



Water System Plan Update *Appendices*



FINAL | MAY 2021

Appendix K
WATER DESIGN STANDARDS AND DETAILS



**WATER UTILITY
DESIGN AND CONSTRUCTION STANDARDS**

FEBRUARY 2021

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1-02 PURPOSE

- A. These Water Utility Design and Construction Standards (Standards) set forth minimum standards for the planning, design, and construction of water main extensions within the City of Renton (City) Water Service Area.
- B. The Water Utility Code, Chapter 4 of Title VIII of the Renton Municipal Code (RMC), current through Ordinance 6009, passed December 14, 2020, is the basis for these Standards.
- C. The design of all water main extensions of the City water system shall conform to the design standards and requirements of the State of Washington Department of Health’s (DOH) latest Water System Design Manual for Group A Public Water Systems.
- D. The construction of all City water system improvements shall comply with City development regulations and standards and the latest City-adopted version of the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction as amended by the American Public Works Association (APWA) and by the City of Renton Public Works Department.
- E. Although these Standards are intended to apply to physical development within the Utility, the Standards will not apply for all situations. Compliance with these Standards does not relieve the designer of the responsibility to apply conservative and sound professional judgment. These are minimum Standards and are intended to assist, but not substitute for competent work by design professionals. The City Water Utility may at its sole discretion due to special conditions and/or environmental constraints, require more stringent requirements than would normally be required under these Standards.

1-03 DEFINITIONS

- A. The following terms as used in this document shall be defined and interpreted as follows.
 - 1. “City”
City of Renton

2. “City Forces”
City of Renton Public Works personnel.
3. “City Standard Plans”
City of Renton Water Utility Standard Detail Drawings, latest revision, included as Appendix A to this document.
4. “City Water Utility”
City of Renton Public Works Water Utility Department.
5. “Construction Plans”
All official drawings or reproductions of drawings made pertaining to the work provided for in the permit and Developer Extension Agreement.
6. “Contractor”
The person, partnership, firm, or corporation contracting to perform Work under these Standards. The term shall also include the Contractor's agents, employees, and subcontractors.
7. “COR Maps”
City of Renton Maps, online GIS database.
8. “Developer”
Any individual, company, partnership, joint venture, corporation, association, society, or group that has made, or intends to make, application to the City for permission to construct a water system connection or extension to the City’s water system.
9. “Engineer”
The City of Renton Water Utility Engineer or his/her duly authorized assistants in the Water Utility Department, which includes Water Utility Engineering Manager, Project Engineers, Consultant Engineers, and City Inspectors.
10. “Fire Marshal”
Renton Regional Fire Authority Office of the Fire Marshal.
11. “Or Equal”
Any manufactured article, material, method, or work which, in the opinion of the Engineer, is equally desirable or suitable for the purposes intended in these Standards as compared with similar articles specifically mentioned herein.
12. “Owner”
Entity that has an enforceable claim or title to an asset or property, and is recognized as such by law.

13. “Project”
The water main extension, system connections, and improvements to be constructed in whole or in part.
14. “Standards”
City of Renton General Design and Construction Standards for Water Main Extensions (this document).
15. “Survey Control Network”
City of Renton Survey Control Network online survey monument GIS database.
16. “Surveyor”
Professional Land Surveyor registered in the State of Washington.
17. “Water Service Area”
The City of Renton Water Service Area and Retail Service Area, encompassing the area where the City of Renton has existing water distribution mains or where distribution mains can be extended in a reasonable timeframe, as defined in Chapter 5 of the 2019 City of Renton Water System Plan.
18. “Water System Plan”
2019 City of Renton Water System Plan, document that fully describes the current status of the City’s water system.
19. “Words and Phrases”
Whenever the words, “as directed”, “as required”, “as permitted”, or words of similar effect are used, it shall be understood that the direction, requirement, or permission of the Engineer is intended. The words, “sufficient”, “necessary”, “proper”, and the like shall mean sufficient, necessary, or proper in the judgment of the Engineer. The words, “approved”, “acceptable”, “satisfactory”, or words of similar import shall mean approved by or acceptable to the Engineer.
20. “Work”
The work necessary to manufacture and deliver machinery, equipment and material and/or the furnishing of all labor, tools, material, equipment, construction equipment, working drawings, where required, and other, necessities for the construction or erection of the structures shown and called for in the Construction Plans, specifications, and agreements, and the act of constructing or erecting said structures complete.
21. “WSDOT Standard Specifications”
“2020 Standard Specifications for Road, Bridge, and Municipal Construction”, English edition, Washington State Department of Transportation and the American Public Works Association, including all amendments.

1-04 ABBREVIATIONS

A. The abbreviations used in this document and its appendices shall be defined as follows.

AC	Asbestos Cement
ADD	Average Day Demand
ADU	Accessory Dwelling Unit
AMI	Advanced Metering Infrastructure
AVR	Air and Vacuum Release Valve Assembly
BHN	Brinell Hardness Number
BTU	British Thermal Units
CAD	Computer-Aided Design
CC	Corporation Cock (thread type)
CDF	Controlled Density Fill
CED	City of Renton Community & Economic Development
CI	Cast Iron
cy	Cubic Yard
DCDA	Double Check Detector Assembly
DCVA	Double Check Valve Assembly
DFT	Dry Film Thickness
DI	Ductile Iron
dpi	Dots Per Inch
EPDM	Ethylene Propylene Diene Monomer
FDC	Fire Department Connection
FIPT	Female Iron Pipe Thread
FL	Flange
fps	Feet Per Second
GIS	Geographic Information System
gpd	Gallons Per Day
gph	Gallons Per Hour
gpm	Gallons Per Minute
HDPE	High Density Polyethylene
HMA	Hot Mix Asphalt
ID	Inside Diameter
LDPE	Low Density Polyethylene
LF	Linear Feet
MDD	Maximum Day Demand
mg/L	Milligrams per Liter
MIPT	Male Iron Pipe Thread
MJ	Mechanical Joint
MNST	Male National Standard Thread
MUTCD	Manual on Uniform Traffic Control Devices

MVO	Main Valve Opening
NPT	National Pipe Thread
NST	National Standard Thread
OD	Outside Diameter
OS&Y	Outside Screw and Yoke (valve type)
PCC	Portland Cement Concrete
pcf	Pounds Per Cubic Foot
pcy	Pounds Per Cubic Yard
PDF	Portable Document Format
PE	Polyethylene
PHD	Peak Hour Demand
PIV	Post Indicator Valve
PNWS	Pacific Northwest Section (of American Water Works Association)
ppm	Parts Per Million
PRV	Pressure Reducing Valve Assembly
psf	Pounds per Square Foot
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
RJ	Restrained Joint
ROW	Right-of-Way
RPBA	Reduced Pressure Backflow Assembly
RPDA	Reduced Pressure Detector Assembly
SBR	Styrene-Butadiene Rubber
VOC	Volatile Organic Compound

1-05 REFERENCES

- A. Wherever references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. The following acronyms or abbreviations which may appear, shall have the meanings indicated herein.

AASHTO	American Association of the State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
APWA	American Public Works Association
ASTM	ASTM International
AWWA	American Water Works Association
DIPRA	Ductile Iron Pipe Research Association
DOE	State of Washington Department of Ecology
DOH	State of Washington Department of Health
EPA	United States Environmental Protection Agency
NESHAP	National Emissions Standards for Hazardous Air Pollutants

NFPA	National Fire Prevention Association
OSHA	Occupational Safety and Health Administration
PSCAA	Puget Sound Clean Air Agency
RMC	Renton Municipal Code
UPC	Uniform Plumbing Code
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WSDOT	Washington State Department of Transportation

1-06 GOVERNMENTAL AGENCY REQUIREMENTS

- A. All construction on City, County, or State roads or Right-of-Way (ROW) shall be done in accordance with the agency’s standards and requirements and in accordance with the franchise and/or permit requirements. The Contractor is responsible to determine these requirements prior to construction.
- B. Where conflict exists between these Standards and permit requirements, the most stringent permit requirements shall take precedence.
- C. Metal lids, hatches, and manhole covers located in sidewalks, crosswalks, or other pedestrian areas must comply with ADA requirements and have a slip resistant surface.

1-07 THE REDUCTION OF LEAD IN DRINKING WATER ACT

- A. New EPA regulations regarding lead-free water system materials, effective January 4, 2015.
- B. The *Reduction of Lead in Drinking Water Act* was enacted on January 4, 2011, to amend Section 1417 of the *Safe Drinking Water Act*, which covers the use and introduction into commerce of lead pipes, plumbing fittings or fixtures, solder, and flux.
- C. The *Reduction of Lead in Drinking Water Act* changes the *Safe Drinking Water Act* definition of “lead-free”. All water system materials furnished and installed shall comply with this revised Act.
- D. The Contractor shall provide Manufacturer’s Certificate of Compliance in accordance with the current edition of the WSDOT Standard Specifications for all water system materials to be used. The Certificate must clearly state that the materials furnished comply with “lead-free” requirements of the revised *Safe Drinking Water Act*.

END OF CHAPTER 1

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2-06.4 CONSTRUCTION COMPLETION REPORT FORM FOR DISTRIBUTION MAIN PROJECTS

2-02 GENERAL

2-02.1 GENERAL

- A. Following these Plan Submittal Standards will help to produce a clear and constructible water system design and will help ensure a timely review of the proposed Project and minimize review costs.

2-03 DEVIATIONS

2-03.1 DEVIATIONS

- A. The Developer may propose a deviation from the Standards.
- B. Non-standard designs may require longer review times and additional processing costs.

2-03.2 DEVIATION CRITERIA

- A. Requests for deviations which are site- or project- specific shall be reviewed by the City Water Utility. The City’s decision to grant, deny, or modify the proposed deviation shall be based upon evidence that the deviation request meets all of the following criteria.
 - 1. The change will achieve the intended result through a comparable or superior design.
 - 2. The change will not adversely affect safety or operation.
 - 3. The change will not adversely affect maintainability.

2-04 ERRORS AND OMISSIONS

2-04.1 ERRORS AND OMISSIONS

- A. Any errors or omissions in the approved Construction Plans (or information used as a basis for such approvals) may constitute grounds for withdrawal of any approvals and/or stoppage of any or all of the permitted Work, as determined by the City.
- B. It shall be the responsibility of the Developer to show cause why such Work should continue and make such changes in the Construction Plans that may be required by the City before the Construction Plans are re-approved.

2-05 PLANS

2-05.1 PLAN SUBMITTAL REQUIREMENTS

- A. Construction Plans submitted for review shall meet the requirements of the “Civil Construction Permit Application”, available at the City Hall Permit Center and on the City’s webpage. A Department of Community and Economic Development (CED) representative at the Permit Center will determine which requirements are applicable to the proposed project and will facilitate the application process with the Developer.
- B. Only PDF files shall be submitted for plan review, except where noted, and shall conform to the City’s Electronic File Standards, available online.
- C. Refer to RMC, *Title IV Chapter 8 Permits – General and Appeals*, for more information.

2-05.2 DRAFTING STANDARDS

- A. All plan submittals shall conform to CED’s “Survey and Drafting Standards”, available at the City’s website, including the items herein.
- B. Format

1. All Construction Plans shall be prepared to ANSI "D" (22" x 34") standard size and submitted in PDF format.
2. Drafting standards and symbols shall conform to Washington State APWA Chapter CAD Standards.
3. All Construction Plans should be clear and easy to read, with all lines and letters dark enough to provide adequate contrast.
4. Proposed work shall be drawn and indicated in a dark line type. Existing features shall be screened to one-half tone.

C. Sheet Setup

1. Cover Sheet

- a. Title/Project Name
- b. City Permit Number
- c. Table of Contents
- d. Vicinity Map
- e. General description of site, including Quarter Section, Township, Range
- f. Name and phone number of engineering firm preparing Construction Plans

2. Title Block

- a. Border and title block shall conform to standard City format, available at the City's website
- b. City Permit Number (assigned by the City)
- c. Title/Project Name
- d. Sheet Title
- e. Professional Engineer's seal and signature

3. Include a key for abbreviations and a legend for symbols where such are used.

4. Scale and Orientation

- a. A standard engineering scale shall be used (e.g., 1"=20', 1"=40') and shall be indicated on each sheet using a bar symbol for plan reproduction integrity.
- b. Provide matchlines with matched sheet numbers where the water plan is drawn on two or more sheets.
- c. Provide stationing on all centerlines and reference lines, proceeding from left to right or top to bottom. Locations of all design features shall be referenced by station and offset.

B. Horizontal and Vertical Control

1. All Projects shall be tied to the City Survey Control Network, based on NAD 1983/1991 (horizontal) and NAVD 1988 (vertical) datums for survey reference.
2. All existing and proposed improvements shall be dimensioned to City survey monuments, monument lines, or street centerlines. Dimensioning must be done by stationing and offset from these control lines.
3. All referenced monuments or benchmarks shall be shown on the drawings, as well as a description of any such monuments or benchmarks established.

C. Existing Conditions and Topography

1. Show all existing underground improvements, surface improvements, and topography in proximity to the project.
2. Information shall be shown for the full width of the ROW or the easement and for a sufficient distance on either side of the ROW or easement to show possible impacts on adjacent properties and/or the relationship to related facilities.
3. Existing and proposed topography contours shall cover the entire site and a minimum of 30 feet (30') beyond the site boundary. Existing topography should be screened.
4. Information on existing surface and underground City facilities may be obtained from the City Hall Permit Center or City of Renton Maps (COR Maps) online.
5. Utility information may be obtained from the respective utility owners (i.e., Puget Sound Energy, Comcast, CenturyLink, etc.).
6. All property lines (with distances and bearings), ROW lines, sensitive areas, setbacks, and all existing and proposed easements shall be shown and clearly labeled with their recording numbers.
7. All existing and proposed building footprints and retaining walls or similar structures shall be shown
8. All division or phase lines shall be indicated showing proposed limits of construction.

2-05.3 WATER PLAN

- A. Include a dedicated Water Plan for the proposed water system. Water Plan may be combined with sanitary sewer and storm sewer plans for small projects.
- B. All water mains are required to be within utility easements granted to the City, in a form acceptable to the City Water Utility. Easements shall be referenced on the Water Plan.
- C. Water Plan shall indicate the quantity, size, type, and locations of each of the following existing and proposed items.

1. Water mains
 - a. List pipe length, size, and material alongside pipe (e.g., 150 LF - 8" DI).
 - b. Pipe material can be listed in a general note in lieu of listing along pipe.
 - c. Pipe length is to be based on horizontal distance between appurtenances (e.g., valves, fittings).
 - d. Polyethylene (PE) encasement shall be indicated.
 2. Valves (e.g., 8" gate valve).
 3. Fitting connections (e.g., FL, FL x MJ).
 4. Bends (11.25°, 22.5°, 45°, 90°).
 5. Concrete blocking (all blocking shall also be shown on detail drawings, including at vertical bends).
 6. Blow-off assemblies.
 7. All hydrants within 300 feet (300') of the site.
 8. Backflow assemblies (e.g., 4" DCVA, 8" RPBA).
 9. Fire department connections (FDCs).
 10. All water meters (e.g., 2" irrigation, 1" domestic).
 11. Vertical crosses for polypigging of new mains.
 12. Buildings, carports, dumpsters, mailboxes, rockeries, retaining walls, and other structures.
 13. Surface improvements, including parking areas.
- D. Provide callouts for each section or detail in the Construction Plans to reference assigned detail and sheet numbers.

2-05.4 WATER PROFILE

- A. Include profiles of all proposed water main alignments with the following information.
 1. List pipe length, size, and material alongside of pipe (e.g., 220 LF - 12" DI).
 - a. Pipe material can be listed in a general note in lieu of listing along pipe.
 - b. Pipe length is to be based on horizontal distance between appurtenances (e.g., valves, fittings).

2. Show existing underground features within 10 feet (10') of where they cross or connect to new improvements.
3. For utility crossings which involve vertical offsets in water line, provide detail showing the crossing, including vertical bends, blocking, shackle rods, and pipe elevations.
4. Show the existing grade and the proposed grade.

2-05.5 WATER UTILITY STANDARD PLANS

- A. All applicable City Standard Plans shall be included as a part of the Construction Plans.
- B. City Water Utility Standard Plans are as follows.

- 300.1 Connection to Water Main - Cut-In Tee and One Valve
- 300.2 Connection to Water Main - Cut-In Tee and Two Valves
- 300.3 Connection to Water Main - Cut-In Tee and Three Valves
- 300.4 Connection to Water Main - Existing Tee or End Line Cap
- 300.5 Connection to Water Main - Tapping Tee and Valve
- 300.6 Tapping Tee
- 300.7 Polypigging New Water Mains
- 300.8 Steel Pipe Casing
- 310.1 Fire Hydrant Assembly
- 310.2 Fire Hydrant Assembly - Location in Cut or Fill
- 310.3 Fire Hydrant Assembly - Pavement Marker
- 320.1 1" Water Service
- 320.2 1 ½" and 2" Water Service in Planting Strip
- 320.3 1 ½" and 2" Water Service in ROW Behind Sidewalk
- 320.4 3", 4", & 6" Meter
- 330.1 Concrete Blocking for Horizontal Fittings
- 330.2 Concrete Blocking for Vertical Fittings
- 330.3 Concrete Blocking for Vertical Fittings with Restrained Joints
- 330.4 Concrete Blocking - Pipe Clamp and Anchor Rods
- 330.5 Shackle Rod Joint Restraint System
- 330.6 Asbestos Cement Water Main Replacement at New Utility Crossing
- 330.7 Valve Box, Operating Nut Extension, and Marker Post
- 340.1 2" Blow-Off Assembly (Permanent)
- 340.2 2" Blow-Off Assembly (Temporary)
- 340.3 1" Air and Vacuum Release Valve Assembly
- 340.4 Individual Pressure Reducing Valve Assembly (Residential)
- 350.1 3" to 10" DCVA - Vault Installation - Domestic and Irrigation Services
- 350.2 3" to 10" DCVA - Interior Installation - Domestic and Irrigation Services
- 350.3 3" to 10" DCDA - Vault Installation - Fire Sprinkler Systems
- 360.1 ¾" to 2" RPBA - Heated Enclosure Installation - Domestic and Irrigation Services
- 360.2 3" to 10" RPBA - Heated Enclosure Installation - Domestic and Irrigation Services

- 360.3 3" to 10" RPBA - Interior Installation - Domestic and Irrigation Services
- 360.4 3" to 10" RPDA - Heated Enclosure Installation - Fire Sprinkler Systems
- 370.1 Commercial Fire Sprinkler System - 1 ½" and 2" DCVA or RPBA - Outside Installation
- 370.2 Commercial Fire Sprinkler System - 3" to 10" DCDA or RPDA - Outside Installation
- 370.3 FDC and Check Valve Routed Through Backflow Assembly Vault
- 370.4 Concrete Blocking Adjacent to Vault
- 370.5 Vault Ladder

- C. Note that each connection of new water main to the existing water system is unique and may require an original detail in place of the City Standard Plans. Include site-specific “testing connection” and “final connection” configurations for each water main connection, using City Standard Plans as a reference.
- D. See Appendix A of this document for City Water Utility Standard Plans.

2-05.6 WATER UTILITY GENERAL NOTES

- A. The following is a listing of Water Utility General Notes that shall be incorporated into the Construction Plans on or before the first sheet of the Water Plan.
- B. Water Utility General Notes
 - 1. All work and materials shall be in accordance with the latest edition of the City of Renton Public Works Standard Specifications, the City of Renton Developer Extension Agreement, and WSDOT Standard Specifications, latest edition as amended by the City of Renton.
 - 2. The locations of all existing utilities shown herein have been established by field survey or obtained from available records and should be considered approximate only and not necessarily complete. It is the sole responsibility of the Contractor to independently verify the accuracy of all utility locations shown, and to further discover and avoid any other utilities not shown herein which may be affected by the implementation of these Plans.
 - 3. All existing utilities shall remain in service during construction unless otherwise noted. The Contractor shall call 1-800-424-5555 or 811 to verify utility locations a minimum of 72 hours before beginning excavation.
 - 4. All materials used for the construction of water system improvements shall be new and undamaged. Products and materials shall meet the requirements of the City of Renton Water Utility Approved Materials List. Cut sheets for all materials shall be approved in writing by the City of Renton prior to bringing any materials on-site.
 - 5. All water main pipe materials shall be cement-lined (double thickness) ductile iron pipe, thickness Class 52 per AWWA C151 and C104 standards. Pipe joints shall be push-on or mechanical joint. Cast iron or ductile iron pipe fittings shall be Class 250

per ANSI/AWWA C110/A21.10-82. All ductile iron pipe and fittings shall be wrapped with 8-mil black, tube-type, polyethylene encasement per AWWA C105.

6. All pipe and fittings not to be disinfected in place shall be swabbed with 5-6% available chlorine solution prior to installation under the observation of a City of Renton Utility Inspector.
7. In fill areas, the water main shall be installed only after the trench and roadway subgrade materials have been graded and compacted.
8. Before commencement of trenching, the Contractor shall provide catch basin inserts for all catch basins that will receive runoff from the project site. The Contractor shall periodically inspect the condition of all inserts and replace as necessary.
9. Minimum cover from top of water mains to finished grade shall be 36 inches (36") for pipe diameter of 10 inches (10") or less and 48 inches (48") for pipe diameter of 12 inches (12") and larger. Maximum cover for all water mains shall be 72 inches (72"). Any deviations must be approved by the City of Renton prior to construction. Where utility conflicts occur, the profile of the water main shall be adjusted as necessary to clear conflicts and to provide required minimum vertical clearance between utilities and minimum cover.
10. Pipe deflection shall not exceed one-half of pipe manufacturer's specification for size of pipe used.
11. All trench backfill shall be compacted to 95 percent (95%) maximum dry density (MDD) as determined by the Modified Proctor Test Method in roadways, roadway shoulders, roadway prism and driveways, and 85 percent (85%) MDD in unpaved areas. All pipe zone compaction shall be 95 percent (95%) MDD.
12. Concrete blocking for water mains shall be designed, installed, and poured into place in accordance with the City of Renton Standard Plans and shall be installed at all vertical and horizontal bends and fittings. Joint restraints may be required on all mechanical joints in addition to concrete blocking.
13. Minimum clearance between concrete blocking and other buried utilities or structures shall be 5 feet (5').
14. All new services shall be minimum 1-inch (1") per City of Renton Standard Plans. Adapters for 3/4-inch by 5/8-inch (3/4" x 5/8") meters shall be used where applicable.
15. Privately owned and operated pressure reducing valves are required by the Uniform Plumbing Code where the static service pressure exceeds 80 psi.
16. Where a new utility line crosses below an existing asbestos cement main, the asbestos cement pipe shall be replaced with polywrapped ductile iron pipe to 3 feet

(3') past each side of the trench as shown on City of Renton Standard Plan 330.6. When working with asbestos cement pipe, the Contractor is required to maintain workers' exposure to asbestos material at or below the limit prescribed in WAC 296-62-07705.

17. Where water main crosses sanitary sewer or storm drain pipe, one full length of water pipe shall be centered for maximum joint separation.
18. All new water main pipes and fittings shall be flushed and cleaned via foam polypig prior to disinfection, and testing. Cleaning, hydrostatic testing, and purity testing shall be done in the presence of and under the supervision of a City of Renton Utility Inspector. The Contractor shall supply, install, and remove plugs, corporation stops, blow-off assemblies, and thrust restraint/blocking for testing and purity acceptance. No connection shall be made between the new main and the existing system until the new piping has been polypigged, disinfected, flushed, and passed both hydrostatic and purity testing.
19. New water mains including service laterals shall be tested at a static pressure of 150 psi above working pressure with a minimum of 225 psi test pressure for 120 minutes with a maximum of 5 psi pressure drop during the entire test period. Upon satisfactory completion of the pressure test, the line shall be disinfected, flushed, and then water samples shall be taken for purity testing by a City of Renton Utility Inspector.
20. After disinfecting the water main, dispose of chlorinated water by discharging to the nearest operating sanitary sewer.
21. The Contractor shall notify the City of Renton Water Utility a minimum of ten (10) working days prior to making connections to the existing water system. Water main shut offs shall not be scheduled to occur on Fridays, City holidays, nor on the five days before nor one day after a City holiday, unless approved by the City of Renton Water Utility. The Contractor shall expose the existing water main and fittings at the connection point before ordering the necessary adapters and fittings required for the final connection. The Contractor shall excavate, remove all surface materials, and provide shoring and all materials required for The City of Renton to perform the connection to the existing water system. The Contractor shall provide and install backfill, concrete blocking, and complete surface restoration.
22. All work on the existing water system, including connections to existing mains, abandonment of existing pipes, water services, or other system components shall be performed by City Forces with the direct support of the Contractor.
23. The Contractor shall use a vacuum street sweeper to remove dust and debris from pavement areas as directed by the Engineer. Flushing of streets shall not be permitted without prior City approval.

24. Trench backfill and surface restoration of existing asphalt pavement shall be as required by the right-of-way use permit.
25. When work is to occur in easements, the Contractor shall notify the easement grantor and the City of Renton Water Utility in writing a minimum of 48 hours in advance of beginning work (not including weekends or holidays). Failure to notify grantor and The City of Renton Water Utility will result in a Stop Work Order being posted until the matter is resolved to the satisfaction of The City of Renton Water Utility. A written release from the easement grantor shall be furnished to the City of Renton Utility Inspector prior to permit sign-off.
26. The Contractor shall restore the right-of-way and existing public utility easements after construction to a condition equal or better than condition prior to entry. The Contractor shall furnish a signed release from all affected property owners after restoration has been completed.
27. Manholes, catch basins, and vaults are considered to be permit-required confined spaces. Entry into these and any other confined spaces shall be in accordance with Chapter 296-809 WAC.

2-06 AS-BUILT DOCUMENTATION

2-06.1 AS-BUILT STANDARDS

- A. All water main projects are required to be “as-built” (post-construction survey) per City of Renton Municipal Code (RMC) *Title IV Development Regulations* and *Title IX Public Ways and Property*.
- B. As-built conditions shall be recorded during the construction of the project and As-Built Plans shall be provided to the City at the completion of the project.
- C. All improvements must be located and recorded both horizontally to within one-tenth of a foot (0.1') and vertically to within one-hundredth of a foot (0.01') by a radial survey or by a station offset survey.
- D. The As-Built Survey must be based on the same baseline or control survey used for the construction staking survey for the improvements.
- E. All survey work shall be performed under the supervision of a Surveyor.
- F. All subsurface improvements shall be surveyed prior to backfilling. Close cooperation between the installing contractor and the Surveyor is therefore required.
- G. Dimensions from ROW centerline for utility features in the public ROW, or from property line for utility features located within easements, shall be recorded.

- H. As-built information shall be recorded on plan and profile views of the Construction Plans. The profile view shall note any changes from the design finished grade over each pipe.
- I. Items not built shall be crossed out. Changes to design attributes (e.g., elevations, pipe lengths) shall have a strikethrough or be crossed out and relabeled in bold font.
- J. Asset ownership changes (e.g., City-owned to Private or other agency and vice-versa) shall be clearly noted. Easement boundaries and recording numbers shall be recorded if obtained.
- K. All As-Built Plan sheets shall be affixed with an “As-Built” or “Record Drawing” stamp with a statement certifying accuracy.

2-06.2 AS-BUILT SUBMITTAL REQUIREMENTS

- A. All As-Built Plans shall be submitted digitally in PDF format.
- B. The Surveyor shall provide the following physical documents.
 1. Hard-covered field book(s) containing As-Built notes.
 2. One set of Project drawings showing located existing utilities.
 3. One set of Project drawings showing as-built locations of new work with the Surveyor’s seal and signature.

2-06.3 AS-BUILT INFORMATION REQUIREMENTS

- A. Existing Utilities
 1. Location by centerline station and offset
 2. Depth of cover
 3. Type of utility
 4. Size
- B. Mains
 1. Length (based on horizontal distances from center of fitting to center of fitting)
 2. Diameter
 3. Material
 4. Name of pipe manufacturer
 5. Type of joint restraint
 6. Depth of cover
- C. Valves
 1. Location by centerline station and offset
 2. Depth to top of operating nut

3. Size
 4. Type (e.g., gate valve, butterfly valve)
 5. Joint type (e.g., MJ x MJ)
- D. Fittings
1. Location by centerline station and offset
 2. Size
 3. Fitting type (e.g., 45° bend)
 4. Joint type (e.g., MJ x MJ)
- E. Services
1. Location by centerline station and offset (measured to center of meter box)
 2. Service size
 3. Meter size
- F. Hydrants
1. Location by centerline station and offset (measured to center of hydrant)
 2. Distance from valve to hydrant
 3. Depth of bury (e.g., 5' bury)
- G. Abandoned and Removed Utilities
1. Indicate the full extents of all water main, water system components, and other utilities abandoned in place or removed.

2-06.4 CONSTRUCTION COMPLETION REPORT FORM FOR DISTRIBUTION MAIN PROJECTS

- A. A Construction Completion Report Form for Distribution Main Projects (DOH Form 331-147) is required for all water main projects, in accordance with WAC 246-290-125(2)(b).
- B. The Project Owner and/or Developer shall work with the City Water Utility to complete the Construction Completion Report Form. The City Water Utility will keep a copy on file and submit to DOH as required.
- C. The Construction Completion Report Form for Distribution Main Projects is available online on the DOH website and is included with this document as Appendix C.

END OF CHAPTER 2

CHAPTER 3 PLANNING AND DESIGN

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3-02 PLANNING CRITERIA

3-02.1 WATER MAIN EXTENSION

- A. All water main extensions within the City shall be extended in a manner and along routes which comply with the City's latest adopted Water System Plan.
- B. All water main extensions shall extend through the full frontage and to the extreme boundaries of the subject properties with adequate capacity and pressure.
- C. Where possible, provisions shall be made for looping all dead-end mains associated with the Project.
- D. An easement shall be provided to the adjacent property line or ROW for future connection to a temporary dead-end main.

