direction. Consequently, the modeled capture areas for CPU Wells 4, 5, 7, and

23 would have extended beyond the groundwater divide if the model output were not corrected. If the model could assess a variable, two-dimensional flow field, the capture areas would align with variations in the natural flow field, paralleling the divide boundary. To correct for this limitation, the model output for Wells 4, 5, 7, and 23 was graphically modified to reflect the non-uniform flow field caused by the groundwater divide north of these wells.

5.1.2.2.2 Well 401

Well 401 lies in the Chelatchie Focus Area. It supplies the community of Amboy and the Chelatchie Prairie area, which lies east of Amboy along Highway 503. The well is completed in a Glacial Outwash Aquifer that underlies the prairie. The aquifer is shallow and highly transmissive, possibly exceeding 100,000 gpd/ft. The average water demand, based on recent water-use statistics, is approximately 15 gpm.

Water-level data for the Chelatchie Prairie are limited, so water-level contours have not been developed for the area and time-related capture zones could not be defined for Well 401. Rather, an area of probable capture was delineated for the well based on hydraulic boundaries and on inferred directions of groundwater flow using hydrogeologic mapping, which considers how the flow system influences its location and shape. At Well 401, the average pumping rate is low and the aquifer transmissivity is high, producing a narrow capture zone and a stagnation point that lies relatively close to the well. Assuming a hydraulic gradient of 0.001, a transmissivity of 100,000 gpd/ft, a pumping rate of 15 gpm, a porosity of 0.20, and an aquifer thickness of 20 feet, the width of the capture zone is less than 200 feet. The stagnation point is about 40 feet downgradient of the wellhead.

Figure 13 shows the estimated extent of the capture zone for Well 401. Several hydraulic boundaries influence the shape of Well 401's capture zone. One is the groundwater divide that likely occurs about midway between Chelatchie Creek and Cedar Creek, the two the streams that drain the valley. This "no-flow" boundary would constrain the well's capture zone. Another is the bedrock that crops out upgradient of the well, which forms a "no-flow" boundary and constrains that capture zone. The downstream extent is constrained by the stagnation point, which is assumed to be 40 feet from the wellhead. The lateral extent of the capture area was estimated by rotating a 200-foot-wide capture zone through the range of probable directions of groundwater flow.

6.0 Risk Assessment

6.1 Data Sources

Contaminant sources that lie within the capture zones for CPU wells were investigated and mapped using two databases that were imported into the project GIS. The first, a parcel database that contains information on land use, was provided by Clark County. The second, a commercially available environmental database, was purchased from VistaInfo. The parcel and environmental information from these two databases were plotted on GIS coverages for the County to assess whether existing and potential contaminant sources were located within the capture zones for CPU wells.

6.1.1 Land Use Database

Clark County's database contains a description of the land use within each parcel in the study area. A GIS analysis was used to identify land uses that could pose a risk to groundwater within the capture zone for each CPU supply well. Parcels where such land uses were identified were designated "parcels of concern." This approach provides a way to assess potential sources of contamination. Parcels of concern are those where the following activities are practiced:

- Manufacturing
- Vehicle or engine repair
- Construction
- Dry cleaning
- Wood processing
- Farming
- Trucking
- Chemical manufacturing, processing, or storage

In addition, parcels containing car washes, gas stations, auto-body repair shops, power stations, golf courses, and cemeteries were identified as parcels of concern. **Figures 11, 12, and 13** show the distribution of land uses in each Focus Area, along with the parcels of concern that fall within the capture zones for CPU supply wells. **Table 4** summarizes the land uses within each capture zone.

6.1.2 VISTA Database

VISTA's Environmental Geographics™ package was used to inventory sources of potential and confirmed contamination in the study area. This GIS package combines data from the following regulatory databases:

- *Comprehensive Environmental Response, Compensation, and Liability Information System*. This database originates from the EPA and includes nationally identified sites that are or have been investigated for contamination.
- *Emergency Response Notification System (ERNS)*. This database originates from the EPA and includes information on reported spills of oil and hazardous substances.
- *Leaking Underground Storage Tank (LUST) List*. This database originates from Ecology. It contains a list of sites with reported leaking USTs and indicates the status of each site.
- *No Further Remedial Action Planned (NFRAP)*. This database includes sites that have been removed from CERCLIS.
- *National Priority List (NPL)*. This Federal database includes sites listed under the Federal Superfund program.
- *Resource Conservation and Recovery Act Information System (RCRIS)*. This Federal database includes all sites where hazardous waste is generated, transported, stored, treated, or disposed of.
- *State Priority List (SPL)*. This database originates from Ecology and contains a list of sites with suspected or confirmed contamination.
- *Solid Waste Landfill Sites (SWLF)*. This database originates from Ecology and includes active landfills, inactive landfills, transfer stations, incinerators, recycling stations, or other facilities where waste is treated or stored.
- *Toxics Release Inventory System Database (TRIS)*. This database includes annual reporting by all owners or operators of facilities that manufacture, process, or import toxic chemicals in quantities that exceed 25,000 pounds annually.
- *Underground Storage Tank Registration*. This database lists storage tanks registered in the State of Washington.
- *Washington State Toxic Cleanup Program Site Register*. This database originates from Ecology and contains sites listed under the Model Toxics Control Act (MTCA) and the Independent Remedial Action Program (IRAP). It includes some leaking underground storage tanks.

Since many of these individual databases contain information about the same sites, the *VISTAS* system produces some duplication. The Environmental Geographics™ data references NAD27. **Table 5** lists the sites within each capture zone where contamination has been confirmed, as well as the sites that have potential sources of contamination. These sites are shown on **Figures 11, 12, and 13**.

6.1.3 Comparison of Land-Use and VISTA Data

In theory, all sites identified in the *VISTA* database should be reflected in the land use data from Clark County. However, because of problems related to address mapping in one or both of the databases, not all of the sites that should overlap do.

6.2 Current Land Use and Zoning

Land use in the study area was evaluated under the following categories:

- Agricultural/forestry
- Commercial
- Urban reserve
- Industrial
- Parks
- Residential
- Other

The most common land use in the study area is residential, followed by agricultural/forestry **(Figures 11, 12, and 13)**. The eastern part of Clark County is dominated by agricultural and forestry uses. In addition to the established residential areas, a number of sections have been designated "urban reserve," which means that they have been earmarked for residential urban growth. These sections lie mostly north of Salmon Creek and southwest of the Battle Ground and Meadow Glade areas.

Most of the commercial and industrial use occurs along highways (Highway 99, I-5, SR-520, and SR-502) and major arterials (N.E. 78th Street, St. John's Road, and Mill Plain Road). Nearly all the park areas surround lakes and rivers.

6.3 Contaminant Sources

Two types of sources were evaluated for these delineations: potential contaminant sources and known or confirmed contaminant sources.

6.3.1 Potential Sources

This section discusses potential sources of contamination in the WHPAs based on the *VISTA* and parcel databases. The following potential contamination sources have been identified within or near the capture zones for the CPU wells:

- Hazardous materials
- On-site septic systems
- Underground storage tanks
- Stormwater
- Dry, unused, and improperly constructed wells
- Agriculture, golf courses, parks, and cemeteries
- Transportation spills

6.3.1.1 Hazardous Materials

6.3.1.1.1 Potential Risks

The commercial use of chemicals poses a major threat to groundwater quality, since the chemicals can be accidentally spilled or disposed of improperly. Spills can occur, although the likelihood of such releases can be reduced by proper methods of handling, spill prevention measures, and emergency response strategies. Risk reduction strategies should target on-site waste management practices. Improper disposal is likely the most common pathway for chemicals to be released into the environment.

The EPA defines three categories of hazardous waste generators based on the quantity of waste they generate per month:

- Conditionally exempt small quantity generators (CESQGs), which generate less than 200 lbs. of per month
- Small quantity generators (SQGs), which generate between 220 and 2,200 lbs. per month
- Large quantity generators (LQGs), which generate more than 2,200 lbs. per month

SQGs and LQGs are regulated under the Resource Conservation and Recovery Act (RCRA) and are required to keep “cradle to grave” documentation of all activities involving hazardous materials. Disposal facilities must be licensed. RCRA regulates all facilities that generate, transport, store, treat, or dispose of hazardous materials such as fuels, chemicals, solvents, and other miscellaneous wastes.

The most significant threats to groundwater are related to the use and storage of solvents. Solvents are persistent, both miscible and immiscible in water, and highly mobile. A large plume of contamination can be created with a small quantity of solvent.

6.3.1.1.2 Occurrence in Study Area

The *VISTA* database indicated several SQGs within the capture zones for CPU wells **(Figures 11, 12, and 13; Table 5).** These facilities lie within the capture zones for Wells 5, 23, and 7, which are located in the Hazel Dell area, and Wells 9, 17, 18, and 19, which lie along Salmon Creek. All these wells are completed in shallow aquifers (either the Pleistocene Alluvial Aquifer or the Upper Troutdale).

Most of the *VISTA* sites are located in areas that are zoned commercial or industrial, as shown on **Figures 11, 12, and 13**. The parcel data corroborate this observation, since most "parcels of concern" lie within zoned commercial or industrial areas, with a few notable exceptions.

6.3.1.2 On-Site Septic Systems

6.3.1.2.1 Potential Risks

On-site septic systems pose a risk to a groundwater where they are relatively high in density and/or where hazardous wastes are discharged to them. Potential contaminants from septic systems include pathogenic organisms (bacteria and parasites), toxic substances, and nitrogen compounds.

The extent to which pathogens are transported in the subsurface away from a septic drain field depends on the type of pathogen and the chemical and physical conditions in the subsurface. In general, if a septic system is properly sited, constructed, and maintained, the transport of microorganisms will be limited. Household hazardous chemicals such as cleaners, polishes, waxes, and paints can be transported to groundwater can via a septic system. Some products contain toxic and persistent chemicals that can cause low-level contamination when coupled with a high density of septic systems. Homeowners can improperly apply or dispose of chemicals because they do not understand the threat they pose to groundwater quality. In some areas, business and commercial facilities still use on-site septic systems for sewage disposal. Business, commercial, and industrial operations that rely on on-site systems need to take special precautions to avoid contamination of their wastewater.

Ammonia and nitrate are highly soluble in water and can be expected in detectable quantities wherever portions of an aquifer are affected by septic system discharges. Septic systems are a source of nitrates in groundwater throughout Clark County. Nitrate is regulated, since ingestion can result in methemoglobinemia, or "blue baby" syndrome. Other sources of nitrate include ferti-

lizers, feedlots, and natural mineral deposits. Background concentrations of nitrates in groundwater are typically less than 1 milligram of nitrogen per liter (mg-N/L). The MCL for nitrate is 10 mg-N/L.

6.3.1.2.2 Occurrence in Study Area

Although significant portions of the urban areas are served by sewer systems, many residents still rely on septic systems. Clark County maintains a GIS coverage of on-site septic system locations, locations that are based on information provided by the Southwest Washington Health Department (SWWHD). The locations of the septic systems in the SCLR and Hazel Dell Focus Areas are plotted on **Figures 14 and 15**. This figure indicates that the highest concentration of septic systems occurs in the densely populated southwestern portion of the County. This area includes the City of Vancouver and the communities of Hazel Dell and Orchards. In the remainder of the County, septic systems are scattered throughout developed areas.

Septic systems lie within the capture zones for nearly all the CPU supply wells. They pose the biggest threat to shallow wells such as Wells 9, 17, 18, and 19, which lie along Salmon Creek.

6.3.1.3 Underground Storage Tanks

6.3.1.3.1 Potential Risks

Although USTs usually contain flammable motor fuels or heating oils, they may contain other compounds used by industry, government, or business. Contamination in soil and groundwater caused by leaking USTs (LUSTs) is a major environmental, legal, and regulatory issue. In 1991, the EPA estimated that 35 percent of all USTs could be leaking (EPA, 1991). The most common causes of leaks are structural failure, corrosion, improper fittings, improper installation, and natural phenomena.

Leakage from USTs and associated piping often occurs without detection. Even relatively small amounts of certain compounds can adversely impact on groundwater quality. For instance, 1 gallon of gasoline can render a million gallons of groundwater “unpotable” for several decades. A 1/4-inch hole in a UST can release up to 930 gallons of gasoline in a single day. Once released from an UST, some VOCs and petroleum products can rapidly migrate to groundwater, a problem that is especially serious in areas with permeable soils such as sand and gravel.

Of the many materials stored in USTs, solvents are considered the most toxic. However, petroleum products may pose a greater risk because a large number of tanks contain them. In addition, petroleum products contain many potential contaminants, including three EPA priority pollutants: benzene, toluene, and ethylbenzene. Benzene is a known human carcinogen.

6.3.1.3.2 Occurrence in Study Area

Locations of USTs in the Focus Areas are shown on **Figures 11, 12, and 13**. These were identified from the *VISTA* database. Although USTs are widespread, more occur in the Hazel Dell Focus Area, where commercial and industrial land uses are concentrated, particularly along the Highway 99 corridor. Sites with documented LUSTs are discussed in Section 6.3.2.

6.3.1.4 Stormwater

Much of the stormwater runoff in Clark County is discharged to the subsurface through dry wells, infiltration basins, and ditches, lawns, and other vegetated areas. Stormwater can dissolve many pollutants and serve as a carrier for insoluble compounds. Consequently, stormwater runoff from highways and roads can introduce contaminants such as heavy metals and organic compounds into the groundwater system. Stormwater runoff from lawns and agricultural areas can introduce nitrate, herbicides, pesticides, and bacterial contaminants.

Stormwater water quality impacts are of particular concern in commercial and high-density residential development areas where large runoff volumes can occur. Impervious surfaces in the commercial area of Highway 99 contribute substantial amounts of runoff in the Hazel Dell area.

6.3.1.5 Unused and Improperly Constructed Wells

Well casings can provide a conduit between the ground surface and underlying aquifers. Improperly constructed or abandoned wells pose several potential problems. In wells with no surface seal, contaminants introduced near the wellhead can move downward outside the casing to underlying aquifers. Many older wells that were constructed before the implementation of WAC 173-160 have no surface seal. Unused wells that have not been properly abandoned are left uncapped in many cases, posing a special risk because contaminants can be introduced directly into the aquifer. Unused wells also pose a risk when they are damaged during site redevelopment. Any of these situations can provide a conduit for contaminant movement.

Clark County (Swanson and McCarley, 1993) estimates that there may be more than 10,000 private wells in the County. Since many of these wells were constructed before drilling standards were adopted, the likelihood that some are improperly constructed is high. In addition, since there has been no inventory of the number or location of these wells, some of these wells may have been abandoned properly.

6.3.1.6 Agriculture, Golf Courses, Parks, and Cemeteries

Agricultural activity, golf courses, and parks can provide nitrogen to the groundwater in the form of fertilizers and livestock manure. They can also be the source of pesticides and herbicides such as EDB, DBCP, and dicamba. Golf courses lie within the capture zones for Wells 8.2 and 15, which are completed in the Upper Troutdale.

Agriculture is not a significant concern in the more urbanized portions of the study area such as Hazel Dell but it is important in the northern two-thirds of the County **(Figure 12)**. The eastern part of the County is largely forested.

Cemeteries threaten groundwater because arsenic may leach into the groundwater. Two cemeteries are located within the capture zones for Wells 9, 17, 18, and 19, and one is located within the capture zone for Well 10 **(Table 4)**.

6.3.1.7 Transportation Spills

Vehicles transporting hazardous material can be a source of groundwater contamination through accidents and resultant chemical spills. Hazardous materials are transported through the Hazel Dell Focus Area on a daily basis. The major arterials in this Focus Area include **(Figure 11)**:

- Highway 99
- I-5 and I-205
- SR-502 and SR-503

The Highway 99 and I-5 corridors present a risk because a major spill could adversely impact groundwater in the capture zones for Wells 9, 17, 18, and 19, and Well 4, which are all completed in shallow aquifers. Well 21's capture zone also intersects I-5, although this well is completed in a deep aquifer.

I-205 is a concern because a major spill could adversely impact groundwater in the capture zones for Wells 10 and 22, which are completed in shallow aquifers. Well 24's capture zone also intersects I-205, although this well is completed in a deep aquifer.

SR-502 and SR-503 do not intersect the capture zones for any CPU supply wells, although several deep wells lie within 1 mile of these highways. These wells include Wells 25, 26, 28, and 31.

6.3.2 Known/Confirmed Sources

Table 5 summarizes the contaminant sources based on the *VISTA* data. Twenty sites are on State and/or Federal cleanup lists, indicating that they comprise actual sources of contamination. The listed sites include the following RCRA violators:

- *Boomsnub and BOC Gases*, which are located along NE 78th Street within the 5-year capture zone for CPU Wells 5, 7, and 23. These two businesses comprise a Superfund site.
- *Permalume Plastics*, which is also located along NE 78th Street within the 5-year capture zone for Wells 5, 7, and 23.
- *Commercial Repair & Machine Works*, which is located along Highway 99 within the capture zone for Wells 9, 17, 18, and 19.
- *Electronic Specialty Corp*, which is located on NE 13th Avenue, within the capture zone for Wells 9, 17, 18, and 19.
- *C Wells & Company*, which is located along NE 106th Street, within the capture zone for Wells 9, 17, 18, and 19.

In addition, releases have been reported to the EPA at two sites:

- *International Composites Corp*, a RCRA small generator located on NE 10th within the capture zone for Wells 9, 17, 18, and 19.
- *Pollen County Heating and Air*, located on St. John's Road within the 10-year capture zone for Well 24

A number of sites are listed under MTCA because they contain LUSTs. These sites include:

- Lyle's Village Pantry, Rockwell, an Exxon station, a Tosco station, a site owned by Waiseth, the Vista Mart, and Westwood Cabinets. These sites lie within the 5- or 10-year capture zone for Wells 9, 17, 18, and 19.
- WSU's research facility, CPU's Public Works facility, a 7-11 store, the Astro Minit Mart, and an Arco Station, which lie within capture zones for Wells 5, 7, and 23. The WSU facility also lies within the 1-year capture zone for CPU Well 16.1.

The contaminants associated with each of these sources are discussed below. In addition, several known contaminated sites that lie outside of the capture zones for the CPU wells are of interest. One of these sites is located near the capture zone for Well 4. Another group of sites is located in the Amboy-Chelatchie area. These sites are also discussed below.

6.3.2.1 Boomsnub/BOC Superfund Site

Boomsnub operated as a metal plating facility from 1967 until June 1994 at 7608 NE 47th Avenue. BOC Gases (formerly Airco), located across the street from Boomsnub at 4658 NE 78th Street, is an active plant that manufactures compressed gas. For the purpose of environmental investigation, Boomsnub and BOC Gases are considered one site because contamination migrating from both facilities has created one plume consisting of VOCs and high levels of hexavalent chromium. Groundwater in the Pleistocene Alluvial Aquifer near and downgradient from this

Superfund site is extensively contaminated. Although a competent aquitard generally separates the Pleistocene Alluvial Aquifer from the underlying Upper Troutdale Aquifer, low concentrations of TCE have been detected in the Upper Troutdale. Several of CPU's supply wells are completed in the Upper and Lower Troutdale Aquifers 1,000 to 3,000 feet from the leading edge of the plume.

EPA assumed responsibility for cleanup of the site in 1994 and added it to the National Priorities List in 1995. Interim remedial actions under Superfund included removing the building where chrome plating took place during the summer and fall of 1994, and excavating 6,051 tons of chromium-contaminated soil. The VOC and chromium plume in the Pleistocene Alluvial Aquifer is contained by a pump-and-treat system that has operated since 1990, although chromium-contaminated soils still exist at and near the site (ICF Kaiser Engineers, 1999). The pump-and-treat system has been expanded and improved several times, and concentrations of chromium in the Pleistocene Alluvial Aquifer, which once exceeded 10,000 ug/L, have decreased in most areas by one or more orders of magnitude. Although over 20,000 pounds of chromium have been removed from this aquifer since 1990, pockets of groundwater with chromium concentrations exceeding 10,000 ug/L still occur. The EPA improved the system in 1999 to treat and contain larger contaminant volumes more efficiently, adding monitoring and extraction wells. A Record of Decision has been issued and the design phase for the final remedial actions is expected to begin soon.

Detections of contaminants in CPU monitoring and supply wells are discussed in Section 4.2. These contaminants include:

- Hexavalent chromium
- TCE
- 1,1,1-TCA
- 1,1-DCE
- cis-1,2-DCE

6.3.2.2 Permalume Plastics

Permalume Plastics is located at 5015 NE 78th Street, just east of the Boomsnub/BOC gases Superfund site. VOC contamination has been confirmed in both soils and groundwater at the site and is suspected in air and surface water. The site is currently being investigated under MTCA, although no cleanup actions have been reported yet.

6.3.2.3 Commercial Repair & Machine Works

Commercial Repair & Machine Works, Inc. specializes in the repair of pumps, compressors, turbines and other industrial equipment for paper mills, mining and other industrial companies. Neither the type of contamination nor the extent of the release that occurred at this facility is

known at this time. Although files pertaining to the reported release were requested from both Ecology and the EPA, no information has been received yet. This lack of response may indicate that the release did not affect the environment.

6.3.2.4 International Composites

Neither the type of contamination nor the extent of the release that occurred at this facility is known at this time. Although files pertaining to the reported release were requested from both Ecology and the EPA, no information has been received yet. This lack of response may indicate that the release did not affect the environment.

6.3.2.5 Electronic Specialty Corp.

Neither the type of contamination nor the extent of the release that occurred at this facility is known at this time. Although files pertaining to the reported release were requested from both Ecology and the EPA, no information has been received yet. This lack of response may indicate that the release did not affect the environment.

6.3.2.6 C Wells & Company, Inc.

Neither the type of contamination nor the extent of the release that occurred at this facility is known at this time. Although files pertaining to the reported release were requested from both Ecology and the EPA, no information has been received yet. This lack of response may indicate that the release did not affect the environment.

6.3.2.7 LUST Sites

The contaminants associated with the LUST sites listed on **Table 5** typically include petroleum hydrocarbons such as gasoline and diesel, along with compounds such as benzene, ethylbenzene, toluene, and xylene. Contamination may be confined to soils or it may affect groundwater.

6.3.2.8 Additional Sites of Concern Outside Capture Zones

6.3.2.8.1 Astro Service Station #606

Contamination in soils and groundwater was discovered in 1991 at an old Astro Service Station located at 716 NE 99th Street, less than ½ mile from the 10-year capture zone for CPU Well 4. The contaminants included petroleum hydrocarbon constituents such as BTEX and methyl-tert-

butyl-ether (MTBE), which is expected to be added to Ecology's list of regulated compounds in the near future. Although this site has been remediated since 1992, concentrations of these contaminants still exceed cleanup levels. Groundwater at this site has been remediated using pump-and-treat, air sparging, and vapor extraction systems.

6.3.2.8.2 Amboy-Chelatchie Area

A number of sites are located upgradient of Well 401, in the Amboy-Chelatchie area. They include:

- The Chelatchie Tank farm
- IPC Plywood Mill
- IPC Waste Site

The contaminants at these sites include petroleum products, PCBs, and VOCs. At the IPC sites, contamination is suspected in surface water and sediment but confirmed only in soils. At the tank farm, contamination is suspected in groundwater but confirmed only in soil.

None of the three sites lies within the capture zone for Well 401. In fact, they are separated from Well 401's capture zone by hydraulic boundaries formed by bedrock. The bedrock is much less permeable than the Glacial Outwash Aquifer that it bounds.

6.4 Aquifer Vulnerability Analysis

The sensitivity of aquifers to potential water quality impacts was evaluated for 32 CPU supply wells using an aquifer vulnerability matrix. This analysis considers both the physical susceptibility of a well source and the risks imposed by existing or potential contamination sources that lie within the WHP capture zones. It indicates which sites are most vulnerable to land-use impacts and provides a basis for designing monitoring and other management strategies.
The aquifer vulnerability matrix is presented in **Table 6**. The following parameters were considered for this evaluation:

- ***Pumping rate.*** The capture zone for each well and the rate of contaminant transport increase as pumping rate increases. Contaminant risks are proportionately greater for high capacity wells since a loss of these sources is of greatest consequence to the water purveyor.

- ***Depth to top of screen.*** Wells that produce water from shallow zones are more susceptible to contamination from the surface than those in deeper zones. Not only do the contaminants have a longer vertical migration path to the deeper zones, but their movement may also be inhibited by fine-grained strata, as discussed below.

- ***Occurrence and thickness of an overlying fine-grained or confining unit.*** Fine-grained units such as clays and silts inhibit contaminant transport because groundwater flow velocities in these units are slow and because they may adsorb metals and other mobile constituents before they reach the production zone. In addition, the denser fluid phases associated with contaminants may be unable to penetrate them.

- ***Distance to known/potential sources of contamination*** was considered because the risk of water quality degradation is substantially higher for wells located near documented sources of contamination.

Results of the capture-zone analyses discussed in Section 5 were used in conjunction with the aquifer vulnerability matrix. For each production well, a ranking of 0 to 10 was assigned for the four parameters. A score of 10 indicates highest vulnerability; a score of 0 indicates lowest vulnerability. The ranking criteria for each parameter are presented in **Table 6**. A weighting factor of 1 was assigned to all the parameters except for depth to top of the screened or perforated interval and distance to confirmed contaminant source which were both assigned a weighting factor of 2. A total "score" of 70 points was possible for each well. The well rankings were normalized by dividing the score for each well by the total possible score.

Results of the analysis indicate that the normalized scores range from 0.10 at Well 20 to 0.94 at Well 19. The wells have been divided into three groups based on relative vulnerability:

- ***High Vulnerability***: Wells 5, 7, 9, 17, 18, 19, and 23. Wells in this group received a vulnerability ranking that exceeded 0.60.

- ***Moderate Vulnerability***: Wells 4, 8.2, 10, 15, 16, 21, 22, 24, 104, 108, 109, and 401. Wells in this group received a vulnerability ranking that was between 0.60 and 0.25.

- ***Low Vulnerability***: Wells 14, 20, 23, 25, 27 through 33, 105, 106, and 110. Wells in this group received a vulnerability ranking that was less than 0.25.

The results of this analysis indicate the wells that are most vulnerable to contamination are the shallow wells located along Salmon Creek (Wells 9, 17, 18, and 19). These wells ranked high not only because of their shallow construction but also because of their proximity to potential and confirmed sources of contamination. Ranking for Wells 5, 7, and 23 were slightly lower. These wells are deeper than the Salmon Creek wells but they also lie close to confirmed sources of contamination.

The least vulnerable wells are deep and/or they are located far from potential and confirmed sources of contamination.

7.0 Contingency Plan

7.1 Introduction

This section presents a contingency plan identifying measures that should be taken if CPU's largest production well is lost. It is consistent with Department of Health guidance on WHP planning and includes:

- Analyses of system capacity, water rights, and source loss
- Options for expansion using CPU's existing sources of supply and water rights
- An analysis of existing and potential interties
- An analysis of potential future water supplies
- A description of emergency procedures in case a source is lost
- A description of emergency notification procedures

7.2 Analysis of System Capacity, Water Rights, and Source Loss

7.2.1 System Capacity and Water Rights

The utility is currently updating its Comprehensive Water System Plan, which includes current, detailed information on supply and system capacity. In general, the utility has a peak-day water demand of approximately 18.9 mgd and a total supply capacity of approximately 24.8 mgd (**Figure 16, Table 7**). The sources of supply lie throughout the County **(Figure 1)**.

CPU's main supply sources are 34 production wells. Of these wells, 32 are currently active. Water rights and installed capacities for each well are summarized on **Table 7**.

7.2.2 Source-Loss Analysis

CPU's supply wells are distributed throughout the County and are completed in several different aquifers: Upper Troutdale, the Lower Troutdale, and the SGA.

The susceptibility of the SGA wells to contamination from a spill or other surface event is low because they are deep and protected by thick confining layers. CPU's largest producing wells are screened in this aquifer. It is more likely that one of the shallow wells could be lost because of contamination.

A loss of any single well would not present a problem for the utility in the short-term. **Figure 16** shows the demand and supply curve for a loss of each CPU well. The demands shown on this

figure were developed from a 1999 source of supply study (ref??). In some areas, however, the loss of a well would require replacement or infrastructure improvements to provide a long-term supply from another area of the system.

7.3 Options for Expansion Under Existing Water Rights

Table 7 shows that, in theory, CPU's instantaneous water rights total 36.4 mgd, but its installed capacity is 24.8 mgd. In reality, many of the wells used to calculate the 36.4-mgd capacity have been abandoned, and Ecology has applied these water rights to new wells. In addition, Ecology has applied the excess capacity of many CPU wells to water rights for newer wells. Consequently, there is little or no opportunity to expand the source of supply under the Utility's existing water rights, except for Wells 32 and 8.2, which could add an additional 1.5 mgd.

CPU has applied for new water rights in the Meadow Glade and Pioneer areas. The Utility also plans to apply for water rights in the Vancouver Lake area.

7.4 Existing Interties

CPU currently has four emergency interties in operation. Three have historically been used to provide water to the City of Battle Ground. The fourth intertie is with the City of Vancouver system. The intertie locations and approximate capacities are shown in **Table 8**.

7.5 Future Interties

Future interties could be established with the City of Battle Ground, at:

- SW 20th Avenue and 199th Street NE (10-inch)
- SW 10th Avenue and 199th Street NE (12-inch)

Each of these interties could supply more than 1,000 gpm (1.44 mgd). Other opportunities for future interties are likely to develop as Battle Ground grows and the County develops. However, the interties with Battle Ground would provide only short-term supply options in a relatively small geographic area.

Future interties could be established with the City of Vancouver, at:

- 117th Ave and 109th St (12-inch)
- 88th St and 59th Ave (12-inch)
- 64th St and St Johns (12-inch)

- Lakeshore Ave and Bernie Drive (8-inch)
- Ward Road and 88th St (8-inch)

Each intertie could supply between 800 and 1,500 gpm (1.15 to 2.16 mgd).

7.6 Emergency Procedures for Loss of a Source

The Utilities' procedure, for short-term loss of each of their sources of supply (except well 401) would be to supply water from the remaining wells in the system. If a long-term loss was expected the utility would apply for a transfer of water rights and replace the source. If well 401 was contaminated, the short-term response would be to install treatment for removal of the contaminant, and to replace the lost supply by drilling a new well. If treatment is needed in an emergency, trailer mounted Granular Activated Carbon Tanks can be dispatched in 24 hours from Weststates Carbon (714-622-6166).

The length of time the utility would have in developing new supplies is somewhat dependant on the capacity of the well. If a well of 1000 to 1500 gpm capacity is lost, the utility would need to replace the well in a fairly short time frame (1 to 2 years). The utility does have three wells that have been drilled and not supplied with pumping equipment. These supplies could be put on line in a relatively short time frame if needed.

7.6.1 Emergency Notification Procedures

In case a spill of any magnitude occurs within the WHPA, Ecology must be notified at (360) 407-6300. In addition, the following CPU personnel should be notified:

- Mat McCudden, Director of Water Services, (360) 992-3363
- Steve Prather, Water Quality Manager, (360) 992-8023

7.6.2 Utilities Chain-of-Command for Spill Response

The Utility's Chain-of-Command response team is summarized in **Table 9**.

7.6.3 External Emergency Notification Procedures

In case a spill cannot be contained, Ecology should be contacted at its 24-hour number, (360) 407-6300. Safety Kleen, a clean up contractor under contract with CPU for spill containment at the River Road Generating Plant, could also be contacted for assistance (503) 655-3068. If a spill can be contained, it should be pumped into a containment tank of appropriate size. If there is no containment tank on site, Baker Tanks should be contacted at (800) 283-5170 to provide one.

7.7 Emergency Phone Numbers

The following is a list of contacts and telephone numbers to be used in case of an emergency:

Police:	911
Ambulance:	911
Fire:	911
Hospital:	(360) 256 – 2000
Sheriff:	(360) 737 – 6079
Labor Department:	(360) 896 - 2338

Fatal injuries and accidents in which two or more employees are hospitalized must be reported to the Washington State Department of Labor and Industries, Division of Consultation and Compliance (800) 423-7233.

8.0 Spill Response Planning

8.1 Responsibilities for Spill Prevention and Response

Many organizations have responsibilities for spill prevention in Washington State. This section briefly summarizes those responsibilities.

8.1.1 The Responsible Party

The primary responsibility for assessing, responding to, and containing an oil spill or discharge falls upon the individual, agency, and/or company responsible for the spill incident. The Responsible Party (RP) is responsible for containing and cleaning up the spill, disposing of contaminated debris, restoring the environment, and paying damages regardless of whether there is an approved contingency plan. State and federal law specifically require that the removal of a discharge of oil or hazardous substance should be immediate.

If the spiller is unknown or fails to respond, or if the State or Federal On-Site Coordinator (OSC) considers the response inadequate, the agency with jurisdiction may take over the response and recover expenses from the spiller (RCW 90.48.335).

8.1.2 Environmental Protection Agency

The EPA has primary responsibility for land spills and spills that occur on inland U.S. waters that are not under US Coast Guard jurisdiction. In the past, EPA has delegated authority for certain spill-response activities to Ecology.

8.1.3 Department of Ecology

Ecology is the lead agency for environmental pollution response in Washington. As such, it has predesignated the OSC and the Incident Commander (IC) for many spills occurring in the State's jurisdiction. If a spill occurs on a State highway, Ecology coordinates with the Washington State Patrol (WSP). The WSP then assumes responsibility as IC and leads the cleanup. The key responsibilities of Ecology include:

- Providing 24-hour emergency response to reported spill incidents
- Identifying the source, cause, and responsible party
- Assuming responsibilities of RP if a spiller cannot be located or is unresponsive
- Ensuring that containment, cleanup, and disposal are carried out in a timely and adequate manner

8.1.4 State Patrol

The WSP acts as the designated IC for incidents on Interstate and State highways and on other roads and jurisdictions as delegated. When a spill occurs on a State highway, Ecology joins the Unified Command and leads the cleanup response.

8.1.5 Local Emergency Planning and Emergency Management

CPU has developed a Local Emergency Planning Committee (LEPC) to facilitate planning efforts. LEPCs are responsible for creating emergency response plans. General requirements for local response plans are contained in Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). Generally, local agencies, particularly fire districts and law enforcement agencies, can be activated to provide emergency response services when there is a threat to life and property. Emergency response services may include:

- Investigating and documenting fire and explosion controls
- Establishing perimeter controls, evacuation routes, and traffic controls
- Containing or removing the spilled material, depending on the nature of the incident

The responsibilities of local government's Emergency Management Unit include:

- Developing and maintaining a hazardous material "annex" (supplement or appendix) to the State Comprehensive Emergency Management Plan. The responsibilities and actions of local, State, and Federal agencies should be defined.
- Assisting local agencies in preparing their standing operation procedures for hazardous materials incidents.
- Coordinating the various local emergency organizations and serving as the local liaison to Washington State EMD when that agency is involved.
- Contacting local landowners (may also be performed by local Health Department)
- Developing training programs and conducting exercises for local response agencies.
- Participating as a member of the Washington Wildlife Rescue Coalition.
- Establishing a Joint Information Center (JIC).
- Coordinating and interfacing with local governmental units (fire, medical, public works, sheriff, and law enforcement).
- Communicating with local government and industry.

8.2 Spill Assessment and Response Procedures on CPU Property

A spill of any magnitude that occurs within the WHPA and is not contained must be reported to Ecology and CPU. After the spill is contained to the extent possible using on-site equipment, CPU personnel, Ecology, and a cleanup contractor should be notified.

8.3 Spill Containment/Cleanup Procedures on CPU Property

If the spill can be contained, the following procedures should be followed:

1. Contain the spill with adsorbent materials. Neutralize with soda ash if the material is an acid.
2. Report the spill according to chain-of-command procedures.
3. Start the cleanup operation.

The spilled material should be pumped into an on-site tank for treatment, if possible. If it cannot be pumped into a tank, a cleanup contractor such as Safety Kleen should be contacted to contain the spill.

8.4 Inspections and Records

To the extent possible, CPU should inspect the inventoried contaminants annually for proper containment. The facilities should also be checked to insure that the facility owners and operators are properly trained in spill prevention. CPU staff should be responsible for inspection and record keeping for the spill prevention procedures. Records should be maintained for reference and recommendations should be made to correct deficiencies found by inspection.

Material Data Safety Sheets (MSDS) should be collected as part of the inspection process. These MSDS sheets must be available at each facility. The fire department also maintains copies of MSDS sheets for many facilities.

8.5 Training

All CPU engineering, planning, and public works personnel should be trained in spill prevention at appropriate levels. For example:

- Engineering staff should be trained to identify proper spill containment and handling facilities when reviewing plans

- Planning staff should be trained to minimize potential contamination problems through changes in long-term zoning,
- Public works staff should be trained in spill response and field inspection procedures

CPU staff should be thoroughly familiar with the procedures outlined in this plan. CPU personnel can significantly impact spill prevention as part of their overall duties. This plan will be revised periodically to ensure that proper techniques are put to the best benefit.

Training should focus on safety, spill prevention, emergency response, evacuation, first aid, and hazardous waste first response.

9.0 Implementation Strategies

Strategies for implementing CPU's WHP plan focus on several key issues:

- Public education and technical assistance
- Contaminant source management
- Monitoring and data management
- Land use and regulatory controls
- Regional coordination
- Planning

Each of these strategies is discussed below.

9.1 Public Education/Technical Assistance Strategies

Public education and technical assistance strategies are required to teach local residents and businesses about practices that could impact the quality of groundwater in the WHPAs. These strategies include the following:

- Developing educational materials that can be distributed to CPU customers to teach them how they can help protect groundwater. The Annual Water Quality Report can be used to inform customers about topics such as the location of WHPA boundaries and the importance of the proper use and disposal of lawn chemicals, household wastes, and other potential contaminants.

- Notifying all businesses that store and handle wastes within the designated WHPAs about the importance of proper waste handling and disposal. The availability of technical assistance and audits should be increased for small businesses within designated WHPAs.

- Developing school programs to educate youth on groundwater protection.

- Placing "Wellhead Protection Area" signs at the WHPA boundaries along transportation corridors

9.2 Contaminant Source Management Strategies

Strategies for managing contaminant sources are required to prevent contamination from point sources such as spills and USTs, as well as from regional sources such as septic systems. These strategies include the following:

- Inventorying all businesses within designated WHP capture areas to assess potential contaminant sources and waste handling practices.

- Requesting that the SWWHD focus its septic maintenance program on designated WHPAs.

- Encouraging residents that are currently served by septic drain fields within WHPAs to connect to the sewer system where possible. CPU may wish to consider financial incentives or other means of enticing residents to change.

- Assisting Ecology with identifying potential contaminant sources that are degrading groundwater quality in vicinity of CPU Monitoring Wells MW-5S and MW-7D.

- Encouraging Ecology to expedite cleanup actions at confirmed contamination sites in WHPAs.

- Encouraging Ecology and the County to inspect the facilities of RCRA hazardous waste generators.

- Inventorying and locating USTs that were not identified through this study, including residential home heating oil USTs.

- Reviewing existing and proposed stormwater management practices to identify areas of concern for groundwater quality. CPU should coordinate with Clark County as required.

- Reviewing EPA's ongoing program for contaminant remediation at the Boomsnub/BOC Gases Superfund site.

9.3 Monitoring and Data Management Strategies

Monitoring data provide a method for assessing trends in groundwater quality, on both regional and local scales. Regional data are available from sources such as Ecology, EPA, Clark County, SWWHD, local purveyors, and CPU's ongoing data collection programs. Recommended strategies for monitoring and data management include:

- Collecting and analyzing water-quality, water-level, production, land-use, and other data that could assist in wellhead protection. This could be accomplished through cooperative programs with Ecology, EPA, Clark County, SWWHD, and other local purveyors.

- Integrating this data into a database management system to facilitate future analyses related to wellhead protection and water-resource issues.

- Monitoring trends in VOCs, chromium, and nitrate in high-risk WHPAs where existing contaminant sources pose a threat to CPU's drinking water supplies. A monitoring program is recommended in **Table 3**.

9.4 Land-Use Controls and Regulation Strategies

A number of strategies related to land-use and regulatory controls could be implemented to protect water quality in WHPAs. These strategies include:

- Developing zoning overlays and adding performance standards to conditional-use permits. However, because such strategies may be difficult and expensive to implement, it may be more practical to relocate the high-risk sources to areas where land-use conditions are not as critical.

- Encouraging and supporting the implementation of Clark County's Critical Aquifer Recharge Areas (CARA) ordinance (Chapter 13.70). This ordinance regulates activities within WHPAs and promotes the use of Best Management Practices (BMPs) to safeguard groundwater. Updated capture-zone maps should be submitted periodically to the County for incorporation into the CARA process.

- Encouraging and supporting the implementation of Clark County's Water Quality ordinance (Chapter 13.26A), which is designed to reduce and control discharges of contamination to surface water and groundwater through BMPs and technical assistance programs.

9.5 Regional Coordination Strategies

Coordinating with other local purveyors in Clark County could enhance the effectiveness of wellhead protection efforts. Regional coordination strategies would include:

- Establishing a "steering group" with other local water purveyors and Clark County to coordinate WHP planning activities. This group should focus existing and future programs related to water quality and water resources on the designated WHPAs.

- Coordinating with other Clark County purveyors on water-supply planning and development issues. These issues include contingency planning and expansion of interties.

9.6 Planning Strategies

Developing strategies for emergency response and contingency planning is essential to wellhead protection. Recommended action items related to such planning include:

- Notifying the appropriate emergency response organizations on the location of WHPAs and establishing formal communication protocols with the first-response emergency units.

- Preparing and distributing an emergency-response contingency plan that covers short- and long-term responses if one or more sources is lost.

- Completing a hydraulic assessment of the distribution system to ensure that the contingency plans adequately address major losses of supply or storage capacity.
- Developing deep supply wells in the Hazel Dell and Pioneer areas to replace or provide backup for the shallow wells (Wells 7, 7.2, 18, 19, and 23), which are at a high risk of contamination. Supplies from these new deep wells would be better protected from potential land-use impacts. CPU should negotiate with Ecology to transfer water rights from the shallow sources to the new wells.

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Appendix K

Clark PUD Wellheads: Capture zones and potential contamination sources

1.1 Wells #5, #7, and #23

Table K–1. Wellhead Information[1,2]

Source Number	05	07	25
Well Name	Well #5 AAD500 HAZ S05	Well #7 AAD497 HAZ S07	Well #23 AAF423 HAZ S25
Type	Ground Water – Well	Ground Water – Well	Ground Water – Well
Use	Permanent	Seasonal	Permanent
Status	Active	Active	Active
Well Depth	233	176	231
Well Tag	AAD500	AAD497	AAF423
Protection Area Type	Modelled	Modelled	Modelled
SAS TOT 6 mo	615	679	748
SAS TOT 1 yr	869	961	1058
SAS TOT 5 yr	1943	2148	2365
SAS TOT 10 yr	2748	3038	3345
SAS Design Capacity	1320	990	1500
Susceptibility	High	Moderate	Moderate
Drought Indicator	N	N	N
Flood Indicator	N	N	N
Surface Indicator	U	U	U
TRS	02N, 01E, 11, SESE	02N, 01E, 12, NWNW	02N, 01E, 11, SWNE
WRIA	28, Salmon-Washougal	28, Salmon-Washougal	28, Salmon-Washougal

1. All three wells above are considered to have the same capture zones due to their proximity.
2. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

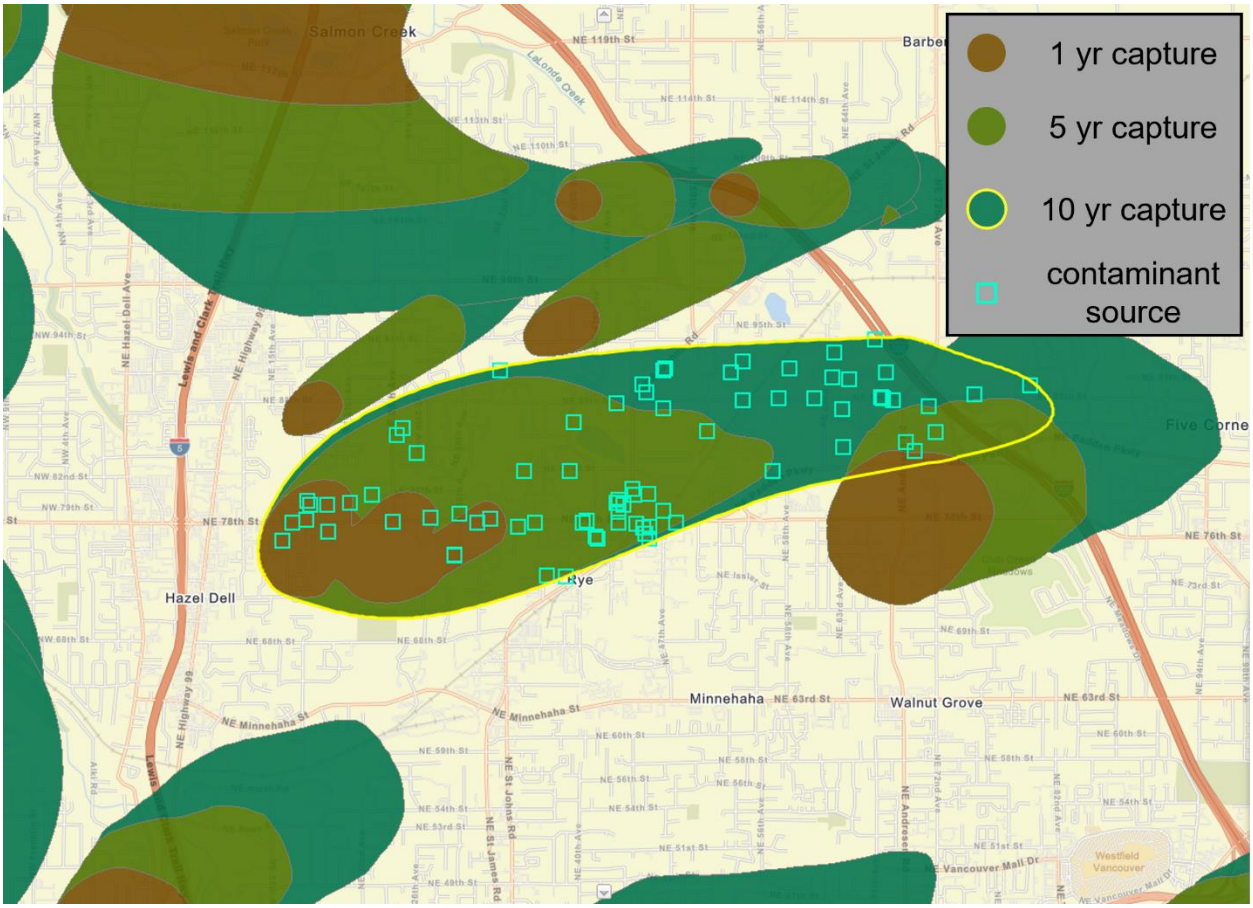

Figure K-1. Map of wells #5, #7, and #23 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-2. Wells #5, #7, and #23 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
7 ELEVEN STORE 235222624J	Emergency/Haz Chem Rpt TIER2	7715 NE ST Johns Rd	98665	I
7 ELEVEN STORE 235222624J	LUST Facility	7715 NE ST Johns Rd	98665	I
7 ELEVEN STORE 235222624J	Underground Storage Tank	7715 NE ST Johns Rd	98665	A
7 ELEVEN STORE 235222624J	Emergency/Haz Chem Rpt TIER2	7715 NE ST Johns Rd	98665	I
82ND STREET	Construction SW GP	3700 NE 82ND ST	98665	I
82ND STREET	Construction SW GP	3700 NE 82ND ST	98665	A
88th St Mini Storage wetland mitigation	SEA Mitigation Site	6208 NE 88TH ST	98665	A
88th Street Mini Storage	SEA Project Site	6208 NE 88TH ST	98684	A
A 1 PRECISION	Industrial SW GP	8014 NE 19TH CT	98665-9751	A

AADLAND OFFICE BUILDINGS PH 1 & 2	Construction SW GP	2710 NE 78TH ST	98665	A
Adams Industrial Coatings Inc	Hazardous Waste Generator	7902 C NE ST JOHNS RD	98665	I
ARCO 948 MINIMART	Underground Storage Tank	NE 78TH & ST JOHNS RD	98661	I
ARCO 948 MINIMART	LUST Facility	NE 78TH & ST JOHNS RD	98661	I
Asco Machine Inc	Industrial SW GP	7916 NE 19TH CT	98665	I
AT&T WIRELESS BARBERTON	Emergency/Haz Chem Rpt TIER2	7002 NE 88TH	98665	A
AT&T WIRELESS BARBERTON	Emergency/Haz Chem Rpt TIER2	7002 NE 88TH	98665	I
Bar Maids	Industrial SW GP	4601 NE 78TH ST	98665	A
BOC PROCESS GAS SOLUTIONS	Underground Storage Tank	4715 NE 78TH ST	98665-0905	A
BOC PROCESS GAS SOLUTIONS	Emergency/Haz Chem Rpt TIER2	4715 NE 78TH ST	98665-0905	A
BOC PROCESS GAS SOLUTIONS	Toxics Release Inventory	4715 NE 78TH ST	98665-0905	I
BOC PROCESS GAS SOLUTIONS	Toxics Release Inventory	4715 NE 78TH ST	98665-0905	I
BOC PROCESS GAS SOLUTIONS	Hazardous Waste Generator	4715 NE 78TH ST	98665-0905	A
BOC PROCESS GAS SOLUTIONS	Hazardous Waste Planner	4715 NE 78TH ST	98665-0905	I
BOC PROCESS GAS SOLUTIONS	Hazardous Waste Generator	4715 NE 78TH ST	98665-0905	I
BOC PROCESS GAS SOLUTIONS	LUST Facility	4715 NE 78TH ST	98665-0905	A
BOC PROCESS GAS SOLUTIONS	Industrial SW GP	4715 NE 78TH ST	98665-0905	A
Bomsnub Airco Superund Site	Underground Injection Control	7608 NE 47th Ave NE	98665	A
Boomsnub Water Treatment System	Hazardous Waste Generator	7608 NE 47TH AVE NW COR	98661	I
BROCKWAY INFILL SHORT PLAT	Construction SW GP	8503 NE 25TH AVE	98665	I
BROCKWAY INFILL SHORT PLAT	Construction SW GP	8503 NE 25TH AVE	98665	A
CARIBOU REALTY GROUP	Haz Waste Management Activity	8914 NE ST JOHNS RD	98665-9221	I
CARIBOU REALTY GROUP	Hazardous Waste Generator	8914 NE ST JOHNS RD	98665-9221	A
CARIBOU REALTY GROUP	Voluntary Cleanup Sites	8914 NE ST JOHNS RD	98665-9221	A
CARIBOU REALTY GROUP	State Cleanup Site	8914 NE ST JOHNS RD	98665-9221	A
CARIBOU REALTY GROUP	Hazardous Waste Generator	8914 NE ST JOHNS RD	98665-9221	I
Cascade Container Fab Co Inc	Hazardous Waste Generator	7319 NE 37TH AVE	98666	I
CLARK CNTY PUBLIC WORKS	Hazardous Waste Generator	4700 NE 78TH ST	98665	I

CLARK CNTY PUBLIC WORKS	LUST Facility	4700 NE 78TH ST	98665	I
CLARK CNTY PUBLIC WORKS	Underground Storage Tank	4700 NE 78TH ST	98665	A
CLARK CNTY PUBLIC WORKS	Emergency/Haz Chem Rpt TIER2	4700 NE 78TH ST	98665	A
CLARK CNTY PUBLIC WORKS	Haz Waste Management Activity	4700 NE 78TH ST	98665	I
CLARK CNTY PUBLIC WORKS	Haz Waste Management Activity	4700 NE 78TH ST	98665	I
CLARK CNTY PUBLIC WORKS	Hazardous Waste Generator	4700 NE 78TH ST	98665	I
CLARK CNTY PUBLIC WORKS	Hazardous Waste Generator	4700 NE 78TH ST	98665	A
Clark County NE 27th Ave & NE 84th St	Underground Injection Control	NE 27th Ave & NE 84th St		A
Columbia River Crossing	Enforcement Final	W OF 17006 SE EVERGREEN HWY	98665	A
Craig Stein Beverages Vancouver	Hazardous Waste Generator	5408 NE 88th St	98662	A
Creative Smiles PLLC	Revised Site Visit Program	3405 NE 78th St	98665	A
Creative Smiles PLLC	State Cleanup Site	3405 NE 78th St	98665	A
Creative Smiles PLLC	Hazardous Waste Generator	3405 NE 78th St	98665	I
Creative Smiles PLLC	Hazardous Waste Generator	3405 NE 78th St	98665	I
DUANE KENNEDY	State Cleanup Site	6700 NE 88TH ST	98665	I
DUBLOON HILL	Construction SW GP	3304 NE 91ST ST	98665	A
Earth Friendly Recycling LLC	Industrial SW GP	8013 NE St Johns Rd Ste H	98665	A
First Church of God Kings Way Athletic Fields	Construction SW GP	3300 NE 78TH ST	98665	I
GAITHER COMMERCIAL CENTER	Construction SW GP	3611 3701 & 3813 NE 78TH ST	98665	I
GB MANCHESTER CORP	Underground Storage Tank	6000 NE 88TH ST	98665	A
Hazel Dell Sports Fields	Construction SW GP	4000 NE 78th St	98665	I
Heritage Villas	Construction SW GP	2306 NE 78th St	98665	A
HEUVEL ENTERPRISES	Voluntary Cleanup Sites	4601 NE 78TH ST	98665	I
HEUVEL ENTERPRISES	Industrial SW GP	4601 NE 78TH ST	98665	I
HEUVEL ENTERPRISES	Industrial SW GP	4601 NE 78TH ST	98665	A
HIDDEN GARDENS	Construction SW GP	INTERSECTION NE 78TH & NE 34TH AVE	98665	I
Hidden Gardens Clark County	Construction SW GP	NE 78th St & NE 30th Ave	98665	A
Home Depot 4718	Hazardous Waste Generator	8601 NE ANDRESEN RD	98665	A
Home Depot 4718	Hazardous Waste Planner	8601 NE ANDRESEN RD	98665	I
Home Depot 4718	Hazardous Waste Planner	8601 NE ANDRESEN RD	98665	A

Hop N Shop	Hazardous Waste Generator	1800 NE 78TH ST	98665	I
I 205 Commerce Park Mitigation Area 2	SEA Mitigation Site			A
I205 Commerce Park	SEA Project Site	6308 NE 88TH ST	98665	I
I205 Commerce Park	SEA Mitigation Site	6308 NE 88TH ST	98665	A
I205 Commerce Park	Construction SW GP	6308 NE 88TH ST	98665	I
I205 Commerce Park	SEA Project Site	6308 NE 88TH ST	98665	A
Janssen Subdivision	Construction SW GP	3915 NE 88TH ST	98665	A
JOEL OLSON TRUCKING INC	Industrial SW GP	1615 NE 78TH ST	98665	A
John Doe Drug Lab	Hazardous Waste Generator	7315 NE 37TH AVE	98661	I
Kennedy Drug Lab	Hazardous Waste Generator	6716 NE 88TH ST	98665-0966	I
KWIK GAS 2	Underground Storage Tank	4409 78TH ST NE	98665-0647	A
KWIK GAS 2	Voluntary Cleanup Sites	4409 78TH ST NE	98665-0647	I
KWIK GAS 2	LUST Facility	4409 78TH ST NE	98665-0647	I
LD Enterprises Shop	Hazardous Waste Generator	6718 NE 88TH ST	98665	I
LG Vancouver WA Storage	Construction SW GP	6301 NE 88th St	98665	A
LUMBERMENS BUILDING CENTER VANCOUVER	Underground Storage Tank	2820 78TH ST NE	98665-0650	I
Mroczek Inc	Hazardous Waste Generator	8009 NE 19TH CT	98665	I
NE 72nd Ave & St Johns Rd NE	SEA Project Site	NE 72ND AVE FROM I205 TO NE 119TH ST	98666	A
NE 88TH ST IMPROVEMENT	Construction SW GP	NE 88TH ST BETWEEN ST JOHNS RD &	98665	I
NE 88TH ST IMPROVEMENT	SEA Project Site	NE 88TH ST BETWEEN ST JOHNS RD &	98665	A
NE 88th Street Improvements Wetland Mitigation Area	SEA Mitigation Site			A
nLIGHT Photonics Corp	Emergency/Haz Chem Rpt TIER2	5408 NE 88TH ST BLDG E	98665	A
nLIGHT Photonics Corp	Enforcement Final	5408 NE 88TH ST BLDG E	98665	A
nLIGHT Photonics Corp	Hazardous Waste Planner	5408 NE 88TH ST BLDG E	98665	A
nLIGHT Photonics Corp	Revised Site Visit Program	5408 NE 88TH ST BLDG E	98665	A
nLIGHT Photonics Corp	Hazardous Waste Generator	5408 NE 88TH ST BLDG E	98665	A
nLIGHT Photonics Corp	Construction SW GP	5408 NE 88TH ST BLDG E	98665	I
nLIGHT Photonics Corp	Industrial SW GP	5408 NE 88TH ST BLDG E	98665	I
Northwest Pipeline Corp Vancouver 78th	Hazardous Waste Generator	2710 NE 78TH ST	98665	I
OMEGA INDUSTRIES INC	Voluntary Cleanup Sites	7304 NE ST JOHNS RD	98665	I

OTT PROPERTY	Hazardous Waste Generator	8013 NE ST JOHNS ROAD	98665	I
OTT PROPERTY	State Cleanup Site	8013 NE ST JOHNS ROAD	98665	A
Padden Andresen Stormwater Facility	Construction SW GP	Padden Parkway & NE Andresen Rd	98665	I
Padden Andresen Stormwater Facility	Construction SW GP	Padden Parkway & NE Andresen Rd	98665	I
Padden Idustrial Complex	Industrial SW GP	4601 NE 78th street STE 240	98661	I
Padden Parkway Business Park	Construction SW GP	78th St & St Johns Rd	98665	A
Padden Parkway Business Park	Construction SW GP	78th St & St Johns Rd	98665	A
Padden Parkway Wetland Mitigation Site	SEA OLD Mitigation Site			A
Padden Wellness Center	Construction SW GP	6712 NE 88th St	98665	A
PECK PROPERTIES	Underground Storage Tank	7801 NE ST JOHNS RD	98665	A
Premiere Polishing	Hazardous Waste Generator	8013 NE ST JOHNS RD UNIT L	98665	I
Qualtiy custom cabinets	Industrial SW GP	St Johns & 78th Street	98665	I
QUICK SHOP MINI MART 27	Underground Storage Tank	8817 ST JOHNS RD	98665-9279	A
QUICK SHOP MINI MART 27	Emergency/Haz Chem Rpt TIER2	8817 ST JOHNS RD	98665-9279	I
QUICK SHOP MINI MART 27	Voluntary Cleanup Sites	8817 ST JOHNS RD	98665-9279	A
QUICK SHOP MINI MART 27	Hazardous Waste Generator	8817 ST JOHNS RD	98665-9279	I
QUICK SHOP MINI MART 27	LUST Facility	8817 ST JOHNS RD	98665-9279	A
Rental Services Corp 489	Underground Storage Tank	7920 ST JOHNS RD NE	98661	I
Rental Services Corp 489	Emergency/Haz Chem Rpt TIER2	7920 ST JOHNS RD NE	98661	A
RIDGEVIEW FIELDSTONE CONSTRUCTION	Construction SW GP	9112 NE ST JOHNS RD	98665	I
Ridgeview Multiple Lots	Construction SW GP	9112 NE ST JOHNS RD	98665	I
Rons Automotive Hazel Dell	Hazardous Waste Generator	7818 NE 30TH AVE	98665	I
Service Partners of Oregon LLC	Emergency/Haz Chem Rpt TIER2	5900 NE 88TH ST	98665	A
Spray on Foam & Coatings Inc	Hazardous Waste Generator	7902 NE St Johns Rd Ste 107	98665	I
Spray on Foam & Coatings Inc	Hazardous Waste Generator	7902 NE St Johns Rd Ste 107	98665	I
Spray on Foam & Coatings Inc	Haz Waste Management Activity	7902 NE St Johns Rd Ste 107	98665	I
St Elizabeth Ann Seton Catholic High School	Construction SW GP	NW of NE 89th & NE 64th Ave	98665	I
St Johns Woods Subdivision	Construction SW GP		98665	A
SUNBELT RENTALS PC 377	Emergency/Haz Chem Rpt TIER2	7103 NE 88TH ST	98665	A

Sunlight Site Plan	Construction SW GP	7508 NE 88th St	98662	A
SUNRISE PLACE	Construction SW GP	3509 NE 82ND ST	98665	I
TARR INC VANCOUVER	Emergency/Haz Chem Rpt TIER2	5419 NE 88TH ST	98665	A
The Flats on 88th Street	Construction SW GP	4305 NE 88th St	98665	A
The Meadows at Heritage Place	Construction SW GP	8525 NE 25th Ave	98665	A
US DFW Northgate Industiral Park	Hazardous Waste Generator	1417 NE 76TH ST STE A	98665	I
US DFW Northgate Industiral Park	Hazardous Waste Generator	1417 NE 76TH ST STE A	98665	I
Vancouver NE 72nd Av	Hazardous Waste Generator	8314 NE 72ND AVE	98665	I
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Voluntary Cleanup Sites	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Emergency/Haz Chem Rpt TIER2	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Underground Storage Tank	1919 NE 78TH ST	98665-9752	A
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	A
WA WSU Vancouver Res & Ext	LUST Facility	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	I

1. All facilities in this table are located in the City of Vancouver, WA within the wells' capture zone.
2. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.2 Wells #9, #17, and #19

Table K–3. Wellhead Information[1]

Source Number	09	17	20
Well Name	Well #9 AAD499 HAZ S09	Well #17 AAF417 HAZ S17	Well #19 AFP638 HAZ S20
Type	Ground Water – Well	Ground Water - Well	Ground Water – Well
Use	Seasonal	Permanent	Permanent
Status	Active	Active	Active
Well Depth	172	80	32
Well Tag	AAD499	AAF417	AAF419
Protection Area Type	Modelled	Modelled	Modelled
SAS TOT 6 mo	889	626	690
SAS TOT 1 yr	1257	885	970
SAS TOT 5 yr	2810	1979	2181
SAS TOT 10 yr	3974	2799	3084
SAS Design Capacity	800	800	960
Susceptibility	High	High	High
Drought Indicator	N	N	N
Flood Indicator	N	N	N
Surface Indicator	U	U	P
TRS	02N, 01E, 35, SESE	03N, 01E, 35, NWNE	03N, 01E, 27, SESW
WRIA	28, Salmon-Washougal	28, Salmon-Washougal	28, Salmon-Washougal

1. All three wells above are considered to have the same capture zones due to their proximity.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

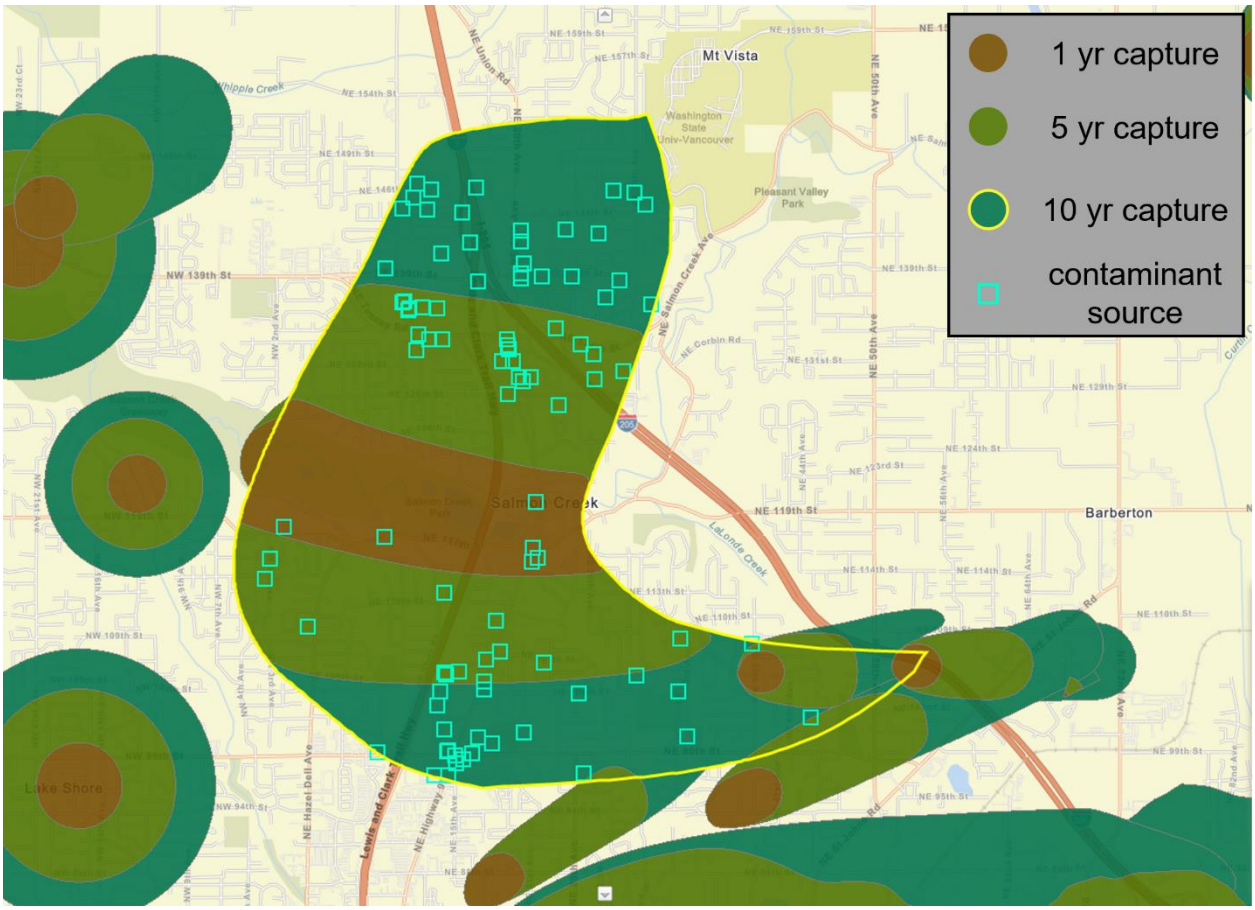

Figure K-2. Map of wells #9, #17, and #19 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-4. Wells #9, #17, and #19 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
139th Medical Plaza	Construction SW GP	13910 NE 10th Ave	98685	I
25th Ave Site Plan	Construction SW GP	9701 NE 25th Ave	98665	A
ADVANCE WELDING INC	Underground Storage Tank	1509 106TH ST NE	98686-5604	I
ALBERTSONS 580 FUEL CENTER	Hazardous Waste Generator	14300 NE 20TH AVE BLDG E	98686	A
ALBERTSONS 580 FUEL CENTER	Underground Storage Tank	14300 NE 20TH AVE BLDG E	98686	A
ASTRO WESTERN STATION 607	Independent Remedial Actn Prg	13117 NE HIGHWAY 99	98686	I
ASTRO WESTERN STATION 607	Underground Storage Tank	13117 NE HIGHWAY 99	98686	I
ASTRO WESTERN STATION 607	Voluntary Cleanup Sites	13117 NE HIGHWAY 99	98686	I
ASTRO WESTERN STATION 607	LUST Facility	13117 NE HIGHWAY 99	98686	A

AT&T SALMON CREEK	Emergency/Haz Chem Rpt TIER2	13404 NE 20TH	98686	I
ATT QWEST	Emergency/Haz Chem Rpt TIER2	1214 NE 99TH ST	98665	A
Bells Velvet Hammer Inc	Hazardous Waste Generator	10803 NE HWY 99	98686	I
Bells Velvet Hammer Inc	Haz Waste Management Activity	10803 NE HWY 99	98686	A
Black Rock Coffee Bar	Underground Injection Control	13309 Ne 20th Ave	98685	A
BLUE JAYS GLEN SUBDIVISION	Construction SW GP	2501 NE 104TH ST	98686	I
BOBS PAINT	Revised Site Visit Program	1501 NE 99TH ST	98665	A
BUENA VISTA STORMWATER FACILITY	Construction SW GP	14518 NE 29TH AVE	98665	I
C Wells & Co Inc	Hazardous Waste Generator	1509 B NE 106TH ST	98686-5604	I
CALLAHAM & CALLAHAM	LUST Facility	10616 NE HWY 99	98686	I
CALLAHAM & CALLAHAM	Voluntary Cleanup Sites	10616 NE HWY 99	98686	I
CALLAHAM & CALLAHAM	Underground Storage Tank	10616 NE HWY 99	98686	I
Canyon Creek Subdivision	SEA Project Site	16706 NE 29TH AVE	98686	A
Carousel Cleaners	Hazardous Waste Generator	13023 NE HWY 99	98686	I
Chucks Produce & Street Market	Construction SW GP	NE Hwy 99 & NE 117th St	98666	I
CLARK COUNTY PUB WKS SALMON CREEK SITE	SEA Project Site	910 NE 117TH ST	98685-3973	I
CLARK COUNTY PUB WKS SALMON CREEK SITE	Underground Storage Tank	910 NE 117TH ST	98685-3973	I
COMCAST CABLE COMMUNICATIONS VANCOUVER 2	Emergency/Haz Chem Rpt TIER2	1311 NE 134TH ST	98685	I
COMMERCIAL REPAIR & MACHINE WORKS	Hazardous Waste Generator	11614 NE HWY 99	98668	I
COMMERCIAL REPAIR & MACHINE WORKS	Industrial SW GP	11614 NE HWY 99	98668	I
Community Home Health & Hospice	Construction SW GP	3100 NE 136TH CIR	98686	A
CONCRETE SHOP INCORPORATED	Sand and Gravel GP	1702 NE 99TH ST	98665	A
DON CRAMER	Underground Storage Tank	1605 NE 99 ST	98665-9094	I
Drying Systems Inc	Hazardous Waste Generator	1509 NE 106TH ST PARKING LOT	98686	I
Electronic Specialty Corp	Emergency/Haz Chem Rpt TIER2	14511 NE 13TH AVE	98685	A
Electronic Specialty Corp	Hazardous Waste Generator	14511 NE 13TH AVE	98685	I
Electronic Specialty Corp	Hazardous Waste Planner	14511 NE 13TH AVE	98685	I
Equipment Roundup & Mfg Inc	Hazardous Waste Generator	1109 NE 146TH ST	98685	I
Equipment Roundup & Mfg Inc	Hazardous Waste Generator	1109 NE 146TH ST	98685	I

EXPRESSWAY FOOD STORE NO 609	Emergency/Haz Chem Rpt TIER2	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	Underground Storage Tank	1309A 134TH ST NE	98685-2746	A
EXPRESSWAY FOOD STORE NO 609	Emergency/Haz Chem Rpt TIER2	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	LUST Facility	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	Voluntary Cleanup Sites	1309A 134TH ST NE	98685-2746	I
EXXON STATION 73594	Voluntary Cleanup Sites	13204 NE HWY 99	98665	I
EXXON STATION 73594	Voluntary Cleanup Sites	13204 NE HWY 99	98665	I
EXXON STATION 73594	LUST Facility	13204 NE HWY 99	98665	I
EXXON STATION 73594	Underground Storage Tank	13204 NE HWY 99	98665	I
Flowserve Corp	Haz Waste Management Activity	10400 NE 13TH AVE	98686	I
Flowserve Corp	Hazardous Waste Generator	10400 NE 13TH AVE	98686	I
Flowserve Corp	Hazardous Waste Generator	10400 NE 13TH AVE	98686	I
Flowserve Corp	Hazardous Waste Planner	10400 NE 13TH AVE	98686	I
Flowserve Corp	State Cleanup Site	10400 NE 13TH AVE	98686	A
Flowserve Corp	Haz Waste Management Activity	10400 NE 13TH AVE	98686	I
Flowserve Corp	Hazardous Waste Generator	10400 NE 13TH AVE	98686	I
Flowserve Corp	Haz Waste Management Activity	10400 NE 13TH AVE	98686	A
FOREST CREEK SUBDIVISION	Construction SW GP		98686	I
Gaiser Estates Subdivision	Construction SW GP	3304 NE 99TH ST	98665	A
General Commercial Grading	Construction SW GP	NE117th ST & NE HWY99	98665	A
HCR MANOR CARE SALMON CREEK	Construction SW GP	2815 NE 139TH ST	98686	I
Hidden Vista Subdivision	Construction SW GP	14513 NE 17th Ave	98686	A
Jack Donna Mackinnon	Hazardous Waste Generator	10921 NE 33RD AVE	98686	I
JB HUNT FORMER	Hazardous Waste Generator	12921 NE ROCKWELL DR	98686	I
JB HUNT FORMER	Underground Storage Tank	12921 NE ROCKWELL DR	98686	A
JB HUNT FORMER	Voluntary Cleanup Sites	12921 NE ROCKWELL DR	98686	I
JB HUNT FORMER	LUST Facility	12921 NE ROCKWELL DR	98686	I
JB HUNT FORMER	Voluntary Cleanup Sites	12921 NE ROCKWELL DR	98686	I
Klineline Rentals	Construction SW GP		98685	I

L & C Deli & Vista Mart	State Cleanup Site	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli & Vista Mart	LUST Facility	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli & Vista Mart	Underground Storage Tank	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli Hazel Dell	Hazardous Waste Generator	NE 20TH AVE & 139TH ST NE	98665	I
LEGACY SALMON CREEK HOSPITAL	Enforcement Final	2217 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Generator	2211 NE 139TH ST	98686	I
Legacy Salmon Creek Hospital Vancouver	Underground Storage Tank	2211 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Haz Waste Management Activity	2211 NE 139TH ST	98686	I
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Generator	2211 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Planner	2211 NE 139TH ST	98686	I
Legacy Salmon Creek Hospital Vancouver	Emergency/Haz Chem Rpt TIER2	2211 NE 139TH ST	98686	A
LIL COLONEL DRIVE IN	Voluntary Cleanup Sites	13309 NE HIGHWAY 99	98686	A
LIL COLONEL DRIVE IN	Voluntary Cleanup Sites	13309 NE HIGHWAY 99	98686	A
Lofts at 134th St	Construction SW GP	2220 NE 134TH ST	98686	A
Long Painting Co Vancouver	Hazardous Waste Generator	1120 NE 146th St	98685	A
Long Painting Co Vancouver	Hazardous Waste Planner	1120 NE 146th St	98685	I
Longs Drug Store 477	Hazardous Waste Generator	14300 NE 20TH AVE STE 201	98686	I
Lyles Village Pantry	Underground Storage Tank	10709 NE HIGHWAY 99	98686	A
Lyles Village Pantry	Emergency/Haz Chem Rpt TIER2	10709 NE HIGHWAY 99	98686	I
Lyles Village Pantry	Voluntary Cleanup Sites	10709 NE HIGHWAY 99	98686	I
Lyles Village Pantry	LUST Facility	10709 NE HIGHWAY 99	98686	I
MacDermid Printing Solutions LLC	Hazardous Waste Planner	14413 NE 10TH AVE BLDG C	98685-1401	I
MacDermid Printing Solutions LLC	Hazardous Waste Generator	14413 NE 10TH AVE BLDG C	98685-1401	I
MacDermid Printing Solutions LLC	Toxics Release Inventory	14413 NE 10TH AVE BLDG C	98685-1401	A
MICHAELSEN INFILL SUBDIVISION	Construction SW GP	321 NW 114TH ST	98685	I
Miller Paint Co Inc 20th Ave Ste 104	Hazardous Waste Generator	14300 NE 20th Ave Ste 104	98686	I
Miller Paint Co Inc 20th Ave Ste 104	Hazardous Waste Generator	14300 NE 20th Ave Ste 104	98686	I
Miller Paint Co Inc 20th Ave Ste 104	Haz Waste Management Activity	14300 NE 20th Ave Ste 104	98686	I
Miller Paint Co Inc 20th Ave Ste 104	Hazardous Waste Generator	14300 NE 20th Ave Ste 104	98686	A

Miller Paint Co Inc 20th Ave Ste 104	Haz Waste Management Activity	14300 NE 20th Ave Ste 104	98686	I
Mt Vista Heights Subdivision	Construction SW GP	2517 NE 144TH ST	98686	I
NE 10th Ave 141st to 149th St Road Imp	Construction SW GP	NE 10th Ave	98685	I
NW 114th Street Subdivision	Construction SW GP		98685	I
OFFICER PROPERTY OIL PITS	Hazardous Waste Generator	2505 NE 134TH ST	98686	I
OFFICER PROPERTY OIL PITS	Independent Remedial Actn Prg	2505 NE 134TH ST	98686	I
PACIFIC AIRGAS INC VANCOUVER	Emergency/Haz Chem Rpt TIER2	11912 NE HIGHWAY 99	98686	I
Parkridge 2	Construction SW GP	10912 NE HAZEL DELL AVE	98685	I
Performance Abatement Services	Hazardous Waste Generator	13600 NE 10TH AVE	98685	I
Precision Rebar & Accessories Inc	Construction SW GP	1712 NE 99th St	98665	A
PRO COAT	Revised Site Visit Program	10403 NE 13TH AVE	98686	A
Pro Tech Collision	Hazardous Waste Generator	9807 NE 15TH AVE	98665	I
Rameys Custom Painting	Hazardous Waste Generator	1614 NE 99TH ST	98665	I
RAUCH PROPERTY	State Cleanup Site	10314 NE 33RD AVE	98686	A
Reser Short Plat	Construction SW GP	3009 NE 145th St	98642	A
SAFEWAY FUEL CENTER HWY 99	Underground Storage Tank	13023 NE HWY 99	98686	A
Safeway Store 1842	Hazardous Waste Generator	13023 NE Hwy 99	98686	A
SALMON CREEK ARCO AM PM	Underground Storage Tank	2619 NE 134TH ST	98686	A
SALMON CREEK BUSINESS PARK	Construction SW GP	1301 NE 144TH ST	98685	A
SALMON CREEK BUSINESS PARK 2	Construction SW GP	NE 13TH AVE & NE 144TH ST	98685	I
Salmon Creek Interchange Project	Construction SW GP	I-5 & I-205	98663	I
Salmon Creek Medical & Dental	Hazardous Waste Generator	14406 NE 20TH	98684	I
Salmon Creek Medical & Dental	Hazardous Waste Generator	14406 NE 20TH	98684	I
Salmon Creek Medical & Dental	Haz Waste Management Activity	14406 NE 20TH	98684	I
Salmon Creek Medical & Dental	Hazardous Waste Generator	14406 NE 20TH	98684	I
Salmon Creek Medical & Dental	Haz Waste Management Activity	14406 NE 20TH	98684	A
Salmon Creek Medical & Dental	Haz Waste Management Activity	14406 NE 20TH	98684	I
SALMON CREEK PARK N RIDE	Construction SW GP	13619 NE 10TH AVE	98666	I
SALMON CREEK PLASTIC SURGERY	Construction SW GP	13716 NE 10TH AVE	98685	I
Salmon Creek Walgreens	Construction SW GP	14011 NE 20th Avenue	98686	A

Salmon Run Short Plat	Construction SW GP	NE 117th St	98685	A
SHERWOOD HOLLOW WEST	Construction SW GP	2112 NE 104TH ST	98661	I
SHERWOOD PLACE	Construction SW GP	NE 101ST ST & NE 44TH CT	98686	I
SHERWOOD PLACE 39TH AVE	Construction SW GP	10825 NE 39TH AVE	98686	A
SKYLAND AMERICAN ROAD FUEL	Underground Storage Tank	9512 NE HWY 99	98665	I
Skyview East and West	Construction SW GP	2319 NE 144th St	98686	I
Sorenson Construction Inc	Hazardous Waste Generator	13619 NE CLARK RD	98685	I
SOUTHLAND CORP 234224279	Emergency/Haz Chem Rpt TIER2	12908 NE HWY 99	98686-2726	I
SOUTHLAND CORP 234224279	Underground Storage Tank	12908 NE HWY 99	98686-2726	A
SOUTHLAND CORP 234224279	State Cleanup Site	12908 NE HWY 99	98686-2726	A
SOUTHLAND CORP 235217754B	Underground Storage Tank	9900 N HWY 99	98686-5608	A
SOUTHLAND CORP 235217754B	State Cleanup Site	9900 N HWY 99	98686-5608	I
SOUTHLAND CORP 235217754B	Emergency/Haz Chem Rpt TIER2	9900 N HWY 99	98686-5608	I
STAR BUILDING MATERIALS INC	Underground Storage Tank	11316 HWY 99 NE	98686-4050	I
STATION 3 VANCOUVER	Underground Storage Tank	13419 NE CLARK RD	98685	I
Supreme Dry Cleaners	Underground Storage Tank	10501 NE HWY 99	98686-5612	A
Supreme Dry Cleaners	Hazardous Waste Generator	10501 NE HWY 99	98686-5612	I
Tenny Creek Subdivision	Construction SW GP	2012 NE 99th St	98686	A
The Hampton at Salmon Creek	Construction SW GP	2305 NE 129TH ST	98686	I
Unocal 6166	Underground Injection Control	13218 NE Highway 99	98686	A
UNOCAL SERVICE STATION 6166	Voluntary Cleanup Sites	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	Underground Storage Tank	13218 NE HWY 99	98686	A
UNOCAL SERVICE STATION 6166	Emergency/Haz Chem Rpt TIER2	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	Hazardous Waste Generator	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	Haz Waste Management Activity	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	LUST Facility	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	LUST Facility	13218 NE HWY 99	98686	A
Vancouver Cyclery	Underground Injection Control	10108 NE Hwy 99	98686	A
VANCOUVER OIL COMPANY INC	Voluntary Cleanup Sites	1503 NE 136TH ST	98685	A
VANCOUVER OIL COMPANY INC	Enforcement Final	1503 NE 136TH ST	98685	A

VANCOUVER OIL COMPANY INC	Underground Storage Tank	1503 NE 136TH ST	98685	A
VANCOUVER OIL COMPANY INC	Emergency/Haz Chem Rpt TIER2	1503 NE 136TH ST	98685	A
VANCOUVER OIL COMPANY INC	State Cleanup Site	1503 NE 136TH ST	98685	A
VANCOUVER OIL COMPANY INC	Class 2 Facility	1503 NE 136TH ST	98685	A
VISTA MEADOWS PARK	Construction SW GP	NE 129TH AVE	98686	I
WA DOT ROCKWELL DR	Underground Storage Tank	12925 NE ROCKWELL DR	98665	I
WESTERN STATION CORP	LUST Facility	716 NE 99TH ST	98665-8068	A
WESTERN STATION CORP	Underground Storage Tank	716 NE 99TH ST	98665-8068	A
YARD N GARDEN LAND INC	Underground Storage Tank	9812 NE HWY 99	98665-8935	I

1. Except for L&C Deli Hazel Dell (located in Hazel Dell), all facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.3 Well #10

Table K–5. Wellhead Information[1]

Source Number	10
Well Name	Well #10 AAF412 HAZ S10
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	185
Well Tag	
Protection Area Type	Modelled
SAS TOT 6 mo	382
SAS TOT 1 yr	541
SAS TOT 5 yr	1209
SAS TOT 10 yr	1709
SAS Design Capacity	600
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 02E, 31, SWSW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

Figure K-3. Map of well #10 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-6. Well #10 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Luca Glen	Construction SW GP	10729 NE St Johns Rd	98686	A
NORTH GLEN	Construction SW GP	6807 NE 109TH ST	98686	I
NORTH GLEN	Construction SW GP	6807 NE 109TH ST	98686	I
North Glen GG One	Construction SW GP	6807 NE 109TH ST	98686	A
North Glen Vog LLC	Construction SW GP	6807 NE 109TH ST	98686	A
SILVER STAR HOMES	LUST Facility	MAITLEND RD	98686	I
SILVER STAR HOMES	Underground Storage Tank	MAITLEND RD	98686	I
VILLAGE ON THE GLEN	Construction SW GP	ST JOHNS RD 7 NE 104TH ST	98664	I
Village on the Glen Lot 64	Construction SW GP	St Johns Rd 7 NE 104th St	98664	I
Village on the Glen lots 26 47 & 64	Construction SW GP	St Johns Rd 7 NE 104th St	98664	A
Village on the Glen VOG 7 Lots	Construction SW GP	ST JOHNS RD 7 NE 104TH ST	98664	A

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.4 Well #15

Table K–7. Wellhead Information[1]

Source Number	15
Well Name	Well #15 AAF415 HAZ S15
Type	Ground Water – Well
Use	Seasonal
Status	Active
Well Depth	209
Well Tag	ABE251
Protection Area Type	Modelled
SAS TOT 6 mo	473
SAS TOT 1 yr	669
SAS TOT 5 yr	1496
SAS TOT 10 yr	2116
SAS Design Capacity	740
Susceptibility	High
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 01E, 21, SESE
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

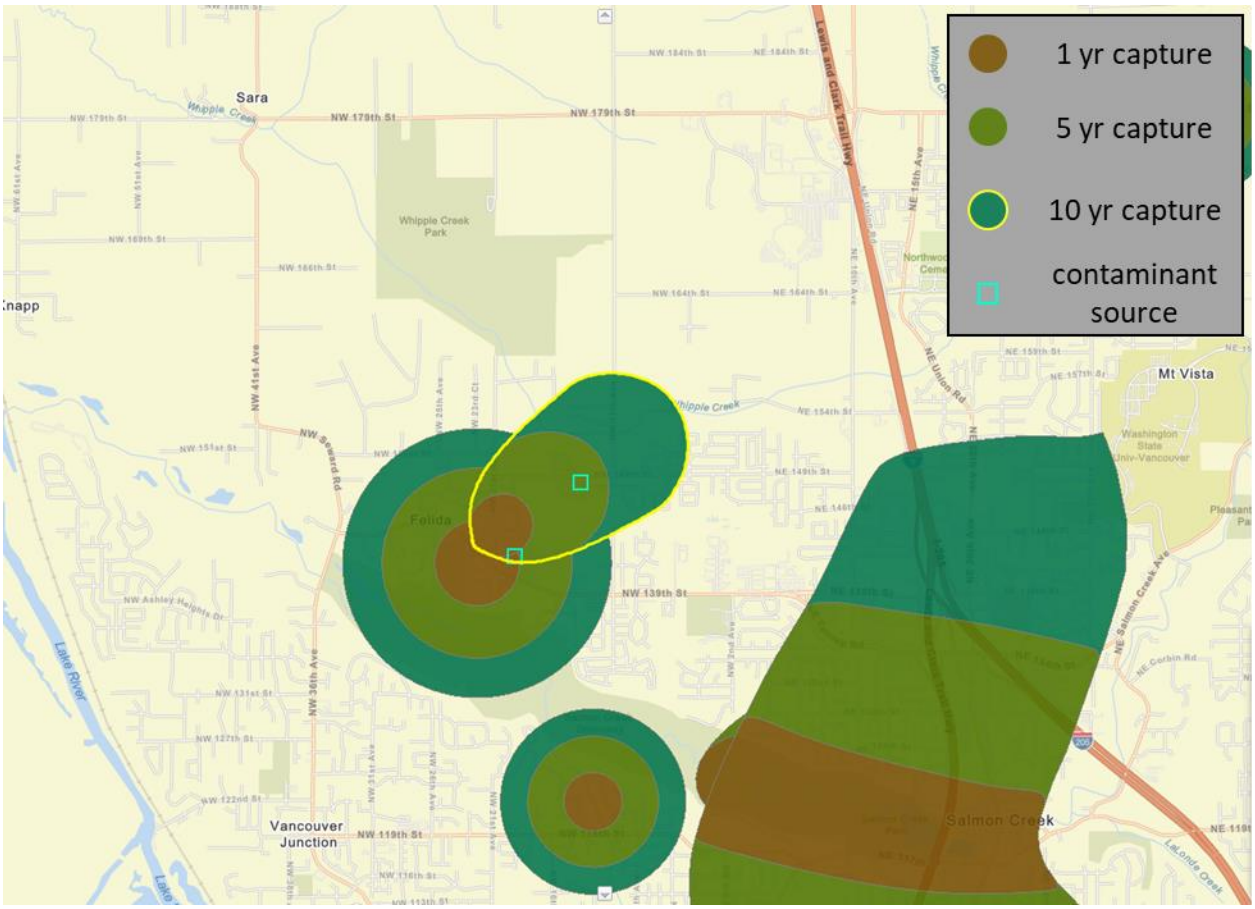

Figure K-4. Map of well #15 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-8. Well #15 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Alki Middle School	Hazardous Waste Generator	1800 NW Bliss Rd	98685	I
Alpha Ready Mix	Enforcement Final	1309 148TH ST	98685	A

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.5 Well #16

Table K–9. Wellhead Information[1]

Source Number	21
Well Name	Well #16 AAF416 HAZ S21
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	535
Well Tag	AAF416
Protection Area Type	Modelled
SAS TOT 6 mo	546
SAS TOT 1 yr	773
SAS TOT 5 yr	1727
SAS TOT 10 yr	2443
SAS Design Capacity	650
Susceptibility	Moderate
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	02N, 01E, 11, NENW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

Figure K-5. Map of well #16 – 10-year capture zone and the contaminant sources located within it.