3-02.2 DEMAND PROJECTIONS

- A. Demand projections are taken from the 2019 Water System Plan Update.
- B. Unit Demands
 - 1. Single Family: 160 gallons per day (gpd)
 - 2. Multi-Family: 100 gpd
- C. Peaking Factor
 - 1. Maximum Day Demand (MDD) = Average Day Demand (ADD) x 1.80

3-02.3 SYSTEM PARAMETERS

- A. Pipeline Velocity
 - 1. In accordance with DOH recommendations, the City requires that the design of new distribution mains provide for operating velocities less than or equal to 8 feet per second (≤ 8 fps) under peak hour demand, fire flow conditions, and other emergency demand conditions.
- B. Service Pressure
 - 1. Desirable
 - a. Minimum 40 psi at the highest domestic water fixture or fire sprinkler head, except during emergencies
 - b. Maximum 110 psi at the ground elevation at the water meter
 - 2. Allowable

- a. Minimum 30 psi
 - b. Maximum 150 psi (during failure in a portion of the system)
3. All domestic services shall be equipped with individual PRVs when the static service pressure exceeds 80 psi, in accordance with UPC requirements
 4. During fire suppression events, the water system must be able to provide 20 psi minimum pressure at ground level at all points throughout the distribution system. The water system must be able to provide this minimum pressure under fire flow conditions plus the MDD rate when all equalizing and fire flow storage is depleted, per WAC 246-290-230(6).

3-02.4 FIRE FLOW

- A. The Fire Marshal will determine fire flow demand and fire protection requirements for each Project.
- B. The City Water Utility will determine the available fire flow using its computer simulated hydraulic model of the City water distribution system.
 1. The minimum allowable system pressure during fire flow analysis is 20 psi at the fire location and 30 psi throughout the rest of the distribution system.
- C. The Developer shall provide all necessary information to the City to determine fire flow requirements for the Project.
 1. The Project shall meet the minimum fire flow requirements and design criteria set forth by the City and the Fire Marshal.
 2. The Developer is responsible for the design and installation of all necessary water system improvements to provide the required fire flow, including fire sprinkler systems and on-site and off-site hydrants and water mains.
 3. The change of use of existing buildings or areas may also require water system improvements.

3-03 WATER MAIN

3-03.1 WATER MAIN LOCATION

- A. Locations of new water mains in City streets shall be as follows.
 1. Water mains shall be located on the north or east side of the street.
 2. Water mains with a diameter of 10 inches (10") or less shall be located within the paved area of a roadway and 4 feet (4') from the face of the curb line.

3. Water mains with a diameter of 12 inches (12") or larger shall be located within the paved area of roadway and 6 feet (6') from the face of curb line.
 4. Horizontal bends or pipe deflection shall be used where necessary to maintain uniform offset from the face of curb line.
 5. Where water mains are constructed within paved areas on private properties, water mains shall be located outside of the parking stalls.
- B. Where conflicts with existing utilities or other features are present, deviations from the above criteria may be necessary and will be considered and reviewed by the City Water Utility on a case-by-case basis.

3-03.2 WATER MAIN ALONG CURVES

- A. Long radius curves of 400 feet (400') or more, either horizontal or vertical, may be laid with standard pipe lengths by deflecting the joints.
- B. The amount of deflection at each pipe joint when pipe is laid on a horizontal or vertical curve shall not exceed one-half the manufacturer's printed recommended deflections.

3-03.3 WATER MAIN SIZING

- A. The diameter of water mains shall be determined by hydraulic analysis to verify that fire flow demands and velocity and pressure requirements are met for the proposed Project.
- B. Minimum Pipe Diameter
 1. All new water mains shall be at least 8 inches (8") in diameter.
 2. All new water mains shall be at least 12 inches (12") in diameter in the City's Central Business District, Urban Center, Commercial and Industrial Corridors, and Sunset Reinvestment Strategy Area.
- C. Water Main Oversizing
 1. The City may require the installation of an oversized water main if it is determined that the City or the general locality would be benefitted.
 2. If the City requires an oversized water main, the City shall pay the difference in cost between the installation cost of the similar main and that of the larger main.
 3. If the Developer requires an oversized water main for its own purposes, the Developer shall pay the complete cost of installation.

4. Any party required to oversize the water mains may request the City participate in the cost of the project.

3-03.4 PIPE PROTECTION

A. Polyethylene Encasement

1. All DI pipe and adjacent fittings shall be encased in 8-mil polyethylene (PE) in accordance with the requirements of AWWA C105.

B. Water Main Depth of Cover

1. Depth of cover measured from finished grade to the top of water main.
2. Minimum 3 feet (3') cover for water main 10 inches (10") in diameter or less.
3. Minimum 4 feet (4') cover for water main 12 inches (12") in diameter or larger.
4. Maximum 6 feet (6') cover for all water mains.

C. Building Setback Requirements.

1. Minimum 10 feet (10') from building and retaining walls to water main.
2. Minimum 5 feet (5') from covered parking area to water main.

D. Pipe shall not be located below soil nails or other retaining wall reinforcement. If the pipe is located above a soil nail or other retaining wall reinforcement, a minimum of 5 feet (5') of clearance is required.

E. Service connections or distribution system piping shall not be used for grounding of electrical systems or for the maintenance, integrity, or continuity of any grounding attachment or connection.

F. Under certain conditions, water main shall be installed within steel casing. Refer to Section 3-17 for further guidance.

3-03.5 SPECIAL DESIGN FOR SITES WITH CONTAMINATED SOILS

A. Projects sites known to have contaminated soils shall be required to implement special design measures in order to protect the integrity of water quality in the water distribution system.

B. Special design measures for sites with contaminated soils will be approved by the City on a case-by-case basis and may include, but are not limited to, the following items.

1. Comply with the recommendations of the Project Geotechnical Report specific to the installation of the water main and water system components.

2. Remove and dispose of contaminated soils from the site under the observation of an environmental consultant and in compliance with the recommendations of the Geotechnical Report and governing regulatory agencies.
3. Provide impermeable lining for the full extents of trenches for the water main and water system components.
4. Provide imported clean backfill materials from a State-approved materials source.
5. Provide a joint restraint system in addition to concrete blocking for the full extents of the water main and water system components.
6. Locate water system improvements away from the known extents of soil contamination.

3-04 VALVES

3-04.1 VALVE PLACEMENT

- A. The quantity and placement of valves should be sufficient to minimize the number of services and fire hydrants that will be out of service when a water main must be isolated for maintenance, repair, replacement, or additions.
- B. Valves shall be installed along water mains at a maximum spacing of 400 feet (400') and at the intersection with other water mains.
- C. Valves shall be installed at water main intersections as follows.
 1. Valves shall be placed on all legs of each cross or tee, unless tapping an existing main.
 2. Valves shall be installed on all legs of the tee for fire service connections 4 inches (4") and larger.
 3. Valves shall be installed on all legs of the tee for domestic service connections 2 inches (2") and larger.
 4. Valves shall be located in clusters where possible.
- D. Valves shall be installed at each end of a water main within an easement.
- E. Valves may be required at or near the end of water mains where future extensions are anticipated.
- F. Additional valves may be required for area isolation.

3-04.2 VALVE TYPE

- A. Resilient seated gate valves shall be used on water main 12 inches (12") in diameter and smaller.
- B. Butterfly valves shall be used on water main 12 inches (12") in diameter and larger.

3-04.3 VALVE MARKER POSTS

- A. Valve marker posts shall be installed for all main line valves outside paved areas.

3-05 VAULTS

3-05.1 VAULTS

- A. Vaults shall be required for water meters and backflow assemblies 3 inches (3") in size or larger.
- B. Vaults shall be designed and sized in accordance with City Standard Plans.
- C. Vaults shall drain to daylight or to the storm drain system where draining to daylight is not feasible.
- D. Vaults shall not be placed within sidewalks or within the wheel path of vehicle traffic, where possible.
- E. Reduced Pressure Backflow Assemblies (RPBAs) located outside of a building shall not be permitted in buried vaults, unless given special approval by the City Water Utility.

3-06 CONCRETE BLOCKING AND JOINT RESTRAINT

3-06.1 CONCRETE BLOCKING AND JOINT RESTRAINT

- A. Concrete thrust blocking shall be placed at bends, tees, dead ends, fire hydrants, and blow-off assemblies.
- B. Minimum thrust block bearing areas are indicated in the City Standard Plans. In muck or peat, all thrusts shall be restrained by piles or tie rods to solid foundations or by removal of muck or peat and replacement with ballast of sufficient stability to resist thrust.
- C. Special blocking or joint restraint designs may be required depending on site constraints such as poor soils or utility conflicts.

3-06.2 VERTICAL BENDS

- A. Anchor blocks shall be used in conjunction with joint restraint systems where slopes are 20 percent (20%) or greater.

- B. Vertical bends and blocking shall be used when joint deflection would exceed one-half of the pipe manufacturer's recommended maximum deflection.
- C. Pipe shall be restrained and no change in pipe direction or diameter shall occur within 36 feet (36') of the vertical bend.
- D. Ninety-degree (90°) bends shall only be installed where given prior approval by the City Water Utility.

3-07 BLOW-OFF ASSEMBLIES

3-07.1 BLOW-OFF ASSEMBLIES

- A. A 2-inch (2") blow-off assembly shall be installed at the end of all dead-end lines 6 inches (6") or less in diameter. A fire hydrant shall be installed at the end of all dead-end lines 8 inches (8") or larger in diameter.
- B. Blow-off assemblies shall be placed at the high end of the line, where possible.

3-08 AIR & VACUUM RELEASE VALVE ASSEMBLIES

3-08.1 AIR & VACUUM RELEASE VALVE ASSEMBLIES

- A. Air and vacuum release valve assemblies (AVRs) shall be installed at local high points on the water system where air can accumulate.
- B. Locate AVR boxes outside of traffic areas, behind curbs.
- C. The open end of an AVR shall be provided with a screened, downward-facing return bend and shall maintain a minimum air gap of 2.5 times the outlet pipe diameter and a maximum air gap of 18 inches (18").
- D. Discharge piping from AVRs shall not connect directly to any storm sewer or sanitary sewer.
- E. Groundwater must be prevented from entering the AVR vault.

3-09 INDIVIDUAL PRESSURE-REDUCING VALVE ASSEMBLIES

3-09.1 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

- A. Individual PRVs are required where the service connection pressure exceeds 80 psi, in accordance with the UPC.
- B. Individual PRVs shall be installed on customer's property downstream of the water meter.
- C. Individual PRVs shall be contained inside a new water meter box, if installed outside.
- D. The customer shall be responsible for the proper operation and maintenance of the PRV.

3-10 HYDRANTS

3-10.1 HYDRANTS

- A. Fire hydrants shall be installed in accordance with City codes and development regulations. The number of hydrants and their locations shall be determined and approved by the Fire Marshal.
 - 1. No building permit shall be issued until required Construction Plans have been submitted and approved by the City.
 - 2. No construction beyond the building foundation shall be allowed until hydrants and mains are in place.

3-10.2 HYDRANT COVERAGE

- A. General
 - 1. When the required fire flow for the Project is 2,500 gpm or greater, on-site fire hydrants will be required and shall be served by a water main which loops around the building(s) and reconnects back to a distribution supply main.
 - 2. A fire hydrant shall be installed at the end of all dead-end lines 8 inches (8") or larger in diameter.
- B. Single-Family Residential Properties
 - 1. The maximum spacing of hydrants in single-family residential areas shall be 600 feet (600').
 - 2. Hydrant coverage shall be no more than 300 feet (300') to any residential dwelling, with the distance measured from the hydrant along a traveled roadway, access road, and driveway to the dwelling.
- C. Multi-Family Residential, Commercial, and Industrial Properties
 - 1. One hydrant is required per 1,000 gpm of fire flow demand.
 - 2. The maximum distance between hydrants in multi-family (including duplexes) and commercial areas shall be 300 feet (300').
 - 3. Hydrants shall be located no closer than 50 feet (50') and no greater than 300 feet (300') from the structure.
 - 4. The primary hydrant shall be no further than 150 feet (150') from the structure.
 - 5. A fire hydrant is required within 50 feet (50') of the FDC to a fire sprinkler system.

3-10.3 HYDRANT LOCATION

- A. Hydrants shall be located at roadway intersections, where feasible.
- B. Hydrants shall be located on the same side of the street as the water main, where feasible.
- C. The pumper port of the fire hydrant shall face the street or fire access road.
- D. Minimum 3-foot (3') clearance shall be provided around the outside of the hydrant for operation.
- E. Minimum 5-foot (5') clearance shall be provided from the outside of the hydrant to concrete walls, structures, utility poles, and above grade electrical enclosures.
- F. A 4-foot by 4-foot by 6-inch (4' x 4' x 6") concrete shear block shall be installed around the hydrant.
- G. Hydrant guard posts may be permitted in exposed areas or areas where no curbs are present within parking lots.

3-10.4 HYDRANT RUNS

- A. Fire hydrant runs over 50 feet (50') in length must be 8 inches (8") in diameter and must terminate with a tee, plug, and hydrant assembly.
- B. Fire hydrant runs less than 50 feet (50') in length shall be 6 inches (6") in diameter.

3-10.5 PRIVATE HYDRANTS

- A. Private fire hydrants shall not be permitted.

3-10.6 EXISTING HYDRANTS

- A. Existing hydrants that do not conform to current City Standards shall be fitted with a 5-inch (5") Storz adapter or be replaced with new conforming hydrants, as necessary, as part of the Project.
- B. Existing hydrants shall not be relocated or otherwise moved to accommodate Project design, rather they shall be fully removed and replaced with a new fire hydrant with a new connection to the water main.
- C. Hydrant extensions may be allowed in some cases to accommodate a change in grade and will require prior approval by the City. Such work may necessitate hydrostatic testing of the modified fire hydrant assembly.

3-11 UNDERGROUND UTILITIES

3-11.1 LOCATING UNDERGROUND UTILITIES

- A. A letter and preliminary plan shall be sent to existing utility owners to inform them of new construction. Request as-built information and incorporate existing utility information into the Construction Plans.
- B. The permittee will be required to remove utility locate marks on sidewalks only within the Downtown Core Area. The permittee shall remove the utility locate marks within 14 days of job completion.

3-11.2 STANDARD UTILITY SEPARATION FROM WATER MAINS

- A. Clearance between water mains and other utilities, as measured between the outside edges of each utility pipe or structure, shall be as indicated in Table 3-1.

Table 3-1. Minimum Utility Clearance to Water Mains.

Utility	Horizontal Clearance	Vertical Clearance
Natural Gas	5 feet	12 inches
Electric	5 feet	12 inches
Telecommunications	5 feet	12 inches
Fiber Optics	5 feet	12 inches
Sanitary Sewer	10 feet	18 inches
Storm Drainage	10 feet	18 inches
Reclaimed Water	10 feet	18 inches

- B. Water mains shall pass over non-potable water pipes.
- C. Water mains shall maintain a minimum horizontal clearance of 10 feet (10') from any other facility that is a potential source of toxic or pathogenic contamination (e.g., solid waste disposal site, septic tank).
- D. Minimum clearance between the back of the concrete blocking and other buried utilities and structures shall be 5 feet (5').
- E. Where a water main crosses a non-potable pipe, one full length of water pipe shall be used with the pipe centered for maximum joint separation. Avoid crossing at highly acute angles; the smallest angle measurement between utilities should be between 45 and 90 degrees (45° and 90°).

3-11.3 SPECIAL DESIGN FOR NON-STANDARD UTILITY SEPARATION

- A. Where standard clearance criteria cannot be met due to existing site constraints, installations with less horizontal and/or vertical clearance may be allowed with special design provisions.
- B. Water mains may be installed with as little as 5 feet (5') minimum horizontal separation and 6 inches (6") minimum vertical separation from non-potable water lines (sanitary sewer, storm drainage, reclaimed water), provided the utility systems meet the following criteria.
 - 1. Water main shall be installed with approved restrained-joint piping in addition to standard concrete thrust blocking.
 - 2. Non-potable water pipe shall be installed with pipe and joints having a minimum pressure rating of 150 psi.
 - a. Sanitary sewer pipe shall be pressure-rated HDPE (PE 4710, DR13.5 or better) or Class 52 DI pipe (pressure class 150 or better).
 - b. Storm drainage pipe shall be pressure-rated C900 PVC (AWWA C900-16 DR25 or better) or Class 52 DI pipe (pressure class 150 or better).
 - c. Reclaimed water pipe shall be pressure-rated HDPE (PE 4710, DR13.5 or better) or Class 52 DI pipe (pressure class 150 or better).
- C. Alternate mitigation measures, such as pipe sleeves or cement encasement, may be considered and approved by the City on a case-by-case basis and shall conform to DOH, DOE, and AWWA separation standards in all cases.
- D. Design engineers should consult the DOH/DOE Pipeline Separation Design and Installation Reference Guide, Version 9 (May 2006, Publication Number 06-10-029), available online.

3-12 ASBESTOS CEMENT PIPE

3-12.1 ASBESTOS CEMENT PIPE

- A. AC pipe shall be identified in the Construction Plans, where their locations are known.
- B. Avoid removal of AC pipe where possible.
- C. If removal of AC pipe is necessary, containment and disposal requirements must follow OSHA and WISHA standards.
- D. Any work involving or impacting AC pipe must be in accordance with the EPA's document titled, "Demolition Practices Under the Asbestos NESHAP".

3-13 EASEMENTS

3-13.1 PUBLIC WATER UTILITY EASEMENTS

- A. Public water utility easements to the City are required for the installation, operation, and maintenance of water system improvements on private property and shall be provided as follows.
 - 1. Water mains shall be provided easements extending a minimum of 7 ½ feet (7 ½') to each side of the centerline of water mains.
 - 2. Where located between buildings, water mains shall be provided easements extending a minimum of 10 feet (10') to each side of the centerline of water mains.
 - 3. Water service lines, meters, hydrants, and backflow assemblies shall be provided easements extending a minimum of 7 ½ feet (7 ½') to each side of the center point.
- B. Each easement shall be provided on the City's Utilities Easement Form, available from CED. Legal description of the easement along with a sketch of the easement shall be stamped and signed by a Surveyor and included with the Utilities Easement Form as exhibits.

3-14 CONNECTIONS TO THE EXISTING SYSTEM

3-14.1 CONNECTIONS TO THE EXISTING SYSTEM

- A. Connections to existing mains, including the installation of in-line valves, shall be done via cut-in tee unless otherwise approved by the City Water Utility.
- B. If authorized by the City Water Utility, water mains may be tapped by a City-approved "wet-tap" contractor under the City's observation.
 - 1. Tapping tee may be size-on-size, provided the shell cutter diameter is at least 2 inches (2") smaller than the existing main diameter.

3-15 WATER SERVICES

3-15.1 DOMESTIC WATER SERVICES

- A. Ownership
 - 1. The City owns and shall maintain the water service line from the tap at the main to the meter, the meter setter, the meter tailpiece, and the meter box.
 - 2. The property owner owns and shall maintain the connection fitting to the meter tailpiece, the service line downstream of the meter tailpiece, and other appurtenances such as PRVs, backflow assemblies, etc., behind the meter.
- B. Separate Services

1. A separate water service and water meter is required for each single-family residence, detached accessory dwelling unit (ADU), townhome, duplex unit, and commercial building.
2. All new mixed-used buildings shall have separate water services and water meters for the residential portion and the commercial portion of the building.

C. Water Service Size

1. All new domestic water services shall be minimum 1-inch (1") in size.
2. Existing domestic water services 3/4-inch (3/4") in size shall be disconnected and replaced with a new 1-inch (1") water service.
3. The Developer shall size water service lines in accordance with the UPC and shall verify that minimum pressure can be maintained when service is flowing at anticipated maximum levels.
4. If a customer requires a larger water service, the customer shall be responsible for the upsize of the existing service and meter. The existing service may be reused or removed per Section 3-15.4.

D. Service Pressure

1. Static service pressures at the water meter shall be determined at all properties to ensure compliance with system pressure standards.
2. Individual PRVs shall be installed downstream of the water meter where the service connection pressure exceeds 80 psi in accordance with the latest edition of the UPC.

3-15.2 FIRE SPRINKLER SERVICES

- A. Commercial fire sprinkler systems shall be served by a dedicated water service separate from the domestic water service. Fire sprinkler systems for single-family residences may be served by a dedicated branch off the domestic water service.
- B. The Developer shall coordinate with the fire sprinkler designer to verify the adequate size of the service line and water meter to provide the required flow for domestic use and for the sprinkler system.
- C. Fire sprinkler system connections to the City's water system shall be owned and maintained by the Owner, beginning immediately downstream of the gate valve where the system connects to the City's water main.
- D. FDCs shall be placed within 50 feet (50') of a fire hydrant assembly or as directed by the Fire Marshal.

- E. The fire sprinkler system and supply line shall be designed by a Fire Protection Engineer. Separate plans shall be submitted to the Fire Marshal for review and permitting.
- F. Underground fire sprinkler supply lines shall be installed by a Washington State Certified Level "U" Contractor in accordance with WAC 212-80-010.

3-15.3 LANDSCAPE IRRIGATION SERVICES

- A. A separate landscape irrigation service line and meter shall be installed for all commercial, multi-family, and industrial developments where water is used for landscape purposes and will not discharge to the sanitary sewer system.

3-15.4 EXISTING SERVICES

- A. Existing services may be reused, provided they meet sizing criteria and all other requirements in these Standards.
- B. For services to be abandoned, the water meter shall be removed and the water service shall be disconnected at the water main. This work shall be performed by City Forces at the expense of the Developer through a Water Service Disconnection Permit.

3-16 WATER METERS

3-16.1 WATER METERS

- A. Water Meter Size
 1. The minimum allowable size for a water meter to a single-family residence shall be 5/8-inch by 3/4-inch (5/8" x 3/4") with an adapter to fit the 1-inch (1") service line.
 2. All meters 1-inch (1") or larger shall be the same size as the water service line.
 3. The minimum allowable size for a water meter to a single-family residence with a residential fire sprinkler system shall be 1-inch (1").
 4. The minimum meter size for all commercial and multi-family developments is 1-inch (1").
- B. Water Meter Location
 1. Water meters shall be located in a level unobstructed area as close to the City water main as possible and shall not exceed a distance of 50 feet (50').
 2. Water meters to single family residences shall be placed in landscape strips or behind the sidewalk and within the ROW.
 3. Water meters shall not be installed within driveways.

4. Water meters to commercial, multi-family, and industrial developments should be located near driveway entrances within the ROW or within public utility easements in landscape areas, and near access driveways.
5. Water meters shall be located and oriented such that the service lines may be installed with as few bends as possible.

3-17 CASING PIPE

3-17.1 CASING PIPE

- A. Water mains shall be encased in steel casing where crossing under improvements where the ability to remove and replace the pipe without disturbance to the improvements is necessary, including under retaining walls and rockeries over 4 feet (4') high, under railroad tracks, and at some utility crossings.
- B. Casings shall extend a minimum of 5 feet (5') past each edge of the improvements, or a distance equal to the depth of pipe whichever is greater.
- C. Clearance between bottom of rockery or retaining wall and top of casing shall be 2 feet (2') minimum.
- D. The carrier pipe shall be supported by casing spacers, where the casing exceeds 10 feet (10') in length.
- E. The casing pipe should be 6 to 8 inches (6" to 8") larger than the outside diameter of the bells on the pipe.

3-18 BACKFLOW PREVENTION

3-18.1 BACKFLOW PREVENTION

- A. In order to prevent the contamination of the potable water supply by backflow, all Projects shall be required to install approved backflow assemblies in accordance with the requirements of the following.
 1. WAC 246-290-490 "Cross-Connection Control Regulations in Washington State"
 2. PNWS-AWWA Cross Connection Control Manual, latest edition
 3. The City's Cross Connection Control Program
 4. UPC for on-site water piping
- B. Backflow protection requirements may include premise isolation, point of use protection, or a combination of the two.

- C. Premise isolation at the water meter by an approved air gap or a RPBA is required for all sites utilizing an auxiliary water supply.
- D. All backflow assemblies installed shall be on the DOH list of approved backflow assemblies, most recent edition, at the time of installation.
- E. All backflow assemblies shall be pre-approved by the City Water Utility and must meet UPC requirements as administered by the Building Department.
- F. The City Water Utility reviews all plans submitted for development and redevelopment projects, including plans for tenant improvements. As a part of the City's review and permitting process, new backflow assemblies may need to be installed in order to meet the current standards for backflow prevention.
- G. Satisfactory testing shall be completed upon the installation, repair, or relocation of all backflow assemblies, and annually thereafter. Complete test reports must be submitted to the City's Cross Connection Control Manager and Plumbing Reviewer prior to final acceptance.

3-18.2 BACKFLOW PREVENTION FOR DOMESTIC WATER SERVICES

- A. All residential domestic water services shall have a DCVA installed behind the meter on private property per City Standards.
- B. All commercial domestic water services shall have a RPBA installed behind the meter on private property per City Standards.
- C. A bypass with equal backflow prevention is strongly recommended to avoid loss of service during maintenance and repair of any backflow assembly.
- D. In outdoor installations, RPBA's shall be located within above-ground temperature-controlled enclosures and shall drain to daylight.

3-18.3 BACKFLOW PREVENTION FOR FIRE WATER SYSTEMS

- A. All fire sprinkler systems shall have a DCDA installed behind the meter on private property per City Standards.
- B. The backflow assembly on fire system connections shall be located no more than 50 feet (50') from the water main, either on the Owner's property or an easement dedicated to the Owner's property.
- C. the backflow assembly may be installed as part of the sprinkler riser assembly and be placed within the building riser room under the following conditions.
 - 1. The distance from the supplying water main to the fire sprinkler riser assembly must be less than 50 feet (50').

2. The building riser room must be adjacent to an exterior wall of the building facing the supplying water main to minimize the distance the supply line is located under the building foundation.

D. A post indicator valve (PIV) shall be placed behind the backflow assembly for the fire sprinkler system.

E. Where the backflow assembly is located inside the building, a PIV shall also be placed at the property line for the fire sprinkler connection between the public water main within the ROW and the private fire sprinkler supply line.

3-18.4 BACKFLOW PREVENTION FOR IRRIGATION WATER SERVICES

A. All irrigation water services shall have a DCVA installed behind the meter on private property per City Standards.

3-18.5 BACKFLOW ASSEMBLY LOCATION

A. All backflow assemblies shall be located as close as practicable to the water meter.

B. Backflow assemblies for domestic services and fire sprinkler systems may be located inside the building, if the location is approved by the City Water Utility. RPBA's and RPDAs must be provided a drainage outlet for the relief valve, where located inside the building.

3-19 ABANDONING WATER MAINS

3-19.1 ABANDONING WATER MAINS

A. The abandonment of water main and water system components shall be clearly identified in the Construction Plans.

B. Steel, CI, and DI pipe shall be abandoned in place via MJ cap, MJ plug, or via CDF fill.

C. AC pipe shall be abandoned via CDF fill. Refer to Section 3-12.

D. All appurtenances associated with an abandoned water main, such as hydrants, valves, and valve boxes shall be abandoned.

E. The full extents of abandoned water mains and water system components shall be included in as-built documentation.

3-20 HAZARDOUS MATERIALS

3-20.1 HAZARDOUS MATERIALS

A. Existing water pipes or other water system components containing hazardous materials shall be identified in the Construction Plans, where their locations are known.

- B. Hazardous materials shall be handled and/or disposed of in accordance with all applicable regulations, including but not limited to OSHA and WISHA standards.
- C. Refer to Section 3-03.5 for information regarding contaminated soils.
- D. Refer to Section 3-12 for information regarding AC pipe.

END OF CHAPTER 3

CHAPTER 4 WATER UTILITY CONSTRUCTION MATERIALS

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4-02 GENERAL

4-02.1 STANDARDS

- A. All utility, grading, street, and other civil construction within the City shall abide and fully comply with the following standards.

1. *City General Standards Applicable to Developer Extensions of City Utility System* per Chapter 6 of Title IV of the RMC.
 2. *City Trench Restoration and Street Overlay Requirements*.
 3. *WSDOT Standard Plans* as amended and supplemented by the City Standard Plans.
 4. *WSDOT 2020 Standard Specifications for Road, Bridge, and Municipal Construction*, as amended and supplemented by the City Standards contained herein. All references to pay items are not applicable.
 5. U.S. Department of Transportation *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), current edition.
 6. AWWA Standards, current editions.
- B. Where reference is made to other specifications, it shall be the latest revision at the time of construction, except as noted in the Construction Plans or herein.

4-02.2 CITY WATER UTILITY STANDARD PLANS

- A. All materials shall be as specified in the City Water Utility Standard Plans, included with this document as Appendix A.

4-02.3 MATERIALS

- A. All materials shall be new and undamaged, unless otherwise specified.
- B. The same manufacturer of each item shall be used throughout the work.
- C. All materials shall comply with applicable sections of ANSI, ASTM, AWWA, and the WSDOT Standard Specifications.
- D. Approved manufacturers and model numbers of various materials are listed in the City Water Utility Approved Materials List (Appendix B of these Standards). Substitutions will be considered and reviewed by the City Water Utility on a case-by-case basis and shall be allowed only upon prior approval by the City Water Utility.

4-03 WATER MAIN

4-03.1 DUCTILE IRON PIPE

- A. All new water mains shall be ductile iron (DI) pipe meeting the requirements of ANSI/AWWA C151/A21.51 and in accordance with the following criteria.
1. Centrifugally cast in 18-foot (18') or 20-foot (20') nominal lengths.
 2. Standard Thickness Class 52, cement-lined.

3. Flanged DI pipe shall be Class 53 per AWWA C115.
4. NSF/ANSI 61 certified for contact with potable water.

4-03.2 MARKING

- A. All pipe shall be clearly marked with the manufacturer's name, type, class, and thickness, as applicable, and shall be marked on the component at the place of manufacture.
- B. Marking shall be legible and permanent under normal conditions of handling and storage.

4-03.3 LINING AND COATING

- A. DI pipe shall have a double-thick cement mortar lining and a 1-mil thick seal coat meeting the requirements of ANSI/AWWA C104/A21.4.
- B. Additional exterior coating shall be applied to exposed DI pipe within vaults and shall be water-based, low VOC acrylic polymer.

4-03.4 POLYETHYLENE ENCASEMENT

- A. All DI pipe, valves, and fittings shall be installed with polyethylene (PE) encasement.
- B. PE encasement shall be 8-mil, tube-form, cross-laminated HDPE or linear LDPE film meeting the requirements of ANSI/AWWA C105/A21.5.
- C. Color of PE encasement shall be natural or black.

4-03.5 MARKING TAPE

- A. Marking tape shall consist of inert PE plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil.
- B. Detectable marking tape, when specified, shall include a metallic foil core to provide for the most positive detection and pipeline location.
- C. Marking tape shall be blue in color and shall be imprinted prominently and continuously over its entire length with the words "CAUTION" and "WATER" in permanent black ink.
- D. The width of the marking tape shall be as recommended by the manufacturer based on the depth of installation.

4-03.6 FITTINGS

- A. All water main fittings shall be DI, short body, and cement-lined, in conformance with ANSI/AWWA C104/A21.4.
- B. Fittings include tees, crosses, bends, adapters, sleeves, plugs, caps, and reducers.

- C. Metal thickness and manufacturing process shall conform to applicable portions of ANSI 21.10 and AWWA C110.

4-03.7 JOINTS

A. Mechanical Joints

1. Mechanical joint pipe and fittings shall conform to ANSI/AWWA C111/A21.11 and C153/A21.53
2. Mechanical joint pipe and fittings shall be rated for 350 psi working pressure.

B. Flanged Joints

1. Flanged joint pipe and fittings shall conform to ANSI/AWWA C115/A21.15 and ANSI B16.1 Class 125 drilling pattern.
2. Flanged joint pipe and fittings shall be Special Thickness Class 53 rated for 250 psi working pressure.

C. Push-On Joints

1. Push-on joint pipe shall conform to ANSI/AWWA C111/A21.11.
2. Push-on joint pipe shall be rated for 350 psi working pressure.
3. Push-on joint fittings are not permitted.

4-03.8 COUPLINGS

A. Where DI pipe is to be joined to existing CI pipe of the same nominal size, the following criteria shall be followed.

1. If the outside diameter of the existing CI pipe is within 0.05 inches (± 0.05 ") of the outside diameter of the DI pipe being joined, the pipe shall be joined via MJ sleeve.
2. If the outside diameter of the existing CI pipe conforms to AWWA 1908 classifications A, B, C, D, or F, the pipe shall be joined via transition MJ sleeve with single-piece casting. Threaded pipe and flange combinations shall not be used.

B. Bolted Sleeve-Type Couplings for Plain End Pipe

1. Transition couplings, reducing couplings, transition reducing couplings, sleeves, and flexible couplings for water main shall be compression type.
2. Restrained flexible couplings shall be locking type couplings in accordance with the Construction Plans. Any couplings that utilize set screws tightened against the outside pipe wall are not acceptable. Coupling shall be epoxy-coated.

3. Flexible coupling and transition coupling cast components shall be DI. Center rings and end rings shall be DI in accordance with ASTM 536-80, Grade 65-45-12.
- C. Sleeves
1. Sleeves shall be MJ.
 2. Sleeves less than 12 inches (12") in diameter shall be 12 inches (12") minimum in length.
 3. Sleeves greater than 12 inches (12") in diameter shall be 15 inches (15") minimum in length.
- D. Adapters
1. All FL x MJ adapters shall be DI.

4-03.9 BOLTS

- A. Bolts shall be malleable iron, Corten, or stainless steel, conforming to ANSI/AWWA C111/A21.11.
- B. Stainless steel bolts shall meet the requirements of ASTM A193 Grade B8M.
- C. Stainless steel nuts, bolts, and washers shall be type 316SS.
- D. Bolts and nuts for flanged pipe and fittings shall conform in size and length with ANSI/AWWA C115/A21.15.
- E. The type, material, and identification mark for bolts and nuts shall be provided.

4-03.10 GASKETS

- A. Rubber gaskets for MJ or push-on joints shall conform to ANSI/AWWA C111/A21.11.
- B. Gasket material for flanges shall be neoprene, acrylonitrile butadiene (NBR, Nitrile Buna-N), or chlorinated butyl, 1/8-inch (1/8") thick having a durometer of 60 ± 5 or 1/16" cloth inserted.
- C. Gasket material for bolted sleeve-type couplings on plain end pipe shall be virgin styrene-butadiene rubber (SBR) in accordance with ASTM D2000 MBA 710 or ethylene propylene diene monomer (EPDM).

4-04 VALVES

4-04.1 GATE VALVES

- A. Gate valves shall be DI body, bronze mounted, resilient seat, with a non-rising stem, conforming to AWWA C509 for CI or AWWA C515 for DI.

- B. All valves shall be NSF/ANSI 61 certified for contact with potable water and shall be stamped with "NSF APPROVED" and "CI" or "DI".
- C. Gate valves shall be designed for a minimum water operating pressure of 200 psi.
- D. All external and internal ferrous metal surfaces of the gate valve shall be coated for corrosion protection with fusion bonded epoxy. The epoxy coating shall be factory applied to all valve parts prior to valve assembly and shall meet or exceed the requirements of AWWA C550.
- E. Gate valves shall be provided with two internal O-ring stems seals and shall be equipped with one anti-friction washer.
- F. Gate valves shall have rubber sealing surfaces to permit bi-directional flow.
- G. Gate valves shall open counterclockwise and be provided with a standard 2-inch (2") operating nut.
- H. End connections shall be MJ, FL, or MJ x FL, as shown in the Construction Plans. Where RJ is specified, valve ends shall be FL with appropriate FL x RJ adapters.
- I. Valves shall be marked with the manufacturer's name, year of valve casting, size, and working pressure plainly cast in raised and legible letters on the valve body.
- J. Gate valves for air and vacuum release valve assemblies shall be bronze with threaded end connections.

4-04.2 BUTTERFLY VALVES

- A. Butterfly valves shall be short-body type and shall have flanged joints conforming to ANSI B16.1 Class 125 drilling pattern.
- B. Butterfly valves shall be rubber seated, conforming to AWWA C504 Class 150B.
- C. Butterfly valve discs and bodies shall be DI and shall be suitable for direct burial.
- D. All valves shall be NSF/ANSI 61 certified for contact with potable water and shall be stamped with "NSF APPROVED" and "DI".
- E. Butterfly valves shall be designed for a minimum water operating pressure of 200 psi.
- F. Valve operators shall be of the traveling nut or worm gear type, sealed, gasketed, and permanently lubricated for underground service.
- G. Valves shall be marked with the manufacturer's name, year of valve casting, size, and working pressure plainly cast in raised and legible letters on the valve body.

4-04.3 TAPPING TEE VALVES

- A. See Section 4-11.2.

4-04.4 VALVE BOXES

- A. Valve boxes shall be CI with black asphaltic coating, two-piece, 8-inch (8"), slip-type standard design with a base corresponding to the size of the valve.
- B. Valve box extension pieces shall be provided for valves with cover greater than the depth of the standard valve box.
- C. Valves in paved areas shall be installed with an 8-inch (8") thick hot mix asphalt (HMA) collar 12 inches (12") around the valve box.
- D. Valves in unpaved areas shall be installed with a 3-foot by 3-foot by 6-inch (3' x 3' x 6") concrete pad around the valve box.
- E. Valve box paving risers shall be CI, suitable for H-20 traffic loading.
- F. Valve box covers shall be CI with ears and shall be imprinted with the word "WATER".

4-04.5 VALVE MARKER POSTS

- A. Valve marker posts shall be Carsonite composite utility marker, or approved equal, 3 ¾ inches by 62 inches (3 ¾" x 62") with anchor barb, white in color, with blue label reading "WATER".
- B. Distance to the valve shall be neatly stenciled on the post with 2-inch (2") numerals.

4-04.6 VALVE OPERATING NUT EXTENSIONS

- A. Valves with an operating nut more than 3 feet (3') below finished grade shall have a valve stem extension to raise the operating nut to within 3 feet (3') of the ground surface.
- B. Extensions are to be a minimum of 1 foot (1') with only one extension per valve.
- C. Valve stem extensions shall have a 2-inch (2") square operating nut.
- D. Extensions shall be steel with anticorrosive coating conforming to AWWA C210.

4-05 VAULTS

4-05.1 VAULTS

- A. Vault covers and hatches in pedestrian paths of travel shall be non-slip in compliance with ADA and City requirements, generally having a static coefficient of friction of 0.6 wet and dry for horizontal installations, and 0.8 for ramped or inclined installations, as determined per ASTM C1028-89.

4-06 CONCRETE BLOCKING AND JOINT RESTRAINT

4-06.1 CONCRETE BLOCKING

- A. Blocking shall be poured-in-place concrete with a minimum compressive strength 3,000 psi at 28 days.
- B. All concrete shall be mechanically mixed. Job site mixing, hand-mixed concrete, and mobile concrete mixers are not allowed.

4-06.2 RESTRAINED JOINT PIPES AND FITTINGS

- A. Restrained joint (RJ) pipe and fittings, where required in the Construction Plans, shall be flexible after assembly and able to be disassembled.
- B. RJ fittings shall have a positive metal to metal contact locking system without the use of gripping teeth. Gaskets for push-on joint pipe with integrally molded steel or metal teeth or locking segments shall not be allowed as substitutes for RJ pipes.
- C. The joint restraint system for the pipe shall be boltless.
- D. The joint restraint system for the pipe shall be the same as the joint restraint system for the pipe fittings, except as provided the following item.
- E. Wedge restraint glands shall conform to AWWA C111, ASTM A 536-80, Grade 65-42-12. All bolts and wedges shall be DI. Wedge shall be heat-treated to a minimum 370 BHN. Wedge restraint glands shall be rated for 350 psi for pipe 12 inches (12") in diameter and smaller.
- F. Restrained joint pipe and fittings shall be used in areas with steep slopes.

4-06.3 SHACKLE RODS

- A. Shackle rods and associated hardware shall be 316SS stainless steel.
- B. Shackle rods shall be coated with two coats of asphalt varnish.

4-07 BLOW-OFF ASSEMBLIES

4-07.1 BLOW-OFF ASSEMBLIES

- A. Pipe and fittings shall be brass or bronze.
- B. Gate valve shall be 4-inch (4"), FL x FL, CI body, with non-rising stem and 2-inch (2") square operating nut, in accordance with Section 4-04.1.
- C. Backfill shall be 1 1/4" washed gravel.

4-08 AIR & VACUUM RELEASE VALVE ASSEMBLIES

4-08.1 AIR & VACUUM RELEASE VALVE ASSEMBLIES

- A. Air and vacuum release valve assemblies (AVRs) shall conform to ANSI/AWWA C512.
- B. AVRs shall be single body type and designed to withstand 300 psi.
- C. Bodies and covers shall be CI conforming to ASTM A48, Class 30.
- D. Floats shall be stainless steel conforming to ASTM A240 and designed to withstand 1,000 psi.
- E. Seats shall be acrylonitrile butadiene (NBR, Nitrile Buna-N). Internal parts shall be stainless steel or bronze.
- F. All fittings shall be copper or brass from the water main to the AVR.
- G. Boxes and covers for individual AVRs shall meet the criteria of Section 4-13.2.

4-09 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

4-09.1 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

- A. Individual PRVs for residential applications shall be provided in accordance with the UPC.
- B. Individual PRVs shall be direct-acting piston type with integral strainer and bypass. Valve body shall be bronze with threaded outlet end and integral union on inlet end. Valve shall be line-sized with spring range from 25 to 75 psi.
- C. Boxes and covers for individual PRVs shall meet the criteria of Section 4-13.1.

4-10 HYDRANTS

4-10.1 HYDRANTS

- A. Fire hydrants shall be compression type fire hydrants (opening against pressure).
- B. Fire hydrants shall conform to AWWA C502 and shall be of standard manufacture and of a pattern approved by the City Water Utility.
- C. Manufacturer name or mark, size of the valve opening, and year manufactured shall be plainly cast in raised letters on the hydrant barrel and shall be visible after the hydrant is installed.
- D. Fire hydrants shall be painted with two coats of Safety Yellow DTM acrylic gloss or enamel paint.

- E. Each fire hydrant assembly shall be installed with the following.
1. Main line tee with 6-inch (6") side outlet (FL)
 2. Six-inch (6") gate valve (FL x MJ)
 3. Six-inch (6") DI spool, length as required
 4. 5 ¼-inch (5 ¼") MVO fire hydrant (MJ) with O-ring stem seal
 5. Two (2) 2 ½-inch (2 ½") hose nozzles with National Standard Threads (NST), 7 ½ threads per inch.
 - a. Nozzles shall be fitted with CI threaded caps with operating nut of the same design and proportions as the hydrant stem nut.
 - b. Caps shall be fitted with suitable neoprene gaskets for positive water tightness under test pressures.
 6. One (1) 4-inch (4") pumper nozzle
 - a. Shall be fitted with a Storz adapter, 4.875-inch (4.875") Seattle Thread x 5-inch (5") Storz.
 - b. Storz adapter shall be forged and/or extruded 6061-T6 aluminum alloy, hardcoat anodized. Threaded end portion shall have no lugs and two set screws 180 degrees (180°) apart.
 - c. Storz face to be metal, no gasket to weather.
 - d. Storz cap to have synthetic molded rubber gasket and shall be attached to hydrant adapter with 1/8-inch (1/8") coated stainless steel cable.
 7. One 1 ¼-inch (1 ¼") pentagon operating nut, opening by turning counter clockwise, with operating nut extension, as required
 8. Hydrant restraint system per Section 4-10.3.
 9. Concrete blocks under hydrant and valve, minimum 16 inches by 8 inches by 4 inches (16" x 8" x 4")
 10. One 4-foot by 4-foot by 6-inch (4' x 4' x 6") concrete pad.
 11. One blue two-way reflective pavement marker.

4-10.2 HYDRANT EXTENSIONS

- A. Hydrant extensions, operating stems for the hydrant main valves, and sidewalk flanges shall conform to AWWA C502.

- B. Hydrant extensions shall have a 6 ¾-inch (6 ¾") minimum inside diameter and shall be gray CI or DI conforming to AWWA standards.
- C. Drillings of the connecting flanges on the extensions shall match the drillings of the flanges on the hydrant.
- D. Hydrant extensions shall also include the necessary hydrant operating stem extensions.

4-10.3 HYDRANT RESTRAINTS

- A. The hydrant restraint system shall consist of restrained joint system or two (2) 3/4-inch (3/4") diameter Corten steel tie rods.
- B. If a wedge restraint system is used in lieu of shackle rods, MJ pipe shall be used.
- C. Hydrants shall be provided with a breakaway flange assembly and be equipped with breaking devices at the sidewalk.
- D. Shackle rods shall meet the requirements of Section 4-06.3.

4-10.4 TRAFFIC FLANGES

- A. Hydrants shall be provided with a traffic flange and shall be equipped with breaking devices at the traffic flange to allow the hydrant barrel to separate with a minimal damage in case of impact. There shall also be provided, at this point, a safety stem coupling on the operating stem designed to shear at the time of impact.

4-10.5 HYDRANT GUARD POSTS

- A. Guard posts (bollards) are not standard and may only be installed where indicated for a hydrant outside of the ROW.
- B. Guard posts shall be reinforced concrete having a compressive strength of 3,500 psi with a minimum of five (5) No. 3 deformed steel bars and shall be 6 feet (6') in length by 9 inches (9") in diameter.
- C. Guard posts shall be painted with two coats of Safety Yellow DTM acrylic gloss or enamel paint.

4-10.6 PAVEMENT MARKERS

- A. Pavement markers shall be blue two-way reflective, measuring 4 inches by 4 inches (4"x4").
- B. Thermoplastic adhesive pads shall be used to bond pavement markers to the roadway and shall be black in color, measuring approximately 5 inches by 5 inches (5"x5").

4-11 CONNECTIONS TO EXISTING SYSTEM

4-11.1 CUT-IN TEES

- A. Cut-in tees shall be DI with flanged side outlet and FL x MJ gate valves.

4-11.2 TAPPING TEES

- A. Tapping sleeves shall be stainless steel with full circle seal. Bolts and nuts shall be Corten or stainless steel.
- B. Tapping tees may be size-on-size, provided the shell cutter diameter is at least 2 inches (2") smaller than the existing main diameter.
- C. Tapping Valves
 1. Tapping valve inlet ends shall be flanged.
 2. Tapping valve outlet ends shall be specifically designed for tapping, meeting the requirements of AWWA C500 and AWWA C509.
 3. The seat opening of the valve must permit a diameter cut no less than 1/2-inch (1/2") smaller than the valve size.
 4. Tapping valves shall be of the same type as other valves on the project.

4-12 WATER SERVICES

4-12.1 1-INCH SERVICE CONNECTIONS

- A. One-inch (1") service connections shall be made via corporation stops.
 1. Corporation stops shall be made of bronze or brass alloy, in accordance with AWWA Standard C800.
 2. Corporation stops for direct tapping shall have AWWA tapered (CC) thread inlet and quick joint outlet connections, complete with coupling nut for copper service.

4-12.2 1 ½-INCH AND 2-INCH SERVICE CONNECTIONS

- A. For connections to new mains, 1 ½-inch (1 ½") and 2-inch (2") services shall be installed with new MJ tapped reducing tee with 2-inch (2") threaded side outlet.
- B. For connections to existing mains, 1 ½-inch (1 ½") and 2-inch (2") services shall be made via service saddle.
- C. Side valve shall be 2-inch (2") threaded gate valve.

4-12.3 3-INCH, 4-INCH, AND 6-INCH SERVICE CONNECTIONS

- A. Connections for 3-inch (3"), 4-inch (4"), and 6-inch (6") water meter assemblies shall be made by tee with flanged side outlet and FL x MJ gate valve.

4-12.4 COPPER TUBING

- A. All pipe materials for new water service lines and for extension or replacement of existing water service lines shall be copper and lead free in accordance with the Federal Reduction of Lead in Drinking Water Act.
- B. Water service lines 2 inches (2") or smaller in diameter shall be soft copper tubing, Type K, annealed, seamless, and shall conform to the requirements of ASTM/ANSI B88/H33.1.
- C. Fittings used for service connections shall be made of bronze or brass alloy and shall be compression type with gripper ring.
- D. Bronze threaded nipples and fittings shall meet the requirements of ANSI B-16.15 Class 125.
- E. Polyethylene tubing, including cross-linked "PEX-A" tubing, shall not be permitted.

4-12.5 METER SETTERS

- A. Meter setters shall be manufactured and tested in accordance with AWWA C800.
- B. Meter setters shall have dual purpose couplings, unless otherwise specified, an angle meter stop with drilled padlock wing, an angle check valve, shall measure 15 inches (15") in height, and shall have inlet and outlet threads compatible with fittings connecting to service pipes.
- C. Inlet, outlet, and all fittings shall be quick joint.
- D. Meter setters for 5/8-inch by 3/4-inch (5/8" x 3/4") and 1-inch (1") services shall have meter saddle nuts for installation and removal of the meter.
- E. Meter setters for 1 ½-inch (1 ½") and 2-inch (2") services shall be equipped with a locking bypass.
- F. For 5/8-inch by 3/4-inch (5/8" x 3/4") meters, meter adapters shall be provided to fit within a 1-inch (1") meter setter.

4-13 WATER METERS

4-13.1 WATER METERS

- A. Water meters with Advanced Metering Infrastructure (AMI) radio and battery unit shall be supplied by the City Water Utility for meters size 2 inches (2") and smaller.

- B. Water meters 3 inches (3") and larger shall be provided by the Contractor with AMI radio, battery unit, and water meter manufacturer's certification of testing and accuracy.
- C. Refer to City Standard Plans for a complete list of materials for 3-inch (3"), 4-inch (4"), and 6-inch (6") water meter assemblies.

4-13.2 METER BOXES

- A. Meter Boxes
 - 1. Meter boxes shall be polymer concrete.
- B. Meter Box Covers
 - 1. Meter box covers shall be polymer concrete read lids with cast opening for AMI transmitter.
 - 2. Meter box covers in pedestrian paths of travel shall be non-slip in compliance with ADA and City requirements, generally having a static coefficient of friction of 0.6 wet and dry for horizontal installations, and 0.8 for ramped or inclined installations, determined per ASTM C1028-89.
 - 3. Where meter boxes must be installed within a common path of travel, such as a sidewalk, AMI radio and battery units shall be installed in a recessed position within the meter box and shall not protrude in excess of 1/4 inch (1/4") above grade, in compliance with ADA Standards.

4-14 CASING PIPE

4-14.1 CASING PIPE

- A. Casing pipe shall be black steel pipe conforming to ASTM A53, Schedule 20 or greater.
- B. Anticorrosion Coating
 - 1. Prior to installation, coat casing exterior with shop-applied anticorrosive coating conforming to AWWA C210.
 - 2. Minimum coating thickness shall be 16-mil dry film thickness (DFT); however, thickness shall not exceed manufacturer's recommended thickness.
 - 3. Coating type shall be polyamide epoxy-coal tar.
- C. Hose clamps shall be stainless steel.

4-14.2 CASING SPACERS

- A. Casing spacers shall be “center positioning” type. Height of risers and runners combined shall be sufficient to keep the carrier pipe bell, couplings, or fittings at least 3/4 inches (3/4") from the casing pipe wall at all times and provide at least 1 inch (1") of clearance between runners and top of casing wall to prevent jamming during installation.
- B. Casing spacers shall be stainless steel or heavy duty fusion bonded epoxy-coated steel.
- C. Runners
 - 1. Runners shall be 2 inches (2") in width, glass reinforced plastic, securely bonded to the spacer.
 - 2. Runners shall be aligned on the spacer along the axis of insertion of the water main into the casing pipe.
 - 3. Runner length shall be approximately equal to the width of the spacer.

4-15 BACKFLOW PREVENTION

4-15.1 BACKFLOW ASSEMBLIES

- A. All backflow prevention assemblies shall appear on the USC-Approved Assemblies List, as directed by DOH and in accordance with WAC 246-290.
- B. Materials for backflow assemblies shall be provided per City Standard Plans.

4-16 POLYPIGGING

4-16.1 POLYPIGS

- A. Polypigs used for the cleaning of debris from water mains shall be light density open cell polyurethane foam (1 to 2 pcf) with 90A durometer urethane rubber coating on the rear of the polypig only.
- B. Polypigs shall be cylinder-shaped with bullet nose or squared end.

4-17 BEDDING AND BACKFILL

4-17.1 PIPE BEDDING

- A. Gravel backfill for pipe zone bedding shall consist of crushed, processed, or naturally occurring granular material free from wood waste or other objectionable materials and shall meet the grading requirements indicated in Table 4-1.

Table 4-1. Grading Requirements for Pipe Zone Bedding.

Sieve Size	Percent Passing
1 ½"	99 - 100
1"	75 - 100
5/8"	50 - 100
No. 4	20 - 80
No. 40	3 - 24

- B. Pipe bedding shall conform to Section 9-03.12(3) of the WSDOT Standard Specifications.
- C. For convenience, crushed rock bedding conforming to crushed surfacing top course material of Section 9-03.9(3) of the WSDOT Standard Specifications may also be used as bedding material for pipe.
- D. The Contractor may request to use excavated material as pipe bedding where it has been determined by the Engineer as suitable material, meeting the requirements of this section, and proper compaction levels can be achieved.

4-17.2 TRENCH BACKFILL

- A. Trench backfill shall consist of processed or naturally occurring granular material free from wood waste or other objectionable materials.
- B. Trench backfill shall have such characteristics of size and shape that it will compact readily and shall meet the requirements indicated in Table 4-2.

Table 4-2. Grading Requirements for Trench Backfill.

Sieve Size	Percent Passing
2 ½"	100
2"	75 - 100
No. 4	22 - 10
No. 200	0 – 10
Dust Ratio: 2/3 maximum	
Sand Equivalent: 30 minimum	

- C. Trench backfill material retained on a No. 4 sieve shall not contain more than 0.20 percent (0.20%) by weight of wood waste.
- D. Trench backfill shall conform to Section 9-03.19 of the WSDOT Standard Specifications.
- E. Native Material for Trench Backfill

1. The Contractor may request to use excavated material as trench backfill where it has been determined by the Engineer as suitable material, meeting the requirements of Section 9-03.19 of the WSDOT Standard Specifications, and proper compaction levels can be achieved.
2. Admixtures and/or additives may not be used to modify the moisture content in order to meet compaction specifications.
3. Trench backfill outside the roadway prism shall be excavated material free of wood waste, debris, clods, or rocks greater than 6 inches (6") in any dimension.

F. Backfill material around structures shall conform to the requirements of this section.

4-17.3 FOUNDATION GRAVEL

A. Foundation gravel for structures shall consist of one of the following aggregates as specified in the WSDOT Standard Specifications.

Table 4-3. Approved Materials for Foundation Gravel per WSDOT Standard Specifications.

Material	WSDOT Specification
Ballast	9-03.9(1)
Shoulder Ballast	9-03.9(2)
Gravel Backfill for Foundations (Class A or Class B)	9-03.12(1)
Foundation Material (Class A and Class B)	9-03.17

4-17.4 CONTROLLED DENSITY FILL

- A. CDF shall be a mixture of Portland cement concrete (PCC), admixture (optional), fly ash, aggregates, and water.
- B. CDF shall be proportioned to provide a slurry, non-segregating, free flowing, self-consolidating and excavatable material that will result in a non-settling fill which has measurable unconfined compressive strength.
- C. Desired flowability shall be achieved according to the following guidelines.

Table 4-4. CDF Flowability Guidelines.

Flowability	Slump
Low	< 6"
Normal	6" to 8"
High	> 8"

- D. Unconfined compressive strength at 28 days shall be a minimum of 50 psi and a maximum of 100 psi.
- E. CDF mix materials shall meet the requirements indicated in Table 4-5 and
- F. Table 4-6.

Table 4-5. CDF Mix Requirements.

Ingredients	Amount (pcy)
PCC	50
Aggregates (Class 1 or Class 2)	3,300
Air Entrainment Admixture	Per Manufacturer Recommendations
Fly Ash (Class F)	300
Water	300 (maximum)

Table 4-6. CDF Mix Material Requirements per WSDOT Standard Specifications.

Material	WSDOT Specification
PCC	9-01
Fine Aggregate for PCC	9-03.1(2)
Admixture for Concrete	9-23.6
Fly Ash	9-23.9
Water	9-25

4-18 ABANDONING WATER MAINS

4-18.1 ABANDONING WATER MAINS

- A. MJ plugs or MJ caps for abandoning water mains shall be sized to fit the existing water main and shall meet the requirements of Section 4-03.6.
- B. CDF fill for abandoning water mains shall meet the requirements of Section 4-17.4.

END OF CHAPTER 4

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CHAPTER 5 WATER UTILITY CONSTRUCTION

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5-02 GENERAL

5-02.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. All improvements shall be constructed as shown in the Construction Plans and in accordance with the Project Civil Permit, any other applicable permits, these Standards, City Standard Plans, and WSDOT Standard Specifications.
- B. Products and materials shall be installed in compliance with the specifications of the manufacturer, except where a higher quality of workmanship is required by the Construction Plans.

5-02.2 INSPECTIONS AND TESTS

- A. All work shall be in strict accordance with any applicable regulations of the State, County, and local authorities. The Contractor shall arrange for such inspection as required and shall submit evidence of their approval, if requested by the Engineer.
- B. A City Inspector, operating as a representative of and in conjunction with the Engineer, will be assigned to each construction project and shall have access to the work at all times for the purpose of inspecting and testing. The Contractor shall provide proper facilities for such access and inspection and testing.
- C. If any work is covered up without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for inspection.
- D. Before a performance test is to be observed by the Engineer, the Contractor shall make whatever preliminary tests are necessary to assure that the material and equipment are in accordance with the City Standard Plans.

5-03 WATER MAIN

5-03.1 DUCTILE IRON PIPE

- A. General Pipe Installation
 - 1. Pipe shall be installed in accordance with the manufacturer's printed specifications and instructions, and to the standards of AWWA C600.
 - 2. The Contractor shall provide tools and equipment, including any special tools required for installing each type of pipe used.
 - 3. Short lengths of pipe supplied by the manufacturer shall be used whenever possible to provide the proper spacing of valves, tees, or special fittings.
- B. Handling of Pipe and Fittings
 - 1. Pipe shall be handled in a manner that will prevent damage to the pipe, pipe lining, or coating.
 - 2. Pipe and fittings shall be loaded and unloaded using hoists and slings in a manner to avoid shock or damage, and under no circumstances shall they be dropped, skidded, or rolled against other pipe.
 - 3. Pipe and fittings shall be inspected for defects.
 - 4. If any part of the coating or lining is damaged, repair thereof shall be made by the Contractor.

5. Damaged pipe shall be rejected and the Contractor shall immediately place damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours.
6. Threaded pipe ends shall be protected by couplings or other means until laid.
7. Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned, and re-laid.
8. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or by other means approved by the Engineer to ensure cleanliness inside the pipe.

C. Cutting Pipe

1. Whenever it becomes necessary to cut a length of pipe, the cut shall be made by abrasive saw or by a special pipe cutter.
2. Pipe ends shall be square with the longitudinal axis of the pipe and shall be reamed and otherwise smoothed so that good connections can be made.
3. Threads shall be cleanly cut.
4. Oxyacetylene torch cutting of DI pipe shall not be allowed.

5-03.2 PIPES ON CURVES

- A. Where the pipe is shown curved in the Construction Plans and no special fittings are shown, the Contractor may assume the curves can be made by deflecting the joints with standard lengths of pipe.
- B. Where field conditions require deflection or curves not anticipated by the Construction Plans, the Engineer will determine the methods to be used.
- C. When rubber gasketed pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment. Trenches shall be made wider on curves for this purpose.
- D. Where pipe installation on curves requires the use of bends, concrete blocking shall be installed per Section 5-06.

5-03.3 COATING

- A. Exterior coating for DI pipe within vaults shall be applied in two coats at 2-3 mils DFT each.

5-03.4 POLYETHYLENE ENCASEMENT

- A. The Contractor shall lay DI pipe with a PE encasement in accordance with AWWA C105.
- B. PE encasement shall also be installed on all appurtenances, such as pipe laterals, couplings, fittings, and valves.
- C. Seams in the PE encasement shall be made using 2-inch (2")-wide PE adhesive tape.
- D. Care shall be exercised during backfilling to prevent the PE encasement from being punctured or otherwise damaged.
- E. Any damage that occurs to the wrap shall be repaired in accordance with ANSI/AWWA C105/A21.5-93.

5-03.5 MARKING TAPE

- A. Marking tape shall be placed approximately 12 inches (12") above the top of the pipe and shall extend its full length.

5-03.6 CLEANING AND ASSEMBLING JOINTS

- A. Pipe ends, couplings, fittings, and appurtenances shall be cleaned to remove oil, grit, or other foreign matter from joints.
- B. Care shall be taken to keep joints from contacting the ground.
- C. Pipe not furnished with a depth mark shall be marked before assembly to ensure visual observation of pipe insertion.