Table K-10. Well #16 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
82ND STREET	Construction SW GP	3700 NE 82ND ST	98665	A
82ND STREET	Construction SW GP	3700 NE 82ND ST	98665	I
A 1 PRECISION	Industrial SW GP	8014 NE 19TH CT	98665-9751	A
AADLAND OFFICE BUILDINGS PH 1 & 2	Construction SW GP	2710 NE 78TH ST	98665	A
CARIBOU REALTY GROUP	State Cleanup Site	8914 NE ST JOHNS RD	98665-9221	A
CARIBOU REALTY GROUP	Voluntary Cleanup Sites	8914 NE ST JOHNS RD	98665-9221	A
CARIBOU REALTY GROUP	Hazardous Waste Generator	8914 NE ST JOHNS RD	98665-9221	I
CARIBOU REALTY GROUP	Haz Waste Management Activity	8914 NE ST JOHNS RD	98665-9221	I

CARIBOU REALTY GROUP	Hazardous Waste Generator	8914 NE ST JOHNS RD	98665-9221	A
Clark County NE 27th Ave & NE 84th St	Underground Injection Control	NE 27th Ave & NE 84th St		A
Columbia River Crossing	Enforcement Final	W OF 17006 SE EVERGREEN HWY	98665	A
First Church of God Kings Way Athletic Fields	Construction SW GP	3300 NE 78TH ST	98665	I
Heritage Villas	Construction SW GP	2306 NE 78th St	98665	A
Hop N Shop	Hazardous Waste Generator	1800 NE 78TH ST	98665	I
Janssen Subdivision	Construction SW GP	3915 NE 88TH ST	98665	A
LUMBERMENS BUILDING CENTER VANCOUVER	Underground Storage Tank	2820 78TH ST NE	98665-0650	I
NE 88th Street Improvements Wetland Mitigation Area	SEA Mitigation Site			A
Northwest Pipeline Corp Vancouver 78th	Hazardous Waste Generator	2710 NE 78TH ST	98665	I
QUICK SHOP MINI MART 27	Voluntary Cleanup Sites	8817 ST JOHNS RD	98665-9279	A
QUICK SHOP MINI MART 27	Hazardous Waste Generator	8817 ST JOHNS RD	98665-9279	I
QUICK SHOP MINI MART 27	Emergency/Haz Chem Rpt TIER2	8817 ST JOHNS RD	98665-9279	I
QUICK SHOP MINI MART 27	LUST Facility	8817 ST JOHNS RD	98665-9279	A
QUICK SHOP MINI MART 27	Underground Storage Tank	8817 ST JOHNS RD	98665-9279	A
Rons Automotive Hazel Dell	Hazardous Waste Generator	7818 NE 30TH AVE	98665	I
SUNRISE PLACE	Construction SW GP	3509 NE 82ND ST	98665	I
The Flats on 88th Street	Construction SW GP	4305 NE 88th St	98665	A
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	LUST Facility	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Emergency/Haz Chem Rpt TIER2	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Underground Storage Tank	1919 NE 78TH ST	98665-9752	A
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	A
WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Hazardous Waste Generator	1919 NE 78TH ST	98665-9752	I
WA WSU Vancouver Res & Ext	Voluntary Cleanup Sites	1919 NE 78TH ST	98665-9752	I

WA WSU Vancouver Res & Ext	Haz Waste Management Activity	1919 NE 78TH ST	98665-9752	I

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2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.6 Well #20

Table K–11. Wellhead Information[1]

Source Number	22
Well Name	Well #20 AAF420 HAZ S22
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	478
Well Tag	AAF420
Protection Area Type	Modelled
SAS TOT 6 mo	432
SAS TOT 1 yr	611
SAS TOT 5 yr	1366
SAS TOT 10 yr	1931
SAS Design Capacity	760
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	02N, 01E, 02, NESW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

Figure K-6. Map of well #20– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-12. Well #20 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Gaiser Estates Subdivision	Construction SW GP	3304 NE 99TH ST	98665	A
HALEY COURT SUBDIVISION	Construction SW GP	NE JOHNS RD & W OF 53RD AVE	98665	A
Parkview Heights Lots 19-22 & 27-46	Construction SW GP		98665	I
SUNRISE COVE	Construction SW GP	1802 NE 88TH ST	98665	I

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2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.7 Well #22

Table K–13. Wellhead Information[1]

Source Number	24
Well Name	Well #22 AAF422 HAZ S24
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	188
Well Tag	AAF122
Protection Area Type	Modelled
SAS TOT 6 mo	312
SAS TOT 1 yr	441
SAS TOT 5 yr	986
SAS TOT 10 yr	1395
SAS Design Capacity	440
Susceptibility	Moderate
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 01E, 36, NESW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

Figure K-7. Map of well #22– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-14. Well #22 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
DIAMOND MEADOWS SUBDIVISION	Construction SW GP	10404 NE 52ND AVE	98686	I
Fishwood Subdivision	Construction SW GP	4800 NE 109TH ST	98686	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.8 Well #24

Table K–15. Wellhead Information[1]

Source Number	26
Well Name	Well #24 AAF424 HAZ S26
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	400
Well Tag	AAF424
Protection Area Type	Modelled
SAS TOT 6 mo	464
SAS TOT 1 yr	656
SAS TOT 5 yr	1467
SAS TOT 10 yr	2075
SAS Design Capacity	550
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	02N, 01E, 01, NENW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

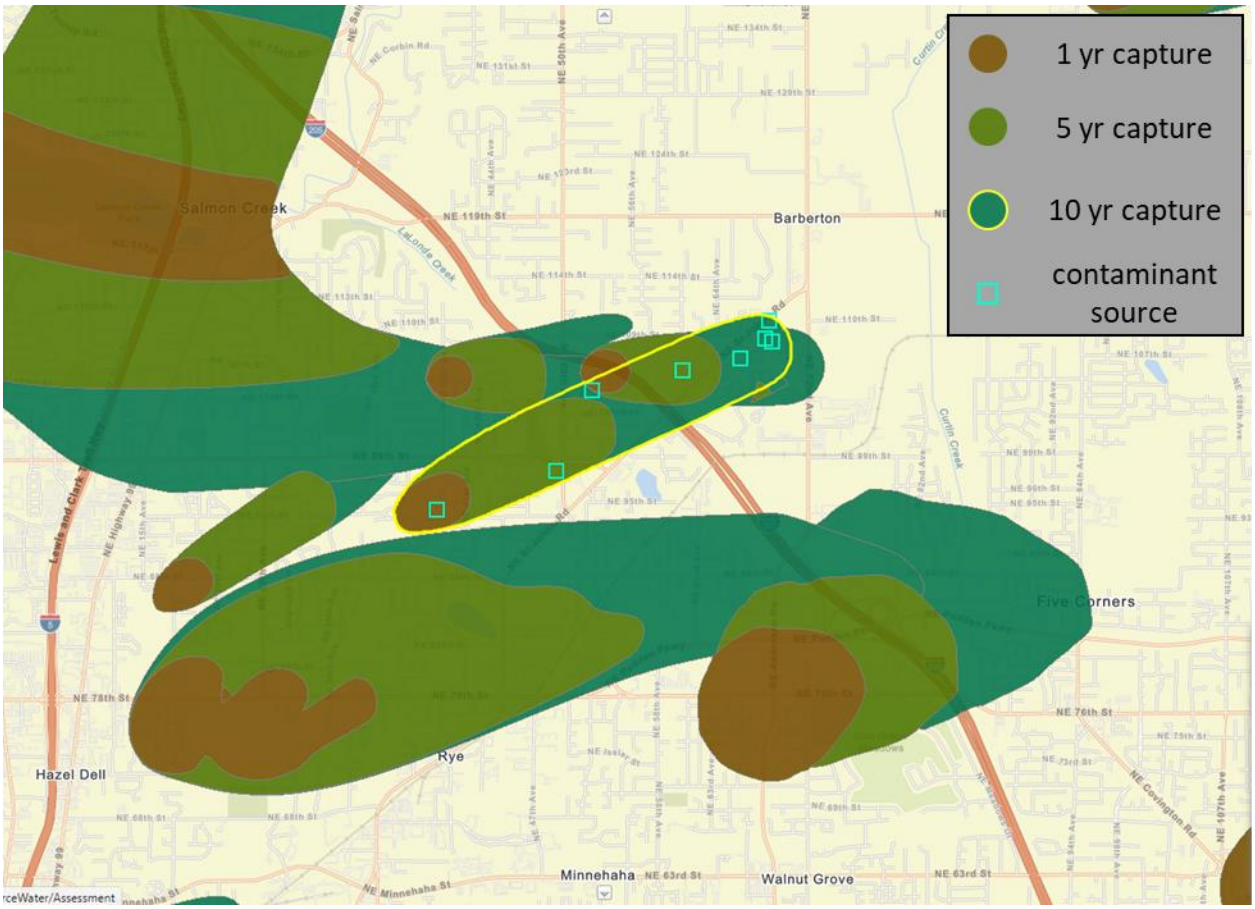


Figure K-8. Map of well #24– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-16. Well #24 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
DIAMOND MEADOWS SUBDIVISION	Construction SW GP	10404 NE 52ND AVE	98686	I
Evergreen Place LID Subdivision	Construction SW GP	9410 NE 39TH AVE	98665	I
LALONDE NEIGHBORHOOD PARK	Construction SW GP	NE 99TH ST WEST OF NE 50TH AVE	98660	I
Luca Glen	Construction SW GP	10729 NE St Johns Rd	98686	A
NORTH GLEN	Construction SW GP	6807 NE 109TH ST	98686	I
NORTH GLEN	Construction SW GP	6807 NE 109TH ST	98686	I
North Glen GG One	Construction SW GP	6807 NE 109TH ST	98686	A
North Glen Vog LLC	Construction SW GP	6807 NE 109TH ST	98686	A
Northwest Air & Equipment	Hazardous Waste Generator	11026 NE ST JOHNS RD	98686-4651	I
SILVER STAR HOMES	LUST Facility	MAITLEND RD	98686	I
SILVER STAR HOMES	Underground Storage Tank	MAITLEND RD	98686	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.9 Well #25

Table K–17. Wellhead Information[1]

Source Number	27
Well Name	Well #25 AAF425 HAZ S27
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	314
Well Tag	AAF425
Protection Area Type	Modelled
SAS TOT 6 mo	432
SAS TOT 1 yr	611
SAS TOT 5 yr	1366
SAS TOT 10 yr	1931
SAS Design Capacity	420
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 02E, 28, NENW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

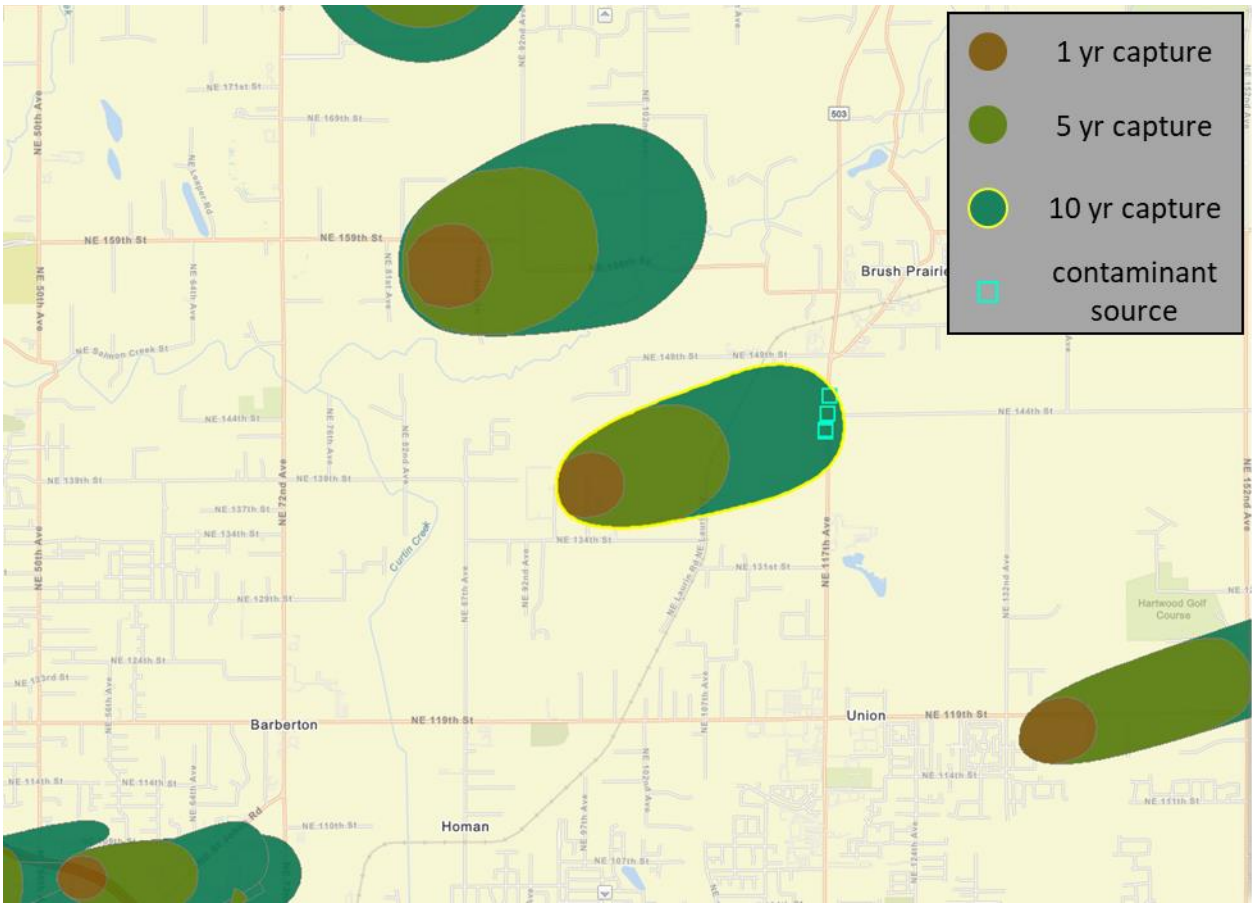


Figure K-9. Map of well #25– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-18. Well #25 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
HARRY NIELSEN	Construction SW GP	12508 NE 117TH AVE	98662-1250	A
HARRY NIELSEN	Underground Storage Tank	12508 NE 117TH AVE	98662-1250	I
JOHNS FOREIGN CAR SERVICE	Underground Storage Tank	11901 117 AVE NE	98662-1250	I
Laglers Dairy	Dairy	13207 NE 117th Ave	98662-1299	A
PRAIRIE SHELL & MART	Underground Storage Tank	18817 NE 117TH AVE	98682	A

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.10 Well #27

Table K–19. Wellhead Information[1]

Source Number	28
Well Name	Well #27 AAI679 HAZ S28
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	175
Well Tag	AAI679
Protection Area Type	CFR
SAS TOT 6 mo	400
SAS TOT 1 yr	565
SAS TOT 5 yr	1264
SAS TOT 10 yr	1788
SAS Design Capacity	300
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 01E, 13, NENW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

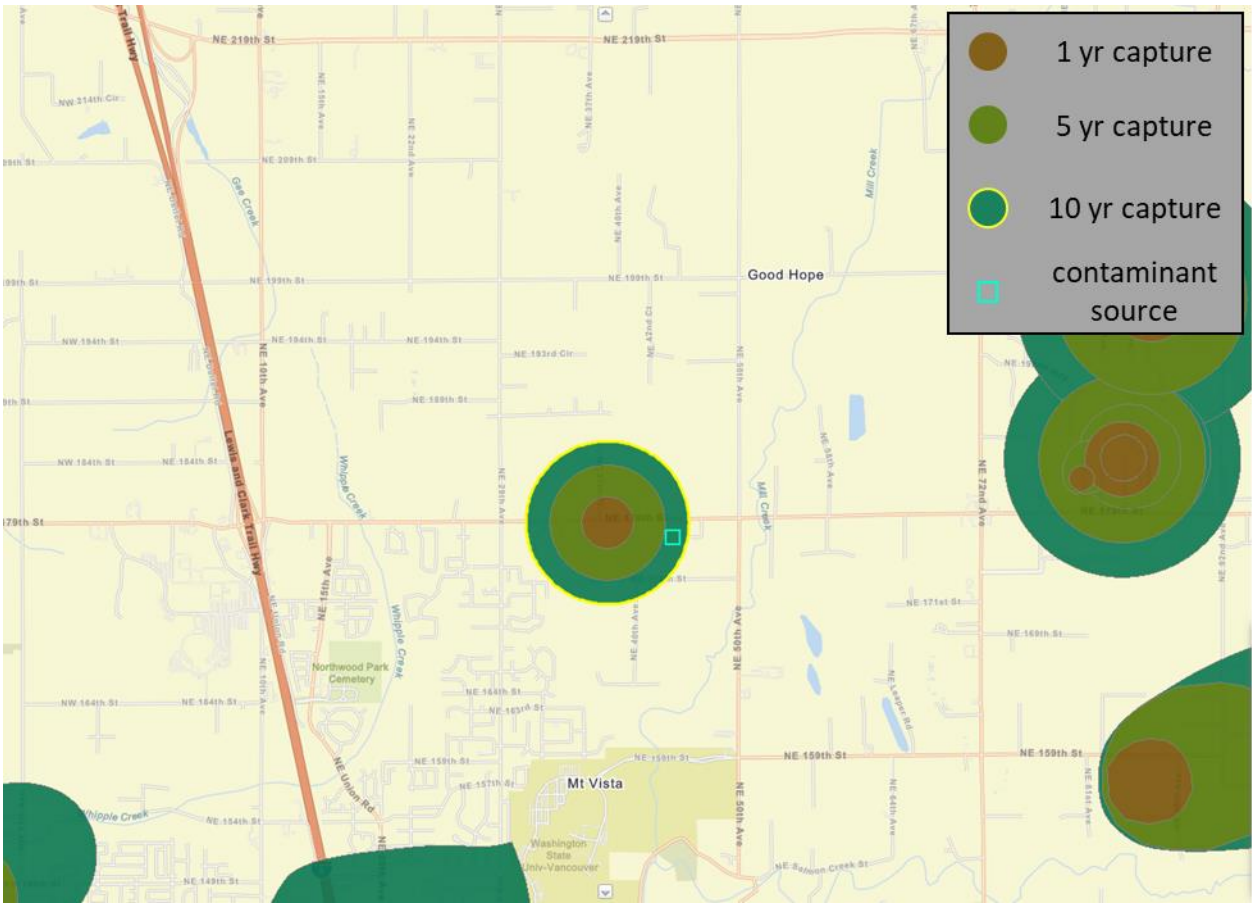


Figure K-10. Map of well #27– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-20. Well #27 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
L & B Dairy Lagoon	Dam site			A

1. The facility in this table is located within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*.

1.11 Well #29

Table K–21. Wellhead Information[1]

Source Number	29
Well Name	Well #29 AAF501 HAZ S29
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	360
Well Tag	AAF501
Protection Area Type	Modelled
SAS TOT 6 mo	277
SAS TOT 1 yr	392
SAS TOT 5 yr	877
SAS TOT 10 yr	1240
SAS Design Capacity	550
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	04N, 01E, 22, NENW
WRIA	27, Lewis

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

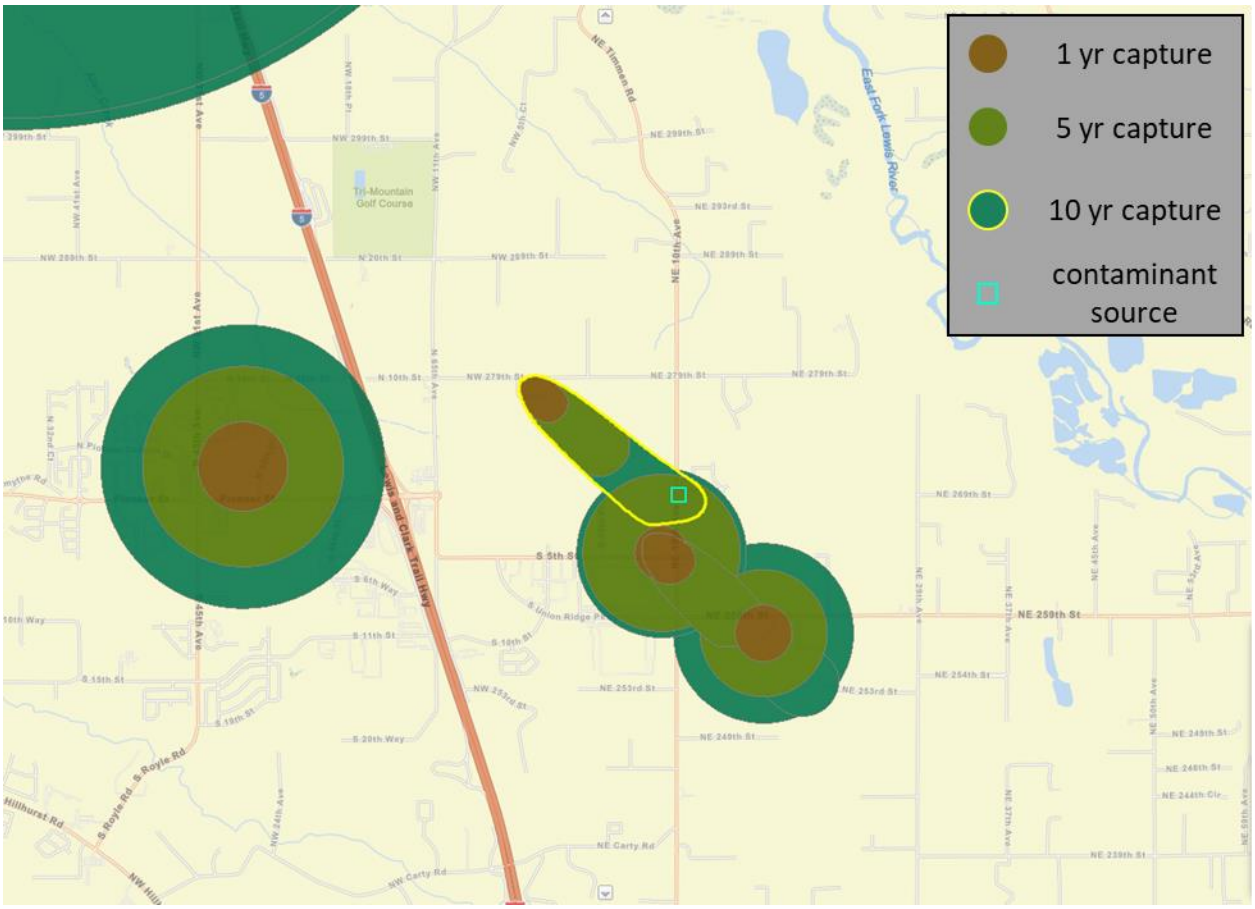


Figure K-11. Map of well #29– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-22. Well #29 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Mountain View Dairy	Dairy	26821 NE 10th Ave	98642-9743	A
Mountain View Dairy	Construction SW GP	26821 NE 10th Ave	98642-9743	A

1. All facilities in this table are located in the City of Ridgefield within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*.

1.12 Well #30

Table K–23. Wellhead Information[1]

Source Number	30
Well Name	Well #30 ABV300 HAZ S30
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	376
Well Tag	
Protection Area Type	Modelled
SAS TOT 6 mo	448
SAS TOT 1 yr	634
SAS TOT 5 yr	1418
SAS TOT 10 yr	2005
SAS Design Capacity	1000
Susceptibility	Moderate
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	04N, 01E, 22, NESE
WRIA	27, Lewis

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

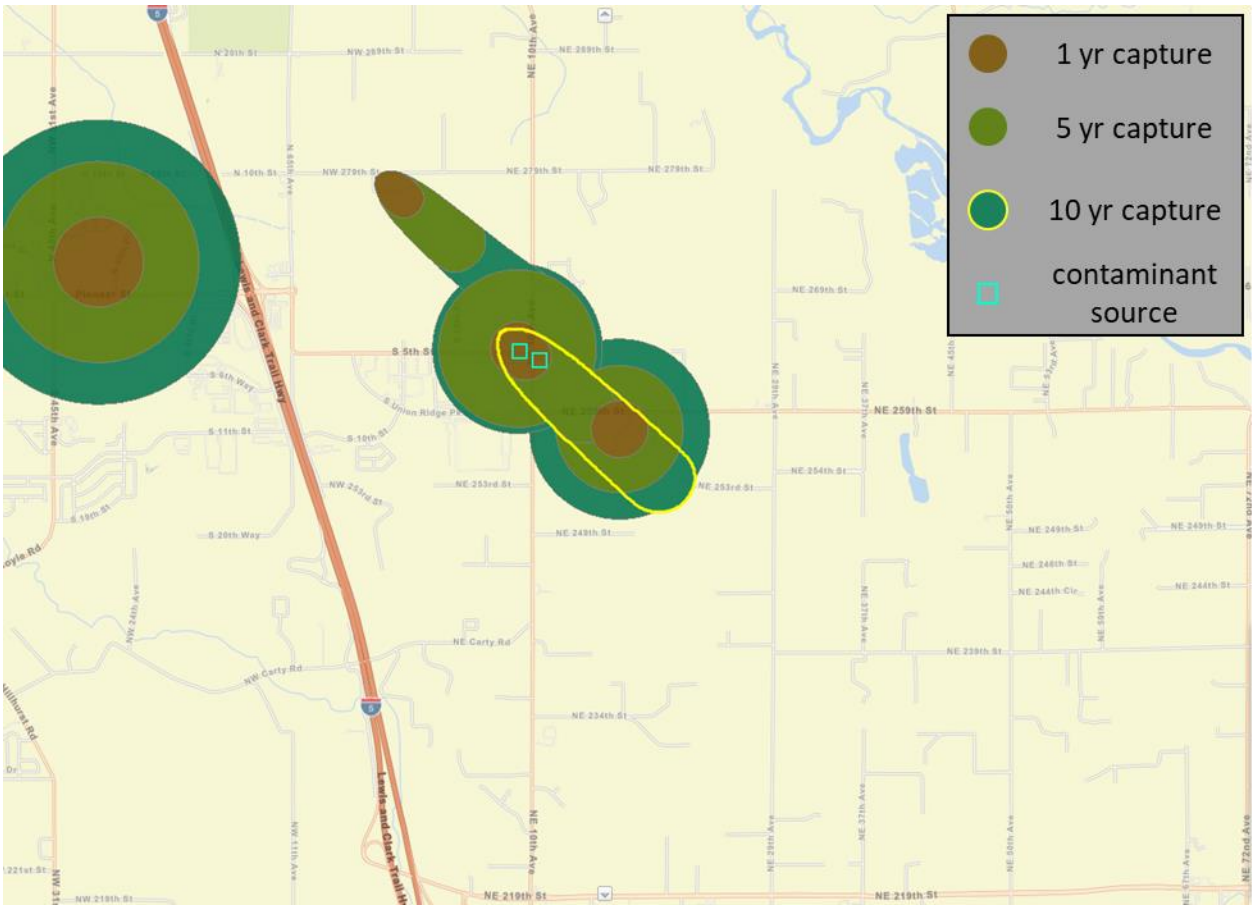


Figure K-12. Map of well #30– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-24. Well #30 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
ADAMS PIONEER MARKET 109	Underground Storage Tank	26410 10TH NE	98642-9743	A
ADAMS PIONEER MARKET 109	LUST Facility	26410 10TH NE	98642-9743	I
ADAMS PIONEER MARKET 109	Voluntary Cleanup Sites	26410 10TH NE	98642-9743	I
ADAMS PIONEER MARKET 109	Emergency/Haz Chem Rpt TIER2	26410 10TH NE	98642-9743	I
Mountain View Business Park LLC	Hazardous Waste Generator	8507 S 5TH ST	98642	I
Mountain View Business Park LLC	State Cleanup Site	8507 S 5TH ST	98642	A
Mountain View Business Park LLC	Revised Site Visit Program	8507 S 5TH ST	98642	A
Mountain View Business Park LLC	Voluntary Cleanup Sites	8507 S 5TH ST	98642	A

1. All facilities in this table are located in the City of Ridgefield within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.13 Well #110

Table K–25. Wellhead Information[1]

Source Number	38
Well Name	Well #110 AAF410 HOC S09
Type	Ground Water – Well
Use	Emergency
Status	Active
Well Depth	219
Well Tag	AAF410
Protection Area Type	Modelled
SAS TOT 6 mo	358
SAS TOT 1 yr	506
SAS TOT 5 yr	1131
SAS TOT 10 yr	1599
SAS Design Capacity	400
Susceptibility	High
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	04N, 02E, 21, SWNE
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

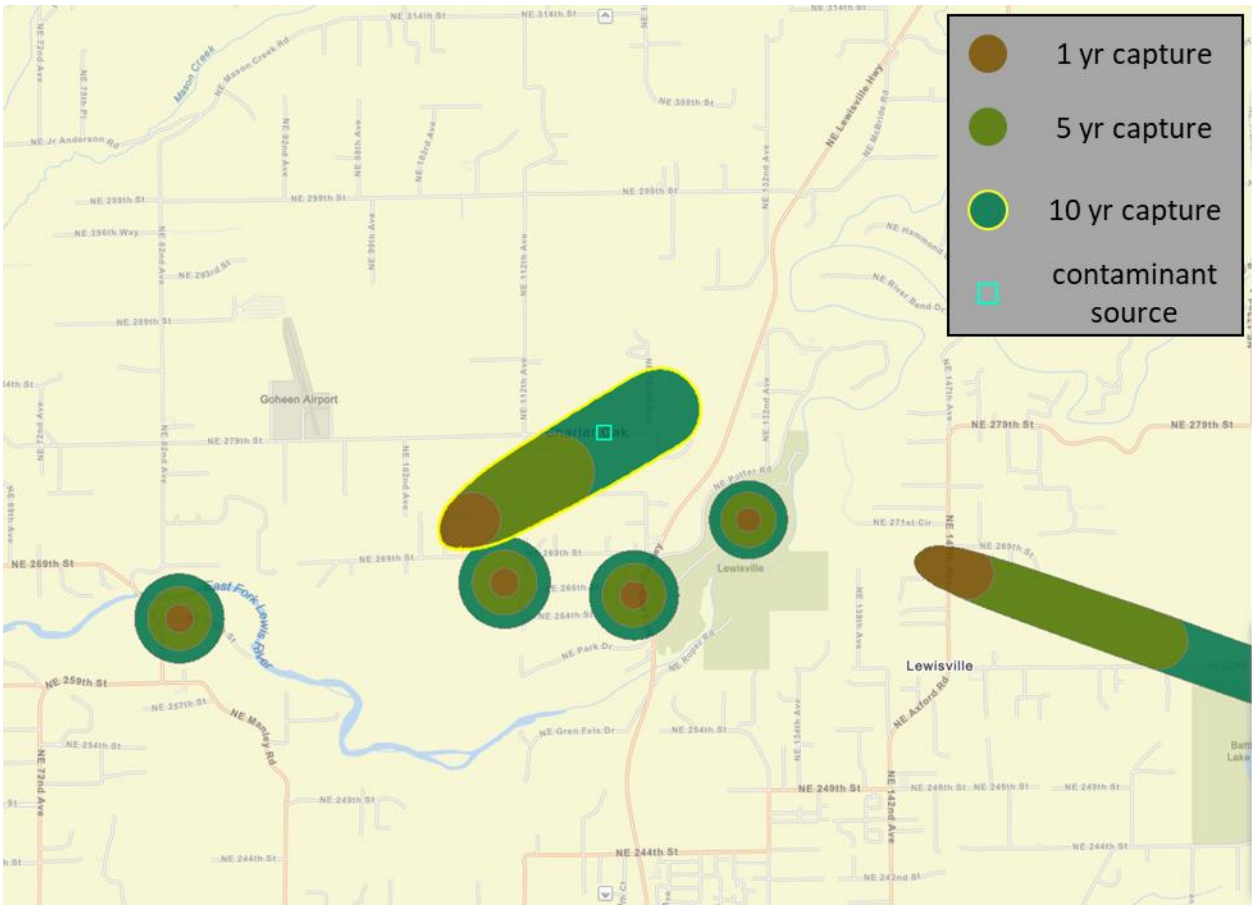


Figure K-13. Map of well #110– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-26. Well #110 – contamination source and its location.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Jacob Schauer	Underground Storage Tank	12515 NE 279TH ST	98604-9306	I

1. The facility in this table is located in the City of Battle Ground within the well's capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: I means *inactive*.

1.14 Well #26

Table K–27. Wellhead Information[1]

Source Number	43
Well Name	Well #26 ABE251 MG S06
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	268
Well Tag	ABE251
Protection Area Type	Modelled
SAS TOT 6 mo	579
SAS TOT 1 yr	819
SAS TOT 5 yr	1832
SAS TOT 10 yr	2591
SAS Design Capacity	600
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 02E, 20, NWNE
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

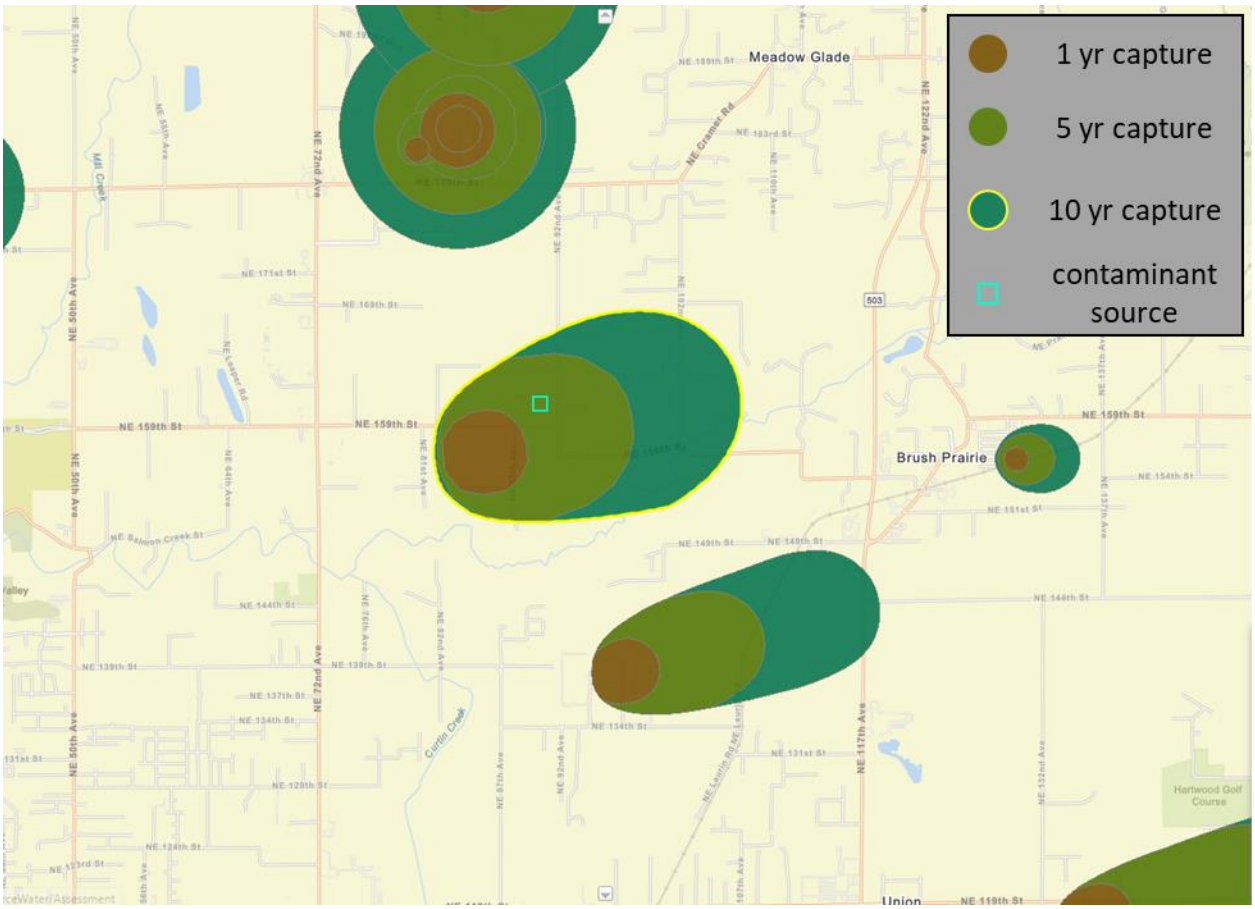


Figure K-14. Map of well #26– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-28. Well #26 – contamination source and its location.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Safeway Fuel Center 1704	Underground Storage Tank	6700 NE 162nd Ave	98682	A

1. The facility in this table is located in the City of Vancouver within the well's capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*.

1.15 Wells #18.1 and #21

Table K–29. Wellhead Information[1]

Source Number	48	49
Well Name	Well #18.1 REPLACES S19 NO WELL TAG	WELL #21 AFP639 SALMON CRK
Type	Ground Water – Well	Ground Water - Well
Use	Emergency	Permanent
Status	Active	Active
Well Depth	32	210
Well Tag	AAF421	AAF421
Protection Area Type	Modelled	Modelled
SAS TOT 6 mo		
SAS TOT 1 yr		
SAS TOT 5 yr		
SAS TOT 10 yr		
SAS Design Capacity	960	1100
Susceptibility	Low	Low
Drought Indicator	N	N
Flood Indicator	N	N
Surface Indicator	P	U
TRS	03N, 01E, 27, SESE	03N, 01E, 27, SESW
WRIA	28, Salmon-Washougal	28, Salmon-Washougal

1. Both wells above are considered to have the same capture zones due to their proximity.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

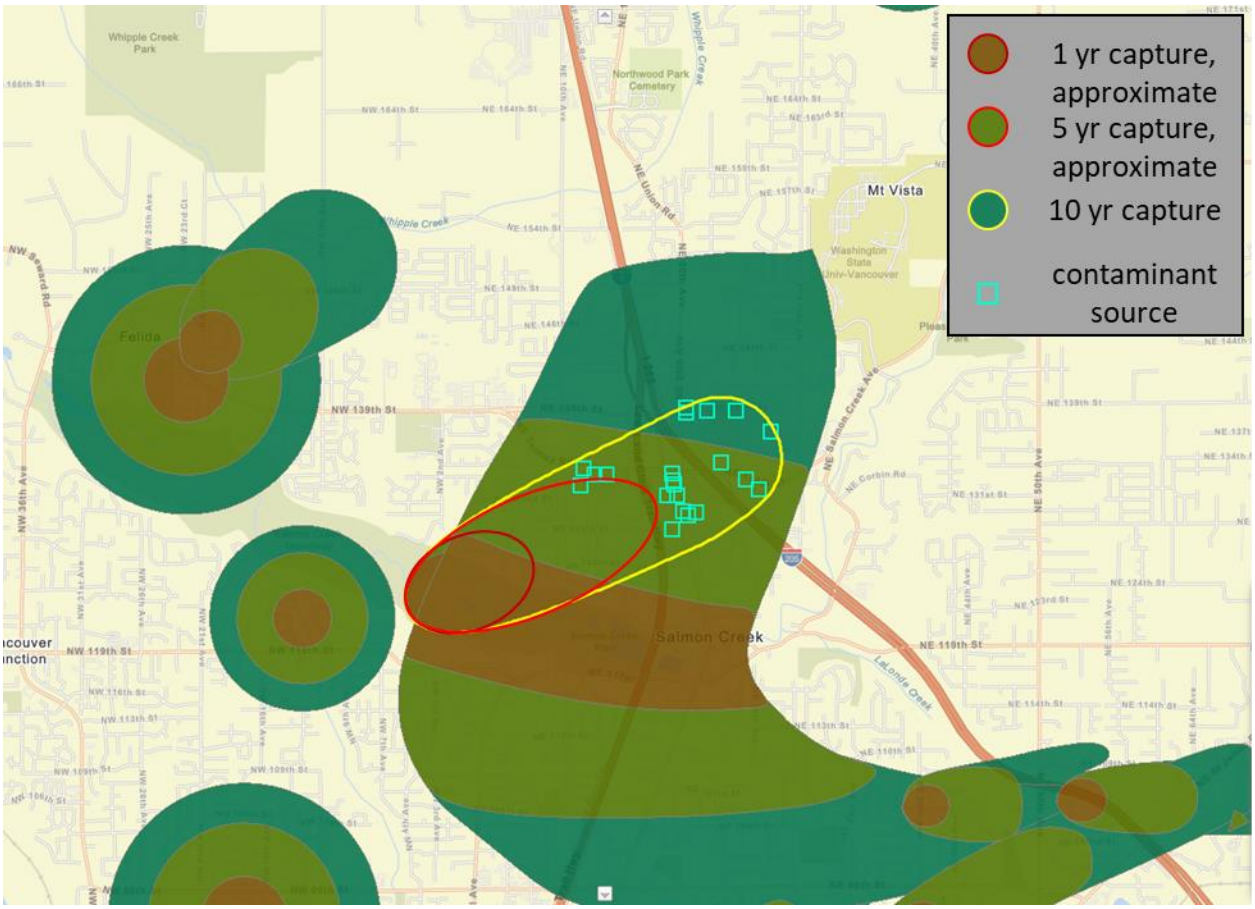


Figure K-15. Map of wells #18.1 and #21– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-30. Wells #18.1 and #21 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
ASTRO WESTERN STATION 607	Underground Storage Tank	13117 NE HIGHWAY 99	98686	I
ASTRO WESTERN STATION 607	Independent Remedial Actn Prg	13117 NE HIGHWAY 99	98686	I
ASTRO WESTERN STATION 607	LUST Facility	13117 NE HIGHWAY 99	98686	A
ASTRO WESTERN STATION 607	Voluntary Cleanup Sites	13117 NE HIGHWAY 99	98686	I
AT&T SALMON CREEK	Emergency/Haz Chem Rpt TIER2	13404 NE 20TH	98686	I
Black Rock Coffee Bar	Underground Injection Control	13309 Ne 20th Ave	98685	A
Canyon Creek Subdivision	SEA Project Site	16706 NE 29TH AVE	98686	A
Carousel Cleaners	Hazardous Waste Generator	13023 NE HWY 99	98686	I
COMCAST CABLE COMMUNICATIONS VANCOUVER 2	Emergency/Haz Chem Rpt TIER2	1311 NE 134TH ST	98685	I

EXPRESSWAY FOOD STORE NO 609	Underground Storage Tank	1309A 134TH ST NE	98685-2746	A
EXPRESSWAY FOOD STORE NO 609	Emergency/Haz Chem Rpt TIER2	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	Emergency/Haz Chem Rpt TIER2	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	LUST Facility	1309A 134TH ST NE	98685-2746	I
EXPRESSWAY FOOD STORE NO 609	Voluntary Cleanup Sites	1309A 134TH ST NE	98685-2746	I
EXXON STATION 73594	LUST Facility	13204 NE HWY 99	98665	I
EXXON STATION 73594	Underground Storage Tank	13204 NE HWY 99	98665	I
EXXON STATION 73594	Voluntary Cleanup Sites	13204 NE HWY 99	98665	I
EXXON STATION 73594	Voluntary Cleanup Sites	13204 NE HWY 99	98665	I
L & C Deli & Vista Mart	LUST Facility	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli & Vista Mart	Underground Storage Tank	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli & Vista Mart	State Cleanup Site	13908 & 13912 NE 20TH AVE	98686	I
L & C Deli Hazel Dell	Hazardous Waste Generator	NE 20TH AVE & 139TH ST NE	98665	I
LEGACY SALMON CREEK HOSPITAL	Enforcement Final	2217 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Emergency/Haz Chem Rpt TIER2	2211 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Generator	2211 NE 139TH ST	98686	I
Legacy Salmon Creek Hospital Vancouver	Underground Storage Tank	2211 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Generator	2211 NE 139TH ST	98686	A
Legacy Salmon Creek Hospital Vancouver	Haz Waste Management Activity	2211 NE 139TH ST	98686	I
Legacy Salmon Creek Hospital Vancouver	Hazardous Waste Planner	2211 NE 139TH ST	98686	I
LIL COLONEL DRIVE IN	Voluntary Cleanup Sites	13309 NE HIGHWAY 99	98686	A
LIL COLONEL DRIVE IN	Voluntary Cleanup Sites	13309 NE HIGHWAY 99	98686	A
Lofts at 134th St	Construction SW GP	2220 NE 134TH ST	98686	A
OFFICER PROPERTY OIL PITS	Independent Remedial Actn Prg	2505 NE 134TH ST	98686	I
OFFICER PROPERTY OIL PITS	Hazardous Waste Generator	2505 NE 134TH ST	98686	I
SAFEWAY FUEL CENTER HWY 99	Underground Storage Tank	13023 NE HWY 99	98686	A
Safeway Store 1842	Hazardous Waste Generator	13023 NE Hwy 99	98686	A
SALMON CREEK ARCO AM PM	Underground Storage Tank	2619 NE 134TH ST	98686	A
SOUTHLAND CORP 234224279	Underground Storage Tank	12908 NE HWY 99	98686-2726	A

SOUTHLAND CORP 234224279	Emergency/Haz Chem Rpt TIER2	12908 NE HWY 99	98686-2726	I
SOUTHLAND CORP 234224279	State Cleanup Site	12908 NE HWY 99	98686-2726	A
STATION 3 VANCOUVER	Underground Storage Tank	13419 NE CLARK RD	98685	I
Unocal 6166	Underground Injection Control	13218 NE Highway 99	98686	A
UNOCAL SERVICE STATION 6166	Underground Storage Tank	13218 NE HWY 99	98686	A
UNOCAL SERVICE STATION 6166	Emergency/Haz Chem Rpt TIER2	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	Hazardous Waste Generator	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	Haz Waste Management Activity	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	LUST Facility	13218 NE HWY 99	98686	I
UNOCAL SERVICE STATION 6166	LUST Facility	13218 NE HWY 99	98686	A
UNOCAL SERVICE STATION 6166	Voluntary Cleanup Sites	13218 NE HWY 99	98686	I

1. Except for L&C Deli Hazel Dell (located in Hazel Dell), all facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/12/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.16 Well #33

Table K–31. Wellhead Information[1]

Source Number	50
Well Name	Well #33 AEJ476
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	477
Well Tag	AEJ476
Protection Area Type	CFR
SAS TOT 6 mo	580
SAS TOT 1 yr	820
SAS TOT 5 yr	1830
SAS TOT 10 yr	2590
SAS Design Capacity	1200
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 02E, 08, SWSE
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

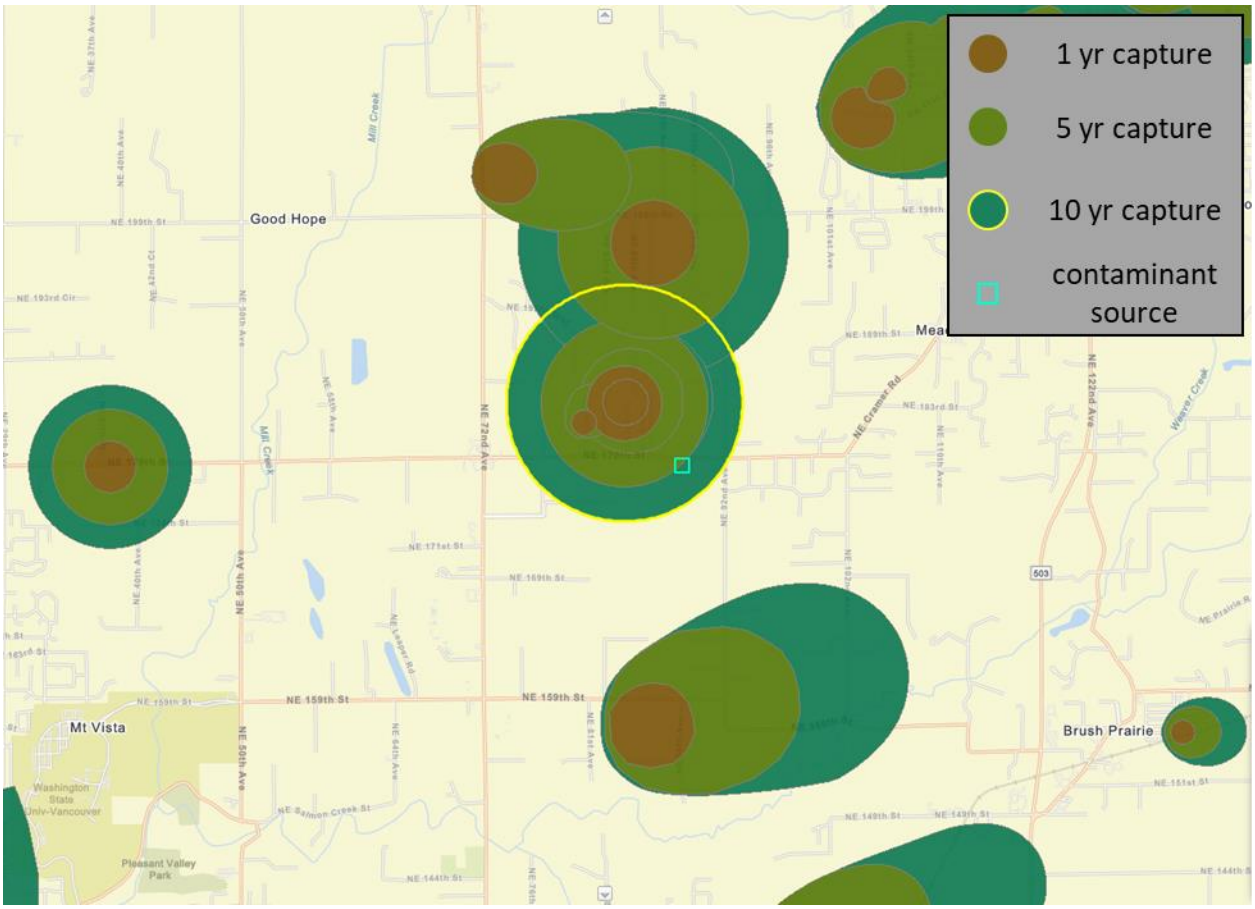


Figure K-16. Map of well #33 – 1-, 5-, and 10-year capture zones and the contaminant source located within them.

Table K-32. Well #33 – contamination source and its location.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Drug Lab Cleanup 7005 NE 179th	Hazardous Waste Generator	7005 NE 179th St	98686	I

1. The facility in this table is located in the City of Vancouver within the well's capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: I means *inactive*.

1.17 Well #8.2

Table K–33. Wellhead Information[1]

Source Number	51
Well Name	Well #8.2 AFE652
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	812
Well Tag	AFE652
Protection Area Type	CFR
SAS TOT 6 mo	669
SAS TOT 1 yr	946
SAS TOT 5 yr	2115
SAS TOT 10 yr	2991
SAS Design Capacity	1100
Susceptibility	High
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	02N, 01E, 04, NENW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

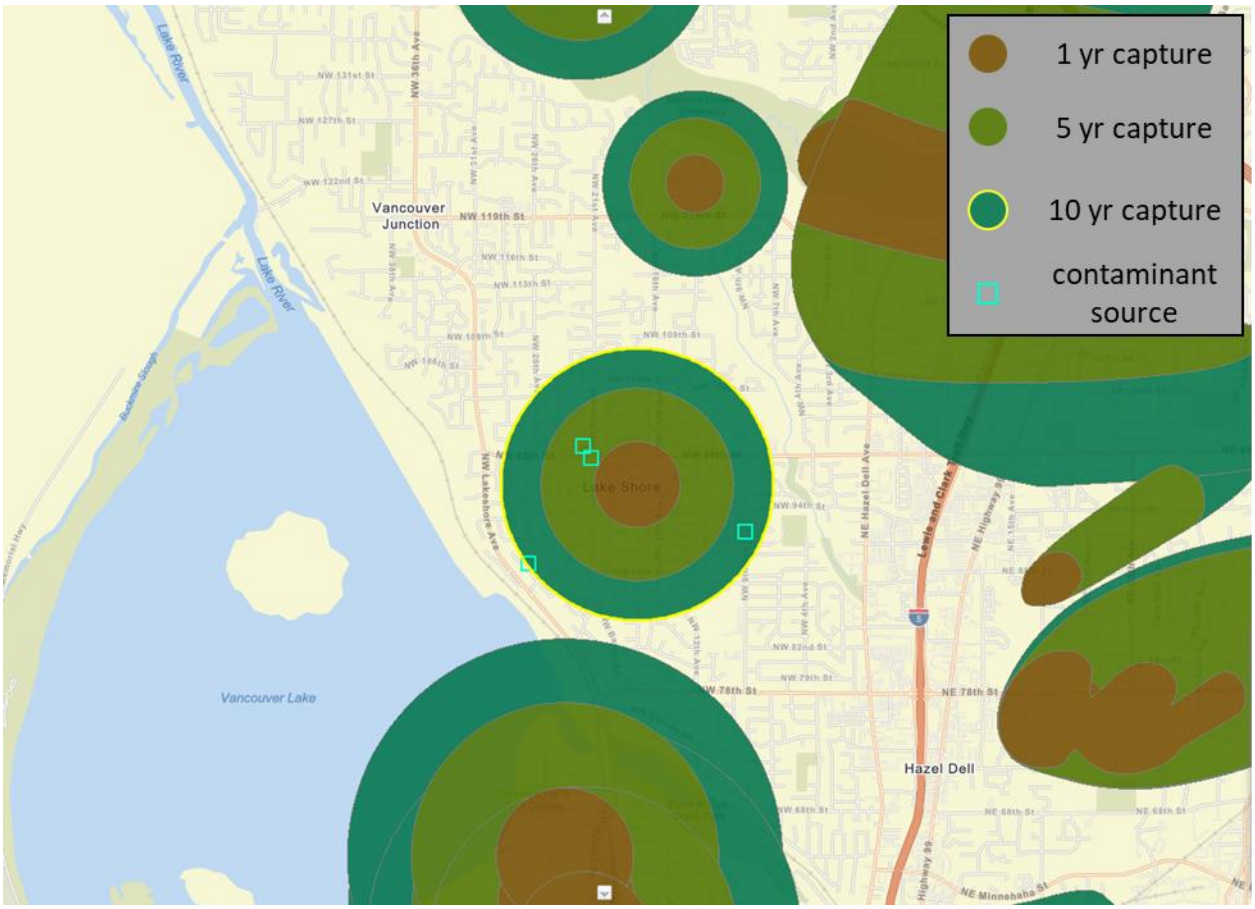


Figure K-17. Map of well #8.2– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-34. Well #8.2 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
ALL SAINTS EPISCOPAL CHURCH SOCCER FIELDS CRP 400969	Construction SW GP	2206 NW 99TH ST	98665	I
Costigan Property	State Cleanup Site	8815 NW LAKECREST AVE	98665	A
Costigan Property	Voluntary Cleanup Sites	8815 NW LAKECREST AVE	98665	A
LAKESHORE NEIGHBORHOOD PARK	Construction SW GP	NW 21ST AVE & NW 99TH ST	98665	I
Phils Repair	Hazardous Waste Generator	903 NW 92ND ST	98665	I

1. All facilities in this table are located in the City of Vancouver within the well's capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.18 Well #32

Table K–35. Wellhead Information[1]

Source Number	53
Well Name	Well #32 AFR834
Type	Ground Water – Well
Use	Seasonal
Status	Active
Well Depth	533
Well Tag	AFR834
Protection Area Type	CFR
SAS TOT 6 mo	414
SAS TOT 1 yr	587
SAS TOT 5 yr	1724
SAS TOT 10 yr	1857
SAS Design Capacity	1206
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	N
TRS	04N, 01E, 22, NESE
WRIA	27, Lewis

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

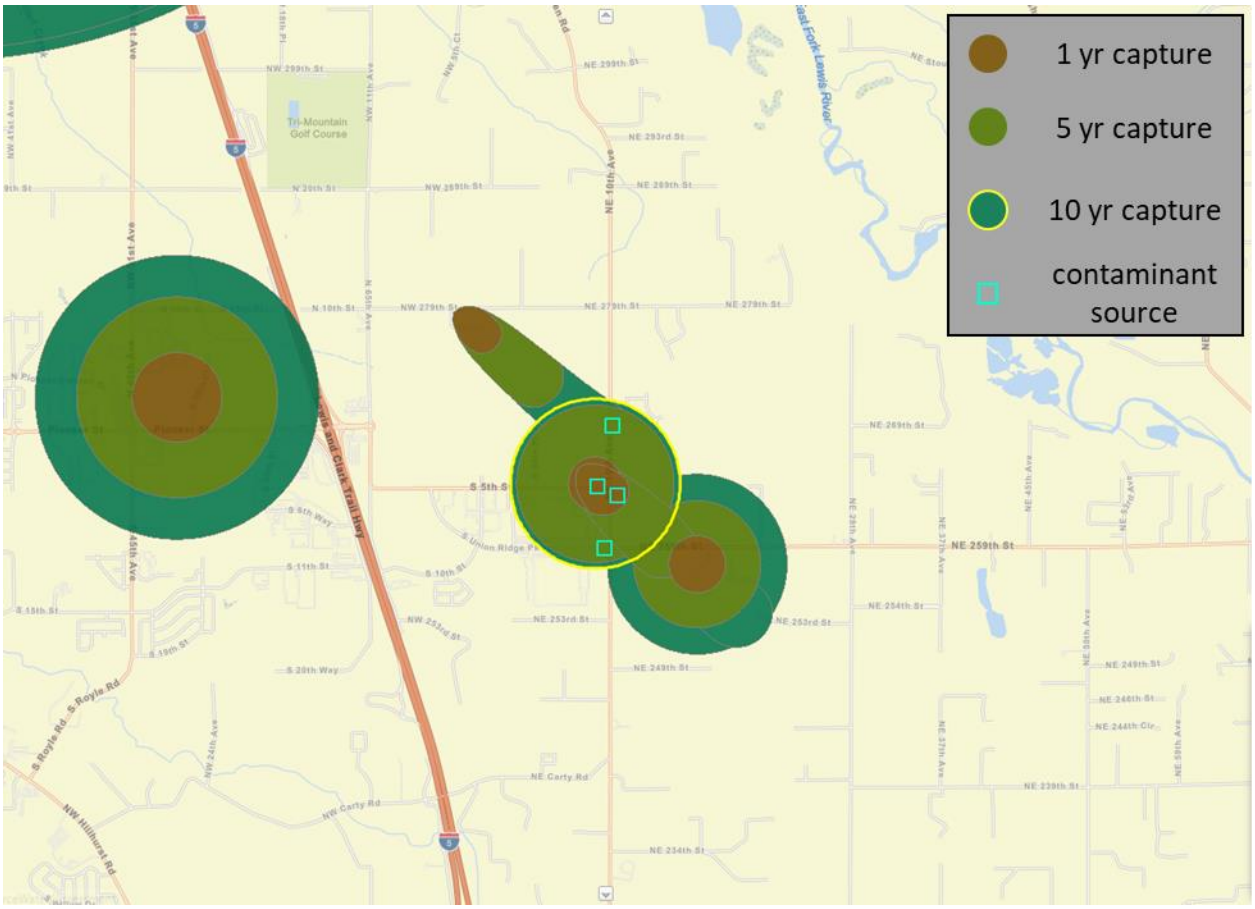


Figure K-18. Map of well #32– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-36. Well #32 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
ADAMS PIONEER MARKET 109	Emergency/Haz Chem Rpt TIER2	26410 10TH NE	98642-9743	I
ADAMS PIONEER MARKET 109	LUST Facility	26410 10TH NE	98642-9743	I
ADAMS PIONEER MARKET 109	Underground Storage Tank	26410 10TH NE	98642-9743	A
ADAMS PIONEER MARKET 109	Voluntary Cleanup Sites	26410 10TH NE	98642-9743	I
Mountain View Business Park LLC	State Cleanup Site	8507 S 5TH ST	98642	A
Mountain View Business Park LLC	Voluntary Cleanup Sites	8507 S 5TH ST	98642	A
Mountain View Business Park LLC	Revised Site Visit Program	8507 S 5TH ST	98642	A
Mountain View Business Park LLC	Hazardous Waste Generator	8507 S 5TH ST	98642	I
Mountain View Dairy	Dairy	26821 NE 10th Ave	98642-9743	A
PIONEER POTATO SITE	State Cleanup Site	405 NE 259TH ST	98642	I
PIONEER POTATO SITE	Voluntary Cleanup Sites	405 NE 259TH ST	98642	I

1. All facilities in this table are located in the City of Ridgefield within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.19 Well #15.1

Table K–37. Wellhead Information[1]

Source Number	54
Well Name	Well #15.1 APN083
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	662
Well Tag	APN083
Protection Area Type	CFR
SAS TOT 6 mo	659
SAS TOT 1 yr	933
SAS TOT 5 yr	2085
SAS TOT 10 yr	2949
SAS Design Capacity	1400
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	N
TRS	03N, 01E, 21, SESW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

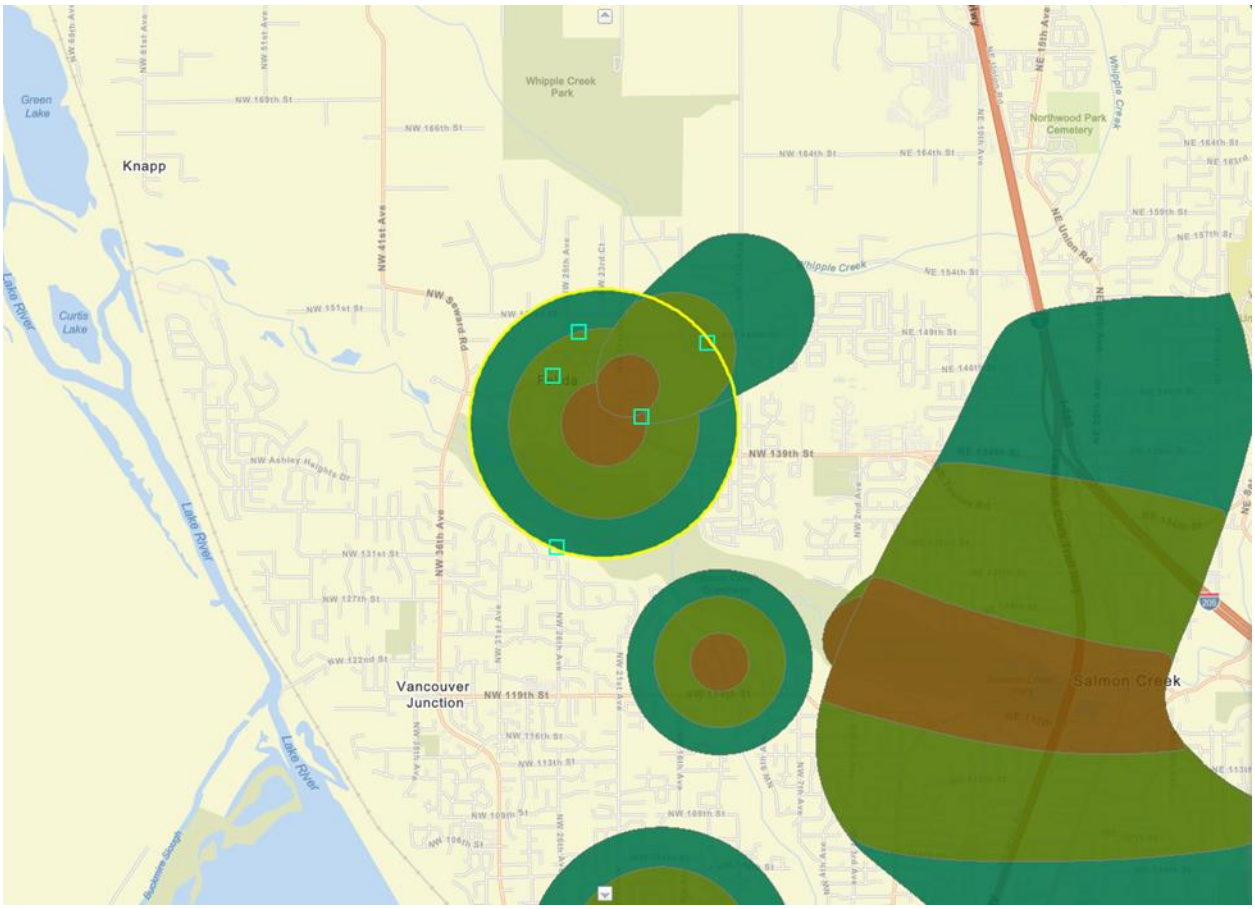


Figure K-19. Map of well #15.1– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-38. Well #15.1 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Alki Middle School	Hazardous Waste Generator	1800 NW Bliss Rd	98685	I
Alpha Ready Mix	Enforcement Final	1309 148TH ST	98685	A
Chinook Place	Construction SW GP	2504 NW Bliss Road	98685	A
TEAL POINTE SW RETROFIT 401632 CRP	Construction SW GP	NW 133RD NEAR TEAL POINTE SUBDIVISION	98668	I
Wild Glen Subdivision	Construction SW GP	2505 NW 151ST ST	98685	A

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.20 Well #13.1

Table K–39. Wellhead Information[1]

Source Number	55
Well Name	Well #13.1 AKW138
Type	Ground Water – Well
Use	Permanent
Status	Active
Well Depth	655
Well Tag	AKW138
Protection Area Type	CFR
SAS TOT 6 mo	454
SAS TOT 1 yr	643
SAS TOT 5 yr	1438
SAS TOT 10 yr	2034
SAS Design Capacity	1100
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	03N, 01E, 28, SWSW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

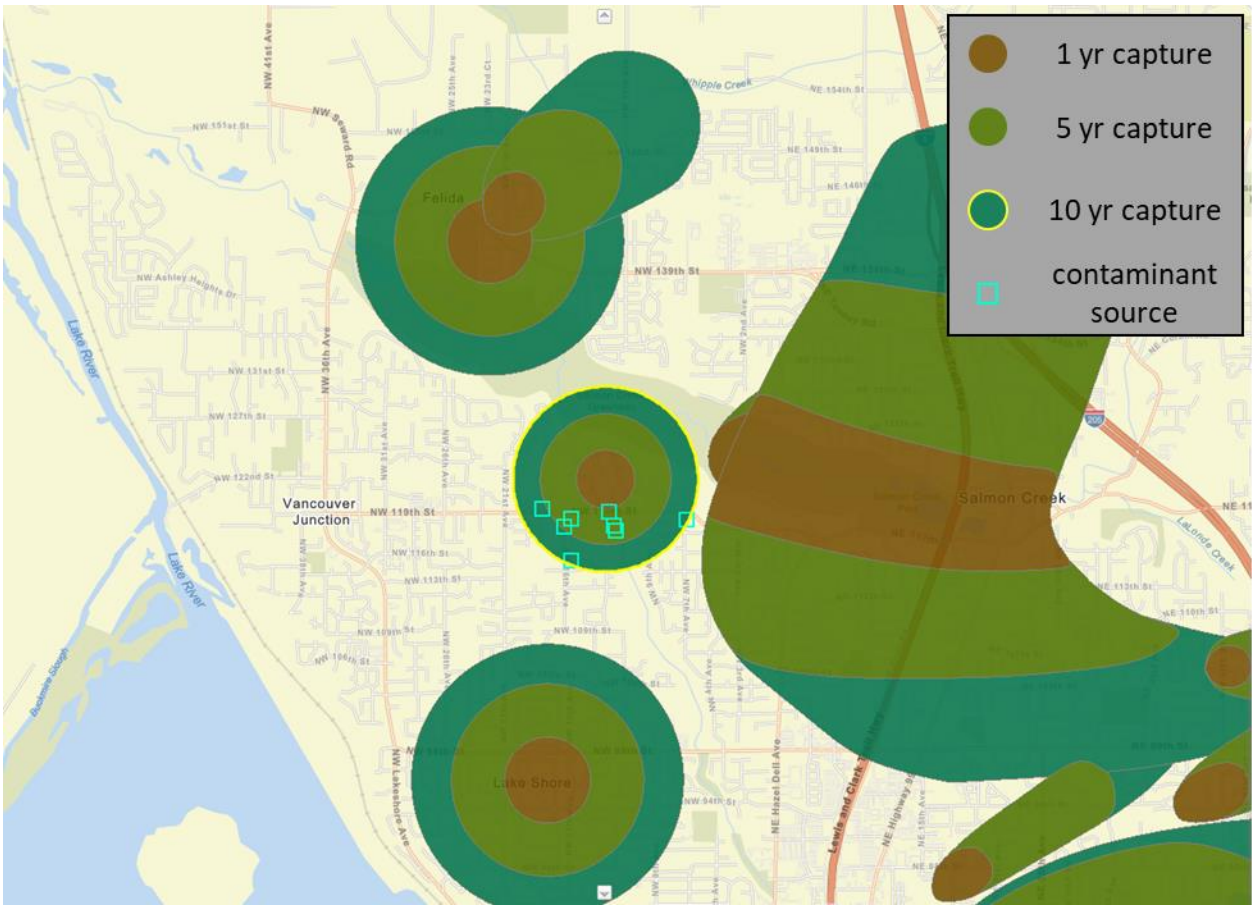


Figure K-20. Map of well #13.1– 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-40. Well #13.1 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
B & B COUNTRY STORE	Underground Storage Tank	1804 119TH ST NW	98665-0000	A
B & B COUNTRY STORE	LUST Facility	1804 119TH ST NW	98665-0000	A
BURTON RIDGE	Construction SW GP	1604 NW 119TH ST	98685	I
Clark Pud Lakeshore 1 Water St	Hazardous Waste Generator	111TH ST W OF 21ST AVE NW	98685	I
Cougar Creek Heights	Construction SW GP	11805 NW 16th Ave	98685	A
COUGAR CREEK WOODS	Construction SW GP	11515 NW 16TH AVE	98685	I
George Drug Lab	Hazardous Waste Generator	11917 NW 13TH AVE	98665	I
Kemper Short Plat	Construction SW GP	11817 NW 7th Ave	98685	A
SUMMERS PROPERTY	Independent Remedial Actn Prg	124 NW 11TH CT	98685	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/19/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.21 Well 58

Table K–41. Wellhead Information[1]

Source Number	58
Well Name	Well 58 BAA302 South Lake SGA-2
Type	Ground Water – Well Field Well
Use	Permanent
Status	Active
Well Depth	611
Well Tag	BAA302
Protection Area Type	CFR
SAS TOT 6 mo	1070
SAS TOT 1 yr	1512
SAS TOT 5 yr	3381
SAS TOT 10 yr	4782
SAS Design Capacity	2500
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	N
TRS	02N, 01E, 09, SWSE
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

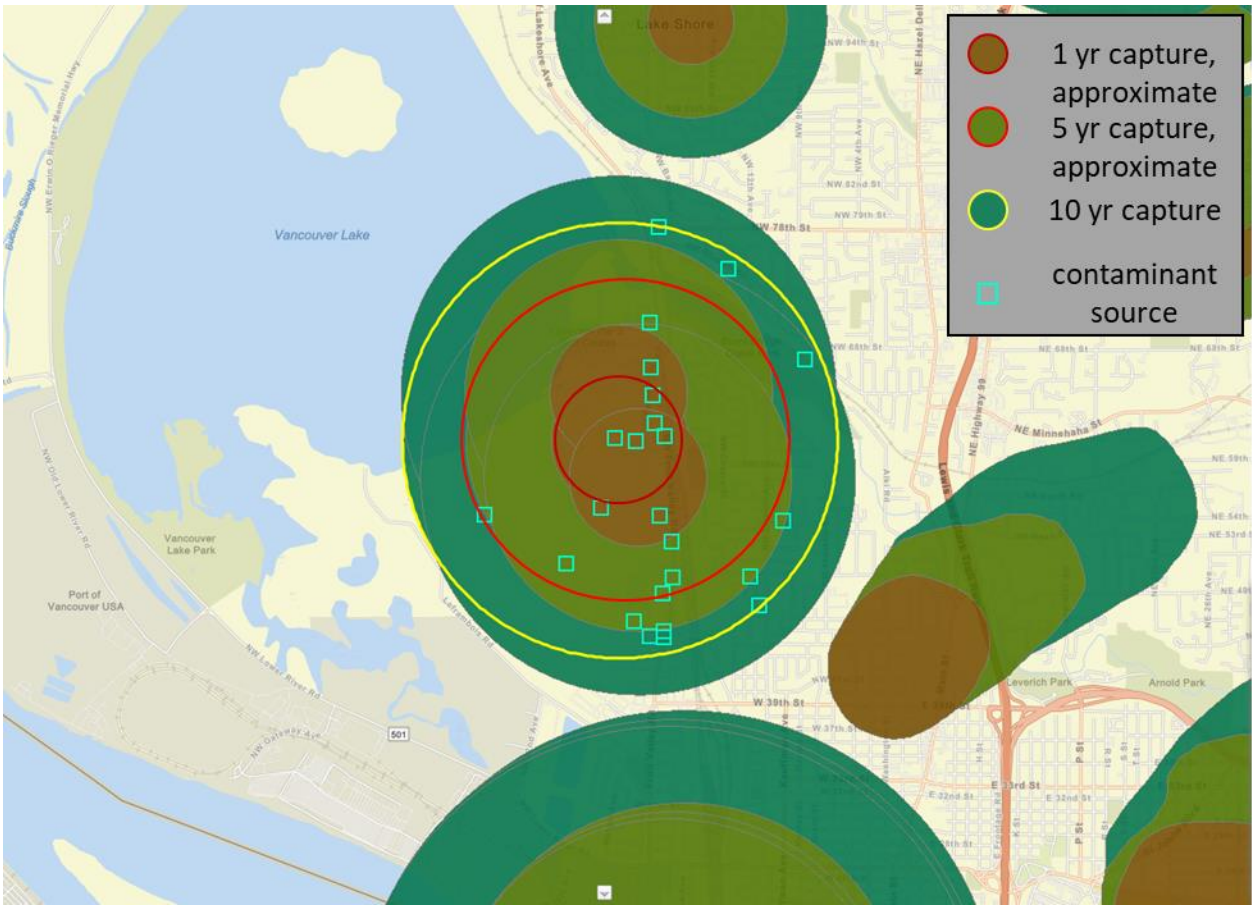


Figure K-21. Map of well 58 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-42. Well 58 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Clark County NW Overlook Dr	Underground Injection Control	NW Overlook Dr	98660	A
FIRESTONE PACIFIC FOODS	Emergency/Haz Chem Rpt TIER2	4320 NW FRUIT VALLEY RD	98660	A
Firestone Pacific Foods Cold Storage	Construction SW GP	4313 & 4611 NW Fruit Valley Rd	98660	A
Firestone Pacific Foods Cold Storage	Emergency/Haz Chem Rpt TIER2	4313 & 4611 NW Fruit Valley Rd	98660	A
Food Express Inc Fruit Valley Rd	Underground Storage Tank	3818 NW FRUIT VALLEY RD	98660	A
Food Express Inc Fruit Valley Rd	Haz Waste Management Activity	3818 NW FRUIT VALLEY RD	98660	I
Food Express Inc Fruit Valley Rd	Haz Waste Management Activity	3818 NW FRUIT VALLEY RD	98660	A
Food Express Inc Fruit Valley Rd	Hazardous Waste Generator	3818 NW FRUIT VALLEY RD	98660	I

Food Express Inc Fruit Valley Rd	Hazardous Waste Generator	3818 NW FRUIT VALLEY RD	98660	I
Frito Lay Inc	Underground Injection Control	4808 NW Fruite Valley Rd	98660	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Emergency/Haz Chem Rpt TIER2	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Underground Storage Tank	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Voluntary Cleanup Sites	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	LUST Facility	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Planner	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Industrial SW GP	4808 NW FRUIT VALLEY RD	98660-1242	A
GLIM Warehouse	Construction SW GP	2401 NW 61st Street	98660	I
HOP N SHOP FOOD STORE	Underground Storage Tank	1800 78TH ST NE	98665	A
HUNTINGTON PROPERTY	State Cleanup Site	1207 NW 49TH ST	98663	A
NALCO COMPANY	Hazardous Waste Generator	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Industrial SW GP	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Emergency/Haz Chem Rpt TIER2	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I

NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NuStar Vancouver 2 Terminal Annex	Underground Injection Control	5420 Nw Fruit Valley Rd	98660	A
Pac Paper Inc	Industrial SW GP	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	I
Pac Paper Inc	Emergency/Haz Chem Rpt TIER2	6416 NW WHITNEY RD	98665	A
PYLE PROPERTY	State Cleanup Site	4416 FRUIT VALLEY RD	98660	A
Rudys Reliable Auto Care Inc	Hazardous Waste Generator	6600 NW WHITNEY RD STE 2A	98665-7018	I
S Vancouver Lake Enhancement Project	SEA Project Site			A
SCHROEDER PROPERTY	State Cleanup Site	4613 NW LAVINA ST	98663	A
Shanky Residential Property	State Cleanup Site	908 NW 53RD ST	98663	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Emergency/Haz Chem Rpt TIER2	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Planner	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Industrial to ground SWDP IP	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	State Cleanup Site	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
Sunlight Supply Inc Vancouver	Underground Injection Control	4525 NW Fruit Valley Rd	98660	A
The Cove at Vancouver Lake	Construction SW GP	2008 & 2102 NW 69th Street	98665	A
Vancouver New Dist Maintenance Facility	Construction SW GP	6014 NW FRUIT VALLEY RD	98660	I
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I

Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	A
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Waste Transportation Services	Hazardous Waste Generator	7505 NW 13TH AVE	98665	I
WINSELL FARMS	Hazardous Waste Generator	6112 FRUIT VALLEY RD	98660-1252	I
WINSELL FARMS	Independent Remedial Actn Prg	6112 FRUIT VALLEY RD	98660-1252	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.22 Well 59

Table K–43. Wellhead Information[1]

Source Number	59
Well Name	Well 59 BAA303 South Lake SGA-3
Type	Ground Water – Well Field Well
Use	Permanent
Status	Active
Well Depth	595
Well Tag	BAA303
Protection Area Type	CFR
SAS TOT 6 mo	1070
SAS TOT 1 yr	1512
SAS TOT 5 yr	3381
SAS TOT 10 yr	4782
SAS Design Capacity	2500
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	N
TRS	02N, 01E, 09, NESW
WRIA	28, Salmon-Washougal

1. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

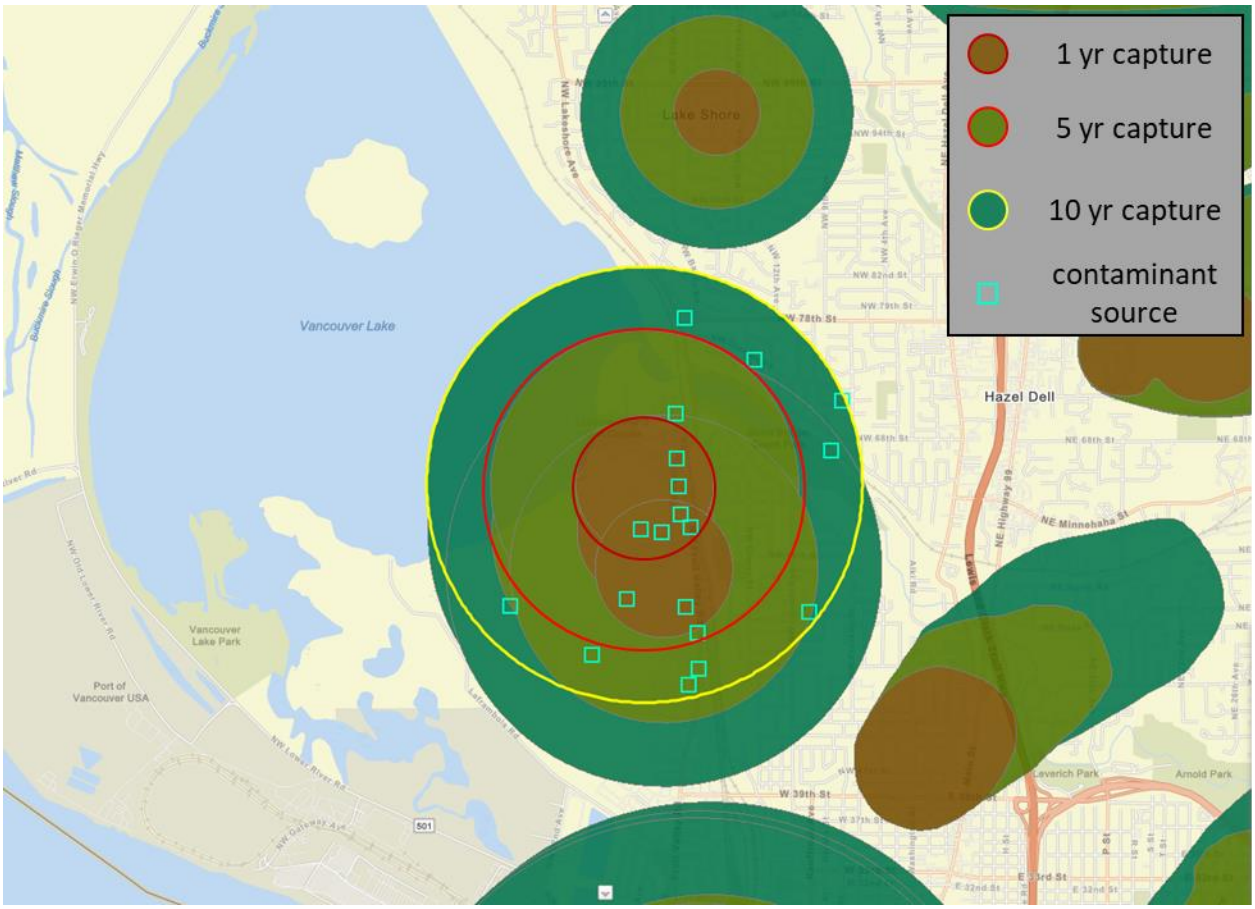


Figure K-22. Map of well 59 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-44. Well 59 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Clark County NW 72nd Circle	Underground Injection Control	NW 72nd Circle		A
Clark County NW Overlook Dr	Underground Injection Control	NW Overlook Dr	98660	A
Firestone Pacific Foods Cold Storage	Construction SW GP	4313 & 4611 NW Fruit Valley Rd	98660	A
Firestone Pacific Foods Cold Storage	Emergency/Haz Chem Rpt TIER2	4313 & 4611 NW Fruit Valley Rd	98660	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Emergency/Haz Chem Rpt TIER2	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	I

Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Underground Storage Tank	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Voluntary Cleanup Sites	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	LUST Facility	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Planner	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Industrial SW GP	4808 NW FRUIT VALLEY RD	98660-1242	A
GLIM Warehouse	Construction SW GP	2401 NW 61st Street	98660	I
HOP N SHOP FOOD STORE	Underground Storage Tank	1800 78TH ST NE	98665	A
NALCO COMPANY	Hazardous Waste Generator	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Industrial SW GP	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Emergency/Haz Chem Rpt TIER2	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NuStar Vancouver 2 Terminal Annex	Underground Injection Control	5420 Nw Fruit Valley Rd	98660	A
Pac Paper Inc	Industrial SW GP	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	I
Pac Paper Inc	Emergency/Haz Chem Rpt TIER2	6416 NW WHITNEY RD	98665	A

Rudys Reliable Auto Care Inc	Hazardous Waste Generator	6600 NW WHITNEY RD STE 2A	98665-7018	I
S Vancouver Lake Enhancement Project	SEA Project Site			A
Shanky Residential Property	State Cleanup Site	908 NW 53RD ST	98663	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Emergency/Haz Chem Rpt TIER2	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Planner	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Industrial to ground SWDP IP	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	State Cleanup Site	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
Sunlight Supply Inc Vancouver	Underground Injection Control	4525 NW Fruit Valley Rd	98660	A
The Cove at Vancouver Lake	Construction SW GP	2008 & 2102 NW 69th Street	98665	A
Vancouver New Dist Maintenance Facility	Construction SW GP	6014 NW FRUIT VALLEY RD	98660	I
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	A
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Waste Transportation Services	Hazardous Waste Generator	7505 NW 13TH AVE	98665	I
WINSELL FARMS	Hazardous Waste Generator	6112 FRUIT VALLEY RD	98660-1252	I
WINSELL FARMS	Independent Remedial Actn Prg	6112 FRUIT VALLEY RD	98660-1252	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.

2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.23 Well 64

Table K–45. Wellhead Information[1]

Source Number	64
Well Name	Well 64 BIP845 SGA-3
Type	Ground Water – Well Field Well
Use	Permanent
Status	Active
Well Depth	612
Well Tag	BIP845
Protection Area Type	CFR
SAS TOT 6 mo	1070
SAS TOT 1 yr	1512
SAS TOT 5 yr	3381
SAS TOT 10 yr	4782
SAS Design Capacity	2300
Susceptibility	Low
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	2NN, 1E, 16, NWNE
WRIA	28, Salmon-Washougal

2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

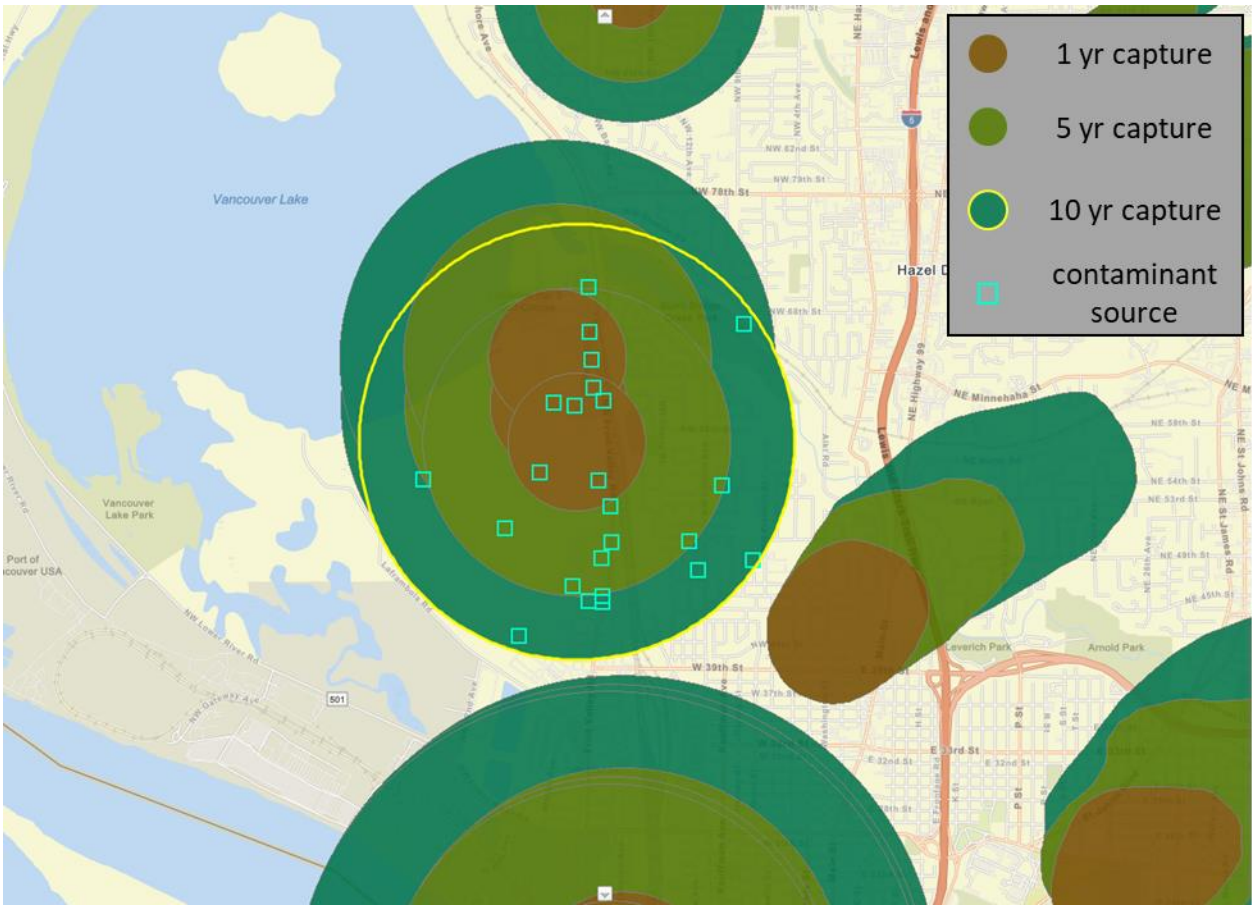


Figure K-23. Map of well 64 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-46. Well 64 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	Zip	Status[3]
Clark County NW Overlook Dr	Underground Injection Control	NW Overlook Dr	98660	A
FIRESTONE PACIFIC FOODS	Emergency/Haz Chem Rpt TIER2	4320 NW FRUIT VALLEY RD	98660	A
Firestone Pacific Foods Cold Storage	Construction SW GP	4313 & 4611 NW Fruit Valley Rd	98660	A
Firestone Pacific Foods Cold Storage	Emergency/Haz Chem Rpt TIER2	4313 & 4611 NW Fruit Valley Rd	98660	A
Food Express Inc Fruit Valley Rd	Underground Storage Tank	3818 NW FRUIT VALLEY RD	98660	A
Food Express Inc Fruit Valley Rd	Haz Waste Management Activity	3818 NW FRUIT VALLEY RD	98660	I
Food Express Inc Fruit Valley Rd	Haz Waste Management Activity	3818 NW FRUIT VALLEY RD	98660	A
Food Express Inc Fruit Valley Rd	Hazardous Waste Generator	3818 NW FRUIT VALLEY RD	98660	I

Food Express Inc Fruit Valley Rd	Hazardous Waste Generator	3818 NW FRUIT VALLEY RD	98660	I
Frito Lay Inc	Underground Injection Control	4808 NW Fruite Valley Rd	98660	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Emergency/Haz Chem Rpt TIER2	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Toxics Release Inventory	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Generator	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Underground Storage Tank	4808 NW FRUIT VALLEY RD	98660-1242	A
Frito Lay Vancouver	Voluntary Cleanup Sites	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	State Cleanup Site	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Haz Waste Management Activity	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	LUST Facility	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Hazardous Waste Planner	4808 NW FRUIT VALLEY RD	98660-1242	I
Frito Lay Vancouver	Industrial SW GP	4808 NW FRUIT VALLEY RD	98660-1242	A
GLIM Warehouse	Construction SW GP	2401 NW 61st Street	98660	I
HUNTINGTON PROPERTY	State Cleanup Site	1207 NW 49TH ST	98663	A
NALCO COMPANY	Hazardous Waste Generator	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Industrial SW GP	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Emergency/Haz Chem Rpt TIER2	5210 NW FRUIT VALLEY RD	98660-1245	A
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I
NALCO COMPANY	Toxics Release Inventory	5210 NW FRUIT VALLEY RD	98660-1245	I

NALCO COMPANY	Hazardous Waste Planner	5210 NW FRUIT VALLEY RD	98660-1245	I
NuStar Vancouver 2 Terminal Annex	Underground Injection Control	5420 Nw Fruit Valley Rd	98660	A
OUR LADY OF LOURDES PARISH	Underground Storage Tank	4701 FRANKLIN ST	98663-1718	I
Pac Paper Inc	Industrial SW GP	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	A
Pac Paper Inc	Hazardous Waste Generator	6416 NW WHITNEY RD	98665	I
Pac Paper Inc	Emergency/Haz Chem Rpt TIER2	6416 NW WHITNEY RD	98665	A
PYLE PROPERTY	State Cleanup Site	4416 FRUIT VALLEY RD	98660	A
Rudys Reliable Auto Care Inc	Hazardous Waste Generator	6600 NW WHITNEY RD STE 2A	98665-7018	I
S Vancouver Lake Enhancement Project	SEA Project Site			A
SCHROEDER PROPERTY	State Cleanup Site	4613 NW LAVINA ST	98663	A
Shanky Residential Property	State Cleanup Site	908 NW 53RD ST	98663	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Emergency/Haz Chem Rpt TIER2	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Planner	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Industrial to ground SWDP IP	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Enforcement Final	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Hazardous Waste Generator	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	State Cleanup Site	5420 NW FRUIT VALLEY RD	98660	A
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
ST Services Nustar Energy LP	Haz Waste Management Activity	5420 NW FRUIT VALLEY RD	98660	I
Sunlight Supply Inc Vancouver	Underground Injection Control	4525 NW Fruit Valley Rd	98660	A
The Cove at Vancouver Lake	Construction SW GP	2008 & 2102 NW 69th Street	98665	A
Vancouver New Dist Maintenance Facility	Construction SW GP	6014 NW FRUIT VALLEY RD	98660	I
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I

Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	A
Vancouver SD 37	Haz Waste Management Activity	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Vancouver SD 37	Hazardous Waste Generator	6000 Fruit Valley Rd	98660	I
Wellons Water Technology	Hazardous Waste Planner	2700 W FIRESTONE LN	98660	I
Wellons Water Technology	Hazardous Waste Generator	2700 W FIRESTONE LN	98660	I
Wellons Water Technology	Haz Waste Management Activity	2700 W FIRESTONE LN	98660	I
Wellons Water Technology	Emergency/Haz Chem Rpt TIER2	2700 W FIRESTONE LN	98660	A
Wellons Water Technology	Haz Waste Management Activity	2700 W FIRESTONE LN	98660	A
Wellons Water Technology	Hazardous Waste Generator	2700 W FIRESTONE LN	98660	I
Wellons Water Technology	Toxics Release Inventory	2700 W FIRESTONE LN	98660	A
WINSELL FARMS	Hazardous Waste Generator	6112 FRUIT VALLEY RD	98660-1252	I
WINSELL FARMS	Independent Remedial Actn Prg	6112 FRUIT VALLEY RD	98660-1252	I

1. All facilities in this table are located in the City of Vancouver within the wells' capture zone.
2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.24 Well PP-1

Table K–47. Wellhead Information[1]

Source Number	66
Well Name	Well PP-1 AA234
Type	Ground Water – Well Field Well
Use	Permanent
Status	Active
Well Depth	198
Well Tag	AA234
Protection Area Type	CFR
SAS TOT 6 mo	2741
SAS TOT 1 yr	3876
SAS TOT 5 yr	8668
SAS TOT 10 yr	12258
SAS Design Capacity	2500
Susceptibility	Moderate
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	05N,, 01E, 32, NWSW
WRIA	27, Lewis

3. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

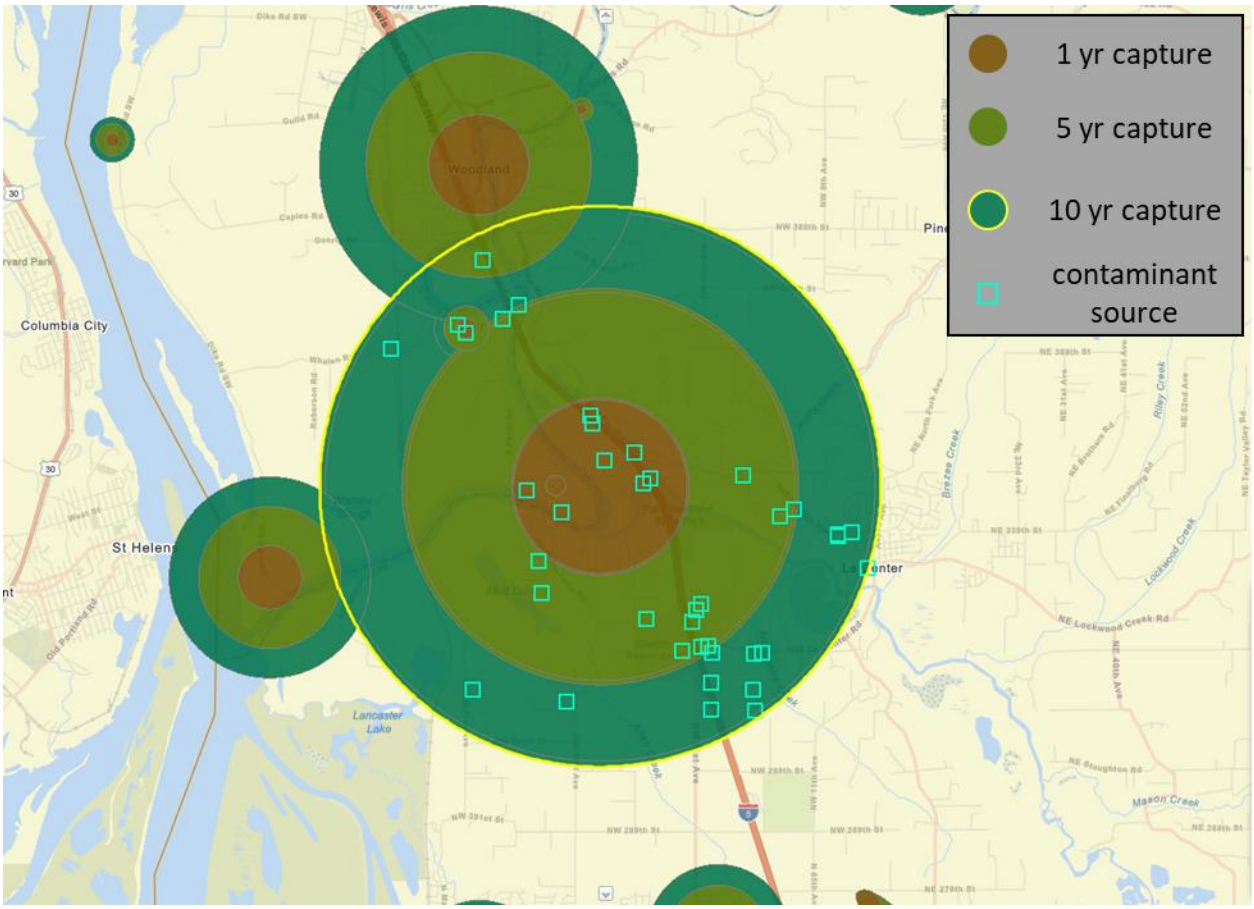


Figure K-24. Map of well PP-1 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-48. Well PP-1 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	City	Zip	Status[3]
ATT MOBILITY WOODLAND	Emergency/Haz Chem Rpt TIER2	5916 NW 334TH ST	RIDGEFIELD	98642	A
CACTUS JACKS	Underground Storage Tank	320 OLD PACIFIC HWY	LA CENTER	98629	A
CACTUS JACKS	LUST Facility	320 OLD PACIFIC HWY	LA CENTER	98629	I
CACTUS JACKS	Voluntary Cleanup Sites	320 OLD PACIFIC HWY	LA CENTER	98629	I
Carlson Woodwaste Dam	Dam Site				A
CIRCLE C LANDFILL	State Cleanup Site	31313 PARADISE PARK RD	RIDGEFIELD	98642	I
CIRCLE C LANDFILL	Underground Storage Tank	31313 PARADISE PARK RD	RIDGEFIELD	98642	I
CIRCLE C ROCK PRODUCTS	Enforcement Final	5611 NW 334TH ST	RIDGEFIELD	98642	A
CIRCLE C ROCK PRODUCTS	Sand and Gravel GP	5611 NW 334TH ST	RIDGEFIELD	98642	A

DONALD BROTHERS DAIRY	Dairy	424 WHALEN RD	WOODLAND	98674	A
Ferguson Brothers Farm LLC	Dairy	1129 S Pekin Rd	Woodland	98674-9536	A
Gee Creek Rest Area	Hazardous Waste Generator	I5 MI 14	RIDGEFIELD	98642	I
GNT Hauling	Revised Site Visit Program	32413 NE 41ST AVE	RIDGEFIELD	98642	A
GOODE CLUSTER SUBDVISION PHASE ONE	Construction SW GP	SW OF NW PACIFIC HWY & NW LARSEN RD	LA CENTER	98629	I
HANNAS FARM SUN COUNTRY HOMES	Construction SW GP	1025 NW PACIFIC HWY	LA CENTER	98629	I
Kays Subdivision	SEA Project Site	PACIFIC HWY	LA CENTER	98629	I
Kays Subdivision La Center	Construction SW GP		La Center	98629	A
KOCH TRACTOR	State Cleanup Site	3000 NW 309TH ST	RIDGEFIELD	98642	A
KOCH TRACTOR	Underground Storage Tank	3000 NW 309TH ST	RIDGEFIELD	98642	I
KOCH TRACTOR	Hazardous Waste Generator	3000 NW 309TH ST	RIDGEFIELD	98642	I
KWRL School Bus Facility	Construction SW GP	32407 NW 31st Avenue	Ridgefield	98642	A
KWRL School Bus Facility Parking Lot Exp	Construction SW GP	32519 NW 31st Ave	Ridgefield	98642	A
La Center Drug Dump	Hazardous Waste Generator	NEAR LA CENTER	LA CENTER	98629	I
La Center Interchange Improvements	Construction SW GP		La Center	98642	I
LA Center Road Pump Station Sewer	Construction SW GP	101 W 3rd St	La Center	98629	I
Moorehaven Slide Repair	Construction SW GP	NW Pacific Hwy	La Center	98629	I
Northwest Pipeline Ridgefield MS	Voluntary Cleanup Sites	30904 NW SPENCER RD	RIDGEFIELD	98642	I
Northwest Pipeline Ridgefield MS	Hazardous Waste Generator	30904 NW SPENCER RD	RIDGEFIELD	98642	I
Northwest Pipeline Ridgefield MS	Haz Waste Management Activity	30904 NW SPENCER RD	RIDGEFIELD	98642	I
PARADISE CFN	Underground Storage Tank	2814 NW 319TH ST	RIDGEFIELD	98642	A
Paradise Point State Park	Construction SW GP	35306 Toenjes to 32401 Paradise	Ridgefield	98642	A
Paradise Point Transmission Main	Construction SW GP		Ridgefield	98642	I
Paradise Pont Wellfield	Construction SW GP	35306 NW TOENJES RD	WOODLAND	98674	A
PARADISE QUICK STOP	Underground Storage Tank	2814 NW 319TH ST	RIDGEFIELD	98642-0000	A
PARADISE QUICK STOP	Voluntary Cleanup Sites	2814 NW 319TH ST	RIDGEFIELD	98642-0000	I
PINKERTON DR FILL	Enforcement Final	218 PINKERTON DR	WOODLAND	98764	A

PINKERTON DR FILL	Construction SW GP	218 PINKERTON DR	WOODLAND	98764	I
Ridgefield Forest Practices	Construction SW GP		Ridgefield	98642	I
Riverside Estates Subdivision	Construction SW GP	1514 NW 339th St	La Center	98629	A
Southbound I5 MP 9	State Cleanup Site				A
UNITED SALVAGE	Voluntary Cleanup Sites	3306 NW 319TH ST	LA CENTER	98642-9785	I
VANDER SALM BULB FARM INC	Underground Storage Tank	35306 NW TOENJES RD	WOODLAND	98674	I
VANDER SALM BULB FARM INC	LUST Facility	35306 NW TOENJES RD	WOODLAND	98674	I
WA DOT I5 Lewis River Bridge	Hazardous Waste Generator	I5 MP 19.83	Ridgefield	98642	I
WA DOT I-5 N Fork Lewis River	Construction SW GP	I-5 MP 19.83 to 20.08	Woodland	98674	I
WA ECY Toenjes Rd Abandoned Drum	Hazardous Waste Generator	NW TOENJES RD	LA CENTER	98629	I
WALTS WHOLESALE MEATS INC	Enforcement Final	350 S PEKIN RD	WOODLAND	98674-9534	A
West Coast Training Center	Construction SW GP	S Pekin Road	Woodland	98674	I
White Timber	Hazardous Waste Generator	275 PINKERTON RD	WOODLAND	98674	I
WOODLAND MAINTENANCE SITE	Underground Storage Tank	38404 NW Lakeshore Dr	WOODLAND	98674	A
WOODLAND MAINTENANCE SITE	LUST Facility	38404 NW Lakeshore Dr	WOODLAND	98674	A

1. All facilities in this table are located within the wells' capture zone.
2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

1.25 Well PP-4

Table K–49. Wellhead Information[1]

Source Number	67
Well Name	Well PP-4 BCS893
Type	Ground Water – Well Field Well
Use	Permanent
Status	Active
Well Depth	199
Well Tag	BCS893
Protection Area Type	CFR
SAS TOT 6 mo	2685
SAS TOT 1 yr	3796
SAS TOT 5 yr	8489
SAS TOT 10 yr	12005
SAS Design Capacity	2500
Susceptibility	Moderate
Drought Indicator	N
Flood Indicator	N
Surface Indicator	U
TRS	05N,, 01E, 32, NWSW
WRIA	27, Lewis

1. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).