5-03.7 BOLTS

- A. Bolts on mechanical pipe and fittings shall be tightened uniformly with a torque wrench as indicated in Table 5-1.

Table 5-1. Torque Requirements for Bolts on Mechanical Pipe.

Pipe Diameter	Bolt Size	Torque
3"	5/8"	45 - 60 ft.-lb.
4" to 24"	3/4"	75 - 90 ft.-lb.

5-04 VALVES

5-04.1 VALVES

- A. Valve Preparation

1. Upon delivery at the work site, valves shall be opened to prevent the collection of water in the valve.
 2. Valves shall have the interiors cleaned of all foreign matter and shall be inspected both in open and closed position prior to installation.
 3. Valves shall be inspected upon delivery in the field to ensure proper working order before installation.
 4. Valves shall be carefully inspected for damage to the outer protective coatings.
 5. Tapping valves shall be air-tested prior to tapping water main. Refer to Section 5-14.3C.
- B. Valve Installation
1. Valves shall be set and jointed to the pipe in accordance with AWWA standards for the type of connecting ends furnished.
 2. At all places where the protective coating has been damaged or scraped off, the affected area shall be cleaned to expose the iron base and be recoated with two or more field coats of approved protective coating.

5-04.2 VALVE BOXES

- A. Valves and valve boxes shall be set plumb with valve boxes centered over the valve or valve operator so the valve box does not transmit shock or stress to the valve.
- B. Valve box top sections shall be adjusted flush with finished pavement and, in areas to be excavated for future roadway grades, adequate depth shall be provided in the valve box to allow the top of the valve box to be adjusted to the required grade.
- C. Where valve operating nut is more than 3 feet (3') below finished grade, a stem extension shall be installed.
- D. The top of the valve box base section shall be located a minimum of 6 inches (6") and maximum of 9 inches (9") below finished grade.
- E. The lower casting of the unit is installed first, in a manner as to be supported by a minimum backfill or by a Styrofoam collar not less than 2 inches (2") in thickness.
- F. The casting shall not rest directly upon the body of the valve or upon the water main.
- G. Cast-iron ears of valve box covers shall be installed in the direction of the main.

5-04.3 ADJUSTING EXISTING VALVE BOXES TO GRADE

- A. Valve boxes shall be adjusted to grade in the same manner as for manholes, as detailed in Section 7-05.3(1) of the WSDOT Standard Specifications.
- B. Existing roadway valve boxes shall be adjusted to conform to final finished grades.
- C. The valve box shall be set to an elevation tolerance of 1/4 inch to 1/2 inch (1/4" to 1/2") below finished grade. The valve box shall not be set above finished grade.
- D. In the event that the existing valve box is plugged or blocked with debris, the Contractor shall use whatever means necessary to remove such debris, leaving the valve installation in a fully operable condition.
- E. Raising the existing valve box cover less than 2 inches (2") shall be accomplished by adjusting the existing top section of the valve box.
- F. Raising the existing valve box cover 2 inches (2") or more may be accomplished by inserting a valve box paving riser into the existing valve box top. The paving riser shall be epoxied to the valve box.
- G. Final adjustment of valve boxes shall be made within 20 calendar days following the final overlay.

5-04.4 VALVE MARKER POSTS

- A. Valve marker posts shall be installed only where indicated in unimproved or unpaved areas.
- B. Valve marker posts shall be placed at the edge of the ROW opposite the valve and be set with 38 inches (38") of the post exposed above grade. The Engineer may specify a safer or more conspicuous location.
- C. Distance to the valves shall be neatly stenciled on the post with 2-inch (2") numerals.

5-05 VAULTS

5-05.1 VAULTS

- A. Vaults for large water meters or backflow assemblies shall be constructed at the locations shown in the Construction Plans and as staked.
- B. The excavation shall have minimum 1 foot (1') clearance between the vault outer surfaces and the earth bank.
- C. Vaults shall be placed on foundation gravel placed to a depth of 12 inches (12").
- D. The vault shall be plumb and watertight.

- E. The vault shall have coal tar coating of 5-mil to 9-mil applied to the exterior.
- F. Vault floor shall drain to daylight or to the location shown in the Construction Plans.
- G. Where knockout locations for pipe do not coincide with locations of pipe penetrations into the vault, the Contractor shall core drill openings for pipe.
- H. The access cover shall be seated properly to prevent rocking and shall be adjusted to match minimum clearances to finished grade.

5-06 CONCRETE BLOCKING AND JOINT RESTRAINT

5-06.1 CONCRETE BLOCKING

- A. The Contractor shall install blocking which is adequate to withstand full test pressure as well as to continuously withstand operating pressures under all conditions of service.
- B. Concrete blocking shall be properly formed prior to pour with plywood or other acceptable forming materials. The forms shall be removed prior to backfilling.
- C. Concrete blocking shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as not to obstruct access to the joints of the pipe or fittings.
- D. Concrete blocking shall have a minimum of 1/4 square foot (1/4 sf) bearing against each fitting.
- E. Concrete blocking shall have a minimum measurement of 12 inches (12") between the pipe and the undisturbed bank.
- F. The Contractor shall provide the Engineer at least one (1) working day advance notice before pouring concrete thrust blocking and one (1) working day advance notice for inspection and approval of all concrete blocking prior to backfilling.
- G. Concrete blocking shall be left open for inspection. Unacceptable concrete blocking shall be replaced at the Contractor's expense.

5-06.2 RESTRAINED JOINT PIPE AND FITTINGS

- A. Restrained joint pipe and restrained joint fittings shall be installed per manufacturer's directions and applicable AWWA standards.

5-07 BLOW-OFF ASSEMBLIES

5-07.1 BLOW-OFF ASSEMBLIES

- A. Blow-off assemblies shall be constructed at the locations shown in the Construction Plans.

5-08 AIR & VACUUM RELEASE VALVE ASSEMBLIES

5-08.1 AIR & VACUUM RELEASE VALVE ASSEMBLIES

- A. Location of AVRs as shown in the Construction Plans is approximate. The installation shall be set at the actual high point of the line. If the high point occurs in a location where the assembly cannot be installed, provide additional depth of line to create a high point at a location where the assembly can be installed.
- B. All piping shall be sloped to permit escape of any entrapped air.

5-09 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

5-09.1 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

- A. Individual PRVs for residential applications shall be installed in accordance with the UPC.
- B. Excavation shall be made manually to minimize disturbance of the surrounding area.
- C. Before attempting to make any cut into the existing service line the Contractor shall make sure that all necessary fittings are available in order to avoid a prolonged interruption in water service.
- D. Where a PRV is installed on an existing service, cut the existing service and install new copper tubing and necessary fittings required.
- E. The customer shall be responsible for the proper installation of the PRV, including obtaining a building plumbing permit prior to installation.

5-10 HYDRANTS

5-10.1 SETTING NEW HYDRANTS

- A. Hydrants shall be installed in accordance with AWWA C600-93.
- B. All hydrants shall be inspected upon delivery in the field to ensure proper working order.
- C. Hydrant Position
 1. Fire hydrant pumper connection shall face the roadway, unless otherwise directed by the Fire Marshal.
 2. A minimum 3-foot (3') radius unobstructed working area shall be provided around all hydrants.
 3. The bottom of the breakaway flange shall be set minimum 2 inches (2") and maximum 7 inches (7") above finished grade.

- D. Concrete pad shall be set flush with the immediately surrounding finished grade.
- E. Hydrant excavation shall be backfilled and compacted when installation and testing are complete and accepted by the Engineer.
- F. After installation, hydrants, auxiliary gate valves, and other appurtenances thereto shall be subjected to a hydrostatic test and disinfection procedures as specified in Section 5-20 and Section 5-21.
- G. All hydrants shall be painted with two coats of paint.
- H. Any hydrant not in service shall be identified by covering with a burlap or plastic bag approved by the Engineer.

5-10.2 MODIFICATIONS TO EXISTING HYDRANTS

- A. Modifications to existing hydrants are not allowed, except where hydrant extensions are expressly approved by the Engineer.

5-10.3 HYDRANT EXTENSIONS

- A. The Contractor shall furnish and install hydrant extensions only where indicated on the Construction Plans.
- B. All rubber gaskets shall be replaced with new gaskets of the type required for a new installation of the same type.
- C. After installation, the extended fire hydrant shall be subjected to a hydrostatic pressure test and disinfection procedures as specified in Section 5-20 and Section 5-21.

5-10.4 HYDRANT GUARD POSTS

- A. Hydrant guard posts shall be constructed only where indicated in the Construction Plans.
- B. The exposed portion of each guard post shall be painted with two coats of paint.

5-10.5 PAVEMENT MARKERS

- A. Pavement markers shall be installed in the roadway to indicate the presence and location of fire hydrants.
- B. Adhesive for pavement markers shall be applied per manufacturer direction.
- C. Where existing pavement markers are damaged or disturbed, new pavement markers shall be installed.

5-11 UNDERGROUND UTILITIES

5-11.1 LOCATING EXISTING UTILITIES

- A. The Contractor shall request field locates and notify the owners of underground facilities about the scheduled commencement of excavation through a one-call number (1-800-424-5555) or 811, 72 hours before construction for utility locations.
- B. Notice shall be made to owners of underground utilities not less than two to ten (2-10) business days prior to scheduled date of commencement of excavation.

5-11.2 PERFORMING WORK NEAR EXISTING UTILITIES

- A. When utility services occupy the same space as the new water main, the Contractor shall complete necessary excavation to fully expose such services.
- B. The Contractor shall protect utility services and work around them during excavating and pipe laying operations.
- C. Where it is necessary to cut, move or reconnect any service lines, arrangements shall be made with the respective utility.
- D. Damages to Existing Services
 - 1. Any damages to services resulting from the Contractor's operation shall be reported to the appropriate utility and shall be repaired in coordination with the utility owner and the City.
 - 2. The Contractor shall complete a report form via the Damage Information Reporting Tool (DIRT), available online, and shall share the contents of the report form with the City Water Utility.

5-12 ASBESTOS CEMENT PIPE

5-12.1 ASBESTOS CEMENT PIPE

- A. Working with AC Pipe
 - 1. When working with AC pipe, the Contractor is required to maintain workers' exposure to asbestos material at or below the exposure limit as prescribed in WAC 296-62-07705 State/Federal Guidelines and Certification.
 - 2. AC pipe shall be cut with a hand-operated carbide blade cutter with controlled flowing water.
 - 3. AC pipe segments shall be filled with CDF and left to be buried in the trench.

4. Contaminated clothing shall be left to be buried in the trench or transported in sealed impermeable bags and labeled in accordance with WAC 296-62-07721.
 5. All work on AC pipe shall be performed by a licensed asbestos abatement contractor.
 6. An Asbestos Demolition Notification shall be filed with the Puget Sound Clean Air Agency (PSCAA), where necessary.
- B. AC Water Main Crossings
1. Where new water main crosses below an existing AC pipe, the AC pipe shall be replaced with Class 52 DI pipe with PE encasement to 3 feet (3') past each side of the trench.

5-13 EASEMENTS

5-13.1 CONSTRUCTION ON EASEMENTS

- A. All work on easements shall be performed strictly in accordance with easement provisions
- B. The Contractor shall do no work on easement areas until a signed and written release from the easement grantor is furnished to the Engineer.
- C. Easements shall be restored to original condition or better.

5-14 CONNECTIONS TO EXISTING SYSTEM

5-14.1 VERIFYING THE EXISTING SYSTEM

- A. Before the installation of the new water mains, the Contractor shall field verify, in the presence of the Engineer and City Forces, the actual location, depth, type, condition, and roundness of the existing water mains and fittings where new connections will be made.
- B. Points of connection to existing water mains shall be exposed via hydro-excavation or potholing prior to trenching of the new line and not less than 48 hours prior to the anticipated connection time.
- C. Care shall be taken not to disturb existing thrust blocks and soil bearing areas.
- D. The Contractor shall immediately notify the Engineer if the connection cannot be made as specified by the Construction Plans in order that the connection detail may be revised.
- E. When necessary, the profile shall be adjusted as directed by the Engineer to prevent abrupt changes in grade and alignment of the water main and connection.

5-14.2 CUT-IN TEES

- A. Work to be Performed by City Forces
 - 1. Affected customers will be notified by City Forces per Section 5-22.
 - 2. All connections to existing water mains will be conducted by City Forces as provided below.
 - a. Operate all valves to accomplish shutdowns and subsequent reactivation.
 - b. Deactivate and dewater the existing and new water main to perform the connections.
 - c. Cut and remove pipe sections as necessary to install the new materials.
 - d. Assemble all materials and swab or spray all connecting pipe and fittings with 5 to 6 percent (5% to 6%) chlorine solution.
 - e. Reactivate and flush the water main.
 - f. Make all connections between the charged and uncharged segments of the new water main.

- B. Work to be Performed by the Contractor
 - 1. The Contractor shall work with City Forces making connections to existing water mains by providing the following services.
 - a. Indicate the exact length of the existing water main that must be removed.
 - b. Provide pumping and disposal of the water from the draining of the existing water mains including dechlorination of the water prior to disposal.
 - c. Provide all saw-cutting, removal, and disposal of existing surface improvements, excavation, haul, and disposal of unsuitable materials, shoring, de-watering, foundation material, at the connection areas before the scheduled time for connection.
 - d. Dispose of sections of pipe cut and removed by the City.
 - e. Provide all materials necessary for City Forces to install all connections as indicated in the Construction Plans, including but not limited to the required fittings, couplings, pipe spools, and shackle materials to complete the connections.

- f. Provide and install concrete blocking, PE for all pipes and fittings, and backfill and surface restoration at the locations shown in the Construction Plans for the points of connection to the existing water system.
 - g. After the installation of the in-line tee and valves by City personnel, the Contractor shall provide and install PE encasement and concrete blocking behind the tee and other fittings. A minimum three (3)-day curing period is required for all concrete blockings before a connection can be made to the new water mains.
- C. Damage caused by the Contractor's operations to existing joints in piping to remain in service shall be repaired by the Contractor at no additional expense to the City.

5-14.3 TAPPING TEES

- A. Wet-tapping of existing water mains shall be performed by the following licensed wet tap contractors.
 - 1. Legacy Tapping, Inc.
 - 2. Speer Taps, Inc.
- B. Connections may be made to existing pipes under pressure with a tapping machine by determining the size and type of pipe and installing tapping tee to fit complete with tapping gate valve.
- C. Air Pressure Test
 - 1. The assembly seals shall be tested via air pressure test after the tapping sleeve is installed to the main and tapping valve is installed.
 - 2. Remove the test plug from the test port and apply an air pressure test at 100 psi.
 - 3. Test pressures shall not exceed manufacturer's recommendations.
- D. Tapping tees shall not be installed on steel or AC water mains.

5-14.4 TRANSITION COUPLINGS

- A. Transition couplings shall be provided by the Contractor as a part of the assembly for the cut-in tee.
- B. Where a special transition coupling is required for connection to an existing pipe material other than ductile iron or cast iron, the existing pipe shall be exposed and the outside diameter shall be verified prior to ordering the transition coupling to ensure the correct size is ordered and on-site before the date of the cut-in tee.

- C. The transition coupling shall be sized such that the existing pipe outside diameter is near the midpoint of the manufacturer's range of acceptable sizes.
- D. The pipe ends shall be beveled to prevent damage to the transition coupling gasket during installation of the coupling.
- E. The exterior of the existing pipe end shall be cleaned to a sound, smooth finish before installation of the coupling.
- F. PE encasement shall be wrapped loosely around the pipe, fittings, and couplings to a minimum of 3 feet (3') past the coupling onto the existing pipe and secured with 2-inch (2") wide PE adhesive tape per Section 5-03.4. No part of the pipe or coupling shall be exposed to the backfill.

5-14.5 SCHEDULING CONNECTIONS TO EXISTING SYSTEM

- A. Connection to the existing main shall take place only after the new main is flushed, disinfected, and satisfactory bacteriological sample results are obtained.
- B. Connections to the existing water main shall not be made without first making the necessary scheduling arrangements with the Engineer in advance.
- C. City Forces shall verify in advance that all materials, equipment, and labor necessary to properly complete the connection are assembled on site. The City reserves the right to re-schedule the connection if the work area is not ready at the scheduled time of the connection.
- D. Once work is started on a connection, it shall proceed continuously without interruption and as rapidly as possible until completed.
- E. The Contractor may be required to perform the connection during times other than normal working hours.
- F. In addition to those connections shown in the Construction Plans, segments of a new water main may be placed in service prior to completion of the new water main.

5-15 WATER SERVICES

5-15.1 NEW SERVICE INSTALLATIONS

- A. Water services on existing water mains will be installed by City Forces. Water services on new water mains will be installed by the Contractor.
- B. One-inch (1") services shall be tapped via corporation stops.
- C. Services larger than 1 inch (1") shall be installed via mainline tee and gate valve with reducing companion flange and tap.

- D. Existing PE encasement shall be field cut and replaced after the tap is installed.
- E. All meter setters for residential domestic use shall be 1-inch by 1-inch (1" x 1"). For 3/4-inch by 5/8-inch (3/4" x 5/8") meters, the Contractor shall furnish and install reducing couplings.
- F. Service piping shall be installed with a 24 inches (24") minimum cover, perpendicular to the main.

5-15.2 RECONNECTING EXISTING SERVICES

- A. Where shown in the Construction Plans, the Contractor shall do the following.
 - 1. Work to identify and notify customers subject to a water service interruption per Section 5-22.
 - 2. Furnish and install new water service lines from the new water main to the new meter setters and new meter boxes near the existing meters. The location of existing service connections shall be verified in the field by the Contractor.
 - 3. Furnish and install adapters for the relocation of the existing water meters to the new meter setters and re-install the existing meters in the new meter setters.
 - 4. Connect the new meter setters to the customers' private service lines.
 - 5. Restore disturbed areas to their approximate original condition as directed by the Engineer.
- B. Service pipelines shall be installed with a 24 inches (24") minimum cover, perpendicular to the main.
- C. Pipe materials used to extend or replace existing water service lines shall be copper.
- D. Service shall be flushed prior to connection to meter.
- E. Install meter setter and boxes as shown in the Construction Plans and as directed by the Engineer.
- F. Multi-meter hook-ups are not allowed. When existing multi-meter hook-ups are encountered, the Contractor shall convert them to single meter hook-ups.
- G. When transferring services to a new water main, the Contractor shall take sanitary precautions to protect the potable water supply in both the existing and new water mains.
- H. Reconnection to substandard service lines shall not be allowed.

5-15.3 EXCAVATION FOR SERVICE CONNECTIONS

- A. Where installation is in existing paved streets, the service lines shall be installed by a trenchless percussion and impact method (hole-hogging). If the trenchless percussion and impact method fails, regular open trench methods may be used.
- B. Particular care shall be exercised to ensure that the main is not damaged by the Work undertaken to install the service.
- C. Backfilling for service connections shall be as specified in Section 5-24.

5-15.4 CUTTING SERVICE PIPES

- A. Service pipes shall be cut using a tool or tools specifically designed to leave a smooth, even, and square end on the piping material to be cut.
- B. Cut ends shall be reamed to the full inside diameter of the pipe.
- C. Pipe ends to be connected using couplings which seal to the outside surface of the pipe shall be cleaned to a sound, smooth finish before the couplings are installed.
- D. The meter box shall be adjusted to the finished grade after the surface has been restored.

5-15.5 FLUSHING AND DISINFECTING SERVICE PIPES

- A. All service pipe and appurtenances shall be pre-chlorinated prior to installation.
- B. The service connection shall be flushed prior to connecting the water meter.
- C. Service connections shall not be transferred to the new main until the new main has been successfully flushed, disinfected, and tested.

5-16 WATER METERS

5-16.1 WATER METERS

- A. Meters shall be installed centered and parallel with meter boxes.

5-17 CASING PIPES

5-17.1 CASING PIPES

- A. Casing pipe annular space shall not be backfilled.
- B. The casing ends shall be sealed with manufactured rubber sealing device and secured with stainless steel hose clamps.

5-17.2 CASING SPACERS

- A. One spacer shall be placed on the spigot end of each segment at the line marking the limit of insertion into the bell. When the joint is complete, the spacer shall be in contact with the bell of the joint so that the spacer pushes the joint and relieves compression within the joint.
- B. The maximum distance between spacers shall be 10 feet (10') on center, with end spacers a maximum of 12 inches (12") from the end of casing.

5-17.3 BORING AND JACKING

- A. Pipe shall be bored and jacked only where indicated in the Construction Plans.
- B. Impacts to Existing Conditions
 - 1. The Contractor shall verify the vertical and horizontal location of existing utilities. If required to avoid conflicts and maintain minimum clearances, adjustment shall be made to the grade of the casing.
 - 2. The Contractor shall remove or penetrate all obstructions encountered.
 - 3. If groundwater is found to be a problem during boring operations, the Contractor shall do all that is necessary to control the flow sufficiently to protect the excavation, pipe and equipment so that the work is not impaired.
 - 4. Special care shall be taken during the installation of the bored and jacked pipe to ensure that no settlement or caving be caused to the above surface. Any such caving caused by the placement of the pipe shall be the Contractor's responsibility and any area so affected shall be repaired as directed by the Engineer.
 - 5. During the jacking operations, particular care shall be exercised to prevent caving ahead of the pipe which will cause voids outside of the pipe. If voids exist, the Contractor shall drill through the wall of the pipe and fill the voids with a pumped cement grout. All voids shall be filled to the satisfaction of the Engineer.
 - 6. Any pipe damaged during the boring and jacking operation shall be repaired by the Contractor in a manner approved by the Engineer.
 - 7. All disturbed ground shall be restored to its original condition or better.
- C. Boring Under Roots
 - 1. Boring under the root systems of trees and plants shall be accomplished by excavating a trench or pit on each side of the tree and then hand digging or pushing the pipe through the soil under the tree.

- 2. Boring pit walls shall be a minimum of 7 feet (7') from the center of the tree and shall be sufficient depth to lay the pipe at the grade shown on the plan and profile.
- D. Backfill for Boring Pits
 - 1. Boring pits shall be backfilled with select native material and compacted to 95 percent (95%) MDD as determined by ASTM D-1557. The contractor shall provide sufficient select backfill material to make up for the rejected material.
- E. Highway and railroad crossings require the placing of steel, CI or concrete pipe casing by jacking or tunneling and laying the carrier pipe within the casing.

5-18 BACKFLOW PREVENTION

5-18.1 BACKFLOW PREVENTION DURING CONSTRUCTION

- A. A hydrant meter with backflow assembly shall be rented from the City for use during construction.
- B. During flushing and disinfection, the metered backflow assembly shall be installed between the existing and new water main.
- C. The backflow assembly and supply hose must be disconnected during hydrostatic pressure testing of the new main.

5-19 FLUSHING AND POLYPIGGING

5-19.1 FLUSHING AND POLYPIGGING

- A. After passing hydrostatic testing and prior to chlorination and final flushing, all water mains shall be flushed and polypigged in the presence of the Engineer to remove any solids or contaminated material that may be present in the pipe.
- B. Polypigs shall be inserted in the pipes and retrieved from the pipes through launching stations with vertical crosses and blow-off assemblies in accordance with the City Standard Plans and Construction Plans.
- C. If the main cannot be polypigged, then a tap shall be provided large enough to develop a velocity of at least 2.5 fps in the main.
- D. The Contractor shall provide taps as required for temporary or permanent release of air.
- E. The Contractor shall exercise special care in flushing and polypigging to avoid damage to surrounding properties.
- F. Water with chlorine residual shall be disposed of via sanitary sewer as follows.

1. The local authority responsible for the sanitary sewer system shall be notified and shall approve of any such discharge.
2. The rate of discharge shall not overload the sewer, as determined by the Engineer.
3. Where a sanitary sewer is not available, water containing a chlorine residual may be disposed of via storm sewer, provided the water is adequately dechlorinated prior to discharge, as determined by the Engineer.
 - a. At a minimum, chlorinated water shall be dechlorinated to a concentration of 0.1 ppm or less, and pH adjustment to within 6.5 to 8.5 standard units, if necessary, before discharging to surface waters of the State or to a storm sewer system that drains to surface waters of the State.

5-20 HYDROSTATIC TESTING

5-20.1 EXTENTS OF HYDROSTATIC TESTING

- A. Water main appurtenances and service connections to the meter setter shall be tested in sections of convenient length, normally limited to 1,500 feet (1,500').
- B. The Engineer may require that the first section of pipe, not less than 1,000 feet (1,000') in length, installed by each of the Contractor's crews, be tested in order to qualify the crew and the materials. Pipe laying shall not be continued more than an additional 1,000 feet (1,000') until the first section has been tested successfully.
- C. Where practicable, no hydrostatic pressure shall be placed against the opposite side of any valve being tested.
- D. Hydrostatic testing shall occur at the high point in the line after all valved connections have been made.
 1. At unvalved connection points, a temporary plug or blow-off assembly shall be installed at the end of the new main. Once the new line is successfully tested and disinfected, the plug or blow-off assembly shall be removed and the connection to the existing main completed.

5-20.2 PREPARING FOR HYDROSTATIC TESTING

- A. The water main shall be filled sufficiently to prevent movement of the pipe under pressure. Concrete blocking shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking and remove it after testing.
- B. Where practicable, hydrostatic testing shall be made with pipe joints, fittings, and valves exposed for inspection.

- C. Prior to scheduling the Engineer to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to ensure that the pipe is in satisfactory condition.
 - 1. Pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing hydrostatic testing shall be furnished and operated by the Contractor.
 - 2. Pressure gauges used in the test shall be accompanied with certifications of accuracy from a testing laboratory and shall be approved by the Engineer.
 - 3. A clean container shall be used for holding water for pumping up pressure on the main being tested. This makeup water shall be sterilized by the addition of chlorine to a concentration of 50 milligrams per liter (mg/L).
- D. The Engineer will inspect and observe the hydrostatic test of the pipe within 24 hours after notification by the Contractor that a section is ready for inspection and test.

5-20.3 CONDUCTING THE HYDROSTATIC TEST

- A. Water main appurtenances and service connections to the meter setter shall be tested in the presence of the Engineer under a hydrostatic pressure equal to 150 psi in excess of the operating pressure. In no case shall the test pressure be less than 225 psi at the highest point on the water main.
- B. Before applying the specified test pressure, the water main shall be slowly filled and air shall be expelled completely from the pipe, valves and hydrants. The main shall be allowed to stand under pressure a sufficient length of time to allow the escape of air and allow the lining of the pipe to absorb water.
 - 1. If permanent air vents are not located at all high points, the contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged.
- C. The test shall be accomplished by pumping the main up to the required pressure, stopping the pump for 15 minutes, and then pumping the main up to the test pressure again. During the test, the section being tested shall be observed to detect any visible leakage.
- D. The quantity of water required to restore the pressure shall be accurately determined by one of the two following methods.
 - 1. Pumping from an open container of suitable size such that accurate volume measurements can be made by the City.

2. Pumping through a positive displacement water meter with a sweep unit hand registering one gallon per revolution. The meter shall be approved by the Engineer.
- E. A leakage test shall be performed concurrently with the pressure test. Acceptability of the tests will be determined by two factors, as follows.
1. The loss in pressure shall not exceed 5 psi during the 2-hour test period.
 2. The quantity of water lost from the main shall not exceed Allowable Leakage as determined by either **Error! Reference source not found.** or **Error! Reference source not found.**

Table 5-2. Allowable Leakage, in Gallons per Hour per 1,000 Feet of Pipe (gph/1000').

PSI	Nominal Pipe Diameter (inches)						
	6"	8"	10"	12"	16"	20"	24"
450	0.95	1.27	1.59	1.91	2.55	3.18	3.82
400	0.90	1.20	1.50	1.80	2.40	3.00	3.60
350	0.84	1.12	1.40	1.69	2.25	2.81	3.37
275	0.75	1.00	1.24	1.49	1.99	2.49	2.99
250	0.71	0.95	1.19	1.42	1.90	2.37	2.85
225	0.68	0.90	1.13	1.35	1.80	2.25	2.70
200	0.64	0.85	1.06	1.28	1.70	2.12	2.55

Equation 5-1. Formula for Calculating Allowable Leakage.

$$L = \frac{ND\sqrt{P}}{7400}$$

in which:

L = Allowable leakage (gph/1000')

N = Number of joints in the length of pipeline tested

D = Nominal diameter of the pipe (inches)

P = Average test pressure during the leakage test (psi)

5-20.4 CORRECTIVE ACTIONS

- A. Any visible leakage detected shall be corrected by the Contractor regardless of the allowable leakage specified above.
- B. Should the tested section fail to meet the pressure test successfully as specified, the Contractor shall, at no additional expense to the City, locate and repair the defects and then retest the pipeline.

- C. Defective materials or workmanship, discovered as a result of hydrostatic field test, shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.
- D. Whenever it is necessary to replace defective material or correct the workmanship, the hydrostatic test shall be re-run at the Contractor's expense until a satisfactory test is obtained.

5-20.5 HYDROSTATIC TESTING FIRE SERVICES

- A. When hydrants are included with the section of main pipe to be tested, the testing shall be conducted in three separate tests as follows.
 - 1. Test No. 1 – Water main gate valves and hydrant auxiliary gate valves closed, with the hydrant operating stem valves and hose ports wide open.
 - 2. Test No. 2 – Water main gate valves and the hydrant operating the stem valves tightly closed but the hydrant auxiliary gate valves and hose ports wide open.
 - 3. Test No. 3 – Each hydrant shall be tested to the pressure indicated in Section 7-09.3(23) of the WSDOT Standard Specifications with the hydrant auxiliary gate valve and hose ports closed and the hydrant operating stem valve wide open.
- B. Fire line testing shall be in accordance with local fire codes and National Fire Prevention Association (NFPA) Standards 13 and 25, with no loss for two hours.

5-20.6 TESTING EXTENSIONS FROM EXISTING MAINS

- A. When an existing water main is extended with new pipe to a new valve and the distance from the existing pipe to the new valve is 18 feet (18') or less, the section of new pipe installed between the new valve and the end of the existing main shall be made with pre-tested, pre-chlorinated pipe, and no hydrostatic test will be required. When the required hydrostatic tests are conducted in the new main section beyond the installed new valve in the closed position, the normal pressure of the existing main may be present against the other side of the new valve.
- B. Where the distance between the end of an existing water main pipe extension to the new valve is more than 18 feet (18'), the connection of the new pipe to existing pipe shall not be made until after hydrostatic tests have been made to the required pressure in both directions against the new valve. This shall be accomplished by a temporary cap or plug installed on the end of the new pipe, beyond the new valve, as close as possible to the existing pipe for testing purposes.
- C. The short length of pipe between the temporary cap or plug end with the new valve in the closed position, with no hydrostatic pressure active on the opposite side of the valve, shall be subjected to the required test pressure. The same test shall be made against the other side short section of pipe toward the existing main. The final connection to the existing main shall be made with pre-tested pre-chlorinated pipe.

5-21 CHLORINATION AND BACTERIOLOGICAL TESTING

5-21.1 CHLORINATION

- A. Before being placed into service, new water mains shall be chlorinated and a satisfactory bacteriological report obtained.
- B. Chlorination shall be performed by the Contractor under the supervision of the Engineer, in accordance with AWWA C651.
- C. Method of Application
 - 1. A sodium hypochlorite solution, 12.5 percent (12.5%) chlorine weight per volume, shall be applied via continuous feed method.
 - 2. Dry calcium hypochlorite shall not be placed in the pipe as laid.
 - 3. Chlorine gas-water mixture shall not be applied.
- D. Point of Application
 - 1. The point of application of the chlorinating agent shall be at the beginning of the main extension or any valved section of it, and through a corporation stop inserted in the horizontal axis of the pipe.
 - 2. The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension.
 - 3. Alternate points of applications may be used when approved by the Engineer.
- E. Rate of Application
 - 1. Water from the existing distribution system, or other source of supply, shall be controlled to flow very slowly into the newly-laid pipeline during application of the chlorine.
 - 2. The initial chlorine content of the water shall be at least 25 mg/L.
- F. Chlorinating Valves, Hydrants, and Appurtenances
 - 1. In the process of chlorinating newly laid pipe, valves, hydrants, and other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.
 - 2. All closure fittings shall be swabbed or sprayed with 5 to 6 percent (5% to 6%) chlorine solution.

5-21.2 RETENTION PERIOD

- A. Treated water shall be retained in the pipe at least 24 hours but no longer than 48 hours.
- B. After this retention period, the chlorine residual at pipe extremities and at other representative points shall be at least 10 mg/L.
- C. If a measurement of less than 10 mg/L is obtained, chlorination must be repeated.

5-21.3 FINAL FLUSHING

- A. Following the retention period, treated water shall be flushed from the newly-laid pipe until the replacement water throughout its length shows a residual at or below the normal residual level in the water supply system.
- B. The Contractor shall be responsible for disposal of treated water flushed from mains in accordance with Section 5-19.1F.

5-21.4 BACTERIOLOGICAL SAMPLING AND TESTING

- A. Following the retention period, the installation of new mains requires that two (2) sets of samples for bacteriological analysis are collected from representative points in the new water main using the following method in accordance with AWWA C651-14 Option B.
 - 1. Provide rest period of at least 16 hours.
 - 2. Collect first set of samples from representative points.
 - 3. Provide wait period of at least 15 minutes.
 - 4. Collect second set of samples from representative points.
- B. Samples will be collected by the Engineer and sent to an approved testing lab. Results are typically available within two to five (2-5) business days.

5-21.5 CORRECTIVE ACTIONS

- A. Should the initial chlorine treatment result in an unsatisfactory bacteriological test, the original chlorination procedure shall be repeated by the Contractor until satisfactory results are obtained. Failure to obtain a satisfactory test shall be considered as failure of the Contractor to keep the pipe clean during construction, or to properly chlorinate the main.
- B. In the event two unsatisfactory bacteriological reports are obtained on a section of pipe, the Contractor shall revise the method of disinfection and the form of applied chlorine.

5-22 WATER SERVICE INTERRUPTION

5-22.1 WATER SERVICE INTERRUPTION

- A. The Contractor shall identify all water services that may experience an interruption of service due to work on the existing water system.

- B. City Forces shall notify all affected water customers in writing at least 48 hours in advance (not including weekends and holidays) of any water service interruptions.
- C. Water service interruptions shall occur during non-holiday weekdays. The City observes the following holidays:
 - 1. New Year's Day
 - 2. Martin Luther King, Jr. Day
 - 3. Memorial Day
 - 4. Independence Day
 - 5. Labor Day
 - 6. Veterans Day
 - 7. Day Before Thanksgiving Day
 - 8. Thanksgiving Day
 - 9. Christmas Day
 - 10. Day Before Christmas Day or Day After Christmas Day
- D. Due to the needs of various water customers in the project vicinity, water service interruptions are limited to the times set forth as follows.
 - 1. Monday through Thursday: 9:00 AM to 3:00 PM
 - 2. Friday through Sunday: Do Not Schedule
- E. No water service interruptions affecting public schools will be allowed during scheduled school hours.
- F. Water service interruption periods may be adjusted at the sole discretion of the City Water Maintenance Manager in order to address specific project circumstances and customer needs.
- G. Advance notice of at least ten (10) working days shall be required for each connection which requires cutting the existing water mains or a shut-down of the existing water mains.
- H. All work that will result in an interruption of water service shall be planned and coordinated so that services will be resumed with the least possible inconvenience to customers.
- I. To supply customers with water during the construction of a water main project where any section of the pipe has passed satisfactory hydrostatic and bacteriological tests, the City Water Utility reserves the right to tap corporation stops into the section of new pipe and install service connections at such locations as the City Water Utility may elect. The installation of any such service connections by the City Water Utility shall not be construed as an acceptance by the City of any part of the Work.

5-23 TRENCH EXCAVATION

5-23.1 TRENCH EXCAVATION

A. Sediment Control

1. Before trenching begins, all dust and sediment control measures shall be in place.
2. Clearing and grubbing limits may be established by the Engineer for certain areas and the Contractor shall confine his operations within those limits. Debris resulting from the clearing and grubbing shall be disposed of by the Contractor.
3. Stockpiling of waste materials along the trench shall not be allowed.

B. Open Cut Excavation

1. Excavations shall be made by open cut unless otherwise specified.
2. Trenches shall be excavated to true and smooth bottom grades and in accordance with the lines given by the Engineer or shown in the Construction Plans.
3. Trench bottom shall provide uniform bearing and support for each length of pipe.
4. Changes in grades of the water main from those shown in the Construction Plans may be necessary because of unexpected utilities or other reasons. When the pipeline horizontal alignment is changed by more than 1 foot (1') from the line indicated in the Construction Plans, after the trench has been excavated, the Contractor shall excavate the trench at the changed location and backfill and compact the previous trench.

C. Extents of Excavation

1. The length of trench excavation in advance of pipe laying shall be kept to a minimum and shall not proceed more than 100 feet (100') in advance except with written approval of the Engineer.
2. Restoration of trenches shall closely follow installation and testing of pipe.

D. Trench Excavation Depth

1. The depth of trenching for water mains shall be such as to give a minimum cover of 36 inches (36") over the top of the pipe unless otherwise specified and approved.
2. Care shall be taken not to excavate below the depth specified. Excavation below that depth shall be backfilled with foundation material and compacted as specified.
3. Deeper excavation may be required due to localized breaks in grade, or to install the new main under existing culverts or other utilities where necessary.

4. Where the profile of the pipeline and the ground surface is shown in the Construction Plans, the pipeline shall be laid to the elevation shown regardless of depth.
 5. The excavation shall be to such depth that the minimum cover over valve operating nuts shall be 1 foot (1').
 6. The Contractor shall verify the locations and establish the depth of the existing water mains at the points where connections are to be made prior to trenching for the pipelines. The profile shall be adjusted so no new high spots or low spots are created between the connection points to the existing water mains.
- E. Minimizing Site Disturbance
1. Bell holes shall be excavated to the extent necessary to permit accurate work in making and inspecting the joints.
 2. The banks of the trenches shall be kept as nearly vertical as soil conditions will permit, and where required to control trench width or to protect adjacent structures, the trench shall be sheeted and braced.
 3. Trench widths to 1 foot (1') above the top of the pipe shall not exceed 30 inches (30") maximum or 1 ½ times the outside diameter of the pipe plus 18 inches (18"), whichever is greater.
 4. Standard excavating equipment shall be adjusted so as to excavate the narrowest trench practicable.
 5. The Contractor shall exercise sound engineering and construction practices in excavating the trench and maintaining the trench so that no damage will occur to any foundation, structure, pole line, pipe line, or other facility because of slough or slopes, or from any other cause.
 6. If, as a result of the excavation, there is disturbance of the ground that endangers other property, the Contractor shall immediately take remedial action.
 7. Excavations shall be either backfilled at the end of the work day or protected per Section 1-07.23(1) of the WSDOT Standard Specifications.
 8. Upon completing the Work, the Contractor shall remove all shoring unless the Construction Plans or the Engineer direct otherwise.
- F. Rock Excavation
1. Rock excavation shall cover the removal and disposal of rock that requires systematic drilling and blasting for its removal, and also boulders exceeding ½ cubic yards (1/2 cy).

2. Ledge rock, boulders, or stones shall be removed to provide a minimum clearance of 4 inches (4") under the pipe.
 3. Hardpan, hard clay, glacial till, sandstone, siltstone, shale, or other sedimentary rocks, which are soft, weathered, or extensively fissured will not be classified as rock excavation.
 4. Rock is defined as one that has a modulus of elasticity of more than 200,000 psi or unconfined compressive strength at field moisture content of more than 2,000 psi.
 5. Materials removed shall be backfilled as directed by the Engineer.
- G. Removal and Replacement of Unsuitable Materials
1. Whenever in excavating the trench for water mains, the bottom of the trench exposes peat, soft clay, quicksand, or other unsuitable foundation material, such material shall be removed to the depth directed by the Engineer and backfilled with foundation material.
 2. When determined by the Engineer that silty soils or fine sandy soils are encountered, Class C foundation material shall be required. Silty soils or fine sandy soils usually flow in the presence of a stream of water.
 3. When determined by the Engineer that clay, peat, or other soft materials are encountered that become saturated with water, but do not break down into fine particles and flow, Class A or Class B foundation material shall be required.
 4. Unsuitable material shall be loaded directly into trucks and hauled to a waste site obtained by the Contractor. Stockpiling of unsuitable material at the project site shall not be allowed.

5-23.2 SHEETING AND SHORING

- A. The Contractor shall provide and install sheeting and shoring as necessary to protect workers, the work and existing utilities and other properties in compliance with OSHA and WISHA requirements. All sheeting and shoring above the pipe shall be removed prior to backfilling.
- B. If workers have to enter any trench or other excavation 4 feet (4') or more in depth that does not meet the open pit requirements of Section 2-09.3(3)B of the WSDOT Standard Specifications, it shall be shored.
- C. Sloping to the angle of repose will be permitted only in non-critical off-street areas.
- D. Removal of the sheeting and shoring shall be accomplished in such a manner that there will be no damage to the work or to adjacent properties.

5-23.3 TRENCH DEWATERING

- A. The trench shall be kept free from water until joining of pipes has been completed. Surface water shall be diverted so as not to enter the trench.
- B. Where water is encountered in the trench, it shall be removed during pipe-laying operations and the trench so maintained until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe.
- C. Trench water and other materials shall not be allowed to enter the pipe at any time.
- D. Dewatering shall be the responsibility of the Contractor and any method used must be in accordance with the specifications and requirements of DOE and local jurisdictions.
- E. The Contractor shall maintain sufficient pumping equipment on the job to ensure that dewatering can be executed whenever necessary.

5-24 BEDDING AND BACKFILL

5-24.1 PIPE BEDDING

- A. Pipe bedding shall conform to Section 7-08.3(1)C of the WSDOT Standard Specifications as modified herein in order to provide uniform support along the entire pipe barrel, without load concentration at joint collars or bells.
- B. Pipe bedding shall be placed in loose layers and compacted to 90 percent (90%) MDD.
- C. Lifts not more than six inches (6") in thickness shall be placed and compacted along the sides of the pipe to a height of at least six inches (6") above the top of the pipe. Material shall be carefully worked under the pipe haunches and then compacted.
- D. Gravel backfill for pipe zone bedding shall be placed to the depths shown in the Construction Plans and shall be rammed and tamped around the pipe to 95 percent (95%) MDD by approved hand-held tools, so as to provide firm and uniform support for the full length of the pipe, valves, and fittings.
- E. Bedding disturbed by pipe movement, by removal of shoring, or by movement of trench shield or box, shall be reconsolidated prior to placing backfill.
- F. Care shall be taken to prevent any damage to the pipe or its protective coating.

5-24.2 TRENCH BACKFILL

- A. Prior to backfilling, form lumber and debris shall be removed from the trench. Sheeting used by the Contractor shall be removed just ahead of the backfilling.
- B. Materials capable of damaging the pipe or its coating shall be removed from the backfill material.

- C. A minimum 3-inch (3") sand cushion shall be placed between the water main and existing pipelines or other conduits when encountered during construction.
- D. Backfill up to 12 inches (12") over the top of the pipe shall be evenly and carefully placed.
- E. Trench backfill shall be compacted to at least 95 percent (95%) MDD as specified in Section 2-03.3(14)D of the WSDOT Standard Specifications.
- F. Backfill shall be carefully tamped around the valve box to a distance of 3 feet (3') on all sides or to the undisturbed face of the trench if it is closer.
- G. Jetting is not an allowable compaction method.
- H. Backfill Lift Depth
 - 1. For mechanical compaction methods ("hoe pack", vibratory roller, static roller, etc.), the maximum backfill lift shall not exceed 2 feet (2') between the application of compaction equipment.
 - 2. For manual compaction methods (all walk-behind equipment, jump jack, etc.), the maximum backfill lift shall not exceed 1 foot (1') between the application of compaction methods.
- I. Compaction Testing
 - 1. The Engineer may request compaction testing to be performed by a certified technician provided by the Contractor.
 - 2. The Contractor shall provide the Engineer with one copy of the compaction test report within 24 hours of the completion of the test.
 - 3. Compaction tests shall be made at a maximum of 4 foot (4') depth increments with a minimum of one test for any backfilling less than 4 feet (4') in depth. The maximum space between tests shall not exceed 100 linear feet (100 LF).

5-24.3 FOUNDATION GRAVEL

- A. Foundation gravel under vaults and other precast concrete structures shall be placed in layers not more than 6 inches (6") thick and compacted to provide a firm and level base on which to place the structure.
- B. Unless shown otherwise in the Construction Plans, the minimum thickness of foundation gravel under precast concrete structures is 12 inches (12").

5-24.4 CONTROLLED DENSITY FILL

- A. Trench section to be filled with CDF shall be contained at either end of trench section by bulkhead or earth fill.

- B. When used to support existing AC pipe, the CDF shall be brought up uniformly to the bottom of the AC pipe, as shown in the Construction Plans or as directed by the Engineer.
- C. Temperature Restrictions
 - 1. CDF patching, mixing and placing may be started if weather conditions are favorable, when the temperature is at 34 degrees Fahrenheit (34°F) and rising.
 - 2. At the time of placement, CDF must have a temperature of at least 40°F.
 - 3. Each filling stage shall be as continuous an operation as is practicable.
 - 4. Mixing and placing shall stop when temperature is 38°F or less and falling.
 - 5. CDF shall not be placed on frozen ground.

5-25 TRENCHLESS PIPE INSTALLATION

5-25.1 TRENCHLESS PIPE INSTALLATION

- A. The use of trenchless excavation methods such as pipe bursting and horizontal directional drilling shall be considered by the City on a case-by-case basis and, at a minimum, must meet the following conditions.
 - 1. Transition couplings shall be installed at both ends of the new main installation.
 - 2. The new main shall be electronically located and marked on the ground for measurement in order to accurately compose as-built drawings.
 - 3. The new main shall be video-inspected following installation, with water running. The video inspection must be provided to the City to approve the installation or require corrections.
 - 4. Pipe bursting is not allowed on private property or within the public ROW without the appropriate permission, such as an easement, or ROW use permit.

5-26 ABANDONING WATER MAIN

5-26.1 ABANDONING WATER MAIN

- A. Cut, cap, and abandonment work shall be performed only as indicated in the Construction Plans.
- B. Abandoned water mains shall be emptied of all water and then plugged or capped to ensure they are not penetrable by groundwater.
- C. Work to Be Performed by City Forces

1. Abandonment of existing water mains will be conducted by City Forces as provided below.
 - a. Operate all valves to accomplish shutdowns and subsequent reactivation, where necessary.
 - b. Cut and remove pipe sections as necessary to abandon the water main.
 - c. Swab or spray all connecting pipe and fittings with 5 to 6 percent (5% to 6%) chlorine solution, where necessary.
 - d. Install caps and plugs on the portions of water main to remain active.
- D. Work to be Performed by the Contractor
 1. The Contractor shall work with City Forces abandoning existing water mains by providing the following services.
 - a. Notify the Engineer 24 hours in advance of abandoning each main and provide safe access for the completion of the process.
 - b. Provide pumping and disposal of the water from the draining of the existing water mains, including dechlorination of the water prior to disposal, if necessary.
 - c. Indicate the exact extents of the existing water main to be removed.
 - d. Provide all saw-cutting, removal, and disposal of existing surface improvements, excavation, haul, and disposal of unsuitable materials, shoring, de-watering, foundation material, at the connection areas before the scheduled time for connection.
 - e. Dispose of sections of pipe cut and removed by the City.
 - f. Provide all materials necessary for City Forces to perform abandonment as indicated in the Construction Plans, including but not limited to the required fittings, couplings, pipe spools, and shackle materials to complete the connections.
 - g. Install caps, plugs, or CDF fill on the water main to be abandoned.
 - h. Provide and install concrete blocking, PE for all pipes and fittings, backfill, and surface restoration at the locations shown in the Construction Plans for the points of connection to the existing water system.
- E. Existing pipe shall not be removed or abandoned until final connection of the new main and transfer of all services to the new main are complete.

- F. In the event the main to be abandoned is cracked or crushed, the Contractor shall excavate to the next joint of pipe and install the cap or plug. Crushed pipe sections shall be removed and disposed of by the Contractor.
- G. For AC pipe, placement of CDF shall be by means of a tremie pipe or other method that enables uniform placement of the CDF throughout the length of the pipe being abandoned.
- H. Abandonment or removal of structures shall be completed only after piped systems have been properly abandoned.

5-26.2 ABANDONING VALVES AND HYDRANTS

- A. Valves shall only be abandoned where indicated in the Construction Plans and in the position (open or closed) directed by the Engineer.
- B. Valves shall be abandoned by removing the valve box lid and valve box to a minimum depth of 2 feet (2') and no deeper than 12 inches (12") above the crown of the abandoned water main.
- C. Where a valve box has been removed, the void space shall be backfilled with native material and patched or paved to match adjacent conditions as directed by the Engineer.
- D. Unnecessary valves at tees shall be removed and replaced by a blind flange on the tee.
- E. When an abandoned valve cannot be removed, as determined by the City Water Utility, the valve shall be closed, a blind flange installed and a piece of 2-inch (2") white PVC shall be placed over the operating nut.

5-26.3 ABANDONING HYDRANTS

- A. Where indicated in the Construction Plans, existing hydrants (upper and lower barrels) shall be removed, salvaged, and returned to the City.
- B. Hydrant concrete pad and bollards shall be removed and properly disposed.
- C. Where a hydrant has been removed, the void space shall be backfilled with native material and paved or landscaped to match adjacent conditions as directed by the Engineer.
- D. Any hydrant not in service shall be identified by covering with a burlap or plastic bag approved by the Engineer.

5-26.4 ABANDONING WATER SERVICES

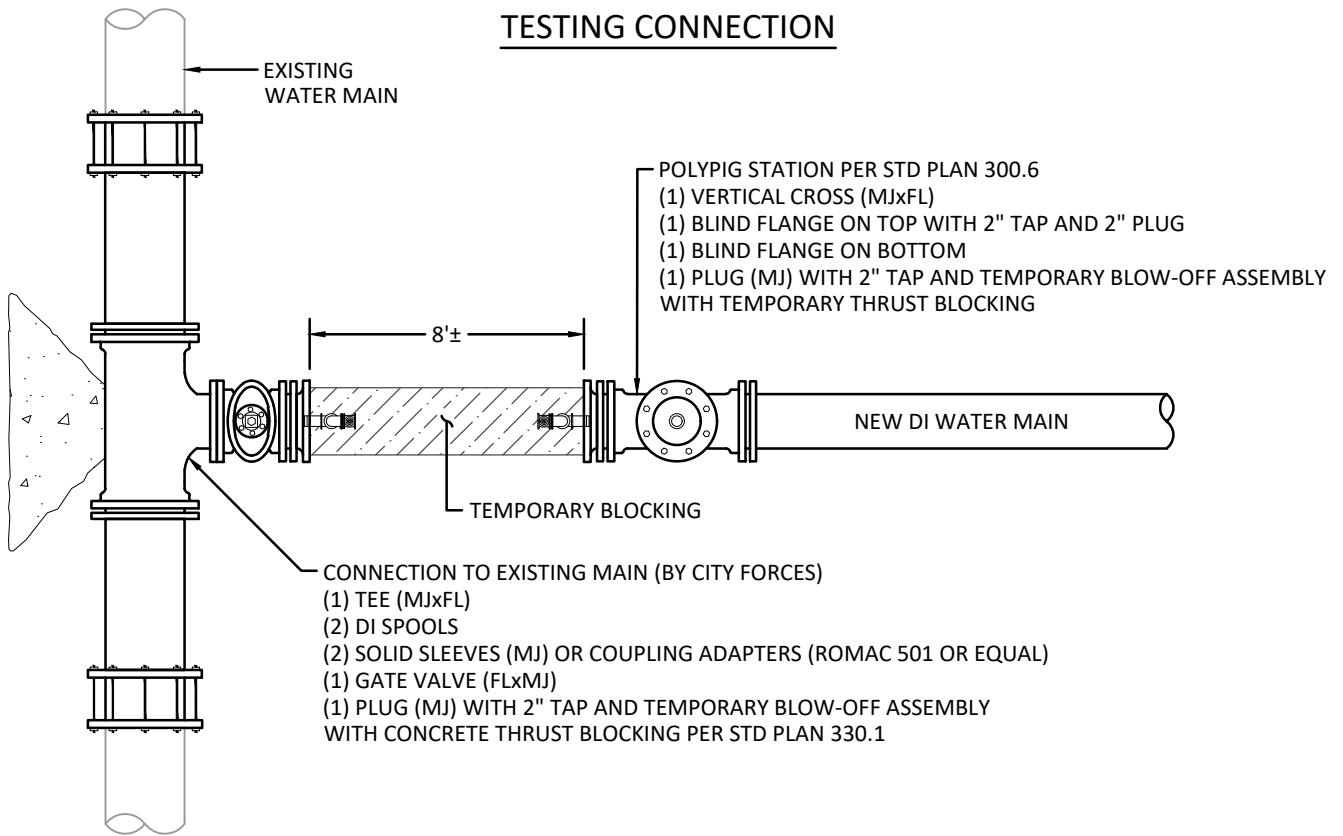
- A. Existing services shall not be removed or abandoned until final connection of the new main and transfer of all services to the new main are complete.
- B. Abandonment of existing water services on active water mains shall be performed by City Forces.

- C. Abandonment of existing water services on abandoned water main shall be performed by the Contractor as follows.
1. Remove and dispose of existing setter and meter box.
 2. Cap or crimp end of existing copper service line to be abandoned in place.
 3. Return existing water meter to the City Water Utility.

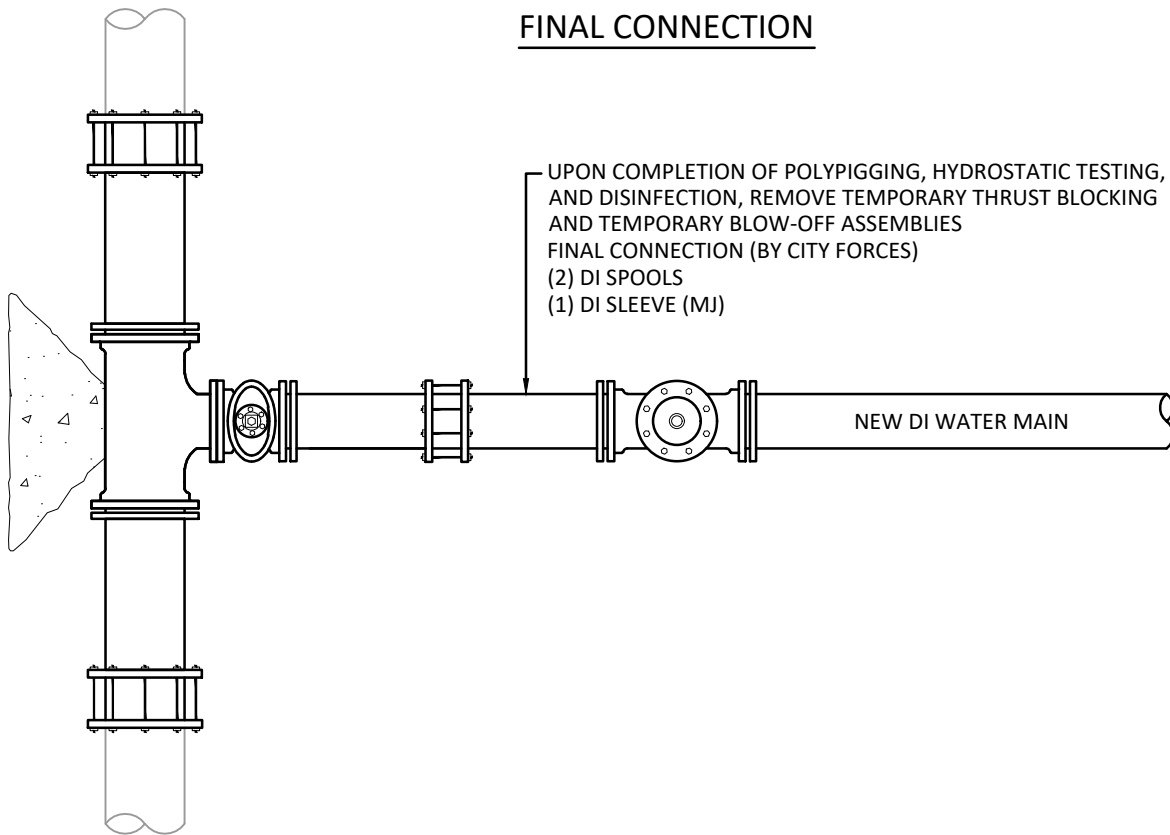
END OF CHAPTER 5

APPENDIX A WATER UTILITY STANDARD PLANS

TESTING CONNECTION



FINAL CONNECTION



PUBLIC WORKS
DEPARTMENT

CONNECTION TO WATER MAIN CUT-IN TEE AND ONE VALVE

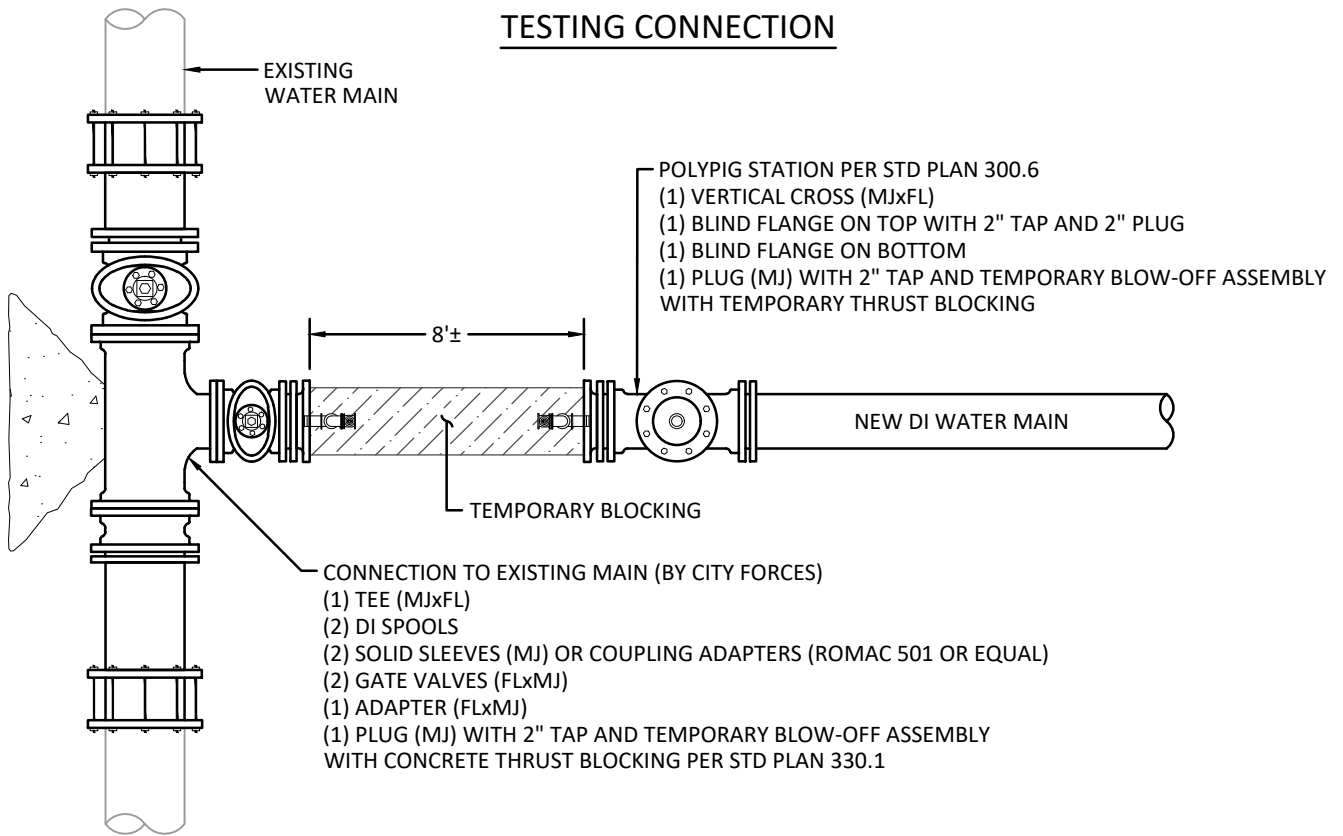
STD. PLAN - 300.1

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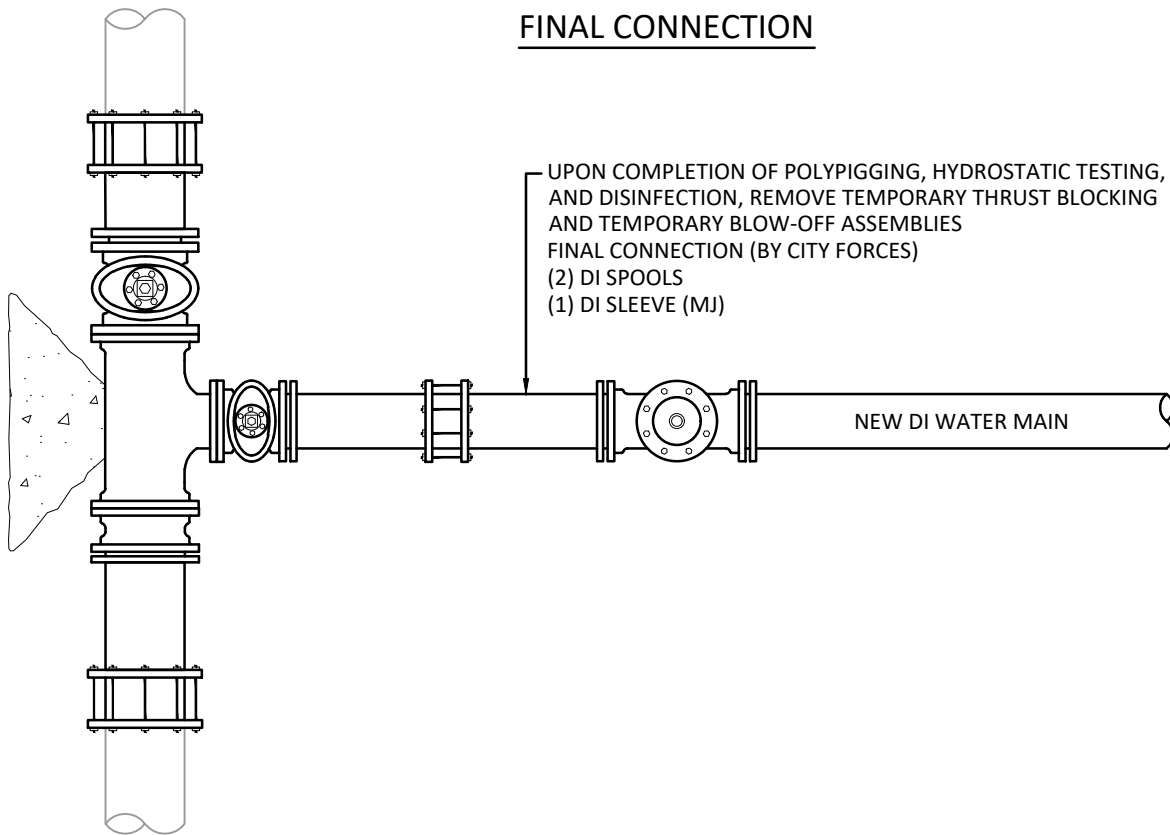
Martin Pastucha
Public Works Administrator