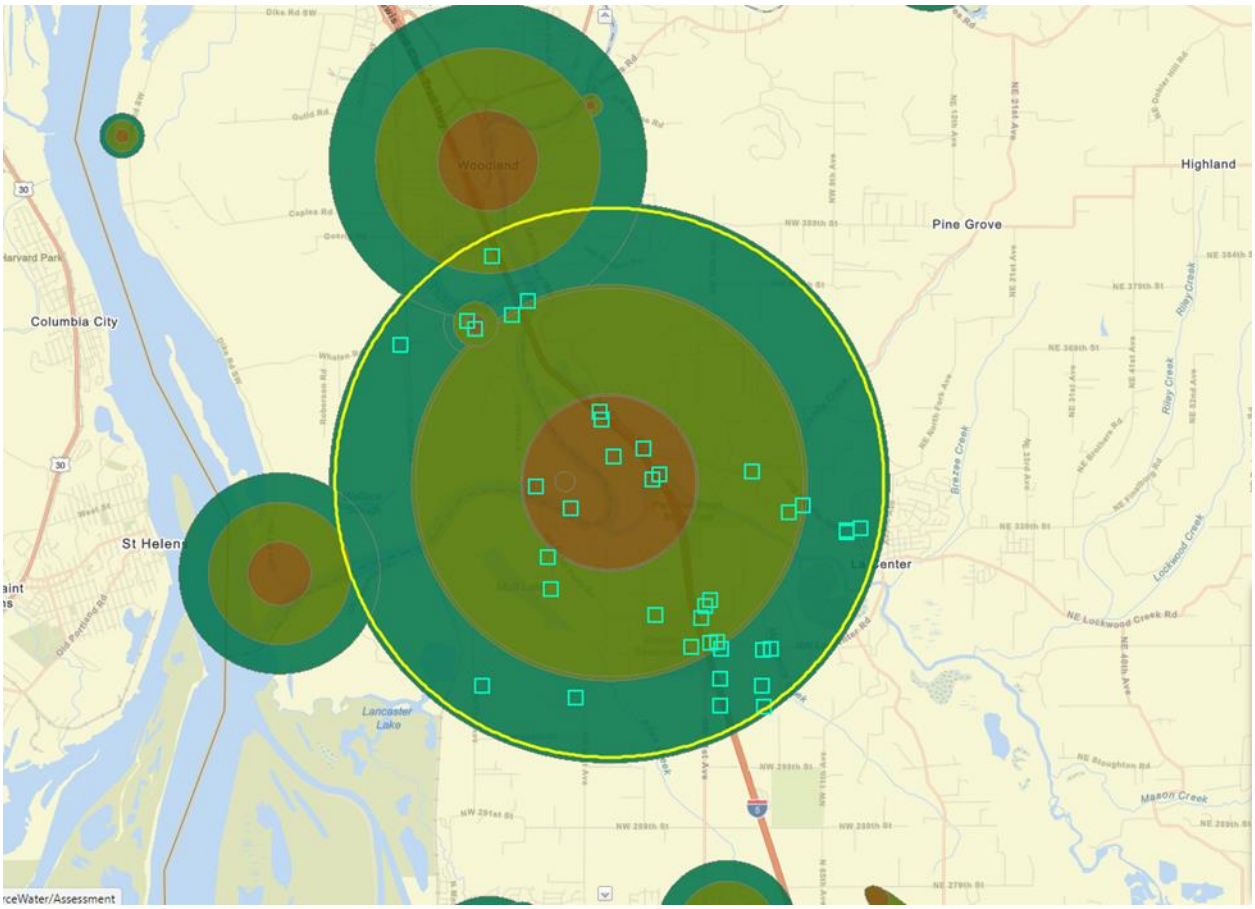


Figure K-25. Map of well PP-4 – 1-, 5-, and 10-year capture zones and the contaminant sources located within them.

Table K-50. Well PP-4 – contamination sources and their locations.[1,2]

Facility Name	Interaction	Street	City	Zip	Status[3]
ATT MOBILITY WOODLAND	Emergency/Haz Chem Rpt TIER2	5916 NW 334TH ST	RIDGEFIELD	98642	A
Carlson Woodwaste Dam	Dam Site				A
CIRCLE C LANDFILL	State Cleanup Site	31313 PARADISE PARK RD	RIDGEFIELD	98642	I
CIRCLE C LANDFILL	Underground Storage Tank	31313 PARADISE PARK RD	RIDGEFIELD	98642	I
CIRCLE C ROCK PRODUCTS	Enforcement Final	5611 NW 334TH ST	RIDGEFIELD	98642	A
CIRCLE C ROCK PRODUCTS	Sand and Gravel GP	5611 NW 334TH ST	RIDGEFIELD	98642	A
DONALD BROTHERS DAIRY	Dairy	424 WHALEN RD	WOODLAND	98674	A
Ferguson Brothers Farm LLC	Dairy	1129 S Pekin Rd	Woodland	98674-9536	A
Gee Creek Rest Area	Hazardous Waste Generator	I5 MI 14	RIDGEFIELD	98642	I

GOODE CLUSTER SUBDVISION PHASE ONE	Construction SW GP	SW OF NW PACIFIC HWY & NW LARSEN RD	LA CENTER	98629	I
HANNAS FARM SUN COUNTRY HOMES	Construction SW GP	1025 NW PACIFIC HWY	LA CENTER	98629	I
Kays Subdivision	SEA Project Site	PACIFIC HWY	LA CENTER	98629	I
Kays Subdivision La Center	Construction SW GP		La Center	98629	A
KOCH TRACTOR	State Cleanup Site	3000 NW 309TH ST	RIDGEFIELD	98642	A
KOCH TRACTOR	Hazardous Waste Generator	3000 NW 309TH ST	RIDGEFIELD	98642	I
KOCH TRACTOR	Underground Storage Tank	3000 NW 309TH ST	RIDGEFIELD	98642	I
KWRL School Bus Facility	Construction SW GP	32407 NW 31st Avenue	Ridgefield	98642	A
KWRL School Bus Facility Parking Lot Exp	Construction SW GP	32519 NW 31st Ave	Ridgefield	98642	A
La Center Drug Dump	Hazardous Waste Generator	NEAR LA CENTER	LA CENTER	98629	I
La Center Interchange Improvements	Construction SW GP		La Center	98642	I
LA Center Road Pump Station Sewer	Construction SW GP	101 W 3rd St	La Center	98629	I
Moorehaven Slide Repair	Construction SW GP	NW Pacific Hwy	La Center	98629	I
Northwest Pipeline Ridgefield MS	Hazardous Waste Generator	30904 NW SPENCER RD	RIDGEFIELD	98642	I
Northwest Pipeline Ridgefield MS	Haz Waste Management Activity	30904 NW SPENCER RD	RIDGEFIELD	98642	I
Northwest Pipeline Ridgefield MS	Voluntary Cleanup Sites	30904 NW SPENCER RD	RIDGEFIELD	98642	I
PARADISE CFN	Underground Storage Tank	2814 NW 319TH ST	RIDGEFIELD	98642	A
Paradise Point State Park	Construction SW GP	35306 Toenjes to 32401 Paradise	Ridgefield	98642	A
Paradise Point Transmission Main	Construction SW GP		Ridgefield	98642	I
Paradise Pont Wellfield	Construction SW GP	35306 NW TOENJES RD	WOODLAND	98674	A
PARADISE QUICK STOP	Underground Storage Tank	2814 NW 319TH ST	RIDGEFIELD	98642-0000	A
PARADISE QUICK STOP	Voluntary Cleanup Sites	2814 NW 319TH ST	RIDGEFIELD	98642-0000	I
PINKERTON DR FILL	Construction SW GP	218 PINKERTON DR	WOODLAND	98764	I
PINKERTON DR FILL	Enforcement Final	218 PINKERTON DR	WOODLAND	98764	A
Ridgefield Forest Practices	Construction SW GP		Ridgefield	98642	I
Riverside Estates Subdivision	Construction SW GP	1514 NW 339th St	La Center	98629	A
Southbound I5 MP 9	State Cleanup Site				A
UNITED SALVAGE	Voluntary Cleanup Sites	3306 NW 319TH ST	LA CENTER	98642-9785	I
VANDER SALM BULB FARM INC	LUST Facility	35306 NW TOENJES RD	WOODLAND	98674	I

VANDER SALM BULB FARM INC	Underground Storage Tank	35306 NW TOENJES RD	WOODLAND	98674	I
WA DOT I5 Lewis River Bridge	Hazardous Waste Generator	I5 MP 19.83	Ridgefield	98642	I
WA DOT I-5 N Fork Lewis River	Construction SW GP	I-5 MP 19.83 to 20.08	Woodland	98674	I
WA ECY Toenjes Rd Abandoned Drum	Hazardous Waste Generator	NW TOENJES RD	LA CENTER	98629	I
WALTS WHOLESALE MEATS INC	Enforcement Final	350 S PEKIN RD	WOODLAND	98674-9534	A
West Coast Training Center	Construction SW GP	S Pekin Road	Woodland	98674	I
White Timber	Hazardous Waste Generator	275 PINKERTON RD	WOODLAND	98674	I
WOODLAND MAINTENANCE SITE	LUST Facility	38404 NW Lakeshore Dr	WOODLAND	98674	A
WOODLAND MAINTENANCE SITE	Underground Storage Tank	38404 NW Lakeshore Dr	WOODLAND	98674	A

1. All facilities in this table are located within the wells' capture zone.
2. Information in table up to date as of 07/26/2021 from SWAP Mapping Application (fortress.wa.gov/doh/swap).
3. For facility status: A means *active*; I means *inactive*.

L Consumer Confidence Report

Clark Public Utilities

WATER QUALITY REPORT FOR 2021

AS A CLARK PUBLIC UTILITIES WATER CUSTOMER

Your water exceeds the highest standards set for drinking water quality. It comes delivered to your home at a fraction of the cost of bottled water. Four gallons of water from your tap cost just a penny, while a single gallon of bottled water from the store can cost upward of $1.29. And by using tap water, you're saving money and not filling up landfills with plastic bottles!

This annual report provides details about the water you drink every day as one of our 37,050 Clark Public Utilities water customers. The bottom line: **The quality of your water is excellent.**

We test our water supply wells for the presence of more than 100 substances, and this report includes a chart showing you the levels of several regulated and non-regulated substances we detected in 2021. Our goal is to meet your need for a clean, plentiful supply of drinking water at a reasonable cost, while providing long-term management of our precious water resources.

Clark Public Utilities

Please contact us at **360-992-8022** or at **mailbox@clarkpud.com** if you have questions about any of the information in this water quality report. You also may contact the EPA Drinking Water Hotline at 1-800-426-4791.

WATERSHED RESTORATION

Our water utility supports one of the strongest watershed restoration and enhancement efforts in the state. We sponsor and participate in many projects to improve and protect our water quality, restore streams, enhance fish populations and educate children and adults alike about habitat and watershed stewardship. If you are a landowner along Salmon Creek or the East Fork Lewis River and would like have your stream restored call 360-992-8577.

StreamTeam Clark Public Utilities

Since 1992, our StreamTeam volunteers have planted more than 970,000 trees to restore over 500 acres of land along 19 miles of stream length. To volunteer, call our StreamTeam coordinator at 360-992-8585.

WATER USE EFFICIENCY PLAN

As part of Municipal Water Law and in the spirit of conservation and stewardship, Clark Public Utilities implemented a water use efficiency plan in 2008. As part of that plan, the following conservation goals were set:

- **Supply-side water conservation goal** — Reduce annual leakage from the water distribution system to 8.5 percent.
- **Demand-side water conservation goal** — Reduce average residential annual water consumption by a minimum of 1 percent.

In 2021, we accounted for all known water uses in each of the three water systems addressed in this report to determine water leakage amounts for each. On our Regional Water System, last year's water leakage was calculated at 8.03% which is less than the previous year. The Yacolt Water System water loss is 12.5%, lower than calculated last year. Amboy's Water Systems water loss is 11.3%, up from last year.

We continue to improve our operational water usage with improved tracking of water main flushing, water treatment, and source water equipment calibrations and upgrades. Communicating with local fire departments also helps us account for water they use. We make every effort to minimize leakage an all water systems to ensure water supplies are used efficiently.

Many improvements were made to help account for water we produce and deliver. In 2021 we replaced 839 water meters with new technology that measures water flow more accurately with the ability to read automatically.

WATER CONSERVATION TIPS

Conservation efforts help maintain a reliable, low-cost water supply that benefits current and future residents. Conservation also saves you money, especially in the summer months when water use is higher.

OUTDOOR CONSERVATION

- Water your lawn in the early morning or evening.
- Use a hose with a shut-off nozzle when watering plants or washing your car.
- Place a two- to four-inch layer of mulch around plants and trees to reduce evaporation.
- Install a trickle or drip irrigation system for a slow, steady supply of water to the plant roots.
- Incorporate drought resistant plants into your landscape that require less water.

INDOOR CONSERVATION

- Run your dishwasher only when it's full.
- Wash only full loads of laundry.
- Fix leaky faucets immediately.
- Take shorter showers and use less water in your bath.
- Check toilets for leaks.
- Install water-efficient toilets, faucets and shower heads.

A MESSAGE ABOUT WATER QUALITY

As water travels over land or through the ground, it dissolves naturally occurring minerals and may pick up substances resulting from human activity or the presence of animals. Substances that may be present in source water include: biological contaminants, such as viruses and bacteria; inorganic contaminants, such as salts and metals; pesticides and herbicides; organic chemicals from industrial or petroleum use; and natural or man-made radioactive materials.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants, but ***their presence does not necessarily indicate that water poses a health risk.*** More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

All stream water and other surface water should be considered not safe for drinking unless it's properly treated. Children are most likely to drink from surface water and need to be made aware of this health risk by a guardian.

WATER QUALITY SUMMARY

Clark Public Utilities' Regional Water System

Substance (measuring unit)	Highest Level Allowed (MCL)	Range of Level Detected	MCLG	Typical source of Contaminant
REGULATED AT THE WELL				
Copper (ppm)	1.3 (AL)	ND – 0.022	1.3	Naturally occuring mineral
Fluoride (ppm)	4	ND – 0.23	4	Naturally occurring mineral
Nitrate (ppm)	10	ND – 2.7	10	Runoff from fertilizer use; leakage from septic tanks, sewage; erosion of natural deposits
Arsenic (ppb)	10	ND – 3	0	Naturally occurring mineral
Gross Alpha (pCi/L)	15	ND – 2.37	0	Erosion of geological deposits
Radium 228 (pCi/L)	5	ND – 1.26	0	Erosion of geological deposits
REGULATED IN THE DISTRIBUTION SYSTEM				
Trihalomethane (ppb)		ND - 12	N/A	Chlorination by-products
Haloacetic Acids (ppb)		ND	N/A	Chlorination by-products
Trihalomethane Highest quarterly LRAA (ppb)*	80	7.5	N/A	
Haloacetic Acids Highest quarterly LRAA (ppb)*	60	0	N/A	
REGULATED AT THE CONSUMERS' TAP				
Lead (ppb) 2019	15(AL)	<1.0 – 1.9	0	Household plumbing
90th percentile		3.7	1 residence exceeded AL	
Copper (ppm) 2019	1.3 (AL)	<0.02 – 0.51	1.3	Household plumbing
90th percentile		0.29		
UNREGULATED AT THE WELL				
Bromide (ppb)	not established	ND - 410	N/A	Used in flame retardants, and over the counter medicines.
Manganese (ppb)	not established	ND - 66	N/A	Naturally occuring mineral
Sulfate (ppb)	not established	ND - 1.6	N/A	Naturally occuring mineral
Chloride (ppm)	not established	ND - 34	N/A	Naturally occuring mineral
Chloroform (ppm)	not established	ND - 2.3	N/A	Chlorination by-products
ADDITIONAL SUBSTANCES OF CUSTOMER INTEREST				
Sodium (ppm)	not regulated	Average 8.7	NA	Occurs naturally in soils
Calcium (ppm)	not regulated	Average 19.6	NA	Occurs naturally in soils
Magnesium (ppm)	not regulated	Average 9.7	NA	Occurs naturally in soils
Hardness (ppm)	not regulated	Average 82	NA	Occurs naturally in soils

* Localized Running Annual Average is the average for the last 4 quarterly sampling events.

WATER QUALITY EXCEEDS HIGHEST STANDARDS

Water is perhaps Clark County's most valuable natural and economic resource. Our health and the quality of our environment depend on access to clean water.

Your Clark Public Utilities water supply meets or exceeds all state and federal requirements for quality, and our top priority is to maintain an excellent level of quality in the water you drink. Our ongoing efforts to provide you with a healthy water supply include:

- Regularly testing all of our wells and distribution system — we do this more frequently than required by the state health department. Last year we tested 2,560 bacteriological samples, and we were only required to test 1,248.
- Checking water quality weekly at key locations throughout our distribution system.
- Testing for heavy metals, bacteria, organic compounds and other contaminants. Both the state health department and independent laboratories conduct these tests.
- Routinely inspecting our above-ground water storage reservoirs.

We keep our water as pure as possible, adding only a trace of chlorine necessary to ensure the water delivered to your home is free of harmful bacteria. We don't add any other chemicals such as fluoride to the water you drink.

Since virtually all water used in Clark County is well water, keeping contaminants out of surface water is critical, because those contaminants can eventually make their way into the groundwater that supplies area wells. Here are some easy things you can do to help prevent groundwater pollution:

- Don't dump motor oil, paint and other toxic materials into storm drains.
- Avoid or limit the use of herbicides, pesticides and fertilizers.
- Don't dump yard debris or grass clippings into ravines, ditches or streams.

WATER QUALITY SUMMARY

Clark Public Utilities' Amboy Water System

The Amboy supply well draws water from a highly productive aquifer that lies beneath Chelatchie Prairie. The water system was constructed and put into service in 1994 as a result of efforts by residents, business owners, Fire District 10 and the Amboy School. A 120,000-gallon storage reservoir provides fire flow capacity.

Substance (measuring unit)	Highest Level Allowed (MCL)	Range of Level Detected	MCLG	Description & Origin of Substance
REGULATED AT THE WELL				
Nitrate (ppm)	10	0.83 - 0.90	10	Runoff from fertilizer use; leakage from septic tanks, sewage; erosion of natural deposits
REGULATED IN THE DISTRIBUTION SYSTEM				
Trihalomethane (ppb)	80	0.76	NA	Chlorination by-products
REGULATED AT THE CONSUMERS' TAP				
Lead (ppb) 2021 90th percentile	15(AL)	ND - 2.9 1.9	0	Household plumbing
Copper (ppm) 2021 90th percentile	1.3 (AL)	ND - 0.26 0.18	1.3	Household plumbing
ADDITIONAL SUBSTANCES OF CUSTOMER INTEREST				
Sodium (ppm)	not regulated	7.3	NA	Occurs naturally in soils
Calcium (ppm)	not regulated	13.9	NA	Occurs naturally in soils
Hardness (ppm)	not regulated	50	NA	Occurs naturally in soils

GLOSSARY OF TERMS

Action Level (AL) – The concentration of a contaminant which, if exceeded, triggers additional treatment measures by the public water system.

Parts Per Billion (ppb) – Unit of measurement.
One part per billion is comparable to one penny out of $10,000,000.

Parts Per Million (ppm) – Unit of measurement. Equivalent to milligrams per liter.
One part per million is comparable to one penny out of $10,000.

Picocuries Per Liter (pCi/L) – Unit of measurement for radioactivity.

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water.

Maximum Contaminant Level Goal (MCLG) – The level of a contaminant in drinking water below which there are no known or expected risks to health.

NA – Not applicable

ND – Not detected

WATER UTILITY SERVICES

The Clark Public Utilities water services team works to provide you with excellent service. Our office is located at 8600 NE 117th Avenue in Orchards, and you can visit us there from 7 a.m. to 4 p.m. on weekdays, or contact us by phone at 360-992-8022. For after-hours emergencies, you can call the utility's general customer service number at 360-992-3000.

In addition to providing your water service, our staff can:

- Test your water if you have concerns about water quality.
- Provide information on home water treatment units, backflow protection devices and many other water-related items.
- Offer advice and suggestions for finding leaks in your water system.
- Provide information on backflow assembly installation and testing for lawn irrigation systems. Without a backflow assembly, your irrigation system could endanger the health of a household, neighborhood or community. Call us at 360-992-8589.

SPECIAL 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/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline (800-426-4791).

WATER QUALITY SUMMARY

Clark Public Utilities' Yacolt Water System

The town of Yacolt water system merged with Clark Public Utilities in November 2000. Our water sources are Well No. 403, located at the town park at 312 W. Humphrey Street, and Well Nos. 405 and 407 at the North Clark Little League ballfields, 202 W. Christy Street. The town has a wellhead protection plan available through Clark Public Utilities that provides more information about our water sources. These wells draw water from a shallow aquifer that occurs 25 to 95 feet below the ground's surface. Please call us at 360-992-8022 for more information.

Substance (measuring unit)	Highest Level Allowed (MCL)	Range of Level Detected	MCLG	Description & Origin of Substance
REGULATED AT THE WELL				
Nitrate (ppm)	10	2.8	10	Runoff from fertilizer use; leakage from septic tanks, sewage; erosion of natural deposits
REGULATED IN THE DISTRIBUTION SYSTEM				
Trihalomethane (ppb)	80	0.8	N/A	Chlorination by-products
REGULATED AT THE CONSUMERS' TAP				
Lead (ppb) 2019	15(AL)	<1 - 7.4	0	Household plumbing
90th percentile		4.2		
Copper (ppm) 2019	1.3 (AL)	<0.02 – 2.3	1.3	Household plumbing
			5 sites exceeded AL	
90th percentile		1.5		
ADDITIONAL SUBSTANCES OF CUSTOMER INTEREST				
Sodium (ppm)	not regulated	6.53	NA	Occurs naturally in soils
Calcium (ppm)	not regulated	11.9	NA	Occurs naturally in soils
Hardness (ppm)	not regulated	39.3	NA	Occurs naturally in soils

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Clark Public Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

EPA has proposed establishing an MCL for radon in drinking water. Radon is a gas that has no color, odor or taste. It's created by the natural radioactive breakdown of uranium in the ground. Breathing radon indoors is the primary public health risk of this gas. We tested our supply wells for radon in 2006, and found levels of this gas ranging from 155 to 610 picocuries per liter (a unit of measurement for radiation). Call the EPA Drinking Water Hotline at 1-800-426-4791 for additional information.

FAST FACTS ABOUT YOUR WATER UTILITY

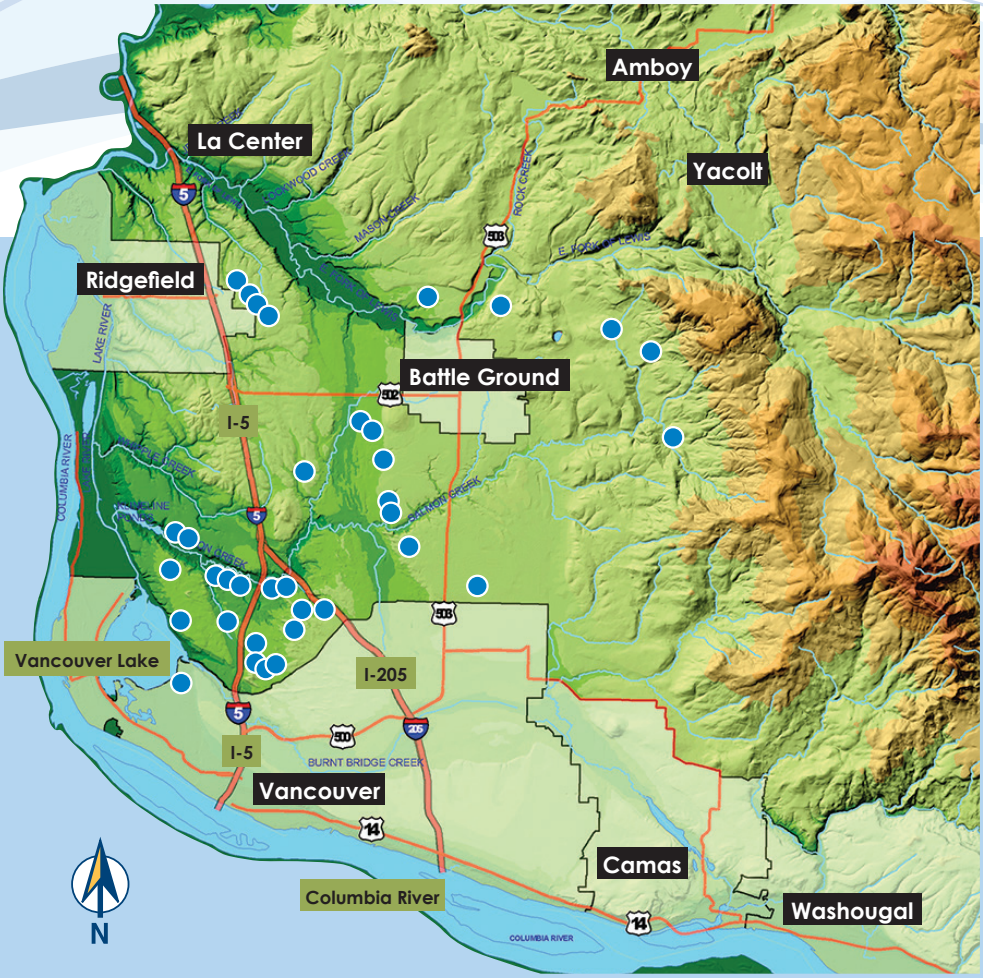
- **History**
  Utility formed in 1950; one of the 10 largest water utilities in the state
- **Customers**
  37,050 homes and businesses
- **Service area**
  220 square miles, including most unincorporated parts of Clark County, the city of La Center and the town of Yacolt
- **Distribution lines**
  853 miles
- **Average annual use per residential customer**
  54,420 gallons
- **Monthly rates**
  The utility's board of commissioners adopted a block rate structure effective January 1, 2008, and again on February 1, 2012, to encourage water conservation.

Block 1: $1.85 per 100 cubic feet up to 1,800 cubic feet of consumption

Block 2: $2.40 per 100 cubic feet for 1,801 to 3,600 cubic feet of consumption

Block 3: $2.95 per 100 cubic feet for more than 3,600 cubic feet of consumption

The rates and consumption levels shown are based on a standard $^{5}/_{8}$ x $^{3}/_{4}$ meter. Residential and commercial rate block volumes vary based on meter size (100 cubic feet = 748 gallons).



CLARK PUBLIC UTILITIES' WATER SERVICE AREA AND WATER SUPPLY WELLS

Clark Public Utilities gets its water from 35 groundwater wells. Four aquifers are the source of water for these wells: Recent Alluvial Aquifer, Troutdale Aquifer, the deep Sand and Gravel Aquifer and fractured basalt formations.

Note to customers in Yacolt and Amboy: Your water comes from different sources than listed on this map.

M Emergency Response Plan

Water Utility

EMERGENCY RESPONSE PLAN

Clark Public Utilities
Clark County, Washington

June 30, 2021

Prepared by

Jacobs

2020 SW 4th Ave #300
Portland, OR 97201

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N Coliform Sampling Plan

Coliform Monitoring Plan for: Clark Public Utilities

A. System Information

Water System Name	County	System I.D. Number
Clark Public Utilities	*Clark*	*13333X*
Name of Plan Preparer	**Position**	**Daytime Phone #**
Gary St John	*Water Quality Specialist*	*360.992.8034*

Sources:
DOH Source Number, Source Name, Well Depth, Pumping Capacity

S05 "Well #5" 233' 1,320 gpm
S07 "Well #7" 176' 990 gpm.
S10 "Well #10" 185' 600 gpm.
S20 "Well #19" 32' 960 gpm.
S21 "Well #16" 535' 650 gpm.
S22 "Well #20" 478' 760 gpm.
S24 "Well #22" 188' 440 gpm.
S25 "Well #23" 231' 1,500 gpm
S26 "Well #24" 400' 550 gpm
S27 "Well #25" 314' 420 gpm
S28 "Well #27" 175' 300 gpm
S29 "Well #29" 360' 550 gpm
S30 "Well #30" 376' 1,000 gpm
S31 "Well #31" 462' 1,200 gpm
S33 "Well #104" 425' 350 gpm
S34 "Well #105" 290' 400 gpm
S35 "Well #106" 370' 240 gpm
S36 "Well #108" 72' 150 gpm
S41 "Well #28" 251' 411 gpm
S43 "Well #26" 268' 600 gpm
S49 "Well #21" 210' 1,100 gpm
S50 "Well #33" 477' 1,200 gpm
S52 "Well #34" 413' 1,200 gpm
S53 "Well #32" 376' 1,206 gpm
S54 "Well #15.1" 487' 1,400 gpm
S55 "Well 13.1" 475' 1,100 gpm
S56 "Well #35" 429' 800 gpm
S57 "Well 110.1" 215' 400 gpm
S60 "Carol J Curtis Well Field" (S58&S59) 415' 5,000 gpm
S65 Paradise Point Well Field (S66 &S67) 145' 5,000 gpm

Storage:
Name, Capacity

R1 "Ludlum" 0.5 MG
R2 "Pfeifer" 2.0 MG
R3 "Lakeshore North" 0.5 MG
R4 "Vista" 3.0 MG
R5 "Tittle Upper" 0.75 MG
R6 "Lakeshore South" 1.5 MG
R7 "Meadow Glade C" 3.2MG
R10 "Tittle Lower" 0.5 MG
R11 "New Steel" 1.2 MG
R12 "Big East" 0.13 MG
R13 "Griffels" 0.75 MG
R15 "Armstrong" 0.75 MG
R16 "Cresap" 0.03 MG
R17 "Tukes" 0.15 MG
R18 "Heisson" 1.2 MG
R19 "Lower Basket Flats" 0.12 MG
R20 "Lower Valley View" 0.06 MG
R21 "Upper Valley View" 0.06 MG
R22 "Upper Basket Flats" 0.05 MG
R23 "Finn Hill" 0.5 MG
R24 "Summer Hills" 0.2 MG
R26 "North County" 0.5 MG
R28 "Rawson" 0.32 MG
R29 "Kelly" 0.25 MG
R31A "Lower LaCenter A" 0.44 MG
R31B "Lower LaCenter B" 1.1 MG
R32 "Upper La Center" 0.5 MG
R14 "Alpine Heights" 0.29 MG

Treatment
Source Number & Process
OSG = on-site generation sodium hypo
CONT = continuous monitoring
BULK = bulk/batched sodium hypo

S05 "Well #5" **OSG**
S07 "Well #7" **BULK**
S10 "Well #10" **OSG**
S20 "Well #19" **OSG**,
S21 "Well #16" **OSG**
S22 "Well #20" **OSG, CONT**
S24 "Well #22" **OSG**
S25 "Well #23" **OSG**
S26 "Well #24" **OSG**
S27 "Well #25" **OSG**
S28 "Well #27" **OSG**
S29 "Well #29" **OSG**
S30 "Well #30" **OSG**
S31 "Well #31" **OSG**
S33 "Well #104" **OSG**
S34 "Well #105" **OSG**
S35 "Well #106" **OSG**
S36 "Well #108" **BULK**
S41 "Well #28" **BULK**
S43 "Well #26" **OSG**
S49 "Well #21" **OSG**, **CONT**
S50 "Well #33" **OSG**
S52 "Well #34" **OSG**
S53 "Well #32" **BULK**
S54 "Well #15.1" **OSG**, **CONT**
S55 "Well 13.1" **OSG**, **CONT**
S56 "Well #35" **OSG**, **CONT**
S57 "Well 110.1" **OSG**, **CONT**
S60 "Carol J Curtis Well Field" (S58&S59) **OSG**, **CONT**
S65 Paradise Point Well Field (S66&S67) **OSG**, **CONT**

Population: 110,665	*Connections: 35,141*
Number of Routine Samples Required Monthly by Regulation **100**	Number of Sample Sites Needed to Represent the Distribution System **102**
Request DOH Approval of Triggered Source Monitoring Plan?	Y/***N***

B. Laboratory Information

Laboratory Name *BSK Associates, Engineers & Laboratories*	Office Phone # *(360)750-0055*
Address *2517 E. Evergreen Blvd. Vancouver, WA 98661*	After Hours # *Madison Biundo (360)953-7685* *Elizabeth Bunger (360) 869-6344*
Contact Name *Elizabeth Bunger*	Hours of Operation *9AM – 5PM Monday - Friday*
Emergency Laboratory Name *BSK Associates, Engineers & Laboratories*	Office Phone # *(360)750-0055*
Address *2517 E. Evergreen Blvd. Vancouver, WA 98661*	After Hours # *Madison Biundo (360)953-7685* *Elizabeth Bunger (360) 869-6344*
Hours of Operation *As Needed*	

C. Wholesaling of Groundwater

Clark Public Utilities sells or provides groundwater to other public water systems.

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	☐	☒
We sell groundwater to other public water systems.	☒	☐
Water System Name: *City of Ridgefield* Contact Name: *Scott Brunson, Utility Supervisor* Telephone Numbers: *Work # (360) 887-3897 Cell # (360) 518-8990*		
Water System Name: *City of Battleground* Contact Name: *Don Risto* Telephone Numbers: *Work # (360) 342-5361 Cell # (360) 798-7044*		

D. General sampling guidance

Clark Public Utilities takes routine monthly distribution samples along with investigative samples for newly constructed water mains. Samples should be taken from faucets or sample stations identified in this coliform monitoring plan. Samples are ***NOT*** collected on Fridays or the day before a holiday generally speaking and as a rule. Monthly sampling should be planned and completed prior to the 20th of each month.

Make sure your hands and sample area is clean. Do not open the sample container until you are prepared to draw a sample. Un-cap and cap the sample bottle a quickly as practical and keep all and any foreign material away from the sample. *There are step by step instructions included near the back/bottom of this document* "**Coliform Sampling Procedure**". To take samples remove strainers, washers or other attachments from faucet taps beforehand. Spray the tap with a solution of sodium hypochlorite. The sample tap should be flushed several minutes then turned off and "flamed" to sterilize the tap. The faucet will then be turned on and flushed for several minutes again before taking the sample. Samples stations are also sterilized with sodium hypochlorite and "flamed" prior to sample collection

Samples are collected in 100 ml bottles, as furnished by the testing lab. These bottles have been sterilized and sealed. Care must be taken that neither the underside of the cap nor the top edge of the bottle is touched. Do not rinse out the sample bottle.

The lab sample form should be filled out by the person taking the sample and sent with the sample to the testing lab within 12 to 24 hours. Instructions for taking samples are on the back of the form. Clark Public Utilities should ensure the person taking the sample fills out the form completely and indicates the source of water and type of sample being submitted.

CPU chlorinates the water at each supply well to maintain a free chlorine residual of 0.2 to 1.0 parts per million in the water distribution system. CPU is required to monitor the chlorine residual in the system on a daily basis and provide monthly reports to DOH. A measurable free chlorine residual of 0.2 ppm should be present in all parts of the distribution system. The chlorine residual of the water at the tap should be tested and noted on the sample form.

Sample sites for the monitoring program should be plotted on a map of the system to ensure that sampling efforts are not overly concentrated in any one area. Sample sites should be reviewed at least annually to ensure representative sampling of all areas of the water system are being conducted.

E. Routine and Repeat Sample Locations (sample instructions & maps below/end)

M1	**M1 - ELECTRIC CENTER** **1200 Ft Vancouver Way**
	Sample point is thru door on N. sd of stairway @ NW corner of bldg. Key for door is in lock box on door. Water key opens lock box.
	NO TREATMENT
	**** FOR INFORMATION ONLY ****
M2	M2 - 1917 NE 60 St **(SAMPL ST)**
M2A	M2A - 2007 NE 60th St
M2B	M2B - 6007 NE 19 Av
	FREE CHLORINE RESIDUAL
M3	M3 - 1015 NE 64 ST **(SAMPL ST)**
M3A	M3A - 1005 NE 64th ST
M3B	M3B - 6318 NE 12th AVE
	FREE CHLORINE RESIDUAL
M4	M4 - 7604 NE 13 AV **(SAMPL ST)**
M4A	M4A - 7614 NE 13 AV
M4B	M4B - 7510 NE 13 Av
	FREE CHLORINE RESIDUAL
M5	M5 - 402 NE 66 ST **(SAMPL ST)**
M5A	M5A - 6600 NE Hazel Dell Av
M5B	M5B - 6428 NE Hazel Dell Av
	FREE CHLORINE RESIDUAL
M6	M6 - 507 NW Overlook DR **(SAMPL ST)**
M6A	M6A - 503 NW Overlook Dr
M6B	M6B - 605 NW Overlook Dr
	FREE CHLORINE RESIDUAL
M7	M7 - 1320 NW Chikeric St **(SAMPL ST)**

M7A	M7A - 1312 NW Chikeric St
M7B	M7B - 7703 NW 15 AV
	FREE CHLORINE RESIDUAL
M8	M8 - 701 NW 79 ST **(SAMPL ST)**
M8A	M8A - 610 NW 79 ST
M8B	M8B - 705 NW 79 ST
	FREE CHLORINE RESIDUAL
M9	M9 - 8302 NW 7 AV **(SAMPL ST)**
M9A	M9A - 805 NW 84 ST
M9B	M9B - 8212 NW 7 AV
	FREE CHLORINE RESIDUAL
M10	M10 - 8810 NW 4 AV **(SAMPL ST)**
M10A	M10A - 421 NW 90 St
M10B	M10B - 312 NW 87 St
	FREE CHLORINE RESIDUAL
M11	M11 - 517 NW 98 ST **(SAMPL ST)**
M11A	M11A - 605 NW 98 St
M11B	M11B - 606 NW 98 St
	FREE CHLORINE RESIDUAL
M12	M12 - 810 NW 104 Lp **(SAMPL ST)**
M12A	M12A - 820 NW 104 Lp
M12B	M12B - 728 NW 104 Lp
	FREE CHLORINE RESIDUAL
M13	M13 - 1314 NW 104 ST **(SAMPL ST)**
M13A	M13A - 1219 NW 104 St
M13B	M13B - 10412 NW 14 Av
	FREE CHLORINE RESIDUAL

M14	M14 - 1907 NW 111 ST **(SAMPL ST)**
M14A	M14A - 1923 NW 111 St
M14B	M14B - 11108 NW 19 Av
	FREE CHLORINE RESIDUAL
M15	M15 - 2619 NW 115 ST **(SAMPL ST)**
M15A	M15A - 2601 NW 115 ST
M15B	M15B - 11506 NW 27 Av
	FREE CHLORINE RESIDUAL
M16	M16 - 2706 NW 108 ST **(SAMPL ST)**
M16A	M16A - 2606 NW 108 St
M16B	M16B - 2713 NW 108 ST
	FREE CHLORINE RESIDUAL
M17	M17 - 2704 NW 100 ST **(SAMPL ST)**
M17A	M17A - 2621 NW 100 St
M17B	M17B - 2713 NW 100 St
	FREE CHLORINE RESIDUAL
M18	M18 - 2806 NW 93 ST **(SAMPL ST)**
M18A	M18A - 2808 NW 93 St
M18B	M18B - 9216 NW 28 Ct
	FREE CHLORINE RESIDUAL
M19	M19 - 8900 NW 24 Av **(SAMPL ST)**
M19A	M19A - 8808 NW 24 Av
M19B	M19B - 8908 NW 24 Av
	FREE CHLORINE RESIDUAL
M20	M20 - 8611 NW 18 AV **(SAMPL ST)**
M20A	M20A - 8604 NW 18 AV
M20B	M20B - 8612 NW 18 Av

	FREE CHLORINE RESIDUAL
M21	M21 - 8205 NW 12 AV **(SAMPL ST)**
M21A	M21A - 8208 NW 12 Av
M21B	M21B - 8102 NW 12 Av
	FREE CHLORINE RESIDUAL
M22	M22 - 1203 NW 93 St **(SAMPL ST)**
M22A	M22A - 1219 NW 93 St
M22B	M22B - 9211 NW 12 Av
	FREE CHLORINE RESIDUAL
M23	M23 - 311 NW 102 St **(SAMPL ST)**
M23A	M23A - 315 NW 102 St (VB)
M23A	M23A - 305 NW 102 St (VB)
	FREE CHLORINE RESIDUAL
M24	M24 - 708 NE 106 St **(SAMPL ST)**
M24A	M24A - 802 NE 106 St
M24B	M24B - 611 NE 106 St
	FREE CHLORINE RESIDUAL
M25	M25 - 11012 NE Stutz Rd. **(SAMPL ST)**
M25A	M25A - 1117 NE 110 St
M25B	M25B - 1303 NE 112 St
	FREE CHLORINE RESIDUAL
M26	M26 - 11607 NE 2 Av **(SAMPL ST)**
M26A	M26A - 11603 NE 2 Av
M26B	M26B - 11612 NE 2 Av
	FREE CHLORINE RESIDUAL
M27	M27 - 10714 NW 4 Av **(SAMPL ST)**

M27A	M27A - 10710 NW 4 Av
M27B	M27B - 10718 NW 4 Av
	FREE CHLORINE RESIDUAL
M28	M28 - 11619 NW 9th Av **(SAMPL ST)**
M28A	M28A - 801 NW 117 St
M28B	M28B - 814 NW 116 St
	FREE CHLORINE RESIDUAL
M29	M29 - 11925 NW 13 Av **(SAMPL ST)**
M29A	M29A - 12005 NW 14 Av
M29B	M29B - 11921 NW 13 Av
	FREE CHLORINE RESIDUAL
M30	M30 - 1608 NW 125th St **(SAMPL ST)**
M30A	M30A - 12417 NW 15 Av
M30B	M30B - 1616 NW 125 St
	FREE CHLORINE RESIDUAL
M31	M31 - 11706 NW 35th Av **(SAMPL ST)**
M31A	M31A - 11710 NW 35 Av
M31B	M31B - 11702 NW 35th Av
	FREE CHLORINE RESIDUAL
M32	M32 - 3506 NW 114 St **(SAMPL ST)**
M32A	M32A - 3507 NW 114 St
M32B	M32B - 3408 NW 114 St
	FREE CHLORINE RESIDUAL
M33	M33 - 3402 NW 128th St **(SAMPL ST)**
M33A	M33A - 3401 NW 128 St
M33B	M33B - 3216 NW 127 St
	FREE CHLORINE RESIDUAL

M34	M34 - 4207 NW 131 St **(SAMPL ST)**
M34A	M34A - 4208 NW 131 St
M34B	M34B - 13007 NW 43rd Av
	FREE CHLORINE RESIDUAL
M35	M35 - 13705 NW 44 Av **(SAMPL ST)**
M35A	M35A - 13709 NW 44 Av
M35B	M35B - 13619 NW 44 Ct
	FREE CHLORINE RESIDUAL
M36	M36 - 15013 NW 25 Av **(SAMPL ST)**
M36A	M36A - 2414 NW 151 St
M36B	M36B - 15011 NW 25 Av
	FREE CHLORINE RESIDUAL
M37	M37 - 215 NE 146 St **(SAMPL ST)**
M37A	M37A - 14417 NE 3 Av
M37B	M37B - 14515 NE 3 Av
	FREE CHLORINE RESIDUAL
M38	M38 - 900 NE 141 St **(SAMPL ST)**
M38A	M38A - 908 NE 141 St
M38B	M38B - 808 NE 141 St
	DO NOT SAMPLE AT 714 NE 141 ST
	FREE CHLORINE RESIDUAL
M39	M39 - 817 NW 143 St **(SAMPL ST)**
M39A	M39A - 818 NW 143 St
M39B	M39B - 818 NW 142 St
	FREE CHLORINE RESIDUAL
M40	M40 - 1613 NW 136 St **(SAMPL ST)**
M40A	M40A - 13610 NW 17 Pl
M40B	M40B - 1614 NW 136 St

	FREE CHLORINE RESIDUAL
M41	M41 - 308 NE 135 St **(SAMPL ST)**
M41A	M41A - 312 NE 135 St
M41B	M41B - 214 NE 135 St
	FREE CHLORINE RESIDUAL
M42	M42 - 1017 NE 126 St **(SAMPL ST)**
M42A	M42A - 12604 NE 10 Av
M42B	M42B - 1103 NE 126 St
	FREE CHLORINE RESIDUAL
M43	M43 - 1708 NE 150 St **(SAMPL ST)**
M43A	M43A - 1709 NE 150 St
M43B	M43B - 1707 NE 150 St
	FREE CHLORINE RESIDUAL
M44	M44 - 17707 NE 2 Av **(SAMPL ST)**
M44A	M44A - 17612 NE 2 Av
M44B	M44B - 105 NW 179 St
	FREE CHLORINE RESIDUAL
M45	M45 - 17704 NE 26 Av **(SAMPL ST)**
M45A	M45A - 17700 NE 26 Av
M45B	M45B - 17802 NE 26 Av
	FREE CHLORINE RESIDUAL
M46	M46 - 16221 NE 33 Av **(SAMPL ST)**
M46A	M46A - 3208 163 St
M46B	M46B - 3309 NE 163 St
	FREE CHLORINE RESIDUAL
M47	M47 - BOOSTER #4 @ Tittle Res.