DATE

TESTING CONNECTION



FINAL CONNECTION



PUBLIC WORKS
DEPARTMENT

CONNECTION TO WATER MAIN CUT-IN TEE AND TWO VALVES

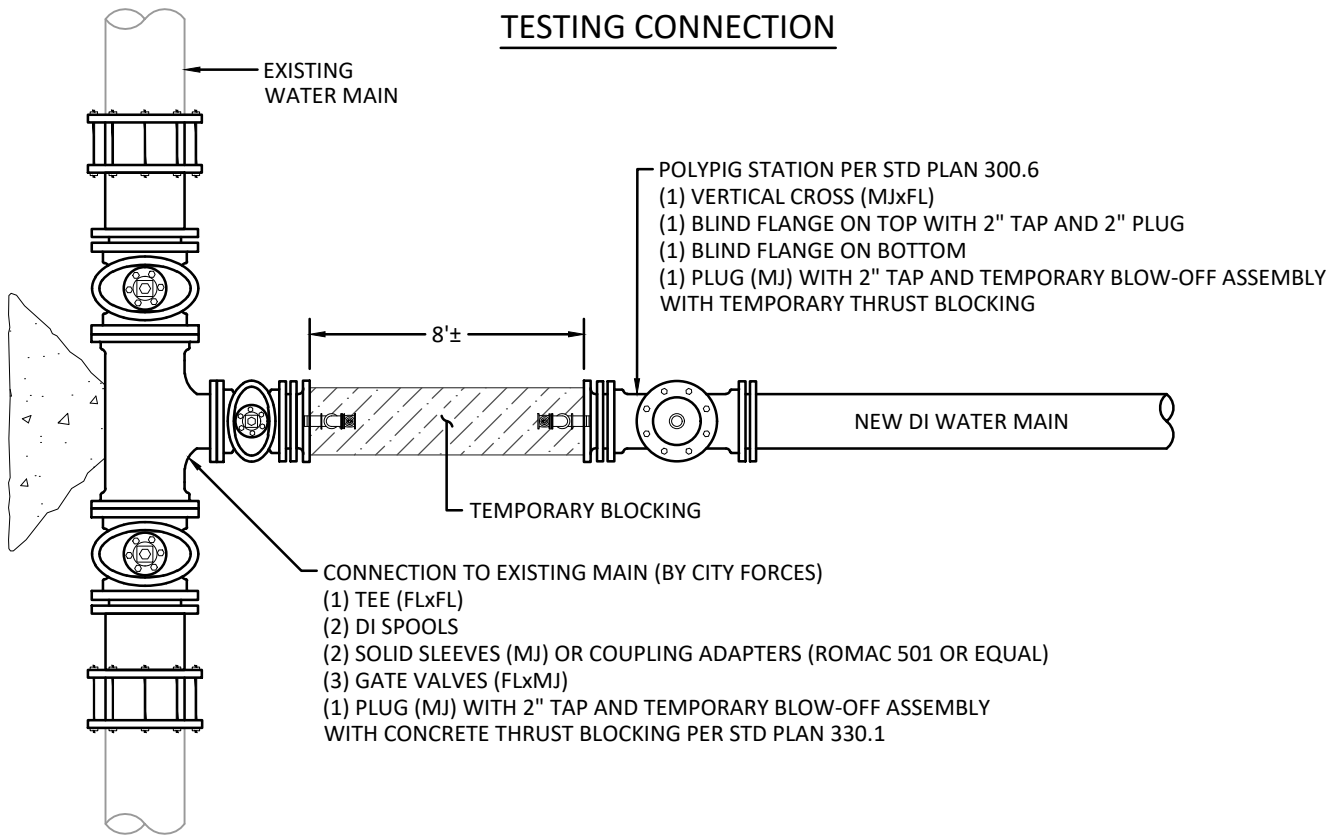
STD. PLAN - 300.2

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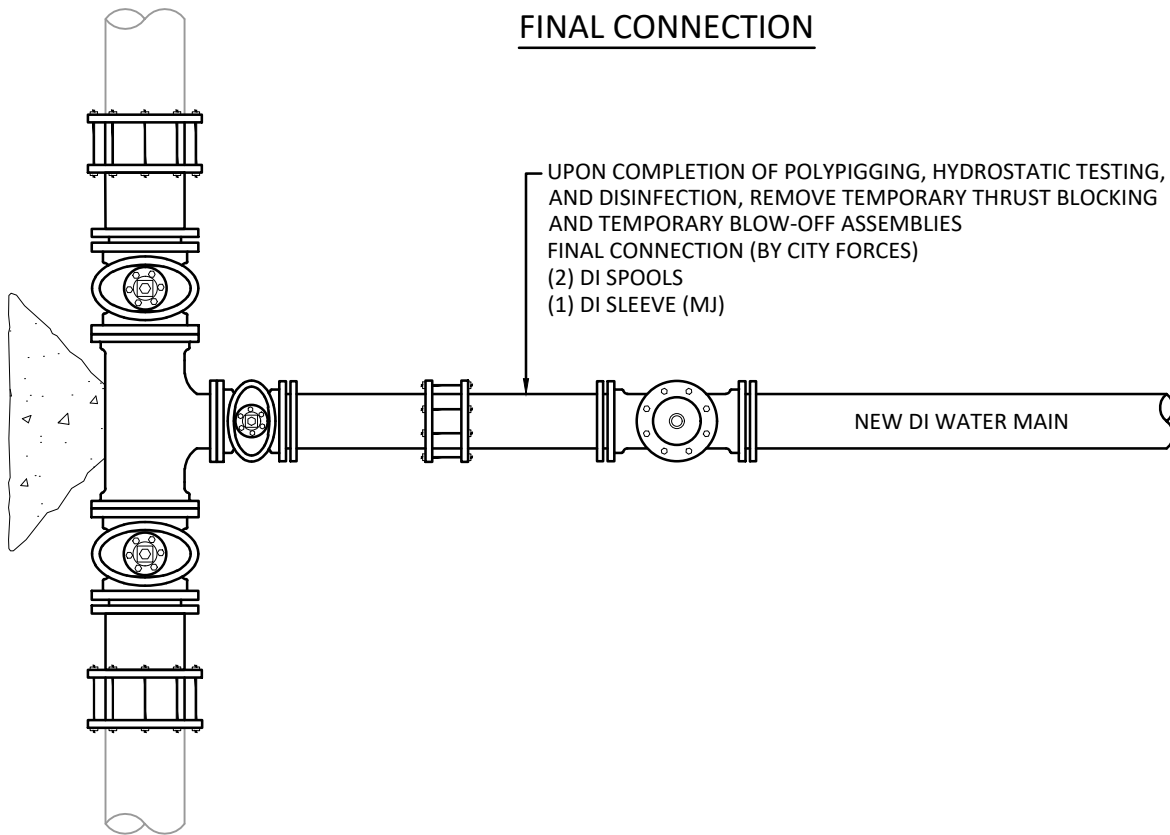
Martin Pastucha
Public Works Administrator

DATE

TESTING CONNECTION



FINAL CONNECTION



PUBLIC WORKS
DEPARTMENT

CONNECTION TO WATER MAIN CUT-IN TEE AND THREE VALVES

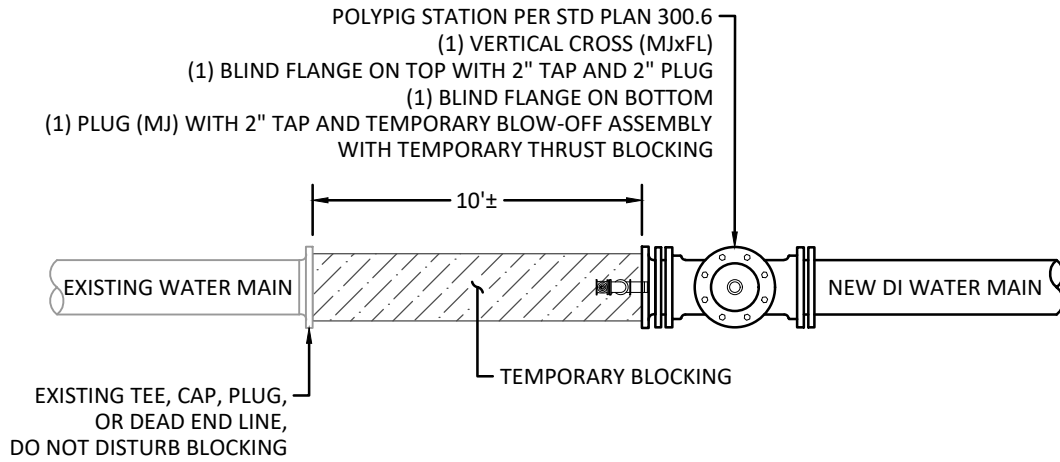
STD. PLAN - 300.3

APPROVED:

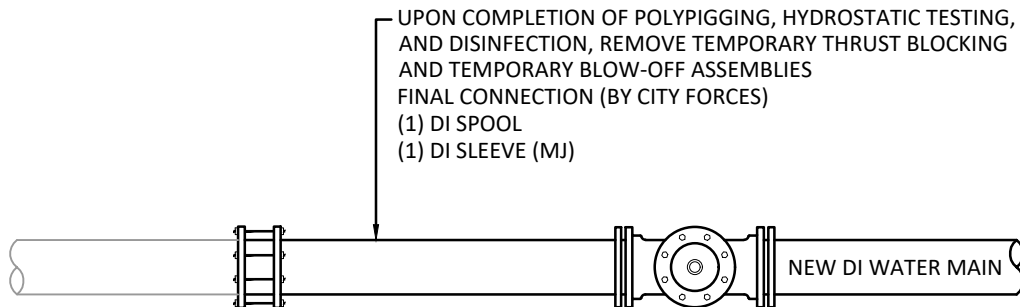
Martin Pastucha
Public Works Administrator

DATE

TESTING CONNECTION



FINAL CONNECTION



PUBLIC WORKS
DEPARTMENT

CONNECTION TO WATER MAIN EXISTING TEE OR END LINE CAP

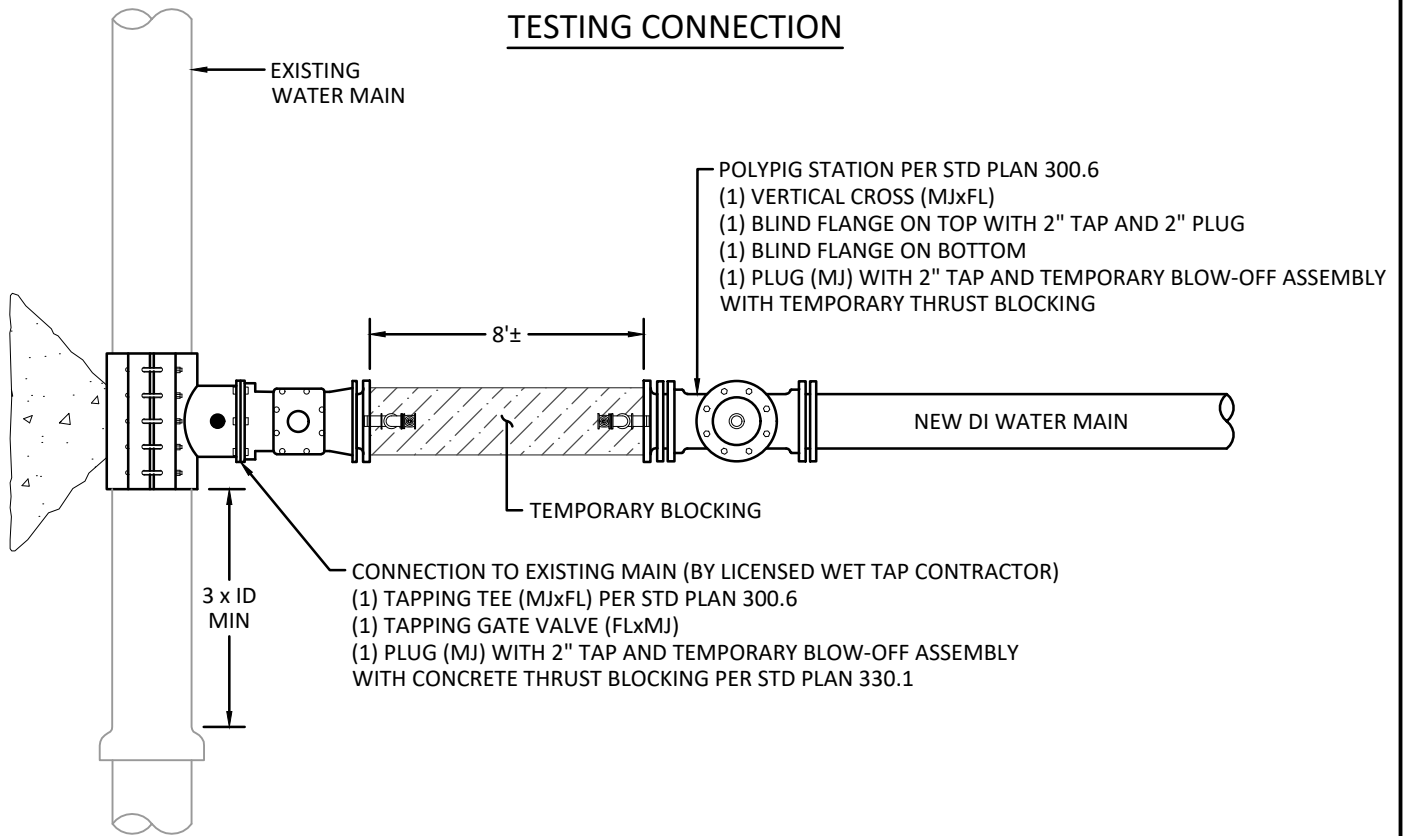
STD. PLAN - 300.4

APPROVED:

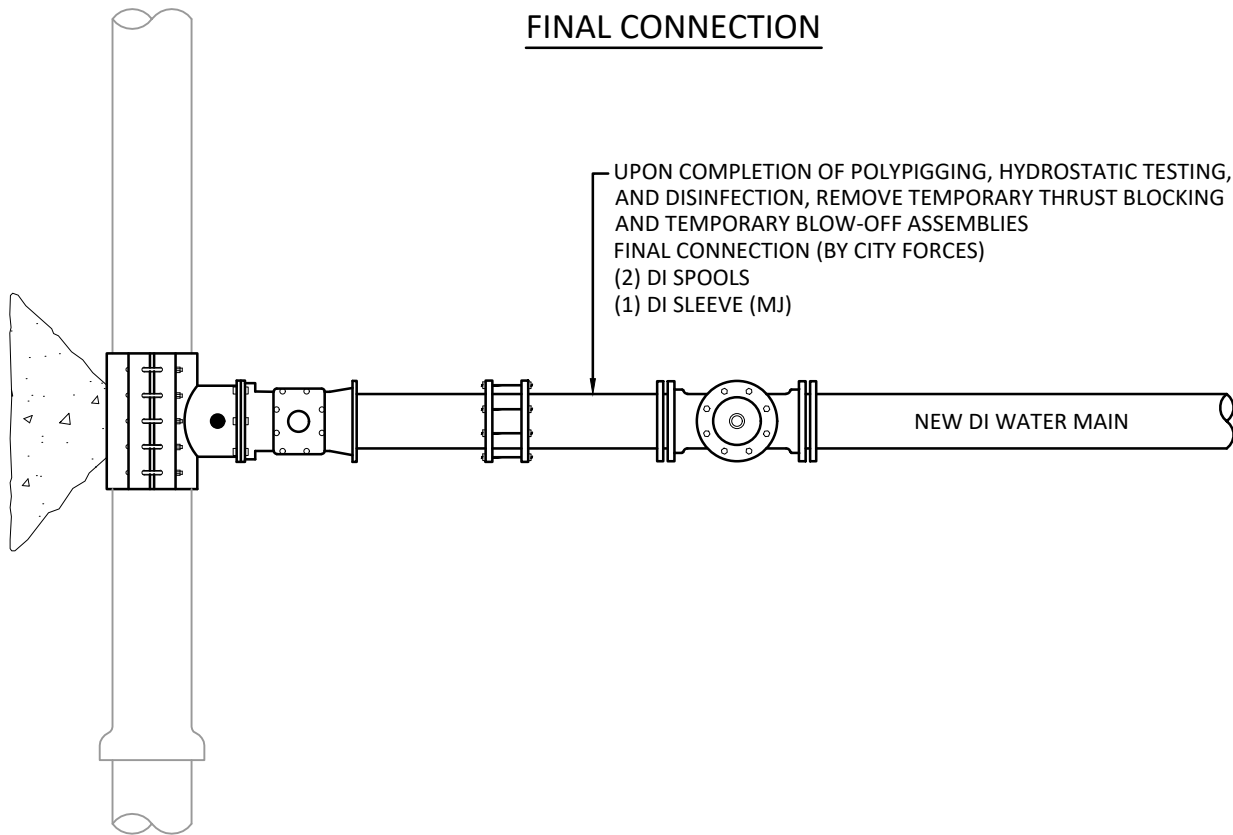
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TESTING CONNECTION



FINAL CONNECTION



PUBLIC WORKS
DEPARTMENT

CONNECTION TO WATER MAIN TAPPING TEE AND VALVE

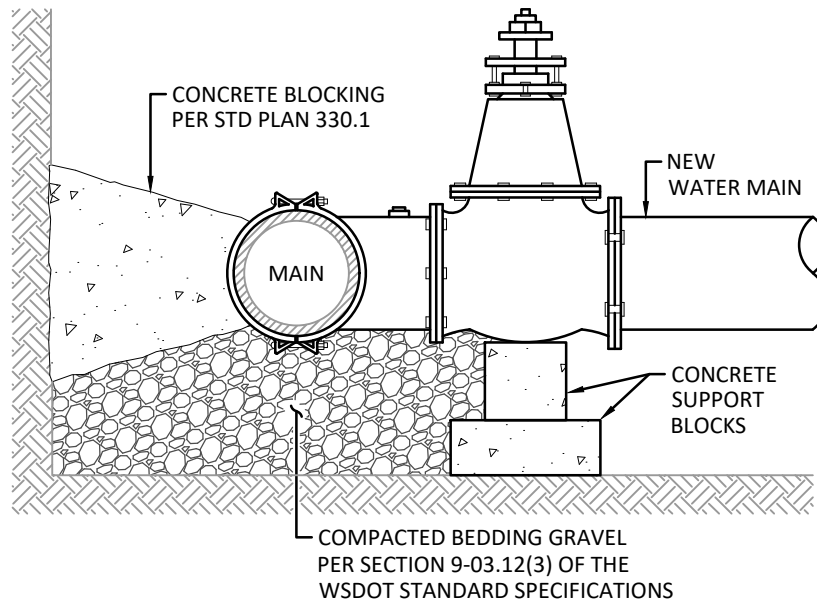
STD. PLAN - 300.5

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ELEVATION



NOTES:

1. WET TAPPING OF EXISTING WATER MAINS SHALL BE PERFORMED BY A LICENSED WET TAP CONTRACTOR (SPEER TAPS, INC. OR LEGACY TAPPING, INC.).
2. CONTRACTOR SHALL POTHOLE AND VERIFY THE HORIZONTAL AND VERTICAL ALIGNMENT OF EXISTING WATER MAIN AND SHALL LAY THE NEW WATER MAIN TO MATCH.
3. TAPPING TEE SHALL BE STAINLESS STEEL WITH FULL CIRCLE SEAL WITH CORTEN OR STAINLESS STEEL NUTS AND BOLTS.
4. ALL TEES AND VALVES SHALL BE WATER TESTED BEFORE TAPPING OR ASSEMBLY SEALS SHALL BE TESTED VIA AIR PRESSURE AFTER THE TAPPING SLEEVE IS INSTALLED TO THE MAIN AND THE TAPPING VALVE IS INSTALLED.
5. TAPPING TEES MAY BE SIZE-ON-SIZE, PROVIDED THE SHELL CUTTER DIAMETER IS AT LEAST 2" SMALLER THAN THE EXISTING MAIN DIAMETER.
6. TAPPING TEES SHALL NOT BE INSTALLED ON STEEL OR ASBESTOS CEMENT WATER MAINS.



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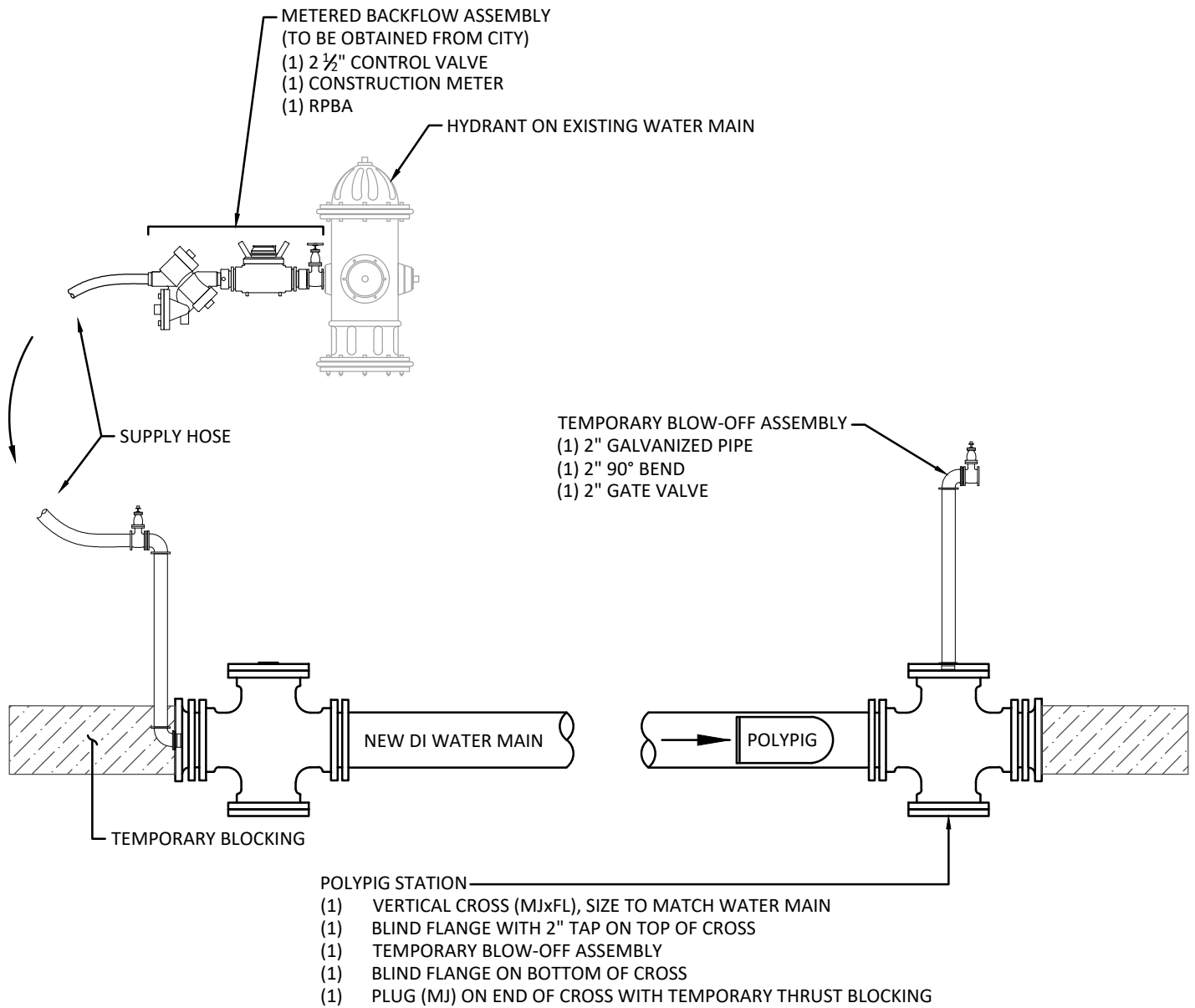
TAPPING TEE

STD. PLAN - 300.6

APPROVED:

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Public Works Administrator

DATE



NOTES:

1. THE BACKFLOW PREVENTION ASSEMBLY AND SUPPLY HOSE MUST BE DISCONNECTED DURING HYDROSTATIC PRESSURE TESTING OF THE NEW WATER MAIN.
2. POLYPIG AND ALL DEBRIS SHALL BE REMOVED FROM SUMP OF VERTICAL CROSS VIA SANITARY METHOD PRIOR TO DISINFECTION OF NEW WATER MAIN.
3. UPON REMOVAL OF POLYPIG, REMOVE TEMPORARY BLOW-OFF ASSEMBLY AND INSTALL 2" PLUG.
4. THE NEW WATER MAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW WATER MAIN IS POLYPIGGED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED.
5. THE INTERIORS OF ALL PIPES AND FITTINGS TO BE USED IN FINAL CONNECTION MUST BE SWABBED OR SPRAYED WITH A 5-6% AVAILABLE CHLORINE SOLUTION.



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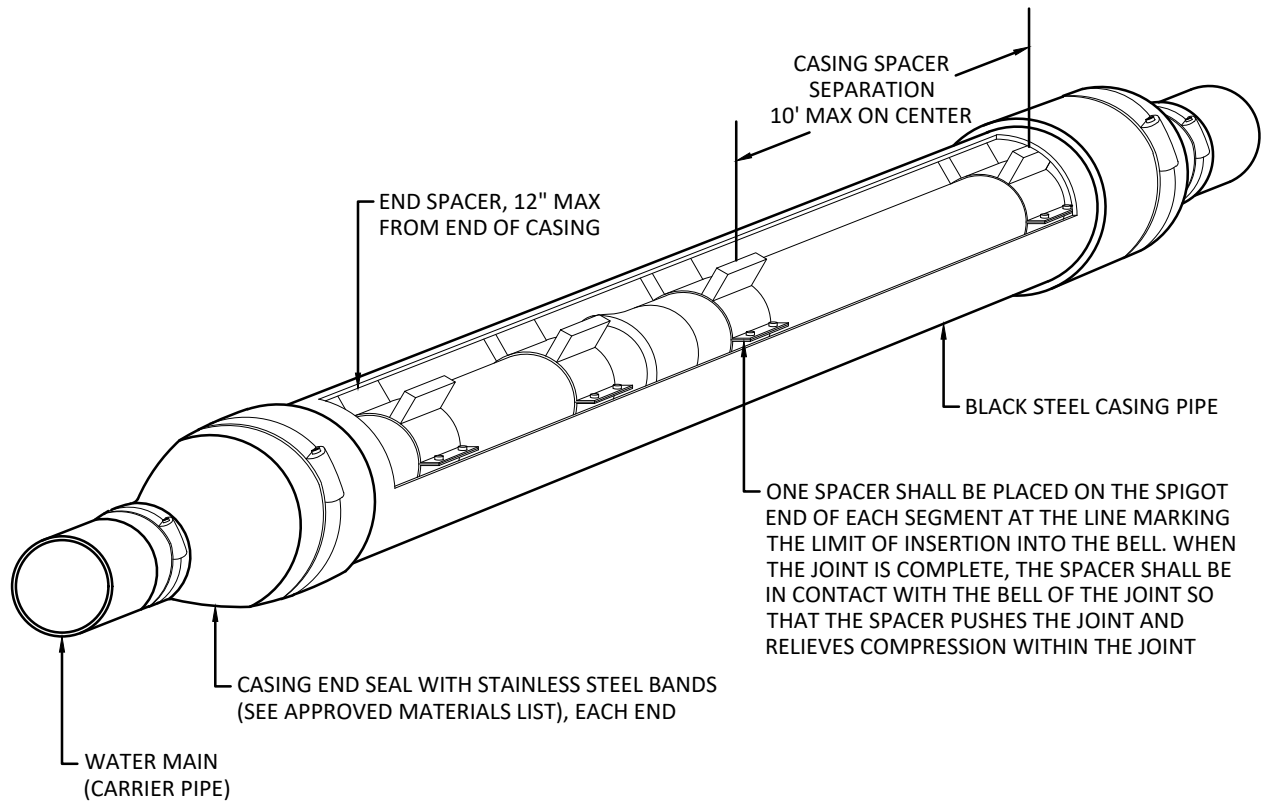
POLYPIGGING NEW WATER MAINS

STD. PLAN - 300.7

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DATE



CARRIER PIPE DIAMETER	4"	6"	8"	10"	12"	16"
CASING PIPE DIAMETER (PUSH-ON JOINT CARRIER PIPE)	10"	12"	14"	16"	20"	26"
CASING PIPE DIAMETER (MJ/MEGALUG CARRIER PIPE)	14"	16"	18"	20"	24"	30"
CASING PIPE WALL THICKNESS	SCHEDULE 20 OR GREATER					
SPACER BAND WIDTH	8"					

NOTES:

1. CASING SPACERS SHALL BE "CENTER POSITIONING" TYPE.
2. RUNNER WIDTH SHALL BE MINIMUM 2".
3. RUNNER HEIGHT SHALL BE SIZED TO PROVIDE:
 - MINIMUM 3/4" BETWEEN CARRIER PIPE BELL AND CASING PIPE WALL AT ALL TIMES.
 - MINIMUM 1" CLEARANCE BETWEEN RUNNERS AND TOP OF CASING WALL TO PREVENT JAMMING DURING INSTALLATION.
4. STEEL CASING DIAMETERS ARE "OUTSIDE DIAMETER" FOR 16" AND LARGER.
5. PROVIDE SHOP-APPLIED ANTI-CORROSIVE COATING ON CASING EXTERIOR CONFORMING TO AWWA C210. TNEMEC HI-BUILD TNEME-TAR SERIES 46H-413 OR EQUAL. MINIMUM COATING THICKNESS 16 MILS DFT, MAXIMUM COATING THICKNESS NOT TO EXCEED MANUFACTURER'S RECOMMENDATIONS.