M47A	M47A - 2715 NE 159 St
M47B	M47B - 2605 NE 159 St
	FREE CHLORINE RESIDUAL
M48	M48 - 2717 NE 147 St **(SAMPL ST)**
M48A	M48A - 2605 NE 147 St
M48B	M48B - 2803 NE 147 St
	FREE CHLORINE RESIDUAL
M49	M49 - 3309 NE 125 St **(SAMPL ST)**
M49A	M49A - 3305 NE 125 St
M49B	M49B - 3311 NE 125 St
	FREE CHLORINE RESIDUAL
M50	M50 - 2700 NE 116 St **(SAMPL ST)**
M50A	M50A - 2611 NE 116 St
M50B	M50B - 2705 NE 116 St
	FREE CHLORINE RESIDUAL
M51	M51 - 10933 NE Sherwood Dr **(SAMPL ST)**
M51A	M51A - 10913 NE Sherwood Dr
M51B	M51B - 10914 NE 36 Ct
	FREE CHLORINE RESIDUAL
M52	M52 - Booster #6 (Pfeifer)
M52A	M52A - 9902 NE 33 Ct
M52B	M52B - 9914 NE 36 Ct
	FREE CHLORINE RESIDUAL
M53	M53 - 1908 NE 107 St **(SAMPL ST)**
M53A	M53A - 10602 NE 19 Av
M53B	M53B - 10606 NE 20 Av
	FREE CHLORINE RESIDUAL

M54	M54 - 1912 NE 84 WAY **(SAMPLE ST)**
M54A	M54A - 1810 NE 84 Way
M54B	M54B - 1916 NE 84 Way
	FREE CHLORINE RESIDUAL
M55	M55 - 2516 NE 90 St **(SAMPL ST)**
M55A	M55A - 2502 NE 90 St
M55B	M55B - 2520 NE 90 St
	FREE CHLORINE RESIDUAL
M56	M56 - 8701 NE 37th Av **(SAMPL ST)**
M56A	M56A - 8700 NE 37th Av
M56B	M56B - 8611 NE 37th Av
	FREE CHLORINE RESIDUAL
M57	M57 - 10104 NE 65 AVE **(SAMPLE ST)**
M57A	M57A - 10100 NE 65 Av
M57B	M57B - 10203 NE 65 Av
	FREE CHLORINE RESIDUAL
M58	M58 - 5416 NE 101 ST **(SAMPL ST)**
M58A	M58A - 5400 NE 101 St
M58B	M58B - 5509 NE 101 Cr
	FREE CHLORINE RESIDUAL
M59	M59 - 11404 NE 48 AVE **(SAMPLE ST)**
M59A	M59A - 4702 NE 114 St
M59B	M59B - 4705 NE 114 ST
	DO NOT USE 4612 NE 114 ST
	FREE CHLORINE RESIDUAL
M60	M60 - 11811 NE 40 PL **(SAMPLE ST)**
M60A	M60A - 11812 NE 40 PL
M60B	M60B - 4001 NE 118 St

	FREE CHLORINE RESIDUAL
M61	M61 - 12003 NE 43 Av **(SAMPLE ST)**
M61A	M61A - 11910 NE 43 Av
M61B	M61B - 12001 NE 44 Av
	FREE CHLORINE RESIDUAL
M62	M62 - 11700 NE 56 Av **(SAMPLE ST)**
M62A	M62A - 11716 NE 56 Av
M62B	M62B - 11614 NE 56 AVE
	FREE CHLORINE RESIDUAL
M63	M63 - 4616 NE 126 CIR **(SAMPLE ST)**
M63A	M63A - 4803 NE 126 CIR
M63B	M63B - 4612 NE 126 CIR
	FREE CHLORINE RESIDUAL
M64	M64 - 13909 NE 52 AVE **(SAMPLE ST)**
M64A	M64A - 13906 NE 52 AVE
M64B	M64B - 14003 NE 52 AVE
	FREE CHLORINE RESIDUAL
M65	M65 - 4810 NE 151 St **(SAMPLE ST)**
M65A	M65A - 15010 NE 49 Ct
M65B	M65B - 4809 NE 151 ST
	FREE CHLORINE RESIDUAL
M66	M66 - 16600 NE 50 Av **(SAMPL ST)**
M66A	M66A - 17501 NE 50 Av
M66B	M66B - 16309 NE 50 Av
	FREE CHLORINE RESIDUAL
M67	M67 - 11505 NE 131 ST (**sample site)**
M67A	M67A - 11515 NE 131 ST

M67B	M67B - 11415 NE 131 ST
	FREE CHLORINE RESIDUAL
M68	M68 - BOOSTER #140 (Cotton)
M68A	M68A - 10812 NE 156 St
M68B	M68B - 15615 NE 112 Av
	FREE CHLORINE RESIDUAL
M69	M69 - 8706 NE 179 St
M69A	M69A - 8705 NE 179 St
M69B	M69B - 8906 NE 179 St
	FREE CHLORINE RESIDUAL
M70	M70 - BOOSTER #138 (Maple Grove)
M70A	M70A - 1700 SW Eaton Bd
M70B	M70B - 617 SW Eaton Bd
	FREE CHLORINE RESIDUAL
M71	M71 - BOOSTER #11 (Meadow Glade)
M71A	M71A - 20702 NE 89 Av
M71B	M71B - 20306 NE 89 Av
	FREE CHLORINE RESIDUAL
M72	M72 - 21609 NE 72nd Av **(SAMPL ST)**
M72A	M72A - 21706 NE 72 Av
M72B	M72B - 21406 NE 72 Av
	FREE CHLORINE RESIDUAL
M73	M73 - 2424 NE 253 St **(SAMPL ST)**
	at meter on NE 29 Av
M73A	M73A - 19300 NE 29 Av
M73B	M73B - 24700 NE 29 Av
	FREE CHLORINE RESIDUAL

M74	M74 - 23701 NE 10 Av
M74A	M74A - 23608 NE 10 Av
M74B	M74B - 23804 NE 10 Av
	FREE CHLORINE RESIDUAL
M75	M75 - 31303 NW 5 Ct **(SAMPL ST)**
M75A	M75A - 31111 NW 5 Ct
M75B	M75B - 30921 NW Spencer Rd
	FREE CHLORINE RESIDUAL
M76	M76 - BOOSTER #127 (9th Ave)
M76A	M76A - 34102 NW 9 Av
M76B	M76B - 34401 NW 11 Av
	FREE CHLORINE RESIDUAL
M77	M77 - BOOSTER #152
M77A	M77A - 353 E Heritage Lp
M77B	M77B - 1400 Aspen Av
	FREE CHLORINE RESIDUAL
M78	M78 - 2008 E 6 ST **(SAMPLE SITE)**
M78A	M78A - 2004 E 6 ST
M78B	M78B - 2012 E 6 ST
	FREE CHLORINE RESIDUAL
M79	M79 - 230 E 18 PL **(SAMPLE SITE)**
M79A	M79A - 310 E 18 PL
M79B	M79B - 226 E 18 PL
	FREE CHLORINE RESIDUAL
M80	M80 - BOOSTER #122
M80A	M80A - 33119 NE 24 Av
M80B	M80B - 32917 NE 24 Av
	FREE CHLORINE RESIDUAL

M81	M81 - BOOSTER #125 (Gable)
	NE 339 ST & GABLE AV
	FREE CHLORINE RESIDUAL
M82	M82 - BOOSTER #110 Early Dawn
	16200 NE 322 ST
	** Gate Code *8845
	** Gate Code *7312
	FREE CHLORINE RESIDUAL
M83	M83 - BOOSTER #120 (Upper Early Dawn)
	16800 NE 332 ST
	** Gate Code #8845
	FREE CHLORINE RESIDUAL
M84	M84 - BOOSTER #144 (314th St)
M84A	M84A - 10409 NE 311 Cir
M84B	M84B - 10705 NE 314 St
	FREE CHLORINE RESIDUAL
M85	M85 - BOOSTER #117 (Kelly)
	NE 299 ST & KELLY RD
	FREE CHLORINE RESIDUAL
M86	M86 - BOOSTER #118 (Nordeen)
M86A	M86A - 30500 NE 181 Av
M86B	M86B - 30718 NE 182 Av
	FREE CHLORINE RESIDUAL
M87	M87 - Booster #104 (Lwr Valley View)
	34019 NE MAPLE WAY
	FREE CHLORINE RESIDUAL

M88	M88 - BOOSTER #119 (Charter Oak)
	NE 112 AV & 299 ST
	BY FIRE STATION
	FREE CHLORINE RESIDUAL
M89	M89 - BOOSTER #105 BASKET FLATS
M89A	M89A - 19216 NE 283 St
M89B	M89B - 19212 NE 280 St
	FREE CHLORINE RESIDUAL
M90	M90 - 26105 NE 180 CT **(SAMPL ST)**
M90A	M90A - 26104 NE 180TH Ct
M90B	M90B - 26000 NE 180TH Ct
	FREE CHLORINE RESIDUAL
M91	M91 - BOOSTER #123 (SPRING HILL)
M91A	M91A - 27502 NE 212 Av
M91B	M91B - 20916 NE 273 St
	FREE CHLORINE RESIDUAL
M92	M92 - 24100 NE Liberty Hill Rd **(SAMPL ST)**
M92A	M92A - 24101 NE Liberty Hill Rd
M92B	M92B - 24500 NE Liberty Hill Rd
	FREE CHLORINE RESIDUAL
M93	M93- BOOSTER #126 (ALVA RD)
M93A	M93A - 24711 NE BERRY Rd
M93B	M93B - 24416 NE BERRY Rd
	FREE CHLORINE RESIDUAL
M94	M94 - BOOSTER #114 (Berry)
M94A	M94A - 24014 NE Berry Rd
M94B	M94B - 23109 NE 240 Av

	FREE CHLORINE RESIDUAL
M95	M95 @ Ne 227th ST and 257th ave
	VIA SKYLINE DR(As of July taken at prv on 227th)
	FREE CHLORINE RESIDUAL
M96	M96 - BOOSTER #134 (Venersborg)
	21104 NE 242 Av
	FREE CHLORINE RESIDUAL
M97	M97 - FINN HILL RESERVOIR
	22408 NE FINN HILL RD
	FREE CHLORINE RESIDUAL
M98	M98 - 18707 NE 229 CT **(SAMPLE ST)**
M98A	M98A - 18701 NE 229 CT
	FREE CHLORINE RESIDUAL
M99	M99 - BOOSTER #145 (169th St)
M99A	M99A - 22103 NE 169 St
M99B	M99B - 22210 NE 169 St
	FREE CHLORINE RESIDUAL
M100	M100 - 20408 NE 163 Cir **(SAMPLE ST)**
M100A	M100A - 20412 NE 163 Cir
M100B	M100B - 20406 NE 163 Cir
	FREE CHLORINE RESIDUAL
M101	M101 - Booster #101 (Steel)
M101A	M101A - 19106 NE 164 St
M101B	M101B - 19311 NE 164 St
	DO NOT USE CHURCH DRIVEWAY

	FREE CHLORINE RESIDUAL
M102	M102 - 17504 NE 182 Ave
M102A	M102A - 17311 NE 182 Av
M102B	M102B - 17508 NE 182 Av
	Back hose bib
	FREE CHLORINE RESIDUAL
M103	M103 - BOOSTER #137 (Blackhawk)
M103A	M103A - 21909 NE 202 Av
M103B	M103B - 20019 NE 219 St
	FREE CHLORINE RESIDUAL
M104	M104 - 20317 NE 176 Ave
	FREE CHLORINE RESIDUAL
M105	M105 - 18224 NE Cedars Dr
M105A	M105A - 18216 NE Cedars Dr
M105B	M105B - 18234 NE Cedars Dr
	FREE CHLORINE RESIDUAL
M106	M106 - Cedars Clubhouse 15001 NE 181st (sample site)
M106A	M106A - 18103 NE 150th Ct.
M106B	M106B - 15301 NE Lot #1 Cedar Village
	FREE CHLORINE RESIDUAL
M107	M107 - 17915 NE 159 ST **(SAMPLE SITE)**
M107A	M107A - 17805 NE 159 ST
M107B	M107B - 18007 NE 159 ST
	FREE CHLORINE RESIDUAL

M108	M108 - 16017 NE 170 AV
M108A	M108A - 16105 NE 170 AV
M108B	M108B - 16003 NE 170 AV
	FREE CHLORINE RESIDUAL
M109	M109 - Booster #147 (139 St)
M109A	M109A - 18507 NE 139 St
M109B	M109B - 13916 NE 182 Av
	FREE CHLORINE RESIDUAL
M110	M110 - BOOSTER #121 (147th St)
M110A	M110A - 21517 NE 147 St
M110B	M110B - 14503 NE 214 Av
	FREE CHLORINE RESIDUAL
M111	M111 - BOOSTER #113 (Bonanza)
M111A	M111A - 23324 NE Rawson Rd
M111B	M111B - 23200 NE Rawson Rd
	FREE CHLORINE RESIDUAL
M112	M112 - BOOSTER #131 (Rawson)
M112A	M112A - 24841 NE Rawson Rd
M112B	M112B - 14712 NE 249 Av
	FREE CHLORINE RESIDUAL
M113	M113 - BOOSTER #102
M113A	M113A - 13907 NE Echo Ridge Rd
M113B	M113B - 13401 NE 212 Av
	FREE CHLORINE RESIDUAL
M114	M114 - 24401 NE 132 Cir **(SAMPL ST)**
M114A	M114A - 24201 NE 132 Cir
M114B	M114B - 13010 NE 227 Av

	FREE CHLORINE RESIDUAL
M115	M115 - 12220 NE 116th St East Grn Wy **(SAMPL ST)**
M115A	M115A - 12220 NE 116th St
M115B	5M114B - 12310 NE 116th St
	FREE CHLORINE RESIDUAL
M116	M116 - 13419 NE 114 WAY **(SAMPLE ST)**
M116A	M116A - 13423 NE 114 WAY
M116B	M116B - 13418 NE 114 WAY
	FREE CHLORINE RESIDUAL
M117	M117 - 18510 NE 82 St **(SAMPL ST)**
M117A	M117A - 18407 NE 82 St
M117B	M117B - 18514 NE 82 St
	FREE CHLORINE RESIDUAL
M118	M118 - 17708 NE 84 CIR **(SAMPL ST)**
M118A	M118A - 17704 NE 84 CIR
M118B	M118B - 17805 NE 84 CIR
	FREE CHLORINE RESIDUAL
M119	M119 - 2825 NE 8 AVE **(SAMPLE ST)**
M119A	M119A - 804 NE 28 WAY
M119B	M119B - 2824 NE 8 AVE
	FREE CHLORINE RESIDUAL
M120	M120 - 7016 NE 124 ST **(SAMPLE ST)**
M120A	M120A - 7012 NE 124 ST
120B	M120B - 7102 NE 134 ST
	FREE CHLORINE RESIDUAL
M121	M121 - 13004 NE 63 AVE **(SAMPLE ST)**
M121A	M121A - 13008 NE 63 AVE
M121B	M121B - 13004 NE 63 AVE
	FREE CHLORINE RESIDUAL
M122	M122 - 8518 N 1 ST **(SAMPLE ST)**

M122A	8524 N 1 ST
M122B	8513 N 1 ST
	FREE CHLORINE RESIDUAL
M123	M123 - 6105 NE ERIN WAY **(SAMPLE ST)**
M123A	M123A - 6103 NE ERIN WAY
M123B	M123B - 6013 NE 99 ST
	FREE CHLORINE RESIDUAL

F. Reduced Triggered Source Monitoring Justification

No reduced triggered source monitoring

G. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	*Representative*	*July*	*Representative*
February	*Representative*	*August*	*Representative*
March	*Representative*	*September*	*Representative*
April	*Representative*	*October*	*Representative*
May	*Representative*	*November*	*Representative*
June	*Representative*	*December*	*Representative*

H. Unsatisfactory Samples

Follow-up to an unsatisfactory routine coliform sample

Following an unsatisfactory sample result ***immediately*** contact the Washington State Department of Health, Southwest Washington Office Coliform Compliance Manager (Charese Gainor 360-236-3045) Also contact your manager or "on-duty" staff to report an unsatisfactory result. Repeat samples will be collected within 24 hours in accordance with WAC 246-290-320(2), see attached fact sheet "***Follow-up to an unsatisfactory routine coliform sample***". Also, as a result of the Groundwater Rule that went into effect as of December 1, 2009, triggered monitoring samples must be collected from every source in operation at the time the unsatisfactory sample was collected and analyzed for fecal indicators. On a case by case basis with sufficient supporting information Drinking Water Staff in the SW Office of DOH may be able to approve a more focused source water sampling plan, based on SCADA/trends and operational data. Results from these triggered source samples will determine possible public notice and corrective actions in accordance with the groundwater rule. A "Level 1 Assessment" is required when a treatment technique is triggered. If greater than 5% of samples in a month test positive for coliforms (5 samples in 100) or if we fail to collect (3) repeat samples for each total coliform-positive samples. A template of the level 1 assessment is attached can be found at the bottom of this plan. **Repeat samples must be collected in the same month that the total coliform-positive occurred.**

I. Month Following Unsatisfactory Samples

As part of the RTCR additional samples in the month following a total coliform positive result are no longer required. Collect the normal number of samples in the month following unsatisfactory samples.

Water System Name:	County:	Water System ID #:
Operator in Responsible Charge (ORC):	ORC Phone:	Water System Mailing Address:
ORC Address, City, State:		
Assessor Name:		
Assessor Address, City, State, Zip:		
Date(s) Assessment Completed:		

Your water system exceeded a treatment technique trigger for the Revised Total Coliform Rule. Assess the water system's condition and operation using this *Level 1 Assessment Template* as a guide.

Part A: Respond to each item below. Identify corrective actions taken to address the issue(s) found.
Part B: Summarize your findings and include an action plan with timetable for corrective actions not yet taken.

For parts A and B, include additional information (photos or other documentation) as needed to depict assessment findings and corrective actions that have been completed. All assessment elements listed in this template must be addressed in your assessment. Systems with multiple facilities such as wells or storage tanks may need to provide additional pages.

Within 30 days of learning of the treatment technique trigger, submit completed assessment documentation to your regional office and keep a copy in your water system files.

Part A: Assessment		**Corrective action needed?**	**Corrective action(s) taken & date taken**
1. Site and Sampling Protocol 1a. Do you have a written coliform monitoring plan & sampling procedure that ensures samples are representative of the distribution system?	☐ Yes	☐ Yes ☐ No	
1b. Have there been any changes in sampling conditions or procedures that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
1c. Inspect the sampling sites: - Are the sampling locations free of potential sources of contamination? - Are the sampling taps in good condition? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
2. Distribution 2a. Do you have procedures in place to ensure proper maintenance of the distribution system, including: - Appropriate pipe replacement and repair procedures - Replacement and repair of other distribution system components - Regular flushing program - Routine vault inspections - Fully implemented cross connection control program - Maintain positive pressure in all parts of the distribution system	☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
2b. Has there been any recently reported low pressure (<20 PSI) or complete loss of pressure in the distribution system?	☐ Yes	☐ Yes ☐ No	
2c. Have there been any changes in distribution conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
2d. Inspect the distribution system: - Are there any visible line breaks or leaks? - Are there any observed unprotected cross connections? - Is there any evidence of vandalism or other security breaches? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
3. Storage Facilities 3a. Does your water system have a water storage tank? *If no, skip to Section 4.*	☐ Yes		
3b. Do you have procedures in place for periodic inspection and maintenance of the exterior and interior of each storage facility?	☐ Yes	☐ Yes ☐ No	
3c. Have there been any changes in storage conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
3d. Inspect the storage facilities: - Does the tank have any cracks or other openings? - Is the reservoir roof free of any unprotected openings? - Is the access hatch constructed and sealed to keep contaminants out? - If there is an air vent on the storage tank, is it constructed to prevent the entry of contaminants? - Is the overflow line constructed to prevent contaminants from entering the tank? - If the overflow line discharges into a storm drain, to surface water, or directly into a sanitary sewer, is it protected by a proper air gap? - Is there any evidence of vandalism or other security breaches? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
4. Source--Groundwater 4a. Does your water system have a well or spring? If no, skip to Section 6.	☐ Yes		
4b. Do you comply with Sanitary Control Area requirements (WAC 246-290-135(2))?	☐ Yes	☐ Yes ☐ No	
4c. Have there been any changes in source conditions or operations that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
4d. Inspect the source facilities: - Is the sanitary control area free of all potential sources of contamination? - Is the wellhead or spring box above grade with no potential for flooding? - Is the pressure tank water logged? - Is the well cap sealed and watertight, and the well casing free of unprotected openings? - (For springs) Is the spring box (structure, hatch, and overflow) free of any unprotected openings? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
5. Treatment--Groundwater 5a. Is any source continuously treated with a disinfectant? If no, skip to Section 6.	☐ Yes		

Part A: Assessment		Corrective action needed?	Corrective action(s) taken & date taken
5b. Do you have procedures in place for proper operation and maintenance of disinfection treatment facilities?	☐ Yes	☐ Yes ☐ No	
5c. Have there been any changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
5d. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
6. Source—Surface Water Supply (watershed) 6a. Does your water system have a surface water supply? If no, skip to Section 8.	☐ Yes		
6b. Do you comply with Watershed Control Program requirements (WAC 246-290-135(4)?	☐ Yes	☐ Yes ☐ No	
6c. Have there been any changes within the watershed or in raw water conditions that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
6d. Inspect the surface water intake/headworks: - Is there evidence of problems at the intake? - Is there evidence of vandalism or other security breaches at the intake? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	
7. Treatment—Surface Water 7a. Do you have procedures in place for proper operation and maintenance of surface water treatment facilities?	☐ Yes	☐ Yes ☐ No	
7b. Have there been any changes in treatment equipment or process that may have contributed to the treatment technique trigger? Describe:	☐ Yes	☐ Yes ☐ No	
7c. Inspect the treatment facilities: - Is the treatment system operating properly? - Is there any evidence of vandalism or other security breaches? - Other: (describe) _____	☐ Yes ☐ Yes ☐ Yes	☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No	

Part A: Assessment	Corrective action needed?	Corrective action(s) taken & date taken
8. Other assessment activities (describe):		

Part B. Assessment Summary and Action Plan with Timetable for corrective actions not yet taken

☐ ASSESSOR: CHECK HERE if you did not identify any issues that may have directly or indirectly caused or contributed to entry of coliform bacteria into the system.

Corrective Actions Completed: ASSESSOR: Summarize the issues found and the corrective actions that have been completed and date completed

Describe issue found	Describe corrective action taken and date completed

Corrective Actions Not Completed: ASSESSOR: Describe the issues for which corrective actions have not yet been completed. **Provide an action plan with timetable for completion.**

Describe issue found	Describe planned corrective action and timetable for completion.

Print Name of Assessor: _____ Signature of Assessor: _____

OFFICE OF DRINKING WATER USE ONLY

Regional Office Reviewer: _____ Date of Review: _____

Assessment sufficient? ☐ Yes ☐ No

Likely cause determined? ☐ Yes ☐ No

Sanitary defect(s) identified? ☐ Yes ☐ No

Corrective actions completed? ☐ Yes ☐ No

Corrective action plan included? ☐ Yes ☐ No

Corrective action plan approved? ☐ Yes ☐ No

Comments:

H. *E.* coli-Present Sample Response

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	X	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	X	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, low pressure and outage incidents.	X	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	X	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	X	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	X	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	X	☐	☐	☐
We have a map of our service area boundaries.	X	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☐	☐	☐
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	☐	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	☐	☐	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☐	☐	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☐	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☐	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☐	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☐	☐	☐	☐
We have a list of all of our customers' addresses.	X	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☐	☐	☐	☐
We have a list of customer email addresses.	☐	☐	☐	☐
We encourage our customers to remain in contact with us using social media.	☐	☐	☐	☐
We have an active website we can quickly update to include important messages.	X	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☐	☐	☐
We need a news release to supplement our public notification process.	☐	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist - All Sources				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	X	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	X	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	☐ ☐	☐ ☐	☐ ☐	☐ ☐
We routinely inspect our well site(s).	X	☐	☐	☐
We have a good raw water sample tap installed at each source.	X	☐	☐	☐
After we complete work on a source, we disinfect the source, flush, and collect an investigative sample.	X	☐	☐	☐
(Cont.)				

E. coli-Present Triggered Source Sample Response Checklist - All Sources				
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*'-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☐	☐	☐	☐
We discussed the requirement for immediate public notice of an *E. coli*'-present source sample result with our wholesale customers and encouraged them to develop a response plan.	☐	☐	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☐	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist - All Sources				
Alternate Sources	**Yes**	**No**	**N/A**	**To Do List**
We can stop using any given source and still provide reliable water service to our customers.	X	☐	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	X	☐	☐	☐
We can provide bottled water to all or part of the distribution system for an indefinite period.	X	☐	☐	☐
We can quickly replace our existing source of supply with a more protected new source.	X	☐	☐	☐
Temporary Treatment	**Yes**	**No**	**N/A**	**To Do List**
Sources are continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? mg/L	☐	☐	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	☐	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☐	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☐	☐	☐	☐

*NOTE: If your system has multiple sources, you may want to complete a separate checklist for each source.

Distribution System *E. coli* Response Plan

If we have *E. coli* in our distribution system we will immediately:

1. Call DOH. (issue boil water advisory)
2. Notify Consecutive Systems.
3. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
4. Review SACDA and trending to establish hydraulic conditions, sources, storage and systems in use or that maybe affected.
5. Inspect our water system facilities, including treatment plants for proper operation.
6. Interview staff to determine whether anything unusual was happening in the water system service area, especially since the previous month's sample(s).
7. Review new construction activities, water main breaks, and pressure outages that may have occurred during the previous month.
8. Review Cross-Connection Control Program status.

E. coli-Present Triggered Source Sample Response Plan - Source

If we have *E. coli* in any Source water we will immediately:

1. Call DOH. (issue boil water advisory)
2. Notify Consecutive Systems
3. In collaboration with DOH, begin work on a corrective action plan. Corrective actions options: discontinue use of contaminated source; provide 4-log virus treatment of the source.

- Cross Connection Control Program

Clark Public Utilities
Cross Connection Control Program

A. Requirement for Program
Clark Public Utilities

Hereinafter referred to as "Clark Public Utilities," or "the Utility" has the responsibility to protect the public water system from contamination due to cross connections. A cross connection may be defined as *"any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid, such that it is possible for a non-potable gas or liquid to enter the potable water system by backflow."*
All public water systems are required to develop and implement cross-connection control (CCC) programs. The CCC requirements are contained in Washington Administrative Code (WAC) 246-290-490 of the Group A Drinking Water Regulations. The minimum required elements of a CCC program are:

1. Establishment of legal authority and program policies;
2. Evaluation of premises for cross-connection hazards;
3. Elimination and/or control of cross connections;
4. Provision of qualified personnel;
5. Inspection and testing of backflow preventers;
6. Quality control of testing process;
7. Response to backflow incidents;
8. Public education for consumers;
9. Record keeping for CCC program;
10. Special requirements for reclaimed water use.

Other CCC program requirements include:

1. Coordination with the Local Administrative Authority (LAA), i.e., the local building or plumbing official regarding CCC activities;
2. Prohibition of the return of used water into the public water system (PWS) distribution system;
3. Inclusion of a written CCC program in a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

Note: Throughout the CCC program plan the term *customer* is used. *Customer* as used herein means the property owner and/or occupant of the premises served by Clark Public Utilities (i.e., whoever interfaces with Clark Public Utilities regarding water service). Also, unless otherwise defined, all CCC-related terms used in this program have the same definitions as those contained in WAC 246-290-010 of the Washington State Drinking Water Regulations.

B. Program Objectives

The objectives of the CCC program are to:

1. Reasonably reduce the risk of contamination of the public water distribution system.
2. Reasonably reduce Clark Public Utilities exposure to legal liability arising from the backflow of any contaminant originating from the customer's plumbing system and then supplied to other customers.

C. Summary of Program Decisions

The following table summarizes the major policy and program decisions adopted for Clark Public Utilities. The items in the table represent CCC program areas that have more than one acceptable approach or option.

CCC Program Decision Summary Table for the Clark Public Utilities

Decision Item	Decision
1. Type of Program [General, WAC 246-290-490(2)(e)]	
a. Premises isolation only	
b. Premises isolation and in-premises protection (combination program)	
2. Extent of Coordination with LAA [WAC 246-290-490(2)(d)]	
a. Information exchange	
b. Interaction	
c. Joint program	
3. Relationship with Customer [Element 1]	
a. Signed service agreement or contract	
b. Ordinance/resolution; implied service agreement	
4. Enforcement of Corrective Action [Element 1]	
a. Rely upon shut-off of water service	
b. Rely upon purveyor-installed premises isolation	
5. Assessment and Re-assessment of Hazard [Element 2]	
a. By purveyor's staff or equivalent	
b. By cross-connection control specialist (CCS) employed by customer; report reviewed by purveyor's CCS	
6. Location and Ownership of Premises Isolation Assembly [Element 3]	
a. On purveyor's service line	
b. On customer's service line	
7. CCS Option – Purveyor's Program Management [Element 4]	
a. Purveyor's staff member certified	
b. Inter-agency agreement or use other agency's CCS	
c. Contract with consultant CCS	
8. Testing of Assemblies [Element 5]	
a. By purveyor's staff or purveyor-employed backflow assembly tester (BAT)	
b. By customer-employed (contractor) BAT	
9. Cost Recovery [WAC 246-290-100(4)(h) and –105(4)(p)]	
a. Borne by all customers (general water rates)	
b. Assessed to specific class (commercial meters)	
c. Each customer directly bears cost	

Cross-Connection Control and Related Materials

Acronyms and Abbreviations

ABPA	American Backflow Prevention Association
AG	air gap
ANSI	American National Standards Institute
ASR	Annual Summary Report
AVB	atmospheric vacuum breaker
AWWA	American Water Works Association
BAT	backflow assembly tester
BPA	backflow prevention assembly
CCC	cross-connection control
CCS	cross-connection control specialist
CV	single-check valve
DCAV	dual-check with atmospheric vent
DCDA	double-check detector assembly
DCV	dual-check backflow preventer
DCVA	double-check valve assembly
DOH	Washington State Department of Health
EPA	U.S. Environmental Protection Agency
HBVB	hose bib vacuum breaker
IAPMO	International Association of Plumbing and Mechanical Officials
L&I	Washington State Department of Labor and Industries
LAA	Local Administrative Authority
MCL	maximum contaminant level
NTNC	non-transient non-community
PNWS-AWWA	Pacific Northwest Section - American Water Works Association
psi	pounds per square inch
PVBA	pressure vacuum breaker assembly
PVC	polyvinyl chloride
PWS	public water system
QA/QC	quality assurance/quality control
RCW	Revised Code of Washington
ROW	right-of-way
RPBA	reduced-pressure backflow assembly
RPDA	reduced-pressure detector assembly
SBCC	Washington State Building Code Council
SDWA	Safe Drinking Water Act
SRC4	Spokane Regional Cross-Connection Control Committee
SVBA	spill-resistant vacuum breaker assembly
SWSMP	small water system management plan

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The Group	Western Washington Cross-Connection Prevention Professionals Group

TNC	transient non-community
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
UPC	Uniform Plumbing Code
USC	University of Southern California
USCFCCCHR	University of Southern California - Foundation for Cross-Connection Control and Hydraulic Research
WAC	Washington Administrative Code
WSP	water system plan

Washington Administrative Code 246-290-490

This section contains Washington State Department of Health drinking water regulations relating to cross-connection control, WAC 246-290-490. These regulations first became effective in April 1999. Below is a list, definitions, abbreviations and acronyms relating to cross connections. These have been extracted from **WAC 246-290-010**.

Definitions Related to Cross-Connection Control

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

• Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and

• Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

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

"Approved backflow preventer" means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public

water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

"High health cross-connection hazard" means a cross connection which could impair the quality of potable water and create an actual public health hazard through poisoning or spread of disease by sewage, industrial liquids or waste.

"In-premises protection" means a method of protecting the health of consumers served by the consumer's potable water system, located within the property lines of the consumer's premises by the installation of an approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

"Local administrative authority" means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted

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

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

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

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

"Uniform Plumbing Code" means the code adopted under RCW 19.27.031(4) and amended under chapter 51-46 WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

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

Elements of the Program

The drinking water regulations for Group A public water systems in Washington, WAC 246-290, require CCC programs to include certain minimum elements. The elements are listed in WAC 246-290-490(3). This section describes how Clark Public Utilities intends to comply with each of the required program elements. Elements are numbered the same as they appear in the WAC.

Element 1: Adoption of a written legal instrument authorizing the establishment and implementation of a CCC program.

Clark Public Utilities water system has adopted a resolution No. 3559, reproduced as exhibit in appendix A, which authorizes Clark Public Utilities to implement a CCC program. The resolution also authorizes the water system to administer the Cross Connection Control Program. The primary method for protection of the distribution system will be the installation of a backflow preventer by the customer, at the customer's expense.

The attached service contract referred to in the resolution shall be the primary enforcement authority for all new customers.

For customers supplied prior to the adoption of the attached resolution, an implied service contract allows the Utility to protect the distribution system from contamination through a Utility- installed backflow preventer on a customer's service.

The Utility will engage the services of a DOH-certified CCS to develop, implement and be in responsible charge of Clark Public Utilities Water System's cross-connection control program. The Utility, under the direction of the aforementioned CCS, will prepare a written cross connection control program plan to implement the requirements of this resolution. The written program shall be consistent with this resolution and shall comply with the requirements of Chapter 246-290 WAC (Group A Drinking Water Regulations). The Purveyor will use the most recently published editions of the following publications as references and technical aids:

1. *Cross-Connection Control Manual, Accepted Procedures and Practice,* published by the Pacific Northwest Section, American Water Works Association, or latest edition thereof.

2. *Manual of Cross-Connection Control,* published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, or latest edition thereof.

3. *Cross-Connection Control Guidance Manual for Small Water Systems,* published by the DOH Office of Drinking Water.

4. The Utility will incorporate the written program plan into the Water System Plan and will submit the plan to DOH for approval when requested. The Purveyor, in consultation with the aforementioned CCS, shall have the authority to make reasonable decisions related to cross connections in cases and situations not provided for in the resolution or written program. If any provision in this resolution, or in the written cross-connection control program is found to be less stringent than or inconsistent with the Drinking Water Regulations (Chapter 246-290 WAC), or other Washington state statutes or rules, the more stringent state statute, rule, or regulation shall apply.

Element 2: Procedures and schedules for evaluating new and existing service connections to assess degree of hazard.

1. For all **New Non-Residential Services,** the customer will be required to submit, with the application for water service, construction plans meeting Clark Public Utilities design standards and state approved backflow assembly installation commensurate with the degree of hazard. All water metered services requiring a 1 ½" or larger water meter are required to install an approved premise isolation backflow assembly commensurate with the degree of hazard as a condition of service.

   As an alternative to the above requirement for a survey by a CCS, or LAA, the customer may agree to install an approved air gap (AG) or RPBA for premise isolation as a condition of service.

2. For all **New Residential Services,** If a customer has special plumbing, such as a lawn sprinkler system, hazardous water use, or unapproved water source on the premises, the customer shall submit to Clark Public Utilities an evaluation by a DOH-certified CCS or LAA of the hazard posed by the proposed special plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

As an alternative to the above requirement for a survey by a DOH-certified CCS or LAA, Clark Public Utilities, at its discretion, may specify a backflow preventer assembly is installed as a condition of service.

3. For all **Existing Non-Residential Services,** Clark Public Utilities will require the customer to submit to the Utility, within nine months of notification, an evaluation by a DOH-certified CCS or LAA, of the hazard posed by the plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA. The utility may accept the recommendations or submit the recommendations to a CCS employed by the Utility for peer review and concurrence, before acceptance.

   As an alternative to the above requirement for a survey by a DOH-certified CCS or LAA, the customer may agree to install an AG or RPBA for premise isolation within 90 days of notification by Clark Public Utilities or alternate time period acceptable to the Utility.

4. For all **Existing Residential Services,** Clark Public Utilities will require the customer to submit to Clark Public Utilities, within four months of notification, a completed "Water Use Questionnaire." If the customer's reply indicates special plumbing or water use on the premises, the customer shall submit an evaluation by a DOH-certified CCS or LAA of the hazard posed to the water system by the customers plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA.

   As an alternative to the above requirement for a survey by a CCS or LAA, the Utility may specify the backflow preventer required to be installed as a condition of service. The Utilities CCS will provide guidance on the type of backflow preventer to be installed

5. For **All Existing Services,** should the customer fail to supply the required information for a hazard assessment or fail to submit a completed "Water Use Questionnaire," The Utility may have the assessment made by a CCS employed with the Utility and require the installation or an RPBA for premises isolation, or take other such actions consistent with the previously stated policies and bill the customer for the associated costs.

Cross-Connection Hazard Survey Schedule for Initial Hazard Assessments

The Schedule for initial hazard assessment is outlined in the following table. The schedule starts from the date the CCC program is established.

Initial Assessment Task	Schedule
Assessment of all new connections	At time of application for water service
Identification and assessment of high-hazard premises which are listed on Table 13 of Washington Administrative Code (WAC) 246-290-490	Within twelve months
Identification and assessment of hazardous premises supplemental to Table 13 of WAC 246-290-490	Within eighteen months
Identification of residential connections with special plumbing facilities and/or water use on premises	Within twenty four months

Cross-Connection Hazard Survey Schedule for Subsequent Hazard Re-Assessments

For subsequent cross-connection hazard surveys, procedures for evaluating the backflow prevention requirements are:

1. For **Residential Services,** Clark Public Utilities will require the customer to submit within two months of notification, a completed "Water Use Questionnaire." The procedure used for evaluating the hazard re-assessment and the potential change in the required backflow prevention will be the same as used for the initial assessment.

2. For all **Non-Residential Services,** Clark Public Utilities will require the customer to submit to the Utility within two months of notification, a hazard re-assessment (at the customers expense) by a DOH-certified CCS or LAA.

The frequency of hazard re-assessments will be shown in the table below:

Type of Service	Frequency of Re-Evaluation
Any services with reduced-pressure principle backflow assembly (RPBA) installed for premises isolation.	None required as long as the RPBA passes annual tests and inspections
Commercial services with double-check valve assembly (DCVA) installed for premises isolation.	Upon change in use or ownership

Residential services with special plumbing where the Utility relies upon compliance with Uniform Plumbing Code (UPC)	Every 2-3 years (questionnaire)
Residential services with DCVA installed for premises isolation.	Every 4-5 years (questionnaire)
Residential services with no known special plumbing or water use on premises.	Every 4-5 years and upon change in use, ownership, or plumbing system (questionnaire)

Clark Public Utilities will Inform the customer that the Utilities survey of a customer's premises (whether by a representative of the Utility or through the evaluation of a questionnaire completed by the customer) is for the sole purpose of establishing the Utilities minimum requirements for the protection of the public water supply system, and that the required backflow protection will be commensurate with the Utilities assessment of the degree of hazard.

The Utility will also inform the customer or any regulatory agencies when the Utilities survey, requires the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by Utilities personnel or agent do not constitute an approval of the customer's plumbing system or an assurance to the customer or any regulatory agency of the absence of cross connections.

<u>Element 3:</u> Development and implementation of procedures and schedules for elimination and/or control of cross-connections.

Backflow Preventer Requirements
The following service policy shall apply to all new and existing customers:

1. Clark Public Utilities will require that water service to all **non-residential customers** be isolated at the meter by a DOH-approved DCVA or RPBA acceptable to the Utility. All high hazard connections of the type described in Table 13 of WAC 246-290-490 shall be isolated with an RPBA and or AG.

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2. Clark Public Utilities will require all **residential customers** with facilities of the type described in Table13 of WAC 246-290-490 to be isolated with an RPBA. All remaining residential customers will be isolated at the meter by a purveyor-installed meter check valve (single or dual). Residential customers with special plumbing or water use on the premises will be isolated with a DCVA. "Special plumbing" includes, but is not limited to, the following:

   a. A lawn irrigation system;
   b. A solar heating system;
   c. An auxiliary source of supply, e.g., a well or creek;

d. Piping for livestock watering, hobby farming, etc.;
e. Residential fire sprinkler system; and
f. Property containing a small boat moorage.

3. **For all customers with Clark Public Utilities water service, the required premises isolation DCVA or RPBA shall be:**

• Purchased and installed by the customer (at the customer's expense) in accordance with Clark Public Utilities standards.

• Maintained, tested, and inspected in accordance with DOH-approved methods.

4. Approved Backflow Preventers and Installation

All backflow preventers relied upon by Clark Public Utilities to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. Clark Public Utilities will obtain and maintain a current list of assemblies approved for installation in Washington State from the DOH Office of Drinking Water. All backflow preventers will be installed in:

• The orientation for which they are approved;
• A manner and location that facilitates their proper operation, maintenance, and testing or inspection;
• A manner that will protect them from weather-related conditions such as flooding and freezing; and
• Compliance with applicable safety regulations.

Installation standards contained in the most recently published edition of the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) *CCC Manual* or the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR) *CCC Manual* shall be followed unless the manufacturer's requirements are more stringent.

The water utility has no regulatory responsibility or authority over the installation and operation of the customer's plumbing system. The customer is solely responsible for compliance with all applicable regulations and for prevention of contamination of his plumbing system from sources within his/her premises. Any action taken by the Utility to survey plumbing, inspect or test backflow prevention assemblies, or to require premises isolation (installation of DCVA or RPBA on service) is solely for the purposes of reducing the risk of contamination of Clark Public Utilities distribution system. Clark Public Utilities will inform the customer that any action taken by the Utility shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. Clark Public Utilities will not provide advice to the customer on the design and installation of plumbing other than through the general public education program discussed in Element 8.

Except for easements containing the Utilities distribution system, Clark Public Utilities will not undertake work on the customer's premises.

6**. Schedule for Installation of Backflow Preventers**

The following table shows the schedule that Clark Public Utilities will follow for installation of backflow preventers when they are required (based on the hazard evaluation).

Type of Service	Schedule
New connections with cross-connection hazards	Before service is initiated
Existing connections with Table 13-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than Table 13 of WAC 246-290-490 or high cross-connection hazards	Within 180 days after notification (suggested)
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by purveyor's water	Within 1 year after notification (suggested)

Clark Public Utilities may consider granting an extension of time for installation of backflow prevention assembly for an existing connection if requested by the premises owner.

<u>Element 4:</u> Provision of qualified personnel, including at least one person certified as a CCS, to develop and implement the CCC program.

1. **Program Administration:** The responsibility for administration of the CCC Program rests with Clark Public Utilities. The Clark Public Utilities commissioners and Directors establish general policy direction and risk management decisions.

2. Clark Public Utilities will employ or have on staff at least one person certified by DOH as a CCS to develop and implement the CCC program. As an alternative, or when no staff or employees are properly qualified, the Utility may retain a DOH-certified CCS on contract to provide the necessary expertise and services.

3. The following cross-connection related tasks will be performed by or under the direction of Clark Public Utilities CCS (on staff or under contract):

- Preparation of and recommendations regarding changes to the CCC program;
- Performance of and/or reviews of CCC hazard evaluations;
- Recommendations on the type of backflow preventer to be installed;
- Recommendations on schedules for retrofitting of backflow preventers;
- Inspections of backflow preventers for proper application and installation;
- Reviews of backflow preventer inspection and test reports;

* Upon request, review of proposed design drawings of the water system for the purposes of eliminating or controlling cross connections;
• Reviews of backflow testing quality control information;
• Recommendations and/or the granting of exceptions to mandatory premises isolation;
• Participation in or cooperation with other water utility staff in the investigation of backflow incidents and other water quality problems;
• Completion of Backflow Incident Reports; and
• Completion of CCC Activity and Program Summary Reports.

4. Clark Public Utilities may delegate other CCC program activities to other personnel who are not certified CCSs, including clerical support staff. These activities include:

• Administration of paperwork associated with service agreements;
• Mailing, collecting, and initial screening of hazard evaluation/water use questionnaires;
• Mailing of assembly testing notices;
• Receiving and screening of assembly testing reports;
• CCC program database administration and record keeping;
• Dissemination of public education material; and
• Assisting tasks associated with coordination with the LAA.

5. The following table identifies the current CCS employed or retained on contract by Clark Public Utilities to manage the Utilities CCC program and/or act as the CCC technical resource for Clark Public Utilities:

Name of CCS	Gary St John
Telephone Number	360-992-8034
Email address	gstjohn@clarkpud.com
CCS Certification Number	9840

<u>Element 5:</u> Development and implementation of procedures to ensure that approved backflow preventers are inspected and/or tested (as applicable).

1. Inspection and Testing of Backflow Preventers

All backflow preventers that Clark Public Utilities relies upon for protection of the water system will be subject to inspection and, if applicable, testing. This includes backflow preventers installed for in-premises protection that the Utility relies upon for protection of the water systems.

Inspection and testing of backflow preventers will be as follows:

• Clark Public Utilities DOH-certified CCS or LAA will inspect backflow preventers for proper application (i.e., to ensure that the preventer installed is commensurate with the assessed degree of hazard).

• Either a DOH-certified CCS, LAA or backflow assembly tester (BAT) will perform inspections of backflow preventers for correct installation.

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• A DOH-certified backflow assembly tester will test all assemblies relied upon by the Utility to protect the public water system.

2. Frequency of Inspection and Testing
Inspection and testing of backflow preventers will be conducted:

• At the time of installation;
• Annually after installation;
• After a backflow incident; and
• After repair, reinstallation, relocation, or re-plumbing.

Clark Public Utilities may require a backflow preventer to be inspected and/or tested more frequently than once a year, when it protects against a high-health hazard or when it repeatedly fails tests or inspections.

3. Responsibility for Inspection and Testing

Clark Public Utilities will be responsible for inspection and testing of all Utility owned backflow preventers. Clark Public Utilities will require the customer to be responsible for inspection and testing of backflow preventers owned by the customer. The customer shall employ, at customer expense, a DOH-certified BAT to conduct the inspection and test within the time period specified in the testing notice sent by the Utility. The test report shall be completed and signed by the BAT. The customer may request an extension of the due date for returning a test report by submitting a written request. Clark Public Utilities may grant one extension up to 90 days.

4. Approved Test Procedures

Clark Public Utilities will require that all assemblies relied upon to protect the public water system be tested in accordance with DOH-approved test procedures as specified in WAC 246-290-490(7)(d). Any proposal to use alternate test procedures must be approved by the Utility CCS.

5. Notification of Inspection and/or Testing

Clark Public Utilities will notify in writing all customers who own backflow preventers that are relied upon to protect the public water system to have their backflow preventer(s) inspected and/or tested.

6. Enforcement

When a customer fails to send in the inspection/test report and the Utility has not approved an extension to the due date, Clark Public Utilities will take the following enforcement action:

• Clark Public Utilities will send a notice giving the customer an additional 60 days to send in the inspection/test report.

• If the customer has not sent in the inspection/test report within 30 of the due date given in the second notice, Clark Public Utilities will send a third notice, giving the customer an additional 30 days to send in the report. The notice will also inform the customer that failure to satisfactorily respond to this notice may result in water service shut-off.

• Clark Public Utilities will send copies of the third notice to the owner and occupants of the premises (if different from the customer) and to the LAA.

• If the owner and/or occupants have not responded satisfactorily to the Utility within 30 days of the due date specified in the third notice, Clark Public Utilities may implement water service shut-off procedures.

<u>Element 6:</u> Development and implementation of a backflow prevention assembly testing quality assurance/quality control program

1. Clark Public Utilities will maintain a list of local, DOH-certified BATs that are pre-approved by DOH to perform the following activities:

• Backflow preventer inspection for proper installation; and
• Backflow assembly testing.

Pre-Approval Qualifications

BATs who wish to be included on Clark Public Utilities preapproved list and/or provide testing in the Clark Public Utilities service area must furnish the following information:

- Evidence of current DOH certification in good standing;
- Make and model and serial number of testing equipment
- Evidence of test equipment verification of accuracy and/or calibration within the past 12 months.
- Testers name, telephone number, and email address.

2. Quality Assurance

Clark Public Utilities CCS will review within 30 days of receipt the backflow preventer inspection/test report forms submitted by the customer or certified BAT. The Utilities CCS will provide follow up on test reports that are deficient in any way. Clark Public Utilities CCS will report incidences of fraud or gross incompetence on the part of any BAT or CCS to DOH Operator Certification program staff.

<u>Element 7:</u> Development and implementation (when appropriate) of procedures for responding to backflow incidents.

1. Backflow Incident Response Plan

Clark Public Utilities CCS will participate in developing a backflow incident response plan that will be part of the water system's emergency response program as required by WAC 246-290-415(2). The incident response plan will include, but will not be limited to:

• Notification of affected population;
• Notification and coordination with other agencies, such as DOH, the LAA, and the local health jurisdiction;
• Identification of the source of contamination;
• Isolation of the source of contamination and the affected area(s);
• Cleaning, flushing, and other measures to mitigate and correct the problem; and
• Apply corrective action to prevent future backflow occurrences.

2. Technical Resources

Clark Public Utilities will use the most recently published edition of the manual, *Backflow Incident Investigation Procedures*, published by the PNWS-AWWA as a supplement to the Backflow Incident Response Plan for Clark Public Utilities.

<u>Element 8:</u> Development and implementation of a cross-connection control public education program.

1. Customer Education

Clark Public Utilities will distribute with water bills or some other means, at regular intervals, public education brochures to system customers. For residential customers, such brochures or billing inserts will describe the cross-connection hazards in homes and the recommended assemblies or devices that should be installed by the homeowner to reduce the hazard to the public water system. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply.

Clark Public Utilities staff will produce the public education brochures or will obtain brochures from:

- PNWS-AWWA;
- Spokane Regional Cross-Connection Control Committee (SRC4);
- Western Washington Cross-Connection Prevention Professionals Group (The Group);
- USC FCCCHR;
- Other national backflow prevention associations, such as the American Backflow Prevention Association (ABPA); and/or
- Other water utilities.

The information distributed by Clark Public Utilities will include, but not be limited to, the following subjects:

- Cross-connection hazards in general;
- Irrigation system hazards and corrective actions;
- Fire sprinkler cross-connection hazards;
- Importance of annual inspection and/or testing of backflow preventers; and
- Thermal expansion in hot water systems when backflow preventers are installed for premise isolation.

Clark Public Utilities will distribute information brochures to all customers with the first annual notices.

Element 9: Development and maintenance of cross-connection control records.

1. Types of records and data to be maintained

Clark Public Utilities will maintain records of the following types of information required by WAC 246-290-490:

- Service connections/customer premises information including:
    - o Assessed degree of hazard; and
    - o Required backflow preventer to protect the public water system.

- Backflow preventer inventory and information including:
    - o Air gap (AG) location, installation and inspection dates, inspection results and person conducting inspection;
    - o Backflow assembly location, assembly description (type, manufacturer, make, model, size, and serial number), installation, inspection and test dates, test results and data, and person performing test; and
    - o Information on atmospheric vacuum breakers used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and person performing inspections.

Clark Public Utilities will maintain records on all assemblies that protect the public water system from contamination. At a minimum, the Utility will maintain records on all premises isolation assemblies required to protect the public water system.

By inter-agency agreement, the Utility will also maintain the above information for LAA required backflow preventers that are **not** relied upon by the Purveyor to protect the public water system.

2. Reports to be Prepared and Submitted to DOH

Clark Public Utilities will prepare the following reports required by WAC 246-290-490 including:

- Cross-connection control program activities report for the calendar year, to be sent to DOH when requested;
- Cross-connection control program summary information, when required, or when there are significant policy changes;
- Backflow incident reports to DOH (and voluntarily to the PNWS-AWWA CCC Committee); and
- Documentation when exceptions to mandatory premises isolation are granted.

At a minimum, Clark Public Utilities CCS will prepare and sign the exceptions reports.

Clark Public Utilities CCS will review all CCC-related reports for correctness and the manager of the public water system shall sign the CCC reports before submission to DOH.

<u>Element 10:</u> Additional cross-connection control requirements for reclaimed water.

At this time Clark Public Utilities does not receive or distribute reclaimed water. In the event that reclaimed water use is proposed within Clark Public Utilities service area, the Utility will make all cross-connection control requirements mandated by the Permitting Authority in accordance with Chapter 90.46 RCW part of the written CCC program plan and comply with such additional requirements.

Other Provisions

1. Coordination with Local Administrative Authority

Both WAC 246-290-490 and the Uniform Plumbing Code amended for Washington require coordination between the water purveyor and the Local Administrative Authority (LAA) in all matters pertaining to cross-connection control. The water utility will provide a copy of this CCC program to Clark County Community Development. The water utility will inform the LAA of any changes in policy or procedure that may impact the LAA. The Utility will provide information to the LAA in a timely manner regarding any:

- Requirement imposed on a residential customer for the installation of a DCVA or an RPBA on the service, with a description of the cross-connection hazard identified;

- Upgrade of the premises isolation backflow preventer, i.e., from a DCVA to an RPBA;

- Action taken to discontinue water service to a customer.

- Backflow incident known by the water utility to have contaminated the public water system or a customer's plumbing system.

2. The water utility will pursue development of a written agreement with the Local Administrative Authority regarding the details of the coordination on CCC issues between the two parties. The agreement will include, but not be limited to, the following items:

- The purpose of the written agreement;
- Identification of the parties and other interested agencies;
- Delineation of responsibilities;
- Procedures regarding new service connections;
- Procedures regarding existing and changes to existing services;
- Special policies and procedures, such as for fire protection and irrigation services;
- Procedures regarding water service shut-offs, backflow incidents, and other events;
- Communications between parties; and
- Other contingencies."

3. Prohibition of Return of Used Water.
Clark Public Utilities must prohibit the intentional return of used water to the Utilities distribution system per WAC 246-290-490 (2)(l).

Used water is defined as water that has left the control of Clark Public Utilities. This includes water used for heating and cooling purposes and water that may flow back into the distribution system from customers with multiple connections. It is the policy of Clark Public Utilities water system to:

- Prohibit the intentional return of used water to the distribution system by any customer served by the public water system; and
- Require that all customers with multiple connections, where the hydraulics permit the potential return of used water, to install a backflow preventer (DCVA or RPBA) commensurate with the degree of hazard at each point of connection.

4. "Unapproved Auxiliary Supplies.

All water supplies other than those owned by the Utility are considered unapproved auxiliary supplies as defined in WAC 246-290-010. Clark Public Utilities will require backflow protection for customers with auxiliary supplies on their premises as follows:

• Per Table 13 of WAC 246-290-490, Clark Public Utilities will require the installation of an RPBA for premises isolation at the service connection to any customer having an unapproved auxiliary supply on the premises that is served by the Clark Public Utilities water system.

5. "Tanker Trucks.

Clark Public Utilities may allow tanker trucks to obtain water from Clark Public Utilities water system under the following conditions:

• The tanker truck is equipped with an approved AG or an approved RPBA with a current satisfactory inspection or test report."

6. Interties and Wholesale Water Customers.

The Utility will require that interties with other public water systems or wholesale customers (such as mobile home parks) be isolated at the point of delivery by:

- A minimum of a DCVA
- A minimum of an RPBA if the Utility considers the purchasing system or wholesale customers to pose a high health hazard to the Utilities system.

Clark Public Utilities may waive or reduce the level of protection at the intertie, if the purchasing public water system or wholesale customer:

- Is a Group A public water system **not** exempt from DOH regulation as per WAC 246-290-020(2);
- Has a CCC program that complies with WAC 246-290-490 and which has been approved by DOH; and
- Implements the CCC program at a level satisfactory to Clark Public Utilities.

Relationship to Other Planning and Operations Program Requirements

Clark Public Utilities will consider the requirements and consequences of the CCC program on the utility's planning and operations requirements. Such considerations include, but are not limited to ensuring:

• Promoting adequate communication between CCC program personnel and other water utility staff;
• That adequate training is provided to all staff to recognize potential cross-connection control problems;
• That cross-connection issues be considered in water quality investigations;
• That the design of the water distribution system makes adequate provisions for expected head losses incurred through the installation of backflow assemblies;
• That CCC program personnel be consulted in the design of water and wastewater treatment facilities and when proposals are made to receive or distribute reclaimed water;
• That operations under normal and abnormal conditions do not result in excessive pressure losses; and
• That adequate financial and administrative resources are available to carry out the CCC program.

Appendix A

RESOLUTION NO. 3559

A Resolution Adopting a Tariff Schedule of Fees and Charges and General Terms and Conditions for Water Service and Repealing Resolution No. 3220 and All Other Resolutions or Parts of Resolutions in Conflict Therewith.

WHEREAS, the Commissioners of Public Utility District No. 1 of Clark County have periodically established a Schedule of Fees and Charges and General Terms and Conditions for Water Service for purposes of standardization and clarification and to meet changing conditions and service requirements; and

WHEREAS, the District Commission adopted a Tariff Schedule of Fees and Charges and General Terms and Conditions for Water Service with Resolution No. 3220 dated September 5, 1978;

WHEREAS, for purposes of clarification, minor changes, deletions, and additions are recommended; Now, Therefore,

BE IT RESOLVED by the Commissioners of Public Utility District No. 1 of Clark County in regular session assembled this 3rd day of March, 1981, as follows:

Section 1. That the following be and the same are hereby adopted and established as the Tariff of Fees and Charges and General Terms and Conditions for Water Service effective this 3rd day of March, 1981.

Section 2. Resolution No. 3220 and all other Resolutions or parts of Resolutions in conflict herewith be and the same are hereby repealed as of the effective date hereof.

PASSED AND ADOPTED this 3rd day of March, 1981.

President

Attest:

Secretary

O. The District reserves the right to regulate at all times the hours when Customers will be permitted to use District water for purposes of lawn sprinkling, irrigation or any use other than domestic consumption or fire protection.

P. It shall be unlawful for any person to attach or detach from any water main, any service pipe or other connection through which water is supplied by the District or to interfere in any manner with such pipes or connections without first having obtained the written consent of the District.

Q. Unauthorized use of water from an unmetered service is subject to charges per page 1, Fees and Charges.

20. MODIFICATION OR RELOCATION OF FACILITIES

Changes and relocation of District facilities for the convenience of the Customer may be made, where feasible as determined by the District, provided the Customer agrees to pay actual costs.

21. POINT OF DELIVERY

The point of delivery, unless otherwise designated by special contract, will be the point which the District's water meter connects to the Customer's service line.

22. CROSS CONNECTIONS

A. The installation or maintenance of a cross connection which will endanger the water quality of the District's supply is prohibited. Any such cross connection now existing or hereafter installed is hereby declared a nuisance and shall be abated immediately. The control or elimination of cross connections shall be in accordance

with the State of Washington Administrative Code (WAC 248-54-500) or subsequent revisions, together with any existing or future manuals of standard practice pertaining to cross connection control approved by the District or the State of Washington Department of Social and Health Services. The water supply may be discontinued to any premise for failure to comply with the provisions of this section.

B. Service from the District's supply system to any premise upon which a private water supply system is used or operated contrary to the provisions of this section may be discontinued or refused. Furnishing of service shall be contingent upon the Customer's furnishing a type of connection approved by the appropriate Health Authority and the District for protecting the District supply from backflow.

C. Inspection of Cross-Connection Devices: Cross connection and backflow devices required under the provisions of this section shall be provided and installed at the Customer's expense and shall be inspected and approved by the District. Cost of such initial inspection shall be as provided for on Page 2 of Fees and Charges. Periodic inspections and repairs of these devices as required by Paragraph A shall be at the Customer's expense. Upon notification by the District that a periodic inspection is due, the Customer shall have the service performed by a commercial firm licensed to do so by the Washington State Department of Social and Health Services. The District shall be provided with a signed copy of the inspector's completion report prepared on a form provided by the District.

D. The general rule governing the installation of backflow prevention devices for fire service lines is the same as it is for other types of service lines. The degree of protection must be commensurate with the degree of hazard. The following is a listing of the more

common situations which are encountered in fire systems and the corresponding backflow prevention device considered to be necessary to afford the appropriate protection in each case.

	Particulars	Device Required
(1)	Any system with provisions for injecting foamite or toxic fire retardants whether directly connected or not.	RP device
(2)	Any system where an unapproved auxiliary source is permanently connected to fire system.	RP device
(3)	Any systems where toxic antifreeze is used. (Not allowed)	RP device
(4)	Any systems where FDA-approved antifreeze is used.	RP device
(5)	Any system with private hydrants.	Double Check
(6)	Any system with pumper connections located less than 1700 ft. from an auxiliary water supply. (This requirement can be relaxed in cases where the vertical difference in elevation between the auxiliary supply and the pumper connection makes it unlikely that water will be pumped from the auxiliary supply.)	Double Check
(7)	Any systems with or without pumper connections but with pipe size six inches or	

more in diameter.	Double Check
(8) Any systems with or without pumper connections which serve buildings more than three stories high. (If the sprinkler system is confined only to the basement, a double check is not required.)	Double Check
(9) Any system with or without pumper connection, without antifreeze, four inches in diameter or less, and serving buildings less than three stories high, and located more than 1700 feet from an auxiliary water supply.	Sgl. Det. Ck.
(10) Dry system, without pumper connections, all sizes.	Sgl. Det. Ck.
(11) Any system with booster pump	Double Check

23. METERS AND METERING

A. The District shall have the right to designate the size and type of meter required and its location for any given application, except that no meter smaller in capacity than that prescribed by state, county or municipal regulations shall be used. The meter remains the property of the District.

B. Whenever a meter is to be or has been installed within any portion of a street, alley or private property, suitable bases, supports or barriers shall be installed as will secure reasonably the meter and pipes connected therewith against any damage from strain or settlement. The cost of the erection of such bases, supports and barriers shall be paid by the Customer for whom the meter was

P Capital Improvements Projects (2022 – 2042)

Year	Storage & Boosters	Mains	Source	Meters	Total
2022	165,000	83,000	1,545,000	1,001	1,794,001
2023	420,000	10,445,000	713,000	1,100	11,579,100
2024	480,000	718,000	1,275,000	7,129	2,480,129
2025	1,728,000	3,089,000	615,000	24,342	5,456,342
2026	660,000	7,828,000		53,736	8,541,736
2027	615,000	7,828,000		90,868	8,533,868
2028	345,000	1,235,000	5,550,000	149,300	7,279,300
2029	968,000	1,077,000		462,168	2,507,168
2030	1,313,000	2,314,000		744,891	4,371,891
2031	1,448,000	9,738,000		843,267	12,029,267
2032	13,125,000	3,571,000	1,800,000	1,024,170	19,520,170
2033	3,000,000	3,210,000		1,658,802	7,868,802
2034	245,000	3,574,000		1,700,963	5,519,963
2035	525,000	7,973,000		1,730,210	10,228,210
2036	113,000	895,000	1,800,000	1,743,906	4,551,906
2037	1,408,000	1,261,000		1,747,973	4,416,973
2038	470,000	1,293,000		1,730,944	3,493,944
2039	525,000	5,669,000		1,366,674	7,560,674
2040	113,000	8,141,000	1,800,000	1,042,335	11,096,335
2041		1,940,000		972,826	2,912,826
2042		3,256,000		799,078	4,055,078

Project, Type 58 - Meters			Cost	Funding	Notes/Details					
									Reason	Rates or SDCs
Project Type	Year	CIP Project ID	Replacement Count	Unit Cost	Total Cost (Construction)	Design	Overhead & Contingency	Total Project Cost	Growth or Repair & Rehabiliation	Rates or SDCs
Meters	2022	M-1	0	250.00	0.50	-	1,000	1,001	Repair & Rehabilitation	Rates
Meters	2023	M-2	0	257.50	99.55	-	1,000	1,100	Repair & Rehabilitation	Rates
Meters	2024	M-3	19	265.23	5,128.97	-	2,000	7,129	Repair & Rehabilitation	Rates
Meters	2025	M-4	67	273.18	18,342.24	-	6,000	24,342	Repair & Rehabilitation	Rates
Meters	2026	M-5	145	281.38	40,735.77	-	13,000	53,736	Repair & Rehabilitation	Rates
Meters	2027	M-6	241	289.82	69,868.46	-	21,000	90,868	Repair & Rehabilitation	Rates
Meters	2028	M-7	383	298.51	114,299.94	-	35,000	149,300	Repair & Rehabilitation	Rates
Meters	2029	M-8	1,155	307.47	355,167.65	-	107,000	462,168	Repair & Rehabilitation	Rates
Meters	2030	M-9	1,809	316.69	572,890.63	-	172,000	744,891	Repair & Rehabilitation	Rates
Meters	2031	M-10	1,987	326.19	648,267.42	-	195,000	843,267	Repair & Rehabilitation	Rates
Meters	2032	M-11	2,343	335.98	787,169.92	-	237,000	1,024,170	Repair & Rehabilitation	Rates
Meters	2033	M-12	3,687	346.06	1,275,801.57	-	383,000	1,658,802	Repair & Rehabilitation	Rates
Meters	2034	M-13	3,670	356.44	1,307,962.60	-	393,000	1,700,963	Repair & Rehabilitation	Rates
Meters	2035	M-14	3,623	367.13	1,330,210.47	-	400,000	1,730,210	Repair & Rehabilitation	Rates
Meters	2036	M-15	3,546	378.15	1,340,906.33	-	403,000	1,743,906	Repair & Rehabilitation	Rates
Meters	2037	M-16	3,451	389.49	1,343,972.80	-	404,000	1,747,973	Repair & Rehabilitation	Rates
Meters	2038	M-17	3,318	401.18	1,330,943.52	-	400,000	1,730,944	Repair & Rehabilitation	Rates
Meters	2039	M-18	2,543	413.21	1,050,673.92	-	316,000	1,366,674	Repair & Rehabilitation	Rates
Meters	2040	M-19	1,883	425.61	801,335.24	-	241,000	1,042,335	Repair & Rehabilitation	Rates
Meters	2041	M-20	1,706	438.38	747,826.49	-	225,000	972,826	Repair & Rehabilitation	Rates
Meters	2042	M-21	1,360	451.53	614,077.82	-	185,000	799,078	Repair & Rehabilitation	Rates

Project Type	Year	CIP -ID		Construction	Design	Overhead and Contingency	Total Project		
Source	2023	S-1	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2023	S-2	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2023	S-3	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2023	S-4	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2023	S-5	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2023	S-6	Chlorine Day Tank @ PPTP	$15,000	3,000	5,000	23,000	Growth - Additional Chlorine Volume	SDCs
Source	2023	S-7	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2024	S-8	Paradise Pt. Well #3 Drilling	$850,000	170,000	255,000	1,275,000	Growth - Well & Pump House	SDCs
Source	2022	S-9	C.J.Curtis PAA Well #1	$700,000	140,000	210,000	1,050,000	Growth - Well, Building & Treatment	SDCs
Source	2022	S-10	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2022	S-11	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2022	S-12	Pump/Motor Replacement	$76,000	16,000	23,000	115,000	Rehabilitation/replace pumps/motors	Rates
Source	2025	S-13	PPTP Well #3 Pump Station	$850,000	170,000	255,000	1,275,000	Growth	SDCs
Source	2025	S-14	PPTP Additional Filters	$1,200,000	240,000	360,000	1,800,000	Growth	SDCs
Source	2022	S-15	C.J. Curtis PAA Pilot Testing	$100,000	20,000	30,000	150,000	Growth	SDCs
Source	2028	S-16	C.J. Curtis Hydraulic Containment	$2,500,000	500,000	750,000	3,750,000	Growth	SDCs
Source	2028	S-17	C.J. Curtis Water Treatment Phase 1	$1,200,000	240,000	360,000	1,800,000	Growth	SDCs
Source	2028	S-18	CJ Curtis PFAS/Organics Removal Contingency Phase 1	$7,800,000	1,560,000	2,340,000	11,700,000	TBD	Rates
Source	2032	S-19	C.J. Curtis Water Treatment Phase 2	$1,200,000	240,000	360,000	1,800,000	Growth	SDCs
Source	2032	S-20	CJ Curtis PFAS/Organics Removal Contingency Phase 2	$7,800,000	1,560,000	2,340,000	11,700,000	TBD	Rates
Source	2036	S-21	C.J. Curtis Water Treatment Phase 3	$1,200,000	240,000	360,000	1,800,000	Growth	SDCs
Source	2036	S-22	CJ Curtis PFAS/Organics Removal Contingency Phase 3	$7,800,000	1,560,000	2,340,000	11,700,000	TBD	Rates
Source	2040	S-23	C.J. Curtis Water Treatment Phase 4	$1,200,000	240,000	360,000	1,800,000	Growth	SDCs
Source	2040	S-24	CJ Curtis PFAS/Organics Removal Contingency Phase 4	$7,800,000	1,560,000	2,340,000	11,700,000	TBD	Rates

Facility Type	Year	CIP ID	CIP Description	Capacity	Total
Tank	2032	T-1	Pumped storage to meet Hazel Dell Storage Def	1,000,000	1,875,000
Tank	2033	T-2	NEW HAZEL DELL EAST ZONE PUMPED STORAGE	2,000,000	3,750,000
Tank	2034	T-3	NEW PUMPED STORAGE FOR HAZEL DELL AT WELL 13	1,000,000	1,875,000
Tank	2035	T-4	NEW HOCKINSON RESERVOIR TO ADDRESS STORAGE DEF	1,600,000	3,000,000
Tank	2036	T-5	New Rawson Zone tank to meet storage def	130,000	245,000
Tank	2037	T-6	NEW BIG EAST TANK TO MEET STORAGE DEF	280,000	525,000
Tank	2038	T-7	DECOMISSION TANK TO IMPROVE PRESSURES AND CONNECT ZONE TO GABLE AVE	NA	113,000
Tank	2039	T-8	Beck Zone Tank	750,000	1,408,000
Tank	2040	T-9	Upper La Center Reservoir Additiion	250,000	470,000
Tank	2022	T-10	Demo MG Res 7A & 7B	NA	75,000
Tank	2023	T-11	Upper Basket Flats Reservoir Replacemnt	NA	150,000
Tank	2024	T-12	Garner Rd. Res. Site Acquisition / Design	NA	300,000
Tank	2025	T-13	Demo Elkhorn Res.	NA	60,000
Tank	2026	T-14	Garner Rd Res. Sitework, Fab & Paint	NA	600,000
Tank	2027	T-15	Recoat Summerhills Reservoir	NA	390,000
Tank	2028	T-16	Upper Basket Flats Reservoir Replacemnt	NA	120,000
Tank	2029	T-17	Elkhorn Res Prop. Acquisition & Design	NA	180,000
Tank	2030	T-18	Elkhorn Reservoir Construction & Painting	NA	525,000
Tank	2031	T-19	Recoat Big East Res	NA	240,000
Tank	2032	T-20	Gabriel Rd Res. Site Acq., Design and Found.	NA	375,000
Tank	2033	T-21	Finn Hill Recoat	NA	330,000
Tank	2034	T-22	Replace existing Lakeshore res and add additional capacity	6,000,000	11,250,000
Tank	2025	T-23	REPLACE UBF RESERVOIR AND DECOMISSION EXISTING TANK	130,000	245,000
Tank	2025	T-24	NEW RESERVOIR TO MEET STORAGE DEF. IN GRIFFELS & DECOMISSION LVV TANK	710,000	1,333,000
Pump Station	2022	PS-25	Generator for Booster # 123		90,000
Pump Station	2023	PS-26	Booster #8 Relocation		270,000
Pump Station	2024	PS-27	Upgrade Booster #106		180,000
Pump Station	2025	PS-28	Generator for Booster # 131		90,000
Pump Station	2026	PS-29	PRV Station @ NE 119 Av To UVV Pres.Zone		60,000
Pump Station	2027	PS-30	NE 72 Ave Booster for MG Pressure Zone		225,000
Pump Station	2028	PS-31	PPTP Booster Pump Upgrade		90,000
Pump Station	2029	PS-32	REPLACE EXISTING B106	750	788,000
Pump Station	2030	PS-1	MEADOW GLADE TO DOVE CREEK	750	788,000
Pump Station	2031	PS-10	FireFlow CAPACITY	650	683,000
Pump Station	2032	PS-11	FireFlow CAPACITY	400	420,000
Pump Station	2033	PS-12	MEET FF IN NE UVV PZ	500	525,000
Pump Station	2034	PS-13	Add additional pump capacity at B101	300	315,000
Pump Station	2035	PS-14	FUTURE YACOLT CONNECTION	1,000	1,050,000
Pump Station	2036	PS-16	HAZEL DELL TO MEADOW GLADE	2,000	2,100,000
Pump Station	2037	PS-17	FireFlow CAPACITY	1,000	1,050,000
Pump Station	2038	PS-18	FireFlow CAPACITY	0	3,000
Pump Station	2039	PS-19	FireFlow CAPACITY	350	368,000
Pump Station	2040	PS-2	MEADOW GLADE TO LOCKWOOD	500	525,000
Pump Station	2041	PS-20	FireFlow CAPACITY	300	315,000
Pump Station	2042	PS-21	FireFlow CAPACITY	300	315,000
Pump Station	2040	PS-22	FireFlow CAPACITY	500	525,000
Pump Station	2031	PS-3	Increase capacity to convey flow from Meadow Glade to Griffels	500	525,000
Pump Station	2032	PS-4	NEW BOOSTER FOR FUTURE YACOLT DEMAND AND FF DEF	900	945,000

Project Type	Year	CIP ID	Length	Existing Dia	Prop Dia	CIP Type	Total	Clark PUD Costs	Growth or Repair and Rehabilitation	Rates or SDCs
Pipeline	2024	P-1	803	6	8	UPSIZE	98,000	98,000	Repair	Rate
Pipeline	2023	P-2	680	0	8	NEW	83,000	83,000	Repair	Rate
Pipeline	2025	P-3	360	4	8	UPSIZE	44,000	44,000	Repair	Rate
Pipeline	2026	P-4	426	6	8	UPSIZE	53,000	53,000	Repair	Rate
Pipeline	2027	P-6	569	6	8	UPSIZE	70,000	70,000	Growth	SDCs
Pipeline	2024	P-7	26,930	0	24	NEW	9,697,000	9,697,000	Repair	Rate
Pipeline	2028	P-8	3,518	8	12	UPSIZE	635,000	635,000	Repair	Rate
Pipeline	2029	P-9	45	6	12	UPSIZE	10,000	10,000	Repair	Rate
Pipeline	2030	P-10	2,311	8	12	UPSIZE	418,000	418,000	Growth	SDCs
Pipeline	2025	P-11	761	0	8	NEW	93,000	93,000	Repair	Rate
Pipeline	2031	P-13	16,825	16	24	UPSIZE	6,059,000	6,059,000	Growth	SDCs
Pipeline	2026	P-14	16,270	0	12	NEW	2,930,000	2,930,000	Growth	SDCs
Pipeline	2027	P-15	21,316	0	24	NEW	7,675,000	7,675,000	Growth	SDCs
Pipeline	2032	P-16	11,725	4	12	UPSIZE	2,112,000	2,112,000	Repair	Rate
Pipeline	2028	P-17	3,878	0	8	NEW	468,000	468,000	Growth	SDCs
Pipeline	2033	P-18	550	8	12	UPSIZE	100,000	100,000	Growth	SDCs
Pipeline	2034	P-19	5,062	4	8	UPSIZE	608,000	608,000	Repair	Rate
Pipeline	2035	P-20	1,244	4	6	UPSIZE	113,000	113,000	Repair	Rate
Pipeline	2036	P-21	1,284	4	6	UPSIZE	118,000	118,000	Repair	Rate
Pipeline	2037	P-22	1,074	4	6	UPSIZE	98,000	98,000	Repair	Rate
Pipeline	2038	P-23	1,033	4	6	UPSIZE	94,000	94,000	Repair	Rate
Pipeline	2039	P-24	2,552	4	6	UPSIZE	232,000	232,000	Repair	Rate
Pipeline	2040	P-25	2,010	4	8	UPSIZE	243,000	243,000	Repair	Rate
Pipeline	2041	P-26	1,552	4	6	UPSIZE	142,000	142,000	Repair	Rate
Pipeline	2042	P-27	5,332	8	12	UPSIZE	960,000	960,000	Growth	SDCs
Pipeline	2024	P-28	4,697	6	8	UPSIZE	565,000	565,000	Repair	Rate
Pipeline	2025	P-29	2,620	8	12	UPSIZE	473,000	473,000	Growth	SDCs
Pipeline	2026	P-30	121	8	12	UPSIZE	23,000		Growth	SDCs
Pipeline	2027	P-31	192	8	12	UPSIZE	37,000		Growth	SDCs
Pipeline	2028	P-32	1,086	4	8	UPSIZE	132,000		Repair	Rate
Pipeline	2029	P-33	3,735	4	8	UPSIZE	449,000		Growth	SDCs
Pipeline	2030	P-34	3,441	6	8	UPSIZE	415,000		Repair	Rate
Pipeline	2031	P-35	3,162	6	8	UPSIZE	380,000		Repair	Rate
Pipeline	2032	P-36	889	4	8	UPSIZE	109,000		Repair	Rate
Pipeline	2033	P-37	1,867	6	8	UPSIZE	225,000		Repair	Rate
Pipeline	2034	P-38	1,953	4	8	UPSIZE	237,000	75,000	Growth	SDCs
Pipeline	2029	P-39	2,422	0	12	NEW	438,000	1,000,000	Growth	SDCs
Pipeline	2030	P-40	1,229	0	30	NEW	554,000	554,000	Growth	SDCs
Pipeline	2031	P-41	12,042	0	16	NEW	2,892,000	2,892,000	Growth	SDCs
Pipeline	2035	P-42	844	4	6	UPSIZE	78,000	78,000	Growth	SDCs
Pipeline	2036	P-43	994	4	8	UPSIZE	120,000	120,000	Growth	SDCs
Pipeline	2037	P-44	143	8	8	UPSIZE	19,000	19,000	Growth	SDCs
Pipeline	2038	P-45	513	4	6	UPSIZE	48,000	48,000	Growth	SDCs
Pipeline	2032	P-46	3,417	0	8	NEW	412,000	412,000	Growth	SDCs
Pipeline	2033	P-47	5,888	0	30	NEW	2,652,000	2,652,000	Growth	SDCs
Pipeline	2039	P-48	592	4	6	UPSIZE	55,000	55,000	Growth	SDCs
Pipeline	2040	P-49	750	4	6	UPSIZE	68,000	68,000	Growth	SDCs
Pipeline	2041	P-50	2,776	4	8	UPSIZE	335,000	335,000	Growth	SDCs
Pipeline	2042	P-51	957	6	12	UPSIZE	173,000	173,000	Growth	SDCs
Pipeline	2024	P-52	693	6	8	UPSIZE	85,000	85,000	Growth	SDCs
Pipeline	2034	P-53	5,542	0	30	NEW	2,495,000	2,495,000	Growth	SDCs
Pipeline	2025	P-54	885	8	8	UPSIZE	108,000	108,000	Growth	SDCs
Pipeline	2026	P-55	687	4	8	UPSIZE	83,000	83,000	Growth	SDCs
Pipeline	2027	P-56	1,366	4	4	UPSIZE	83,000	83,000	Growth	SDCs
Pipeline	2028	P-57	635	6	6	UPSIZE	59,000	59,000	Growth	SDCs
Pipeline	2029	P-58	723	6	6	UPSIZE	67,000	67,000	Growth	SDCs
Pipeline	2030	P-59	924	4	8	UPSIZE	112,000	112,000	Growth	SDCs
Pipeline	2031	P-60	1,464	6	8	UPSIZE	178,000	178,000	Growth	SDCs
Pipeline	2032	P-61	2,003	4	6	UPSIZE	183,000	183,000	Growth	SDCs
Pipeline	2033	P-62	531	4	6	UPSIZE	49,000	49,000	Growth	SDCs
Pipeline	2034	P-63	650	4	8	UPSIZE	79,000	79,000	Growth	SDCs
Pipeline	2035	P-64	1,673	4	8	UPSIZE	202,000	202,000	Repair	Rate
Pipeline	2035	P-65	16,485	0	30	NEW	7,420,000	7,420,000	Growth	SDCs
Pipeline	2036	P-66	1,446	4	6	UPSIZE	132,000	132,000	Growth	SDCs
Pipeline	2037	P-67	43	4	8	UPSIZE	7,000	7,000	Growth	SDCs
Pipeline	2038	P-68	1,303	4	8	UPSIZE	158,000	158,000	Growth	SDCs
Pipeline	2036	P-69	715	0	12	NEW	130,000	130,000	Growth	SDCs
Pipeline	2039	P-70	3,339	8	12	UPSIZE	603,000	603,000	Growth	SDCs
Pipeline	2040	P-71	606	4	6	UPSIZE	57,000	57,000	Growth	SDCs
Pipeline	2041	P-72	1,104	8	12	UPSIZE	200,000	200,000	Growth	SDCs
Pipeline	2042	P-73	6,884	6	8	UPSIZE	828,000	828,000	Repair	Rate
Pipeline	2030	P-74	6,782	4	8	UPSIZE	815,000	815,000	Repair	Rate
Pipeline	2031	P-75	1,890	6	8	UPSIZE	229,000	229,000	Repair	Rate
Pipeline	2037	P-76	2,952	0	24	NEW	1,064,000	1,064,000	Growth	SDCs

Pipeline	2032	P-77	6,281	4	8	UPSIZE	755,000	755,000	Repair	Rate
Pipeline	2033	P-78	2,022	4	6	UPSIZE	184,000	184,000	Repair	Rate
Pipeline	2034	P-79	1,702	4	6	UPSIZE	155,000	155,000	Repair	Rate
Pipeline	2038	P-80	2,909	0	8	NEW	350,000	350,000	Growth	SDCs
Pipeline	2035	P-81	1,316	4	8	UPSIZE	160,000	160,000	Growth	SDCs
Pipeline	2036	P-82	2,188	8	12	UPSIZE	395,000	395,000	Growth	SDCs
Pipeline	2037	P-83	588	4	8	UPSIZE	73,000	73,000	Growth	SDCs
Pipeline	2038	P-84	5,348	4	8	UPSIZE	643,000	643,000	Growth	SDCs
Pipeline	2039	P-85	2,768	4	8	UPSIZE	334,000	334,000	Repair	Rate
Pipeline	2040	P-86	3,607	6	8	UPSIZE	434,000	434,000	Growth	SDCs
Pipeline	2039	P-87	12,346	0	24	NEW	4,445,000	4,445,000	Growth	SDCs
Pipeline	2041	P-88	3,048	6	6	UPSIZE	275,000	275,000	Growth	SDCs
Pipeline	2042	P-89	4,059	8	12	UPSIZE	733,000	733,000	Growth	SDCs
Pipeline	2040	P-90	11,647	0	42	NEW	7,339,000	7,339,000	Growth	SDCs
Pipeline	2041	P-91	5,477	0	12	NEW	988,000	988,000	Growth	SDCs
Pipeline	2042	P-92	3,116	0	12	NEW	562,000	562,000	Growth	SDCs

Legend

Pipe Project

- New 6-inch
- New 8-inch
- New 12-inch
- New 16-inch
- New 24-inch
- New 30-inch
- New 42-inch
- Upsize 4-inch
- Upsize 6-inch
- Upsize 8-inch
- Upsize 12-inch
- Upsize 16-inch
- Upsize 24-inch

Pipe Project Deficiency

- Fire Flow
- Fire Flow/ Small Diameter & Condition
- Fire Flow & Velocity
- Growth/Transmission
- Small Diameter & Condition
- Velocity

Supply CIP Projects

- New
- Additional Treatment Capacity

Tank CIP Projects

- Decomission
- New Pumped Storage
- New

Booster Pump CIP Projects

- New
- New Beck Pressure Zone
- County Transportation Projects

Existing System

- Booster Pump
- Well
- FCV
- PRV
- WTP
- Tank

Clark Public Utilities

FIGURE 1

Clark Public Utilities District Water System Plan

Draft CIP

murraysmith

DRAFT

Data Sources:
Clark Public Utilities
Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Disclaimer: Clark Public Utilities makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

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Q SEPA Checklist (for 1,000 or more service connections)

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

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

Instructions for applicants:

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

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

Instructions for Lead Agencies:

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

Use of checklist for nonproject proposals:

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

A. Background [HELP]

1. Name of proposed project, if applicable:

Clark Public Utilities Water System Plan, 2022

2. Name of applicant:

Clark Public Utilities

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

Russell Knutson, P.E.
Engineering Manager
Clark Public Utilities
PO Box 8900
Vancouver, WA 98668
Telephone: (360) 992-8027
Email: rknutson@clarkpud.com

4. Date checklist prepared:

July 26, 2022

5. Agency requesting checklist:

Clark Public Utilities

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

Clark Public Utilities intends to adopt the updated Water System Plan and forward it to the Washington State Department of Health (DOH) for its consideration prior to January , 2023. The plan addresses a 20-year planning horizon. The plan must be updated every five years and approved by Washington DOH, as required under Chapter 246-290-100 of the Washington Administrative Code (WAC).

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

Yes, the plan addresses the improvement of existing and construction of new water supply, treatment, storage, and distribution facilities.

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

Clark Public Utilities circulated a completed environmental checklist on the previous Water System Plan in 2010. Over the past twelve years the utility circulated SEPA checklists and other environmental assessments on numerous projects addressed in that plan.

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.

No application for governmental approval of other proposals is pending that would directly affect the Water System Plan update.

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

Chapter 246-290-100 WAC requires the approval of the Water System Plan by Washington DOH.

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

The Water System Plan update addresses the improvement of existing and construction of new water supply, treatment, storage, and distribution facilities to meet the needs of the population served by Clark Public Utilities Water Utility over the next 20 years. The following are among the projects outlined in the plan:

- Water supply source testing – Carol J. Curtis Wellfield development (rights to expand an additional 40 MGD from a current 10 MGD)
- Water supply source development – 10 MGD of additional capacity (up from a current 5 MGD) from the Paradise Point Wellfield
- Aquifer storage projects – pumping of above wellfields to upland wells to mitigate streamflow, recover well levels, or offset peak summer demands
- Stream restoration projects in the Salmon Creek basin
- Storage – 13.8 MG of additional reservoir capacity, and maintenance of existing reservoirs
- Replacement of steel pipe in the Hazel Dell area and undersized and leaking PVC lines throughout the system

The water utility's service area embraces 316,410 acres (495 square miles) – approximately 79 percent of the county. The water system serves roughly 101,124 people (2022 estimated population served) residing in the unincorporated portion of the county, the city of La Center and the town of Yacolt with approximately 49,570 equivalent residential units (ERUs). It is estimated the the system will service 130,324 people (63,883 ERUs) by the year 2042. The water utility operates 22 satellite systems. The plan is consistent with requirements under Chapter 246-290-100 WAC.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The plan addresses Clark Public Utilities' water service area. The service area includes unincorporated Clark County, the city of La Center and the town of Yacolt. This area lies north of the water service areas of the cities of Vancouver, Camas, and Washougal, but excludes the water service areas of the cities of Ridgefield and Battle Ground (see attached map of Clark PUD's water service area).

B. Environmental Elements [

1. *Earth*

a. General description of the site:

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

The topography of Clark Public Utilities' water service area varies widely. Flood plains and lowlands lie along the western margin of the area where the terrain is only 10 to 20 feet above sea level. The central landscape is made up of terraces interrupted by numerous rivers and creeks and their basins. Elevations in this area range between roughly 200 and 400 feet above sea level. The eastern margin of the service area rises into the foothills of the Cascades where elevations reach and exceed 2,500 feet above sea level.

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

The steepest slope within the water utility's service area exceeds 15 percent. Precise information about slope will be addressed in project and site-specific SEPA checklists, which will be completed and circulated after projects are designed and ready for construction.

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.

Alluvial, clay, loam, and gravel soild – a wide variety of soil types can be found within the water utility's service area, but the basic substrata of the land is alluvial. Details about soil types will be addressed in future project and site-specific SEPA checklists.

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

There are numerous areas within the water utility's service territory that have unstable soils and slopes. Residential and other developments needing public water are sometimes located in these areas. The water utility must continue to maintain facilities in these areas that serve these developments. Meanwhile, local governments strictly regulate development in these and other environmentally sensitive areas, under the provisions of the Washington State Growth Management Act. See future project-specific SEPA checklists for detailed information concerning the stability of soils and slopes in the vicinity of project sites.

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.

Precise construction methods are not available since specific project designs have yet to be developed. Project and site-specific SEPA checklists will be completed in the future.

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

Projects outlined in the plan may result in erosion, but the precise impacts of projects are not available, since specific project designs have yet to be developed. Erosion that may result from projects will be mitigated through the use of best management practices.

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

The new reservoirs, outlined in the plan, will introduce additional impervious surfaces. However, the exact amounts of impervious surface associated with these facilityes are not known since specific project designs have yet to be developed. Project and site-specific SEPA checklists will be completed in the future.

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

Erosion that may result from projects proposed in the plan will be mitigated through the use of best management practices. Details concerning the environmental consequences of erosion and measures that will be taken to mitigate the impacts of erosion will be addressed in future project and site-specific SEPA checklists.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

None of the projects that are planned will result in air emissions of any significance.

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

No. Not applicable.

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

Not applicable.

3. Water [help]

a. Surface Water: [help]

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

Major water bodies within or adjacent to Clark Public Utilities' water service area include the Columbia, Lewis, East Fork of the Lewis, Lake, and Washougal Rivers; Salmon and Whipple Creeks; Vancouver and Battle Ground Lakes. There are numerous small creeks and streams, most of which are tributaries of the previously mentioned larger water bodies. Wetlands are scattered throughout the water service area. Important wetlands are near the major watercourses. Notable wetlands include those adjacent to Vancouver Lake, Lake River, the lower stretch of East Fork Lewis River, and the lower reach of Salmon Creek.

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.

Certain water distribution projects outlined in the plan may be undertaken within 200 feet of water bodies, but these projects will be within the existing road right-of-ways, usually beneath the paved area of the roadways. Most other projects will not be undertaken within 200 feet of water bodies. See future project and site-specific SEPA checklists for details.

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.

Precise construction methods are not available, since project designs have yet to be developed. See future project and site-specific SEPA checklists.

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

The projects outlined in the plan do not involve the withdrawal or diversion of surface water. Development of new sources of water will involve withdrawal of groundwater, not surface water.

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

Certain projects outlined in the plan may be within the 100-year floodplain. If so, preliminary site plan meetings with Clark County staff will address the issue and recommend mitigation measures that would offset the impact. Site-specific projects have not been fully developed at this time. Individual SEPA checklists will be completed in the future to address site-specific projects.

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.

No.

b. Ground Water: [help]

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

The source development projects outlined in the plan will involve the withdrawal of groundwater.

Southlake Wellfield – 10 MGD

See future project and site-specific SEPA checklists. No water will be discharged to groundwater resources.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged to groundwater resources.

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.

Stormwater runoff will be generated from the sites of projects outlined in the plan, particularly the new water treatment and reservoir facilities. A large number of streams throughout the water service area may receive treated runoff from these sites and facilities. Project and site-specific SEPA checklists will be completed in the future.

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

No.

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

Certain projects outlined in the plan may affect drainage patterns in the vicinity of the site. The new reservoirs, outlined in the plan, will introduce additional impervious surfaces which increases the severity (amount and speed) of stormwater runoff to water bodies. However, the exact amounts of impervious surface associated with these facilities are not known since specific project designs have yet to be developed. Project and site-specific SEPA checklists will be completed in the future.

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

The water utility will use best management practices to manage stormwater runoff from project sites and new reservoir facilities. Runoff will be managed in a manner that meets or exceeds the provisions of local stormwater control ordinances. Clark County and local jurisdictions within the water utility's service area have adopted the stormwater control provisions of the Puget Sound Manual. See future project and site-specific SEPA checklists for details.

4. Plants [help]

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

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

Most of the vegetation types listed above and others, except those associated with salt marshes, are found in the water utility's service area. (The Columbia River is tidal to Bonneville dam, which is located upstream from Clark County, but there is no saltwater intrusion in the Columbia River in the Clark County vicinity).

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

Some vegetation will be removed from well and reservoir sites. See future project and site-specific SEPA checklists for details.

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

There are threatened and endangered plant species within the water utility's service area, but there is no threatened or endangered plant species found near any of the planned project sites, to the best of the water utility's knowledge.

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

Construction sites and areas surrounding, e.g., reservoirs will be re-vegetated with native species and returned to a condition that will be equal to or better than their condition before construction. Project and site-specific SEPA checklists will be completed in the future.

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

There are noxious weeds and invasive species within the water utility's service area, but there is no noxious weeds or invasive species found near any of the planned project sites, to the best of the water utility's knowledge.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

All of the animal species listed above and others, except those associated with saltwater intrusion tidal zones, are found in the water utility's service area

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

Threatened and endangered animal species are found in the water utility's service area. Some of these species may be near the sites of projects outlined in the plan. The threatened or endangered animal species that may be found near the project sites and how impacts on these species will be avoided will be addressed in the project and site-specific SEPA checklists, which will be completed in the future.

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

The water utility's service area, as well as all of Clark County, lies beneath an important migratory route for Canadian geese known as the Pacific flyway. Gees and other migrating waterfowl frequently come to rest and feed in the Vancouver Lake lowlands, Ridgefield Wildlife Refuge and La Center Bottoms – all of which are in or near the utility's service area.

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

The plan calls for the development of water supply sources in the Vancouver Lake lowlands, and area where migrating geese rest and feed during certain seasons. The water utility will make its best effort to schedule well facility construction during periods when migrating waterfowl are not present. This issue will be addressed in detail in a future project and site-specific SEPA checklist.

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

There are invasive animal species within the water utility's service area, but there is no invasive animal species found near any of the planned project sites, to the best of the water utility's knowledge.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity will power the new pump and telemetry system facilities outlined in the plan. The water system will not require an inordinate amount of power.