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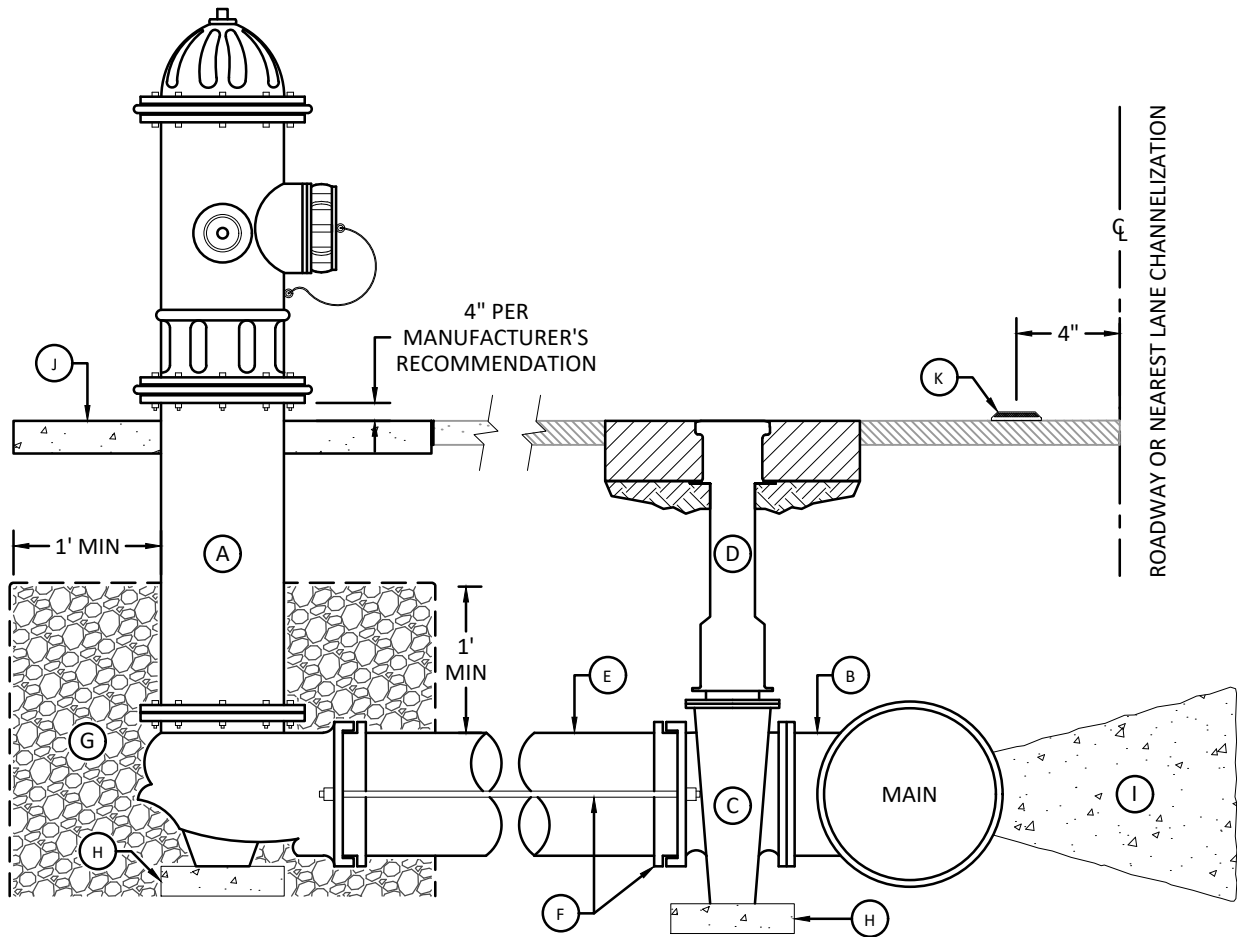
STEEL PIPE CASING

STD. PLAN - 300.8

APPROVED:

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Public Works Administrator

DATE



NOTES:

1. FIRE HYDRANT TO BE PAINTED WITH TWO COATS OF SAFETY YELLOW DTM ACRYLIC GLOSS OR ENAMEL PAINT.
2. PUMPER NOZZLE TO FACE ROADWAY OR AS DIRECTED BY RRFA.
3. A MINIMUM 3' RADIUS UNOBSTRUCTED WORKING AREA SHALL BE PROVIDED AROUND THE OUTSIDE OF THE HYDRANT.

MATERIALS

(A)	HYDRANT	COMPRESSION TYPE HYDRANT (SEE APPROVED MATERIALS LIST) WITH 6" MJ INLET WITH LUGS, 5 1/4" MVO, 1 1/4" PENTAGON OPERATING NUT, TWO (2) 2 1/2" NST HOSE NOZZLES, AND 4.875" SST PUMPER NOZZLE EQUIPPED WITH 5" STORZ ADAPTER AND 1/8" STAINLESS STEEL CABLE, WITH EXTENSION IF NECESSARY.
(B)	TEE	MAIN LINE TEE WITH 6" FLANGE SIDE OUTLET
(C)	VALVE	6" GATE VALVE (FLxMJ)
(D)	VALVE BOX	VALVE BOX AND LID PER STD PLAN 330.7
(E)	PIPE	CLASS 52 DI, LENGTH TO FIT
(F)	JOINT RESTRAINT	MECHANICAL JOINT RESTRAINT OR (2) 3/4" CORTEN STEEL TIE RODS FOR DISTANCES OVER ONE PIPE LENGTH
(G)	GRAVEL	1 1/4" WASHED DRAIN ROCK, MINIMUM 1' ABOVE BOOT FLANGE WITH 8-MIL POLYETHYLENE SHEETING AROUND TOP AND SIDES OF GRAVEL
(H)	CONCRETE BLOCK	MINIMUM 16"x8"x4" CONCRETE BLOCKS UNDER FIRE HYDRANT AND GATE VALVE
(I)	BLOCKING	CONCRETE BLOCKING PER STD PLAN 330.1
(J)	SHEAR BLOCK	4'x4'x6" CONCRETE SHEAR BLOCK AROUND FIRE HYDRANT WITH EXPANSION JOINT AT BACK OF SIDEWALK, FINISH TO MATCH SIDEWALK, ALL CONCRETE SHALL BE MINIMUM 3,000 PSI AND SHALL BE MECHANICALLY MIXED - JOB SITE MIXING, HAND-MIXED CONCRETE, AND MOBILE CONCRETE MIXERS ARE NOT ALLOWED.
(K)	PAVEMENT MARKER	BLUE REFLECTIVE PAVEMENT MARKER PER STD PLAN 310.3



PUBLIC WORKS
DEPARTMENT

FIRE HYDRANT ASSEMBLY

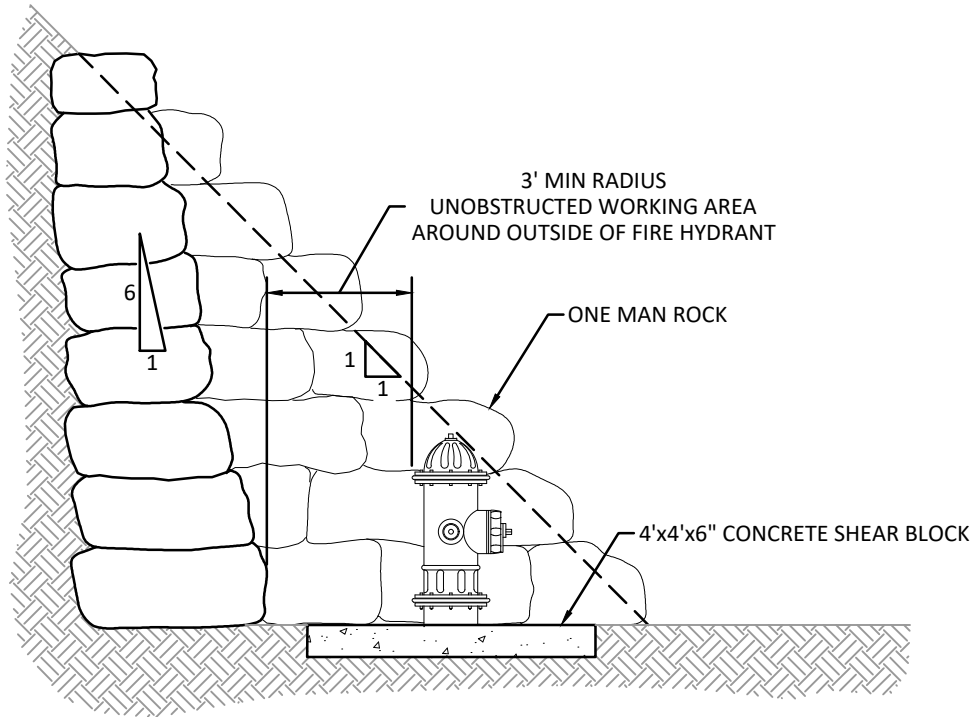
STD. PLAN - 310.1

APPROVED:

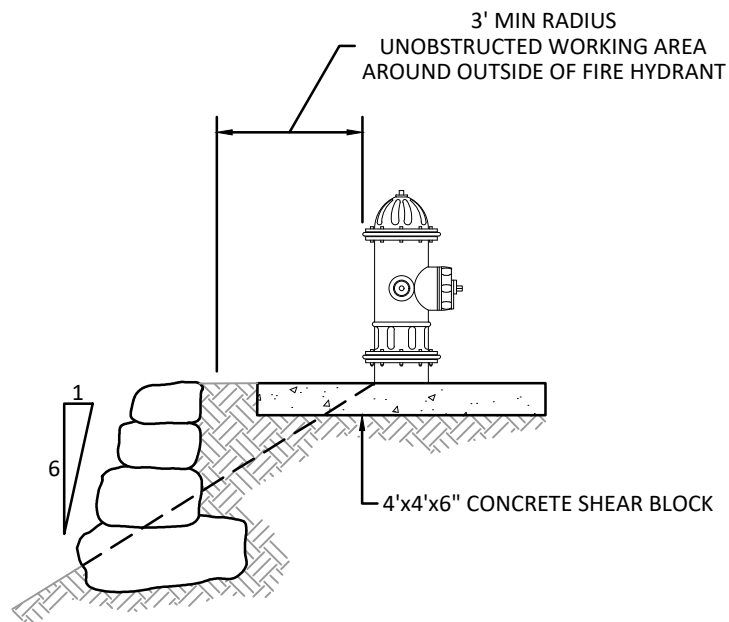
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CUT



FILL



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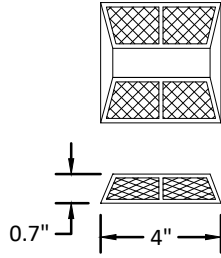
**FIRE HYDRANT ASSEMBLY
LOCATION IN CUT OR FILL**

STD. PLAN - 310.2

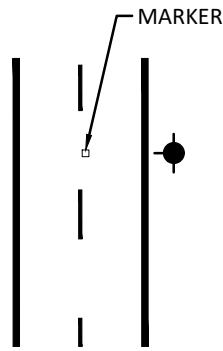
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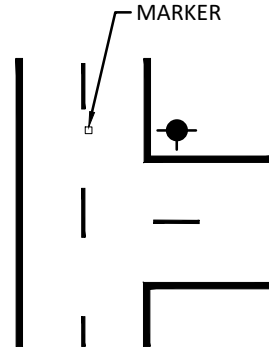
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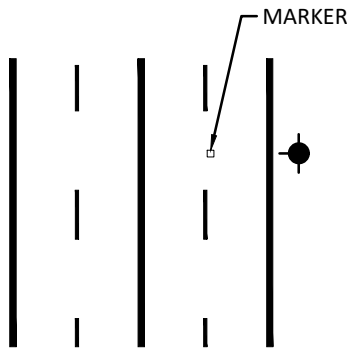
BLUE REFLECTIVE PAVEMENT MARKER,
 STIMSONITE MODEL C88 OR EQUAL,
 PLACED 4" FROM ROADWAY
 CENTERLINE AS INDICATED BELOW



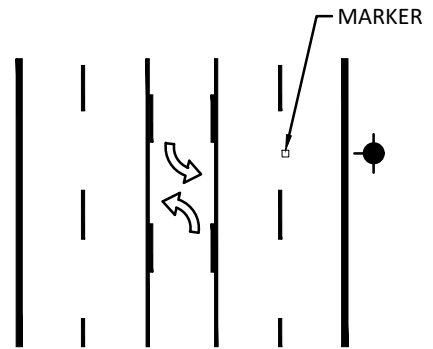
TWO LANE ROAD OFFSET MARKER



ON SIDE STREETS WHERE THE HYDRANT IS
 WITHIN 20' OF A MAJOR STREET, THE MARKER
 SHALL BE INSTALLED ON THAT MAJOR STREET



FOUR LANE ROAD OFFSET MARKER



FIVE LANE ROAD OFFSET MARKER



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 DEPARTMENT

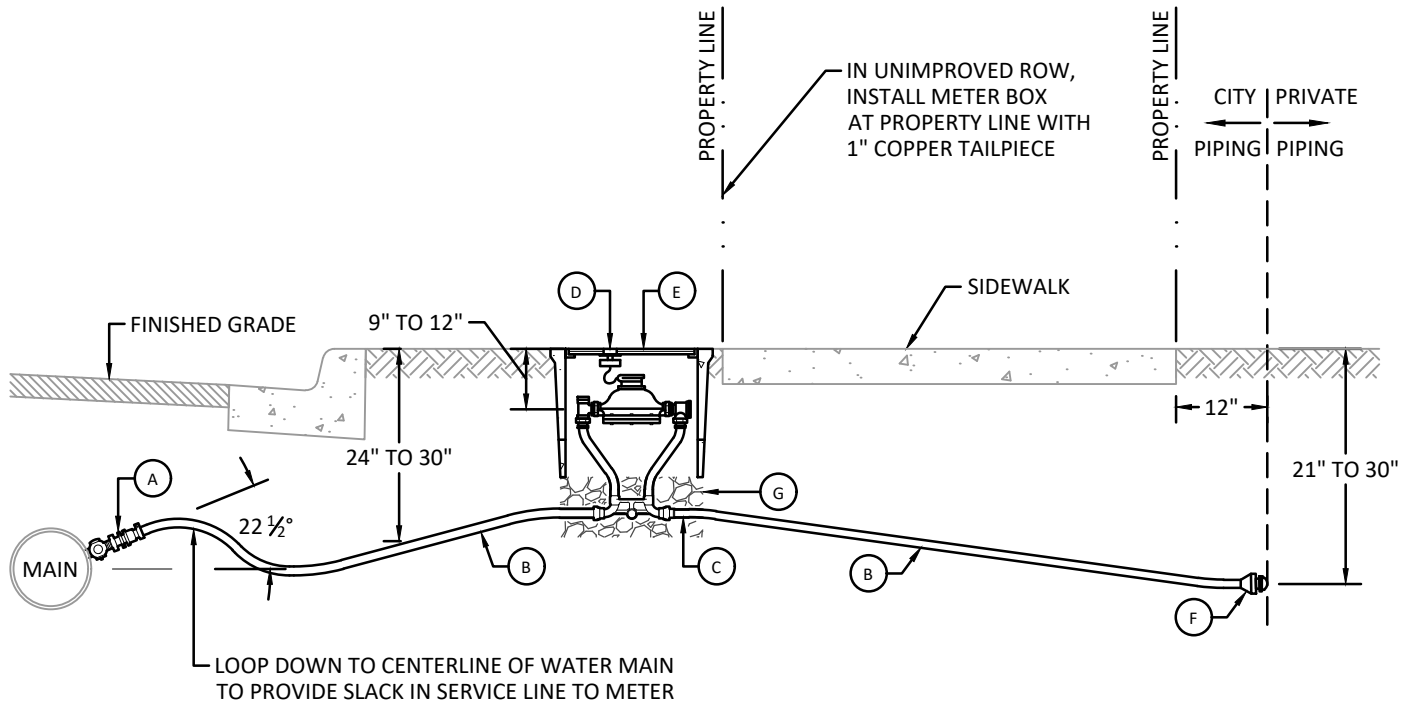
**FIRE HYDRANT ASSEMBLY
 PAVEMENT MARKER**

STD. PLAN - 310.3

APPROVED:

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 Public Works Administrator

DATE



MATERIALS

- (A) CORPORATION STOP 1" BALL CORPORATION STOP WITH BALL VALVE, AWWA TAPERED THREAD (CC) INLET, QUICK JOINT OUTLET, FORD FB1000-4-Q-NL OR A.Y. MCDONALD 74701BQ
- (B) TUBING 1" TYPE "K" SOFT COPPER TUBING
- (C) METER SETTER 1" SETTER, QUICK JOINT INLET AND OUTLET, PADLOCK WINGS ON INLET ANGLE BALL VALVE, SINGLE CHECK VALVE ON OUTLET, FORD VBH74-15W-44-44-Q-NL, A.Y. MCDONALD 721-415WCQQ 44, OR MUELLER B-24701-6AN, INSTALL CENTERED AND SQUARED IN METER BOX, PROVIDE ADAPTERS FOR 5/8"x3/4" METERS
- (D) WATER METER AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE PROVIDED BY THE CITY
- (E) METER BOX METER BOX, ARMORCAST A6001946PCX18, WITH METER BOX LID, ARMORCAST A6001969RCI-H7, TO READ "RENTON WATER"
- (F) COUPLER AND PLUG COUPLER (PACK JOINT x PACK JOINT), FORD C4#-4#-Q-NL, WITH 1" GALVANIZED PLUG IF SERVICE LINE TO PROPERTY IS TO BE INSTALLED IN THE FUTURE
- (G) GRAVEL 1 1/4" WASHED GRAVEL



PUBLIC WORKS
DEPARTMENT

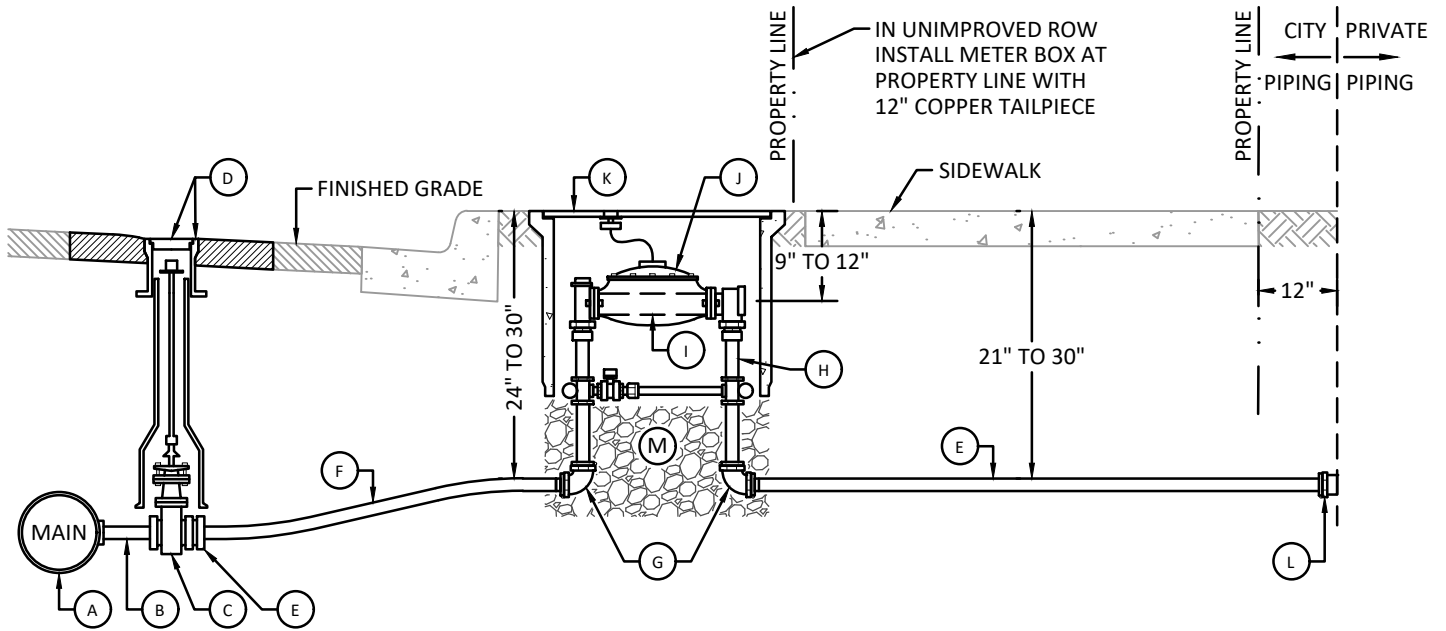
1" WATER SERVICE

STD. PLAN - 320.1

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



MATERIALS

- (A) TEE
- (B) PIPE
- (C) VALVE
- (D) VALVE BOX
- (E) COUPLING
- (F) TUBING
- (G) BEND
- (H) METER SETTER
- (I) METER SPREADER
- (J) WATER METER
- (K) METER BOX
- (L) COUPLER
- (M) GRAVEL

1 1/2" SERVICE

- 2" TAPPED REDUCING TEE (MJxFIPT)
- 2" BRASS NIPPLE (MIPT), 4" LENGTH
- 2" GATE VALVE (FIPT) WITH SQUARE OPERATING NUT AND EXTENSION PER STD PLAN 330.8
- VALVE BOX AND LID PER STD PLAN 330.8
- 2" x 1 1/2" BRASS COUPLING (MIPT x PACK JOINT), FORD C44-76-Q-NL OR EQUAL
- 1 1/2" TYPE "K" SOFT COPPER TUBING
- 1 1/2" 90° BRASS BEND (PACK JOINT x PACK JOINT OR PACK JOINT x FIPT), FORD L44-66-Q-NL OR L41-66-Q-NL OR EQUAL
- 1 1/2" VERTICAL METER SETTER WITH BYPASS, FLANGED ANGLE BALL VALVE AND PADLOCK WINGS ON INLET, ANGLE CHECK VALVE ON OUTLET, AND BALL VALVE ON BYPASS WITH PADLOCK WINGS, FORD VBH86-12B-11-66-Q-NL, A.Y. McDONALD 730B-612WDF665, OR MUELLER B-2427N (1 1/2"), BYPASS NOT PERMITTED ON IRRIGATION METERS
- 13 3/16" RIGID METER SPREADER (TEMPORARY)
- AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE SUPPLIED AND INSTALLED BY CITY FORCES
- 17"X30" METER BOX, ARMORCAST A6001640PCX18, WITH METER BOX LID, ARMORCAST A6001947RCI-H7, TO READ "RENTON WATER"
- 1 1/2" COUPLER (PACK JOINT x PACK JOINT), FORD C4#-6#-Q-NL OR EQUAL, WITH GALVANIZED PLUG IF PRIVATE SERVICE LINE IS NOT YET INSTALLED
- CRUSHED ROCK BASE TO SUPPORT METER BOX, METER BYPASS TO BE EXPOSED

2" SERVICE

- 2" TAPPED REDUCING TEE (MJxFIPT)
- 2" BRASS NIPPLE (MIPT), 4" LENGTH
- 2" GATE VALVE (FIPT) WITH SQUARE OPERATING NUT AND EXTENSION PER STD PLAN 330.8
- VALVE BOX AND LID PER STD PLAN 330.8
- 2" BRASS COUPLING (MIPT x PACK JOINT), FORD C84-77-Q-NL OR EQUAL
- 2" TYPE "K" SOFT COPPER TUBING
- 2" 90° BRASS BEND (PACK JOINT x PACK JOINT OR PACK JOINT x FIPT), FORD L44-77-Q-NL OR L41-77-Q-NL OR EQUAL
- 2" VERTICAL METER SETTER WITH BYPASS, FLANGED ANGLE BALL VALVE AND PADLOCK WINGS ON INLET, ANGLE CHECK VALVE ON OUTLET, AND BALL VALVE ON BYPASS WITH PADLOCK WINGS, FORD VBH87-12B-11-77-Q-NL, A.Y. McDONALD 730B-612WDF665, OR MUELLER B-2427N (2"), BYPASS NOT PERMITTED ON IRRIGATION METERS
- 17 3/16" RIGID METER SPREADER (TEMPORARY)
- AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE SUPPLIED AND INSTALLED BY CITY FORCES
- 17"X30" METER BOX, ARMORCAST A6001640PCX18, WITH METER BOX LID, ARMORCAST A6001947RCI-H7, TO READ "RENTON WATER"
- 2" COUPLER (PACK JOINT x PACK JOINT), FORD C4#-7#-Q-NL OR EQUAL, WITH GALVANIZED PLUG IF PRIVATE SERVICE LINE IS NOT YET INSTALLED
- CRUSHED ROCK BASE TO SUPPORT METER BOX, METER BYPASS TO BE EXPOSED



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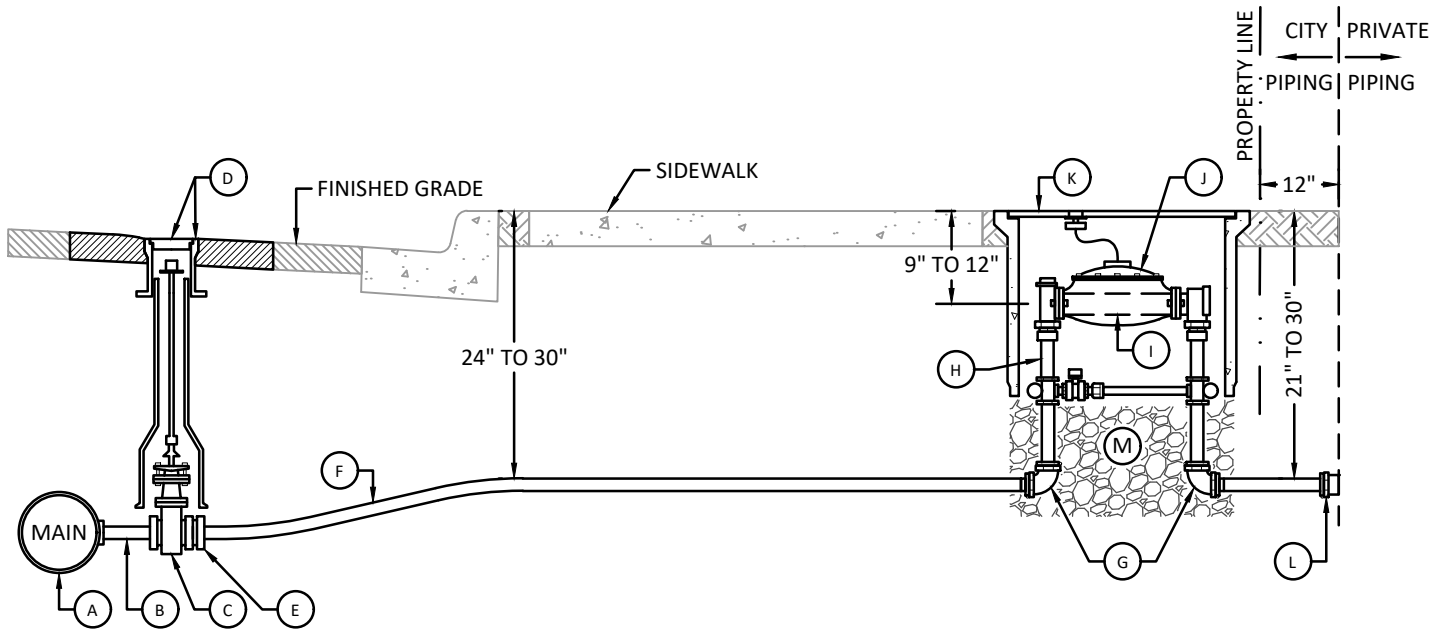
**1 1/2" AND 2" WATER SERVICE
IN PLANTING STRIP**

STD. PLAN - 320.2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



MATERIALS

- (A) TEE
- (B) PIPE
- (C) VALVE
- (D) VALVE BOX
- (E) COUPLING
- (F) TUBING
- (G) BEND
- (H) METER SETTER
- (I) METER SPREADER
- (J) WATER METER
- (K) METER BOX
- (L) COUPLER
- (M) GRAVEL