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

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

None, since the water system will not require an inordinate amount of power.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

No.

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

Not applicable.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Not applicable.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Toxic or hazardous chemicals that might be stored, used, or produced during project development, construction, and operation are not known since specific project designs have yet to be developed. Individual SEPA checklists will be completed in the future to address site-specific projects.

4) Describe special emergency services that might be required.

Not applicable.

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

Should it be determined that an environmental health hazard is introduced during a project development, construction, and operation, the water utility will use best management practices to to reduce or control environmental health hazards at project sites and new reservoir facilities. Measures to reduce or control environmental health hazards will be managed in a manner that meets or exceeds the provisions of local ordinances. See future project and site-specific SEPA checklists for details.

b. Noise

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

None.

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.

Construction of the projects outlined in the plan will generate the kind of noise normally associated with construction. The well and booster pumps will generate low-level noise during their operation.

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

Well pumps will be located inside pump houses. Booster pump stations will be installed within buildings or underground vaults, depending on the particular locations. Project and site-specific SEPA checklists will be completed in the future.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Most of the sites for the projects outlined in the plan are vacant. Some of the sites are occupied by preexisting water facilities, e.g., the sites containing deteriorated water lines that need to be replaced. Some project sites may be currently devoted to agricultural and other low-intensity uses. The existing use of sites will be identified in future project and site-specific SEPA checklists.

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?

Some project sites may be currently devoted to working farmland or forest lands and other low-intensity uses. The existing use of sites will be identified in future project and site-specific SEPA checklists.

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:

Specific affects to or from surrounding working farm or forest land businesses operations will be identified in future project and site-specific SEPA checklists.

c. Describe any structures on the site.

Although most of the sites for projects outlined in the plan are vacant or occupied by existing water facilities, some of the sites will have existing structures that are not related to the water system. See project-specific SEPA checklists, which will be completed in the future.

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

Some preexisting structures may be demolished. Future project and site-specific SEPA checklists will address the circumstances under which these existing structures will need to be demolished.

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

The sites for the projects proposed in the plan will be located in a variety of land use zones – agricultural, residential, commercial, industrial, public facility, and park land-use zoning districts – within unincorporated Clark County and the incorporated areas of La Center and Yacolt.

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

The sites for the projects proposed in the plan will be located in numerous areas of unincorporated Clark County, La Center, and Yacolt. The comprehensive land designations vary widely. See future project and site-specific SEPA checklists.

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

Some of the sites for projects outlined in the plan will be regulated under the Clark County and local shoreline master programs, consistent with the Washington's Shoreline Management Act. The shoreline use designations will vary for these sites. Project and site-specific SEPA checklists will be completed in the future.

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

No.

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

Clark Public Utilities currently provides potable water to approximately 101,000 people who reside in the water utility's service area. It is projected that the utility will provide potable water to 130,000 people by year 2042.

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

None.

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

Not applicable.

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

The Water System Plan update will be submitted to Clark County, La Center and Yacolt for evaluation to determine its consistency with comprehensive plans. The water facility improvements included in the previous Water System Plan were incorporated into the capital facilities element of the county's Comprehensive Growth Management Plan. Facility improvements included in the Water System Plan update were also incorporated into the update

of the Capital Facilities and Utilities element of the county's Comprehensive Growth Management Plan.

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

Given the variability of project types and sites, future project and site-specific SEPA checklists will address proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance if any such measures are needed/applicable.

9. Housing [help]

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

None, not applicable.

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

None.

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

None, not applicable.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest structures will be water reservoirs. The heights of reservoirs will vary depending upon the elevation of the specific site selected for the facility and the function of the facility. The precise heights of the new reservoirs are not known since they have yet to be designed. The tallest existing reservoir is 125 feet, which may provide some indication of the height of new reservoirs. The reservoirs will be of steel or concrete construction. See future project and site-specific SEPA checklists for details.

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

Treatment plants and reservoirs will be the largest, most noticeable water system structures. The impact that reservoirs will have on the views experienced by people residing or working on neighboring properties will vary depending on other physical features surrounding a reservoir and the facility's particular characteristics. Project and site-specific SEPA checklists will be completed in the future.

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

The exterior of reservoirs will be designed as tastefully as possible. Structures will be designed to blend with the surroundings. The grounds surrounding the reservoirs and other above-ground structural elements of the water system will be landscaped.

11. Light and Glare [help]

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

None.

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

No.

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

None.

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

Not applicable.

12. Recreation [help]

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

Some of the sites of the projects outlined in the plan may be near recreational facilities or areas. See future project and site-specific SEPA checklists.

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

No.

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

None, not applicable.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

None at this time. Site specific SEPA checklists will be developed when projects proceed further.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None at this time. Site specific SEPA checklists will be developed when projects proceed further.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Not applicable at this time.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Not applicable at this time. Future SEPA checklists for site-specific projects may address the need for archaeological predetermination investigations and action plans in the event of possible discovery of cultural material on project sites.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The sites for the projects proposed in the plan obtain access from many different public roadways. See future project and site-specific SEPA checklists for details.

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?

Some of the sites for the projects outlined in the plan are served by public transit, but this issue is irrelevant since the facilities are not visited by utility customers and only periodically visited by a limited number of utility personnel.

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

Most of the proposed facilities will not need extensive parking, since the facilities are not visited by utility customers and only periodically visited by a limited number of utility personnel. This will be addressed in site-specific SEPA checklists for individual projects.

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).

Water supply wells and reservoirs will require access roads. Some of these roads may already be in place. See future project and site-specific SEPA checklists for details.

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

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would

be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The number of vehicle trips generated by completed projects is not known at this time. See future project and site-specific SEPA checklists.

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.

Given that most facilities will be visited only periodically by a limited number of utility personnel, we do not expect there to be a significant impact on interference to or from the movement of agricultural and forest products on roads in the area. See future project and site-specific SEPA checklists for specifics.

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

None for now.

15. Public Services [help]

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

No. The proposed water system improvements are intended to serve existing and future development consistent with growth management plans.

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

None, not applicable.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

The sites for the projects proposed in the plan have different utility services available to them and will be addressed in site-specific SEPA checklists for individual projects.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electrical power is important with respect to the operation of booster pump stations, water supply wells, and reservoirs. Clark Public Utilities is in the business of providing water and electric services.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____

D. Supplemental sheet for nonproject actions [HELP]

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

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

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

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

Neither the proposed projects nor the overall improvement of the water system described in the Clark Public Utilities' Water System Plan will result in discharge to water resources; emissions to air; production, storage, or release of toxic or hazardous substances; or the production of significant noise.

Proposed measures to avoid or reduce such increases are:

None, not applicable.

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

Neither the proposed projects nor the overall improvement of the water system described in the Clark Public Utilities' Water System Plan will result in significant impacts to plants, fish, or animals.

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

Neither the proposed projects nor the overall improvement of the water system described in the Clark Public Utilities' Water System Plan will result in significant impacts to plants, fish, or animals.

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

Development of project and site-specific SEPA review.

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

Neither the proposed projects nor the overall improvement of the water system described in the Water System Plan will deplete energy resources, although pumping of the water supply will use electric power. The water supply wells will withdraw substantial quantities of groundwater and, hence, affect the overall supply of groundwater, but consistent with water rights issued by the Washington State Department of Ecology.

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

Clark Public Utilities will apply to the Washington Department of Ecology to transfer certain water rights to new supply wells, and to obtain additional water rights. Ecology allocates water rights considering the overall groundwater supply and the forecasted demand on the resource.

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?

Neither the proposed projects nor the overall improvement of the water system described in the Water System Plan will have an adverse impact on environmental sensitive lands, cultural sites, floodplains, or farmland.

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

Not applicable.

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?

Neither the proposed projects nor the overall improvement of the water system described in the Water System Plan will have an adverse impact on land and shoreline use, or encourage uses that are incompatible with comprehensive plans. The location of new facilities will be sighted to comply with shoreline regulations or be located outside of designated shorelines.

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

None. Not applicable.

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

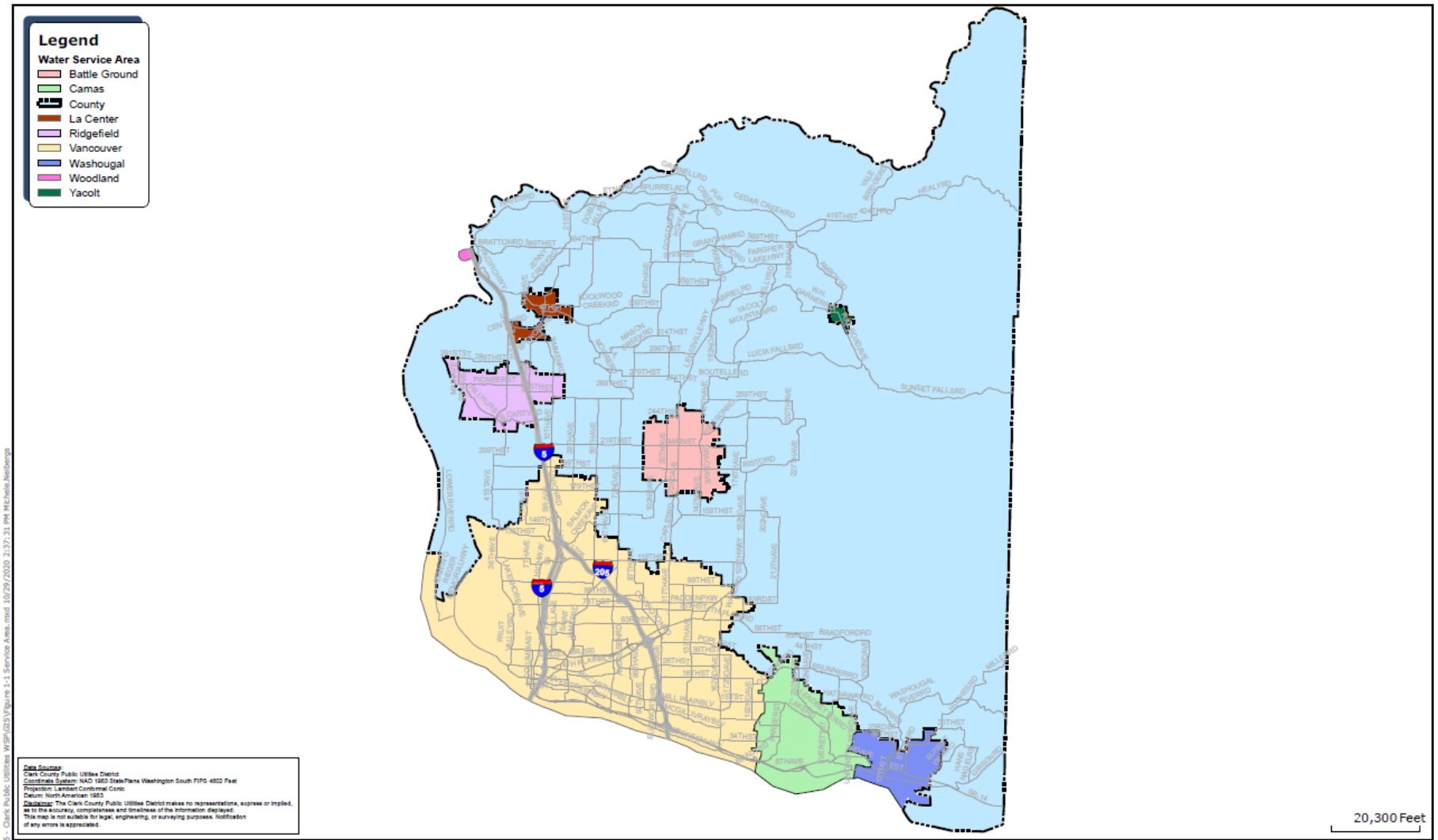
Neither the proposed projects nor the overall improvement of the water system described in the Water System Plan will increase the demand on transportation or other public services. The new pumping and telemetry facilities will require additional electrical power, but the amount used will not constitute a significant increase in power demand.

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

None. Not applicable.

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

Neither the proposed projects nor the overall improvement of the water system described in the Water System Plan will conflict with local, state, or federal laws or requirements pertaining to the protection of the environment.


Legend
Water Service Area
Battle Ground
Camas
County
La Center
Ridgefield
Vancouver
Washougal
Woodland
Yacolt
20,300 Feet
Clark Public Utilties District
Water System Plan
Figure 1-1
Service Area
October 2020
20-0025

R. Correspondence

Drinking Water

Project Approval Application (PAA) Form

331-149 F • Revised 1/10/2022

Please complete all appropriate sections of this application form and include it with your project.

WATER SYSTEM Information

Clark Public Utilities	13333X
Water System Name	PWS ID #
Water System Plan	Clark
Submittal Description	County
A-Communinty	10,000 or more
Classification	# of Service Connections

OWNER Information

Russ Knutson	Enter text
Name	Owner ID #
rknutson@clarkpud.com	360-992-8552
E-mail address	Phone

8600 NE 117th Ave	Vancouver		
Mailing address	City	State	Zip

PROJECT CONTACT Information

Russ Knutson, PE Engineering Manager	Enter text
Name/Position	
rknutson@clarkpud.com	Enter text
E-mail address	Phone

8600 117th Ave	Vancouver	WA	98686
Mailing address	City	State	Zip

CONSULTING/DESIGN ENGINEER Information

Lee Odell, PE, Consor	Enter text
Name/Firm	
Lee.odell@consoreng.com	971-285-7926
E-mail address	Phone

400 E Mill Plain Blvd, #400	Vancouver	WA	98660
Mailing address	City	State	Zip

SMA Information

Enter text	Enter text
Name/SMA	SMA #
Enter text	Enter text
E-mail address	Phone

Enter text	Enter text	WA	Zip
Mailing address	City	State	Zip

BILLING Information*

Sarah Robinson	
Name	
srobinson@clarkpud.com	360-992-3000
E-mail address	Phone

8600 NE 117th AVE	Vancouver	WA	98686
Mailing address	City	State	Zip

GENERAL Submittal Information

☒ Check here if you need a Box.com folder set up for transferring your project to us electronically. (You will receive an invite by email after we have received the PAA form.)

Do you have projects currently under review by us? ☐ Yes ☐ No

☐ This is a new water system (if so, include a completed Water Facilities Inventory Report Form with your project).

☐ DWSRF Loan
Application # Enter Number
Loan # Enter Number

☐ Enforcement
Docket # Enter Number
Type Enter Text

☒ Water System Plan (complete Planning Information)

☐ Small Water System Management Program (complete Planning Information)

☐ Engineering (complete Engineering Information)

☐ Group B (complete Engineering Information)

☐ Satellite Management Agency Plan (complete SMA Information)

☐ Alternate Technology (complete Engineering Information)

ENGINEERING Information

Choose Project Report	Choose Special Report or Plans
Project Report Type	Special Report or Plans
Choose Predesign Study	Choose Existing System Approval
Predesign Study	Existing System Approval
Choose Construction Documents	Choose Waiver

Construction Documents

Choose Other

Other

Waiver

PLANNING Information

How many connections does system currently have?	36890
If system is private-for-profit, is it regulated by UTC?	☐ Yes ☒ No
Is system expanding?	☒ Yes ☐ No
Expanding service area?	☐ Yes ☒ No
Increasing number of approved connections?	☐ Yes ☒ No
If the number of connections is expected to increase, how many *new* connections are proposed in the next ten (10) years?	6516
Is your system pursuing additional water rights from Department of Ecology in the next 20 Years?	☐ Yes ☒ No
Is a new intertie proposed?	☐ Yes ☒ No
Is the system located in a Critical Water Supply Service Area (is there a Coordinated Water System Plan)?	☒ Yes ☐ No
If yes, have you sent a copy of the plan to the county or responsible agency for the CWSP?	☒ Yes ☐ No
Are you requesting distribution main project report and construction document submittal exception?	☒ Yes ☐ No
If so, does the WSP contain standard construction specifications for distribution mains?	☒ Yes ☐ No
	☒ Yes ☐ No
	☒ Yes ☐ No
	☒ Yes ☐ No

The water system/purveyor is responsible for sending a copy of the plan to:

- Adjacent utilities for review or a letter notifying them that a copy is available for their review and where it is located.
- All local governments within the service area.
- County and city planning departments, one or both if applicable, adjacent water systems, etc..

List who have you sent the WSP to for review other than ODW?	Clark County, Cities of Vancouver, Ridgefield, Battle Ground, Camas, Washougal, Lacenter
Are you proposing a change in the place of use of your water right?	☐ Yes ☒ No
If "yes," the purveyor must send a copy of the WSP or SWSMP to all local governments within the service area (county and city planning departments) for a local consistency determination. Has this been completed?	☐ Yes ☐ No
What are the years of the requested plan approval period (for example 2022 to 2032)?	10 years
Does your plan follow your preplan checklist?	☒ Yes ☐ No

SMA Information

☐ Ownership only ☐ Management and Operations only ☒ Ownership, Management & Operations

Where can we find the *SMA Notice of Intent* 331-590, in your plan..... Appendix B

Please submit all documents electronically. We request one paper copy of planning documents be submitted to the address for your regional office below.

☐ **Eastern Regional Office**
Department of Health
eroadmin@doh.wa.gov
Phone: 509-329-2100

☐ **Northwest Regional Office**
Department of Health
dw.nwro.wsprojects@doh.wa.gov
Phone: 253-395-6750

☒ **Southwest Regional Office**
Department of Health
swro.admin@doh.wa.gov
Phone: 360-236-3030

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email civil.rights@doh.wa.gov.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
SOUTHWEST DRINKING WATER REGIONAL OPERATIONS
111 Israel Road Southeast • PO Box 47823 • Olympia, Washington 98504-7823
Tel: (360) 236-3030 • Fax: (360) 236-3029 • TDD/TTY 711

October 2, 2023

John Roth
Clark Public Utilities
Post Office Box 8900
Vancouver, Washington 98668

Subject: Clark Public Utilities Water System, ID #13333, Clark County; WSP Update, ODW Project #23-0510

Dear John Roth:

Thank you for submitting the Water System Plan (WSP) for the water system listed above. The Office of Drinking Water (ODW) received the complete project submittal on May 25, 2023. Please address each of the following comments.

GENERAL COMMENTS

1. Please include the Notices, meeting minutes, and commissioner resolutions or motions regarding the following public meetings or actions:
    a. Include a signed SEPA Environmental Checklist, SEPA Determination, and a copy of the publication of the SEPA determination in the newspaper of general circulation in Clark County. (The SEPA checklist in Appendix Q has not been signed by the lead agency.)
    b. Provide the commissioner's action approving the WSP and minutes from that meeting and the minutes from the meeting with the consumers, see WAC 246-290-100(8).
    c. Provide the commissioner's notice of public forum and minutes from the forum as required under the WUE Goal Setting, see WAC 246-290-830(4).
    d. Provide a Local Government Consistency (LGC) determination signed by the Clark County Planning Department. The LGC form can be found at 331-568.docx (live.com) .

CHAPTER 1 – DESCRIPTION OF THE WATER SYSTEM

2. *Page 1-27, Section 1.8. Satellite Management Agencies.* This water system plan will also be considered an update to your approval as a Satellite Management Agency under WAC 246-295. Please verify the SMA plan provided in Appendix B is consistent with the current policies for managing your satellite systems and the requirements of WAC 246-295-050. Also, no information is provided in Appendix A as referenced in the text.

CHAPTER 2 – PLANNING DATA AND WATER DEMAND FORECASTING

3. *Page 2-1, Section 2-1.* Please explain discrepancies between population figures, e.g., different total populations served for 2020 in Chapter 2 (91,352 persons) and Chapter 1 (98,053 persons).

Please elaborate on whether and how different population models were used in capacity calculations.

4. *Page 2-3, Section 2.4 Equivalent Residential Units.* Please confirm Equivalent Residential Unit values ERU_{ADD} and ERU_{MDD}, in gpd/ERU, and elaborate on how these values were determined. Please also confirm that, wherever ERUs were used in capacity calculations, the same definitional values for the ERU were used.

CHAPTER 3 – SYSTEM ANALYSIS

5. *Chapter 3, Various sections.* The values used in the most recent capacity calculations appear to variously come from the years 2020, 2021, and possibly 2022. Please confirm the analysis year which serves as the basis for capacity calculations. Please confirm that capacity and demand projections use consistent bases.
6. *Page 3-15, Section 3.3. Recent Regulatory Changes.* The environmental protection agency has a new requirement for all water systems to prepare a lead service line inventory and replace all lead service lines. Please include this requirement in your discussion on regulatory changes and provide a summary of your efforts to meet the October 16, 2024, deadline. For more information about this requirement see Lead Service Line Inventory Guidance (wa.gov).
7. *Page 3-28, Section 3.8. Hydraulic Modeling.* The technical memorandum detailing the hydraulic modeling calibration and results is not included in Appendix J as stated in the text.
8. *Page 3-28, Section 3.8. Hydraulic Modeling.* Please elaborate on the circumstances under which pipe velocities are expected to exceed 8 feet per second (fps), whether such velocities are expected to cause problems, and how it was evaluated.

CHAPTER 4 – WATER USE EFFICIENCY, WATER RIGHTS, RELIABILITY, AND INTERTIES

9. *Page 4-1, Section 4.2. Water Use Efficiency Program.* The water use efficiency program does not appear to have been updated since 2008. The water use efficiency program and goal setting should be updated every 6 years and a public meeting is required to adopt new goals. If this is going to be completed outside of the water system plan update please provide a timeframe for when it will be completed.

CHAPTER 5 – WELLHEAD PROTECTION PLAN

10. *Page 5-1, Section 5.1.3. Contaminant Inventory.* All water systems are required to update their contaminant inventory and provide notification to adjacent property owners every five years. It appears this has not been completed. Please provide a timeframe for when the contaminant inventory will be completed, and letters will be mailed to property owners notifying them of the wellhead protection area. This information should be included in the next water system update and will be reviewed during the next sanitary survey. See our wellhead protection guidance document for more information. Wellhead protection program guide (wa.gov)
11. *Page 5-1, Section 5.1.3. Contaminant Inventory.* The sentence at the end of this section is cut off. Please revise.

CHAPTER 6 – OPERATIONS PROGRAM

12. *Page 6-5, Table 6-3. Emergency Water Director Duties.* The plan states that ODW will be contacted if there is water loss for more than 24 hours. Unplanned pressure loss events are considered a health emergency and our office should be contacted for coordination regardless of the duration of the outage. Depending on the situation a boil water advisory and follow-up coliform monitoring may be necessary. Please revise this section to indicate ODW will be contacted for all unplanned pressure outages.
13. *Page 6-7, Section 6.3.4. Emergency Response Procedures.* A common emergency for public water systems is to have coliform contamination. Please include a discussion of the emergency response procedures for this type of event, including how you will assess whether to issue a boil water advisory. Given the extensive size of CPU's distribution system, there should be a process for evaluating what customers are impacted on and public notification will be distributed.
14. *Tables 6-8 and 6-9.* Please include the sampling monitoring for disinfection byproducts and PFAS in the list of monitoring requirements. Add disinfection byproduct monitoring and PFAS sampling requirements to Table 6-8. Remove the reference to trihalomethane potential.
15. *Page 6-17, Section 6.6, and Appendix O. Cross-Connection Control Program.* The cross-connection control program included in Appendix O does not comply with the requirements outlines in WAC 246-290-490. The system needs to develop an updated plan that meets these requirements and ensure their governing documents are consistent with the plan. Please provide a schedule for when this will be completed. It can be evaluated outside of the water system planning process during the next sanitary survey.

CHAPTER 8 – FINANCING STRATEGY

16. *Page 8-19, Table 8-5. Historical and Projected Operating Results.* A balanced operational budget is required for the plan approval period. Based on the information provided the operational budget is shown through 2025, which means this WSP could only be approved through the end of 2025. Please clarify if this is the approval period requested. If you are requesting a full 10-year approval period please provide an expanded operational budget out until 2034.

APPENDIX M – EMERGENCY RESPONSE PLAN

17. The emergency response plan and vulnerability assessment provided in Appendix M is excellent. However, we do not have a process in place for keeping this from being made public through a public records request. We recommend only providing a summary of the emergency response plan in this plan and referring to the full Emergency Response Plan by reference.

DEPARTMENT OF ECOLOGY – WATER RIGHTS COMMENTS

On May 26, 2023, a copy of this WSP was sent to the Department of Ecology (Ecology). Ecology submitted comments dated July 26, 2023, by Mathew Kogle, Staff Hydrologist. Please incorporate these comments into your re-submittal. A copy of the comment letter is enclosed.

The Department's review of your WSP does not confer or guarantee any right to a specific quantity of water. Our review is based on your representation of available water quantity. If the Washington

Department of Ecology, a local planning agency, or other authority responsible for determining water rights and water system adequacy determines that you have use of less water than you represent, the number of approved connections may be reduced commensurate with the actual amount of water and your legal right to use it.

CLOSING

Please respond to all comments in this letter. To expedite the review of the revised WSP, please summarize the response to the comments and where each response is located (for example, page numbers, appendices, and so on). **Please submit your response to these comments electronically to swro.admin@doh.wa.gov.**

Regulations establishing a schedule of fees for review of planning, engineering, and construction documents were adopted March 18, 2012 (WAC 246-290-990). An invoice for $5,484 is enclosed.

If you have any questions, please contact Scott Pollock at 564-669-0854 or by e-mail at scott.pollock@doh.wa.gov, or Regina Grimm at 564-669-0857 or by e-mail at regina.grimm@doh.wa.gov.

Sincerely,

Regina N. Grimm, P.E.
ODW, Assistant Regional Manager

R. Scott Pollock, P.E.
ODW, Regional Engineer

Enclosures

cc: Russel Knutson, Clark Public Utilities
Joe Ellingson, Clark County Public Health
Jose Alvarez, Clark County Planning Department
Matthew Kogle, Ecology
Scott Pollock, ODW
Meredith Jones, ODW

STATE OF WASHINGTON
Department of Health
OFFICE OF DRINKING WATER
Project And Plan Review

INVOICE

ACCOUNTS PAYABLE
CLARK PUBLIC UTILITIES
PO BOX 8900
VANCOUVER, WA 98668

WS ID: 13333
Invoice No: 53780
Invoice Date: 10/02/2023
Due Date: 11/01/2023

WS NAME: CLARK PUBLIC UTILITIES

PROJECT AND PLAN REVIEW SUBMITAL#: 23-0510

DESCRIPTION	QTY	COST	AMOUNT
Water System Plan	1	x $5484.00	$5484.00
		Total Amount Due	**$5484.00**

Comments: Water system plan (new and updated plans) 10,000 or more Services

1. ***Pay online*** with a credit card, debit card, or electronic check (ACH) using the Environmental Health Payment System at https://secureaccess.wa.gov/.
2. For billing questions, please contact Southwest Drinking Water Regional Operations at (360) 236-3030 or via email SWRO.Admin@DOH.WA.GOV.
3. This invoice is issued in accordance with WAC 246-290-990(3)(c)(iii).
4. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 711 Washington Relay Service.
5. If paying by check:
   Make checks payable to Department of Health, Federal ID #91-1444603.

Please return the bottom portion of this invoice with your check.

Invoice Number: 53780
Invoice Amount: $5484.00
Owner Number: 001069
WS Name: CLARK PUBLIC UTILITIES

Invoice Date: 10/02/2023
Invoice Due Date: 11/01/2023
Region: SW
WS ID: 13333

Reference: PROJECT AND PLAN REVIEW FEES

Please remit to:
ACCOUNTS RECEIVABLE
DOH PROJECT AND PLAN REVIEW FEES
PO BOX 1099
OLYMPIA, WA 98507-1099

9DWA10597240100 PP00013333X11012300548400

DOH Staff Name: Regina Grimm **System Name:** Clark Public Utilities
Sublog Number: 23-0510 **County:** Clark
Water System ID: 13333

Fixed Fee for Service

WATER SYSTEM PLANS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
(a)(1) Water system plan (new and updated plans) 10,000 or more Sevices	$5,484			
Total Water system plans	$5,484	$0	0	0

SATELLITE MANAGEMENT AGENCY (SMA) PLANS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total SMA	$0	$0	0	0

PROJECT REPORTS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total Project Reports	$0	$0	0	0

CONSTRUCTION DOCUMENTS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total Construction documents	$0	$0	0	0

EXISTING SYSTEM APPROVAL

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	Number Hr 2nd Review
Total of Existing System approval	$0	$0	0	0

GROUP B AND OTHER EVALUATIONS AND APPROVALS

Project Type	Fee 1st Review	Fee 2nd Review	Approved? Number Hr 1st Review	No Number Hr 2nd Review
Total of Other evaluations and approvals	$0	$0	0	0
Total Fixed Fee for Service	**$5,484**	**$0**	**0**	**0**

Hourly fee for service	Fee	# Hr	System Size

Pay This Invoice Amount For This Review	**$5,484**	**0.0**	**0**	**0**

	Total for All Project Invoices	Total for All Project Hours
Summary	$5,484	0

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

July 26, 2023

Department of Health
Southwest Drinking Water Regional Operations
Attn: Andy Anderson
PO Box 47823
Olympia, WA 98504-7823
Swro.admin@doh.wa.gov

Clark Public Utilities
Attn: Russ Knutson
PO Box 8900
Vancouver, WA 98668
rknutson@clarkpud.com

Re: Clark Public Utilities Water System, ID #13333, Clark County; Wsp Update, ODW Project #23-0510

Thank you for the opportunity to review the Water System Plan (WSP) for the above water system. Consistent with the Memorandum of Understanding between the Department of Health, Office of Drink Water (ODW) and Department of Ecology (Ecology), I reviewed the relevant portions of the above document and have the following comments:

Water Rights Self-Assessment (WRSA)

- When searching Ecology's Water Right Tracking System (WRTS) using Clark Cnty [County] PUD 1 and Clark Public Utilities (CPU), WRTS shows there are 75 active water rights ranging in phase from a new/change application to a superseding certificate. The WRSA and WSP state CPU is using 49 water rights and has two pending applications. The discrepancy between the WRSA and the WRTS query should be addressed. These discrepancies may be the result of the WRSA combining the instantaneous rate (Qi) or annual quantity (Qa) for multiple water rights that share the same point of withdrawal (POW). If there are multiple water rights for a given POW, each water right should be listed in the WRSA.

- G2-03371 [GWC 2073A] is misidentified. Due to change applications filed to GWC 02073A, this water right should be listed as G2-GWC 2073(A) with a Qi of 180 gallons per minute (gpm), and Qa of 290 acre-feet per year (ac-ft/yr) (non-additive) and G2-GWC2073(B) with a Qi of 320 gpm and Qa of 516 ac-ft/yr (non-additive).

- Multiple water rights listed on the WRSA list the Qi incorrectly. Based on our review, Qi discrepancies are noted for:

    - G2-27753
    - G2-29477(B)
    - G2-29293

    - Multiple water rights listed on the WRSA list the Qa incorrectly. This may be due to combining multiple water rights that share the same source or the additive verses non-additive relationship of the water rights. Based on our review, Qa discrepancies are noted for:

    - G2-27753
    - G2-GWC5921
    - G2-24409
    - G2-27979
    - G2-28956
    - G2-29956
    - G2-29477(B)
    - G2-29293
    - G2-26785
    - G2-27075
    - G2-28719

- Water right 49. on the WRSA should be changed from G2-#0428 to G2-30482.

- The WRSA includes a footnote showing 16 water rights that have been transferred, partially transferred, or are in use for satellite water systems. If CPU intends to use these water rights in the future, they should be listed in the WRSA and not included as a footnote.

The WSP states "*Clark Public Utilities has designated its Future Service Area and Retail Service Area as synonymous with its existing service area.*" Since the service area is not being adjusted, a determination of not inconsistent is not necessary.

Thank you for the opportunity to review the above document. Please contact me at (360) 280-2983 or matthew.kogle@ecy.wa.gov if you have questions or need additional information.

Sincerely,

Matthew Kogle
Staff Hydrogeologist – Permit Writer
SWRO Water Resources Program

cc: Andy Anderson – DOH, andy.anderson@doh.wa.gov
Lee Odell, P.E. – Consor, lee.odell@consoreng.com
Clark County Health Department - drinkingwaterprogram@clark.wa.gov

Comment Responses are summarized below in Highlighted Text

GENERAL COMMENTS

1. Please include the Notices, meeting minutes, and commissioner resolutions or motions regarding the following public meetings or actions:

- Include a signed SEPA Environmental Checklist, SEPA Determination, and a copy of the publication of the SEPA determination in the newspaper of general circulation in Clark County. (The SEPA checklist in Appendix Q has not been signed by the lead agency.)
    - The SEPA documentation is included in Appendix Q
- Provide the commissioner's action approving the WSP and minutes from that meeting and the minutes from the meeting with the consumers, see WAC 246-290-100(8).
    - Commissioner's approval follows this comment form
- Provide the commissioner's notice of public forum and minutes from the forum as required under the WUE Goal Setting, see WAC 246-290-830(4).
    - WUE documentation is included in Appendix D
- Provide a Local Government Consistency (LGC) determination signed by the Clark County Planning Department. The LGC form can be found at 331-568.docx (live.com) .
    - The LGC letter follows the Commissioner's Approval

CHAPTER 1 – DESCRIPTION OF THE WATER SYSTEM

2. *Page 1-27, Section 1.8. Satellite Management Agencies.* This water system plan will also be considered an update to your approval as a Satellite Management Agency under WAC 246-295. Please verify the SMA plan provided in Appendix B is consistent with the current policies for managing your satellite systems and the requirements of WAC 246-295-050. Also, no information is provided in Appendix A as referenced in the text.

No updates to individual Satellite Management Plans are included as part of this water system plan update. Appendix A includes a reference to the existing plans on file with DOH.

CHAPTER 2 – PLANNING DATA AND WATER DEMAND FORECASTING

3. *Page 2-1, Section 2-1.* Please explain discrepancies between population figures, e.g., different total populations served for 2020 in Chapter 2 (91,352 persons) and Chapter 1 (98,053 persons). Please elaborate on whether and how different population models were used in capacity calculations.

The lower number was based on the average number of residential customers. Chapter 1 population has been made consistent with Chapter 2

4. *Page 2-3, Section 2.4 Equivalent Residential Units.* Please confirm Equivalent Residential Unit values ERU_{ADD} and ERU_{MDD}, in gpd/ERU, and elaborate on how these values were determined. Please also confirm that, wherever ERUs were used in capacity calculations, the same definitional values for the ERU were used.

Equivalent Residential Unit Water USe was calculated by dividing the Yearly Residential Demand by the Yearly Residential Number of Connections. The following formulas were used throughout the Water System Plant

- ERU Residential Water Use (Annual Use) = Residential Annual Water Consumption/ Residential Connections

- Residential ERUs = Residential Connections
- Residential ERU Average Daily Water Use = ERU Residential Water Use/365 Days/yr
- Commercial ERUs = Commercial Daily AverageWater Use/ Residential ERU Average Daily Water Use
- Miscellaneous ERUs = Miscellaneous Daily Average Water Use/ Residential ERU Average Daily Water Use
- Distribution Leakage ERUs = Distribution System Average Daily Losses/ Residential ERU Average Daily Water Use

CHAPTER 3 – SYSTEM ANALYSIS

5. *Chapter 3, Various sections.* The values used in the most recent capacity calculations appear to variously come from the years 2020, 2021, and possibly 2022. Please confirm the analysis year which serves as the basis for capacity calculations. Please confirm that capacity and demand projections use consistent bases.

The base year for ERU calculations was 2020. Demands were escalated based on the GMA population projection growth rate of 1.26% per year adopted by Clark County. The projected populations and calculated demands for thos projections were used throughout the study. Because a new hydraulic model for the entire water system was developed, it was not possible to conduct all of the evlautions within a single study year,

6. *Page 3-15, Section 3.3. Recent Regulatory Changes.* The environmental protection agency has a new requirement for all water systems to prepare a lead service line inventory and replace all lead service lines. Please include this requirement in your discussion on regulatory changes and provide a summary of your efforts to meet the October 16, 2024, deadline. For more information about this requirement see Lead Service Line Inventory Guidance (wa.gov).

A paragraph has been added addressing the inventory requirements.

7. *Page 3-28, Section 3.8. Hydraulic Modeling.* The technical memorandum detailing the hydraulic modeling calibration and results is not included in Appendix J as stated in the text.

The Calibration plan and data have been added to the Appendix

8. *Page 3-28, Section 3.8. Hydraulic Modeling.* Please elaborate on the circumstances under which pipe velocities are expected to exceed 8 feet per second (fps), whether such velocities are expected to cause problems, and how it was evaluated.

The evaluation criteria for pipe velocities are shown in Table 3-14. Evaluation of pipe velocity was conducted for each model scenario. Velocity deficiencies we addressed with larger pipe sizes.

CHAPTER 4 – WATER USE EFFICIENCY, WATER RIGHTS, RELIABILITY, AND INTERTIES

9. *Page 4-1, Section 4.2. Water Use Efficiency Program.* The water use efficiency program does not appear to have been updated since 2008. The water use efficiency program and goal setting should be updated every 6 years and a public meeting is required to adopt new goals. If this is going to be completed outside of the water system plan update please provide a timeframe for when it will be completed.

Clark Public Utilities will update the Water Use Efificnecy Goals by the end of the year in 2024.

CHAPTER 5 – WELLHEAD PROTECTION PLAN

10. *Page 5-1, Section 5.1.3. Contaminant Inventory.* All water systems are required to update their contaminant inventory and provide notification to adjacent property owners every five years. It appears this has not been completed. Please provide a timeframe for when the contaminant inventory will be completed, and letters will be mailed to property owners notifying them of the wellhead protection area. This information should be included in the next water system update and will be reviewed during the next sanitary survey. See our wellhead protection guidance document for more information. Wellhead protection program guide (wa.gov)

The draft WHP Plan and contaminant inventories have been included in Appendix K. the PUD plans to finalize the WHP plan update in 2025

11. *Page 5-1, Section 5.1.3. Contaminant Inventory.* The sentence at the end of this section is cut off. Please revise.

The sentence has been updated.

CHAPTER 6 – OPERATIONS PROGRAM

12. *Page 6-5, Table 6-3. Emergency Water Director Duties.* The plan states that ODW will be contacted if there is water loss for more than 24 hours. Unplanned pressure loss events are considered a health emergency and our office should be contacted for coordination regardless of the duration of the outage. Depending on the situation a boil water advisory and follow-up coliform monitoring may be necessary. Please revise this section to indicate ODW will be contacted for all unplanned pressure outages.

This table has been updated.

13. *Page 6-7, Section 6.3.4. Emergency Response Procedures.* A common emergency for public water systems is to have coliform contamination. Please include a discussion of the emergency response procedures for this type of event, including how you will assess whether to issue a boil water advisory. Given the extensive size of CPU's distribution system, there should be a process for evaluating what customers are impacted on and public notification will be distributed.

An emergency condition for Confirmed Coliform Presence has been added.

14. *Tables 6-8 and 6-9.* Please include the sampling monitoring for disinfection byproducts and PFAS in the list of monitoring requirements. Add disinfection byproduct monitoring and PFAS sampling requirements to Table 6-8. Remove the reference to trihalomethane potential.

PFAS sampling has been added.

15. *Page 6-17, Section 6.6, and Appendix O. Cross-Connection Control Program.* The crossconnection control program included in Appendix O does not comply with the requirements outlines in WAC 246-290-490. The system needs to develop an updated plan that meets these requirements and ensure their governing documents are consistent with the plan. Please provide a schedule for when this will be completed. It can be evaluated outside of the water system planning process during the next sanitary survey.

The 2023 Updated Cross Connection Control Program has been included in Appendix O.

CHAPTER 8 – FINANCING STRATEGY

16. *Page 8-19, Table 8-5. Historical and Projected Operating Results.* A balanced operational budget is required for the plan approval period. Based on the information provided the operational budget is shown through 2025, which means this WSP could only be approved through the end of 2025. Please clarify if this is the approval period requested. If you are requesting a full 10-year approval period please provide an expanded operational budget out until 2034.

The financing strategy has been updated for a 10 year plan.

APPENDIX M – EMERGENCY RESPONSE PLAN

17. The emergency response plan and vulnerability assessment provided in Appendix M is excellent. However, we do not have a process in place for keeping this from being made public through a public records request. We recommend only providing a summary of the emergency response plan in this plan and referring to the full Emergency Response Plan by reference.

The ERP will be referenced in Appendix M and Removed.

DEPARTMENT OF ECOLOGY – WATER RIGHTS COMMENTS

On May 26, 2023, a copy of this WSP was sent to the Department of Ecology (Ecology). Ecology submitted comments dated July 26, 2023, by Mathew Kogle, Staff Hydrologist. Please incorporate these comments into your re-submittal. A copy of the comment letter is enclosed.

The Department's review of your WSP does not confer or guarantee any right to a specific quantity of water. Our review is based on your representation of available water quantity. If the Washington

Department of Ecology, a local planning agency, or other authority responsible for determining water rights and water system adequacy determines that you have use of less water than you represent, the number of approved connections may be reduced commensurate with the actual amount of water and your legal right to use it.

The Water Rights Self-assessment table has been updated to the version approved by Ecology in the following email.

From:	Gallagher, Mike (ECY)
To:	Grimm, Regina (DOH); Pollock, R. Scott (DOH); Anderson, Andy (DOH); Jones, Meredith L (DOH); jroth@clarkpud.com; rknutson@clarkpud.com
Cc:	Kogle, Matthew (ECY); Marti, Jeff (ECY); Jill Van Hulle; dchang@aspect.com; Lee Odell
Subject:	FW: Follow up - Clark Public Utilities WSP/Water Right Self-Assessment
Date:	Tuesday, October 10, 2023 3:51:46 PM
Attachments:	CPU WSP Comment Letter.pdf WaterRightsSelfAssessment_2022WSP_Revised10052023.docx

Regina

Based on this updated Water Right Self Assessment from Aspect Consulting (on behalf of Clark Public Utilities), Ecology Water Resources is OK with approval of this latest Water System Plan.

Mike

Michael J. Gallagher, LHG - Section Manager
Water Resources Program - Southwest Regional Office
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775
360-870-6291 (work cell) | mike.gallagher@ecy.wa.gov (e-mail)

From: Kogle, Matthew (ECY) <mkog461@ECY.WA.GOV>
Sent: Tuesday, October 10, 2023 12:23 PM
To: Gallagher, Mike (ECY) <MGAL461@ECY.WA.GOV>
Cc: Marti, Jeff (ECY) <jema461@ECY.WA.GOV>
Subject: FW: Follow up - Clark Public Utilities WSP/Water Right Self-Assessment

Just a FYI, I looked at the revised version of CPU's Water Rights Sefl Assessment (WRSA) and it appears Jill's edits addressed my comments. Jill was nice enough to put the corrections in red. See also Jill's explanation for the discrepancies in the number of water rights in WRTS vs the WRSA below.

-Matthew

From: Jill Van Hulle <jvanhulle@aspectconsulting.com>
Sent: Thursday, October 5, 2023 3:25 PM
To: Kogle, Matthew (ECY) <mkog461@ECY.WA.GOV>; Gallagher, Mike (ECY) <MGAL461@ECY.WA.GOV>
Cc: Grimm, Regina (DOH) <Regina.Grimm@DOH.WA.GOV>; jroth@clarkpud.com; Russell Knutson <rknutson@clarkpud.com>
Subject: Follow up - Clark Public Utilities WSP/Water Right Self-Assessment

Dear Mathew and Mike,

In response to your attached comment letter Clark Public Utilities (CPU) has taken the opportunity to review its water right portfolio and at your suggestion make several revisions. I've attached an updated table that should align closer to Ecology's records and corrects a number of inaccurate reference numbers and Qi/Qa values. Our review of Ecology's Water Right Tracking System (WRTS) indicates that there are actually 83 active water rights listed as being for Clark PUD, our revised table captures 67 of those documents. The remaining balance (16 documents between our list and your records) includes a mixture of redundant sibling/child water right/change applications, domestic water rights that were inadvertently assigned to the PUD by Ecology that are actually associated with Clark County Public Works, relinquished water rights, non-domestic water rights such as those associated with stand-alone commercial or industrial uses, and those rights associated with satellite water systems. We are confident that our revised WRSA reflects those rights that are associated with our operations, and plan to revise the narrative sections in the WSP to reflect the additions.

In the interest of capturing all our water rights we have added a table to the WRSA for those water rights associated with our satellite systems – this replaces the footnote.

Given the size of this portfolio and providence of some of these water rights it should not be surprising that minor discrepancies exist between your records and CPU's. As you guys are aware every new application includes yet another review and an opportunity/risk for a different interpretation. In fact, Clark Public Utilities is in the process of, and staff have preliminary approval to enter into a Cost Re-imbursement Agreement with Ecology to pursue several pending change applications which will provide us with a new window to further define and organize our water rights in collaboration with the Department. There should not however be any material difference in the total extent of CPU's water rights or final Qa values – CPU's water right portfolio has been reviewed and the Qa totaled and vetted by Ecology in numerous recent ROE's. The bottom line is that CPU is well-positioned to meet it's future planning horizon and water rights are not a limited factor.

I'm hopeful that with these revisions you feel comfortable letting the Dept. of Health know that you don't have any objections that would prevent the finalization of the water system plan.

Thanks so much, I look forward to meeting with you next week.

Jill Van Hulle | Sr. Associate Water Rights Specialist | Direct: 360.810.3508 | Cell: 360.528.1397
Aspect Consulting LLC | 504 14th Ave SE, Suite 200, Olympia, WA 98501 | www.aspectconsulting.com

Local Government Consistency Determination Form

331-568 • 8/10/2023

Water System Name: Clark Public Utiliites PWS ID: 13333X

Planning/Engineering Document Title: 2024 Water System Plan Plan Date: Feb 15, 2024

Local Government with Jurisdiction Conducting Review: Clark County, WA

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

By signing this form, the local government reviewer confirms the document under review is consistent with applicable local plans and regulations. If the local government reviewer identifies an inconsistency, the reviewer should include the citation from the applicable comprehensive plan or development regulation and explain how to resolve the inconsistency, or confirm that the inconsistency is not applicable by marking N/A. See more instructions on page 2.

Local Government Consistency Statement	For Use by Water System Identify page(s) in submittal	For Use by Local Government Yes or Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the service area.	Page 2-5	Enter here
b) The growth projection used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Page 2-5	Enter here
c) For cities and towns that provide water service: All water service area policies of the city or town described in the plan conform to all relevant utility service extension ordinances.	Page 1-26	Enter here
d) Service area policies for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	Page 1-27	Enter here
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	Page 1-27-29	Enter here

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

Enter date

Date

Click/tap here to enter text

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 the elements; 1a), b), c), d), and e), when they apply.

For **water system plans (WSP)**, a consistency review is required for the municipal water supplier's service area. Municipal water suppliers may exclude wholesale areas from the consistency review provided the water system receiving the wholesale water complies with the requirements for a consistency review when developing a water system plan for any new connection within their service area.

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

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

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

a) A copy of the adopted land use/zoning map corresponding to the service area. The uses provided in the WSP should be consistent with the adopted land use/zoning map. Include any other portions of comprehensive plans or development regulations that relate to water supply planning.

b) A copy of the growth projections that correspond to the service area. If the local population growth projections are not used, explain in detail why the chosen projections more accurately describe the expected growth rate. Explain how it is consistent with the adopted land use.

c) Include water service area policies and show that they are consistent with the utility service extension ordinances within the city or town boundaries. (This applies to cities and towns only.)

d) All **service area policies** for how you will provide new water service to new customers.

e) **Other relevant elements** the Department of Health determines are related to water supply planning. See Local Government Consistency—Other Relevant Elements, Policy B.07

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

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