1 1/2" SERVICE

- 2" TAPPED REDUCING TEE (MJxFIPT)
- 2" BRASS NIPPLE (MIPT), 4" LENGTH
- 2" GATE VALVE (FIPT) WITH SQUARE OPERATING NUT AND EXTENSION PER STD PLAN 330.8
- VALVE BOX AND LID PER STD PLAN 330.8
- 2" x 1 1/2" BRASS COUPLING (MIPT x PACK JOINT), FORD C44-76-Q-NL OR EQUAL
- 1 1/2" TYPE "K" SOFT COPPER TUBING
- 1 1/2" 90° BRASS BEND (PACK JOINT x PACK JOINT OR PACK JOINT x FIPT), FORD L44-66-Q-NL OR L41-66-Q-NL OR EQUAL
- 1 1/2" VERTICAL METER SETTER WITH BYPASS, FLANGED ANGLE BALL VALVE AND PADLOCK WINGS ON INLET, ANGLE CHECK VALVE ON OUTLET, AND BALL VALVE ON BYPASS WITH PADLOCK WINGS, FORD VBH86-12B-11-66-Q-NL, A.Y. MCDONALD 730B-612WDF665, OR MUELLER B-2427N (1 1/2"), BYPASS NOT PERMITTED ON IRRIGATION METERS
- 13 3/16" RIGID METER SPREADER (TEMPORARY)
- AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE SUPPLIED AND INSTALLED BY CITY FORCES
- 17"X30" METER BOX, ARMORCAST A6001640PCX18, WITH METER BOX LID, ARMORCAST A6001947RCI-H7, TO READ "RENTON WATER"
- 1 1/2" COUPLER (PACK JOINT x PACK JOINT), FORD C4#-6#-Q-NL OR EQUAL, WITH GALVANIZED PLUG IF PRIVATE SERVICE LINE IS NOT YET INSTALLED
- CRUSHED ROCK BASE TO SUPPORT METER BOX, METER BYPASS TO BE EXPOSED

2" SERVICE

- 2" TAPPED REDUCING TEE (MJxFIPT)
- 2" BRASS NIPPLE (MIPT), 4" LENGTH
- 2" GATE VALVE (FIPT) WITH SQUARE OPERATING NUT AND EXTENSION PER STD PLAN 330.8
- VALVE BOX AND LID PER STD PLAN 330.8
- 2" BRASS COUPLING (MIPT x PACK JOINT), FORD C84-77-Q-NL OR EQUAL
- 2" TYPE "K" SOFT COPPER TUBING
- 2" 90° BRASS BEND (PACK JOINT x PACK JOINT OR PACK JOINT x FIPT), FORD L44-77-Q-NL OR L41-77-Q-NL OR EQUAL
- 2" VERTICAL METER SETTER WITH BYPASS, FLANGED ANGLE BALL VALVE AND PADLOCK WINGS ON INLET, ANGLE CHECK VALVE ON OUTLET, AND BALL VALVE ON BYPASS WITH PADLOCK WINGS, FORD VBH87-12B-11-77-Q-NL, A.Y. MCDONALD 730B-612WDF665, OR MUELLER B-2427N (2"), BYPASS NOT PERMITTED ON IRRIGATION METERS
- 17 3/16" RIGID METER SPREADER (TEMPORARY)
- AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE SUPPLIED AND INSTALLED BY CITY FORCES
- 17"X30" METER BOX, ARMORCAST A6001640PCX18, WITH METER BOX LID, ARMORCAST A6001947RCI-H7, TO READ "RENTON WATER"
- 2" COUPLER (PACK JOINT x PACK JOINT), FORD C4#-7#-Q-NL OR EQUAL, WITH GALVANIZED PLUG IF PRIVATE SERVICE LINE IS NOT YET INSTALLED
- CRUSHED ROCK BASE TO SUPPORT METER BOX, METER BYPASS TO BE EXPOSED



PUBLIC WORKS
DEPARTMENT

**1 1/2" AND 2" WATER SERVICE
IN ROW BEHIND SIDEWALK**

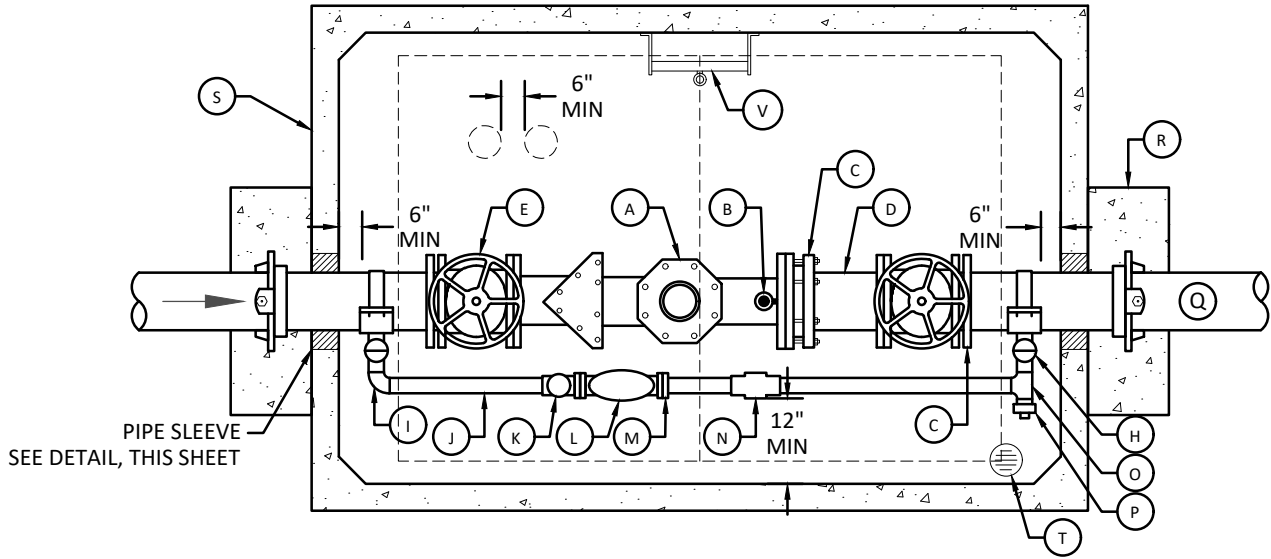
STD. PLAN - 320.3

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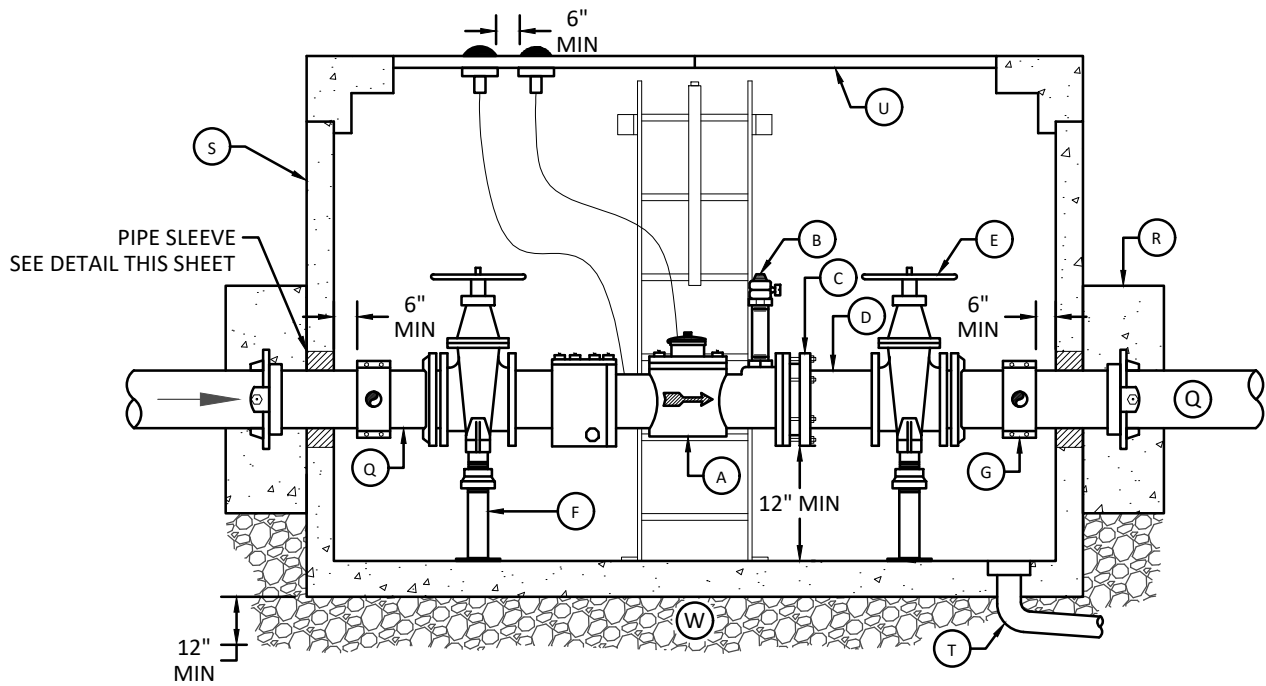
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Public Works Administrator

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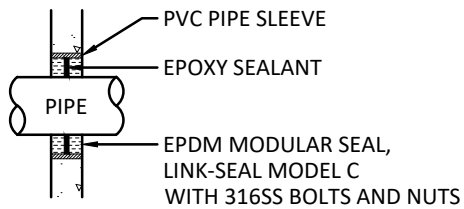
PLAN



ELEVATION



PIPE SLEEVE



PUBLIC WORKS
DEPARTMENT

3", 4", AND 6" WATER METER

STD. PLAN - 320.4 Sht. 1 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

NOTES:

1. VAULTS SHOULD NOT BE INSTALLED IN AREAS WITH VEHICLE TRAFFIC.
2. ALL INTERIOR METAL INCLUDING PIPE, VALVES, AND FITTINGS TO BE PAINTED WITH TWO COATS OF EPOXY AS APPROVED BY THE ENGINEER. USE TNAMEC SERIES 135 CHEMBUILD MODIFIED POLYAMIDE EPOXY. APPLY PER MANUFACTURERS INSTRUCTIONS.
3. VAULT AND HATCH MODELS ARE PROVIDED AS REFERENCE. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY FOR APPROVAL.
4. FOR 3" AND 4" METERS, USE 2" BYPASS MATERIALS, AND FOR 6" METERS, USE 3" BYPASS MATERIALS, AS INDICATED BELOW.
5. INSTALL WATER METER RADIO & BATTERY UNITS IN ACCESS HATCH PANELS WITH MINIMUM 6" SEPARATION.

MATERIALS

- (A) METER AMI WATER METER (SENSUS OMNI WITH INTERNAL STRAINER) WITH RADIO AND BATTERY UNIT
2" BRASS NIPPLE (MIPTxMIPT), 6" LONG, CONNECTED TO TEST PORT OF COMPOUND METER
- (B) METER TEST PORT 1" BALLCORP (MIPTxFIPT), FORD FB1700-4-NL OR EQUAL, FOR 3" METER
OR 1 1/2" BALLCORP (MIPTxFIPT), FORD FB1700-6-NL OR EQUAL, FOR 4" AND 6" METERS
2"x2 1/2" ADAPTER (MIPTxMNST)
2 1/2" CAP (FNST)
- (C) ADAPTER FLANGED COUPLING ADAPTER, MEGAFLANGE SERIES 2100, OR EQUAL
- (D) PIPE CLASS 52 DI PIPE (PExFL)
- (E) VALVE (2) GATE VALVE (FLxFL) WITH HANDWHEEL
- (F) PIPE SUPPORT ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR
- (G) SERVICE SADDLE (2) 2" NPT SADDLE, SMITH-BLAIR MODEL 313 OR EQUAL OR (2) 6"x3" TEE (MJxFL)
- (H) BYPASS VALVE (2) 2" BRASS GATE VALVE (IPT) OR (2) 3" GATE VALVE (FLxFL) WITH 3" THREADED (IPT) FLANGE
- (I) BEND (2) 2" 90° BEND OR (2) 3" 90° BEND
- (J) BYPASS PIPE 2" GALVANIZED PIPE, EPOXY COATED, OR 3" GALVANIZED PIPE, EPOXY COATED
- (K) BYPASS METER VALVE 2" STRAIGHT FLANGE BALL VALVE (FLxFIPT) WITH PADLOCK WINGS, FORD BF31-777W-NL OR EQUAL
OR 3"x2" REDUCER WITH 2" BRASS NIPPLE
- (L) BYPASS METER 2" AMI BYPASS METER WITH RADIO AND BATTERY UNIT, TO BE PROVIDED BY THE CITY
- (M) METER FLANGE 2" METER FLANGE (FLxFIPT), FORD CF31-77-NL OR EQUAL, OR 3"x2" REDUCER WITH 2" BRASS NIPPLE
- (N) UNION 2" TWO-PART UNION OR 3" TWO-PART UNION
- (O) TEE 2" TEE OR 3" TEE
- (P) BUSHING 2"x3/4" BUSHING OR 3"x3/4" BUSHING WITH 3/4" PLUG
- (Q) WATER MAIN CLASS 52 DI PIPE WITH RESTRAINED JOINTS
- (R) WALL FLANGE MIDSPAN PIPE RESTRAINT WITH CONCRETE BLOCKING PER STD PLAN 350.7
- (S) CONCRETE VAULT OLDCASTLE PRECAST VAULT, MODEL NUMBERS PER TABLE BELOW, OR EQUAL
- (T) DRAIN MINIMUM 4" PVC FLOOR DRAIN, SLOPE TO STORM DRAIN OR DAYLIGHT TO DRAINAGE DITCH WITH WIRE MESH RODENT SCREEN AT DRAIN OUTLET, SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT
- (U) ACCESS HATCH TWO LOCKING HINGED ALUMINUM DOORS, TRAFFIC-RATED, WITH SLIP-RESISTANT TREATMENT, MARKED "WATER", LW PRODUCTS MODEL NUMBERS PER TABLE BELOW, OR EQUAL.
- (V) LADDER GALVANIZED STEEL LADDER SECURED TO VAULT PER STD PLAN 350.8
- (W) GRAVEL FOUNDATION GRAVEL PER WSDOT STANDARD SPECIFICATIONS, 12" MINIMUM ALL DIRECTIONS

VAULT MODEL NUMBERS					
METER SIZE	VAULT	BASE PIECE	CENTER PIECE	TOP PIECE	ACCESS HATCH
3"	676-WA	NO. 676-BL	NO. 676-MLW	NO. 676-TL-2-332P	HHD-1C
4"	676-WA	NO. 676-BL	NO. 676-MLW	NO. 676-TL-2-332P	HHD-1C
6"	4484-LA	NO. 4484-BL	NO. 4484-ML	NO. 4484-TL-2-332P	HHD-2D



PUBLIC WORKS
DEPARTMENT

3" , 4" , AND 6" WATER METER

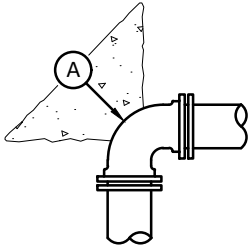
STD. PLAN - 320.4 Sht. 2 of 2

APPROVED:

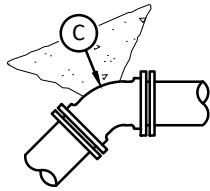
Martin Pastucha
Public Works Administrator

DATE

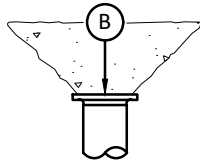
90° BEND



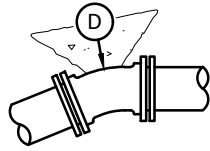
45° BEND



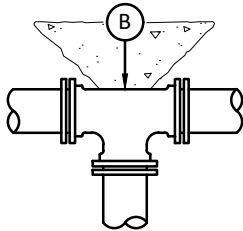
CAP / PLUG



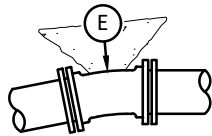
22 1/2° BEND



TEE



11 1/4° BEND



MINIMUM BEARING AREA AGAINST UNDISTURBED SOIL (SF) *

PIPE SIZE	PRESSURE (PSI)	(A)	(B)	(C)	(D)	(E)
4"	200	2/(1)	1/(NONE)	1/(NONE)	NONE	NONE
	300	3/(2)	2/(2)	2/(1)	1/(1)	NONE
6"	200	4/(3)	3/(2)	3/(1)	1/(1)	1/(NONE)
	300	6/(4)	4/(3)	3/(2)	2/(1)	1/(NONE)
8"	200	7/(5)	5/(3)	4/(3)	2/(2)	1/(1)
	300	11/(8)	8/(5)	6/(4)	3/(2)	2/(1)
10"	200	11/(8)	8/(6)	6/(4)	3/(2)	2/(1)
	275	16/(11)	11/(7)	9/(6)	5/(3)	3/(2)
12"	200	16/(11)	11/(8)	9/(6)	5/(3)	3/(2)
	250	24/(16)	17/(11)	13/(9)	7/(5)	4/(3)
14"	200	22/(13)	16/(11)	12/(8)	6/(4)	3/(2)
	250	33/(22)	23/(16)	18/(12)	9/(6)	5/(3)
16"	200	29/(19)	21/(14)	16/(11)	8/(6)	5/(3)
	225	32/(21)	23/(16)	17/(12)	9/(6)	5/(3)
18"	200	36/(24)	26/(17)	20/(13)	10/(7)	5/(4)
	200	45/(29)	32/(21)	24/(16)	13/(8)	7/(4)
20"	200	45/(29)	32/(21)	24/(16)	13/(8)	7/(4)
	200	64/(43)	46/(30)	35/(23)	18/(12)	9/(6)
24"	200	64/(43)	46/(30)	35/(23)	18/(12)	9/(6)
	200	64/(43)	46/(30)	35/(23)	18/(12)	9/(6)

* VALUES BASED ON SAFE BEARING LOAD OF 2,000/(3,000) PSF

SOIL TYPE

SAFE BEARING LOAD (PSF)

MUCK OR PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND AND GRAVEL	3,000
CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

NOTES:

1. MINIMUM BEARING AREA MUST BE ADJUSTED FOR PIPE SIZE, PRESSURE, AND SOIL CONDITIONS.
2. FITTINGS SHALL BE POLYWRAPPED PRIOR TO POURING CONCRETE BLOCKING.
3. CONCRETE BLOCKING SHALL BE CAST IN PLACE AND SHALL HAVE A MINIMUM OF 0.25 SF BEARING AREA AGAINST THE FITTING.
4. CONCRETE BLOCKING SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING JOINT.
5. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL HYDROSTATIC TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
6. ALL CONCRETE SHALL BE MECHANICALLY MIXED. JOB SITE MIXING, HAND-MIXED CONCRETE, AND MOBILE CONCRETE MIXERS ARE NOT ALLOWED.
7. IN MUCK OR PEAT, ALL THRUSTS SHALL BE RESTRAINED BY PILES OR TIE RODS TO SOLID FOUNDATION OR MUCK OR PEAT SHALL BE REMOVED AND REPLACED WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THRUST.
8. CONCRETE BLOCKING SHALL BE LEFT OPEN OR SHEETED FOR MINIMUM 24 HOURS.



PUBLIC WORKS DEPARTMENT

CONCRETE BLOCKING FOR HORIZONTAL FITTINGS

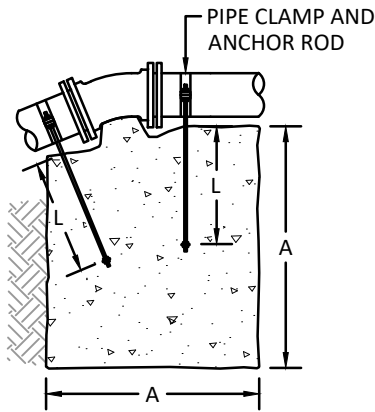
STD. PLAN - 330.1

APPROVED:

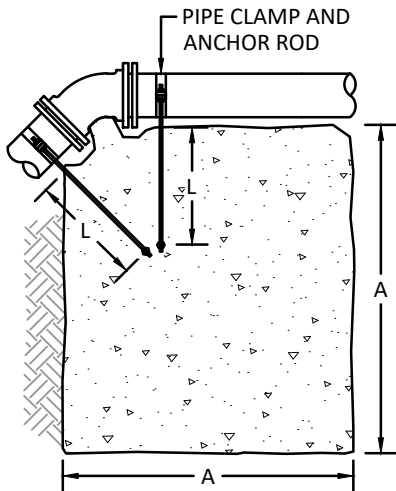
Martin Pastucha
Public Works Administrator

DATE

11 ¼° AND 22 ½° BENDS



45° BEND



PIPE SIZE	BEND	MINIMUM DIMENSIONS			
		VOLUME (CF)	A	D *	L
4"	11 ¼°	8	2.0'	¾"	1.5'
	22 ½°	11	2.2'		2.0'
	45°	30	3.1'		
6"	11 ¼°	11	2.2'	¾"	2.0'
	22 ½°	25	2.9'		
	45°	68	4.1'		
8"	11 ¼°	16	2.5'	¾"	2.0'
	22 ½°	47	3.6'		
	45°	123	5.0'		
12"	11 ¼°	32	3.2'	¾"	2.0'
	22 ½°	88	4.5'		3.0'
	45°	232	6.1'		2.5'
16"	11 ¼°	70	4.1'	1"	3.0'
	22 ½°	184	5.7'		1 ⅛"
	45°	478	7.8'		
20"	11 ¼°	91	4.5'	1 ¼"	3.0'
	22 ½°	225	6.1'		4.0'
	45°	560	8.2'		
24"	11 ¼°	128	5.0'	1 ¼"	3.5'
	22 ½°	320	6.8'		1 ⅜"
	45°	820	9.4'		

* D = ANCHOR ROD DIAMETER

NOTES:

1. CONCRETE BLOCKING SIZES BASED ON 200 PSI HYDROSTATIC PRESSURE AND 3,000 PSI CONCRETE.
2. ALL CONCRETE SHALL BE MECHANICALLY MIXED. JOB SITE MIXING, HAND-MIXED CONCRETE, AND MOBILE CONCRETE MIXERS ARE NOT ALLOWED.
3. PIPE CLAMPS AND ANCHOR RODS SHALL BE INSTALLED PER STD PLAN 330.4.
4. FITTINGS SHALL BE POLYWRAPPED AFTER INSTALLATION OF PIPE CLAMPS AND ANCHOR RODS PRIOR TO POURING CONCRETE BLOCKING.
5. WATER MAIN SHALL NOT BE PRESSURIZED UNTIL ALL TRENCHING WITHIN 100' OF VERTICAL BEND IS BACKFILLED AND COMPACTED TO MINIMUM 3' COVER.
6. CONCRETE BLOCKING SHALL BE LEFT OPEN OR SHEETED FOR MINIMUM 24 HOURS.



PUBLIC WORKS
DEPARTMENT

CONCRETE BLOCKING FOR VERTICAL FITTINGS

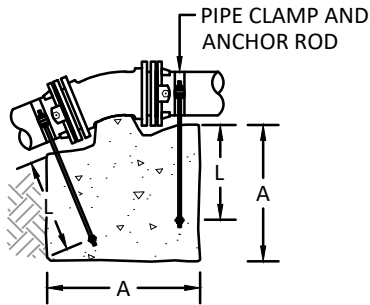
STD. PLAN - 330.2

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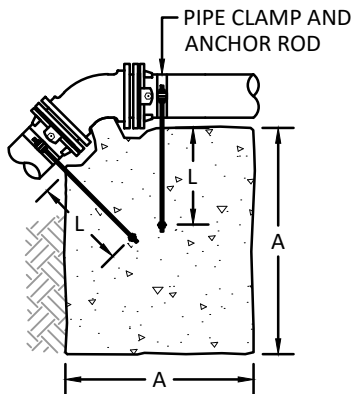
Martin Pastucha
Public Works Administrator

DATE

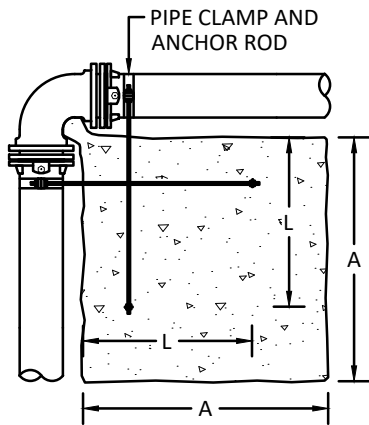
11 1/4° AND 22 1/2° BENDS



45° BEND



90° BEND



NOTES:

1. NO CHANGE IN PIPE DIRECTION OR DIAMETER SHALL OCCUR WITHIN 36' OF THE VERTICAL BEND. BENDS, TEES, REDUCERS, ETC. BEYOND THE 36' LIMIT MAY BE RESTRAINED BY STANDARD CONCRETE BLOCKING PER STD PLANS 330.1 AND 330.2.
2. FITTINGS SHALL BE POLYWRAPPED AFTER INSTALLATION OF PIPE CLAMPS AND ANCHOR RODS PRIOR TO POURING CONCRETE BLOCKING.
3. PIPE CLAMPS AND ANCHOR RODS SHALL BE INSTALLED PER STD PLAN 330.4.
4. JOINT RESTRAINT SHALL BE MEGALUG SERIES 1100 OR EQUAL.
5. WATER MAIN SHALL NOT BE PRESSURIZED UNTIL ALL TRENCHING WITHIN 100' OF VERTICAL BEND IS BACKFILLED AND COMPACTED TO MINIMUM 3' COVER.
6. 90° VERTICAL BENDS SHALL ONLY BE INSTALLED WHERE GIVEN PRIOR APPROVAL BY THE CITY.
7. ALL CONCRETE SHALL BE MECHANICALLY MIXED. JOB SITE MIXING, HAND-MIXED CONCRETE, AND MOBILE CONCRETE MIXERS ARE NOT ALLOWED.
8. BACKFILL TRENCH BEYOND 90° VERTICAL BLOCK WITH CRUSHED SURFACING TOP COURSE MATERIAL COMPACTED TO 95% MDD. CRUSHED BACKFILL SHALL EXTEND 20' BEYOND BLOCK OR TO FIRM BEARING TRENCH WALL, WHICHEVER IS LESS.
9. CONCRETE BLOCKING SHALL BE LEFT OPEN OR SHEETED FOR MINIMUM 24 HOURS.

PIPE SIZE	BEND	MINIMUM DIMENSIONS							
		VOLUME (CF)	A	D*	L				
4"	11 1/4°	BLOCKING NOT REQUIRED							
	22 1/2°								
	45°								
	90°	16	2.5'	3/4"	2.0'				
6"	11 1/4°	BLOCKING NOT REQUIRED							
	22 1/2°								
	45°					13	2.3'	3/4"	2.0'
	90°	43	3.5'	3/4"	2.0'				
8"	11 1/4°	BLOCKING NOT REQUIRED							
	22 1/2°								
	45°					33	3.2'	3/4"	2.0'
	90°	86	4.4'	3/4"	2.0'				
10"	11 1/4°	BLOCKING NOT REQUIRED							
	22 1/2°					13	2.3'	3/4"	2.0'
	45°					64	4.0'	3/4"	2.0'
	90°	141	5.2'	1"	3.5'				
12"	11 1/4°	BLOCKING NOT REQUIRED							
	22 1/2°					20	2.7'	3/4"	2.0'
	45°					111	4.8'	3/4"	2.0'
	90°	206	5.9'	1 1/8"	4.0'				

* D = ANCHOR ROD DIAMETER

MINIMUM DIMENSIONS BASED ON FOLLOWING CONDITIONS:

- PIPE RESTRAINED MINIMUM 36' ON EACH SIDE OF BEND
 - SAFE BEARING LOAD = 1,000 SF
 - CONCRETE STRENGTH = 3,000 PSI
 - CONCRETE WEIGHT = 150 PCF
 - HYDROSTATIC PRESSURE = 200 PSI
 - TRENCH = TYPE 2 FLAT BOTTOM TRENCH WITH LIGHTLY CONSOLIDATED BACKFILL PER ANSI/AWWA C150/A21.50
 - FACTOR OF SAFETY = 1.5
 - SOIL FRICTIONAL RESISTANCE BASED ON COHESIVE GRANULAR SOIL (GC+SC), SAND, GRAVEL, CLAY MIXTURE
- CONCRETE BLOCKING DESIGN MUST BE ADJUSTED FOR VARIANCES IN ANY OF THESE CONDITIONS.



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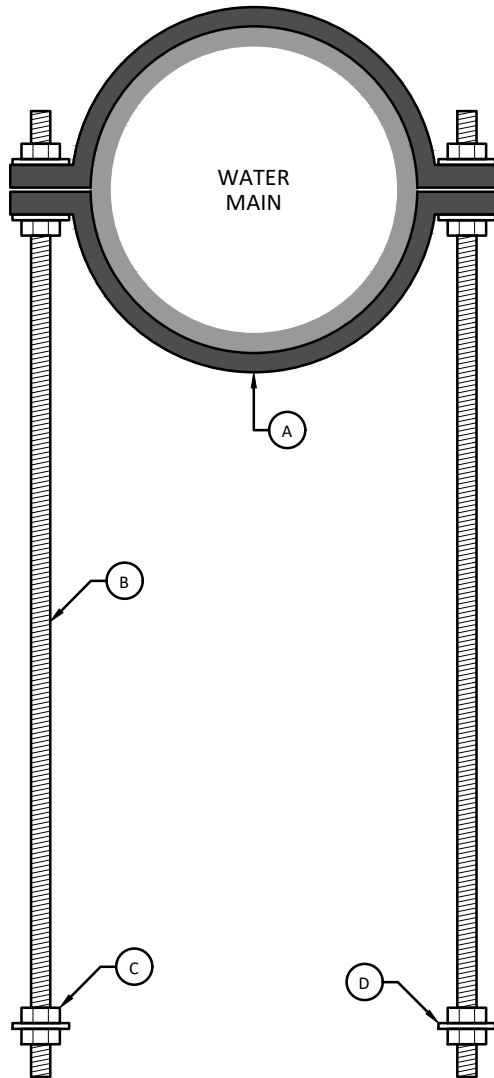
CONCRETE BLOCKING FOR VERTICAL FITTINGS WITH RESTRAINED JOINTS

STD. PLAN - 330.3

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



MATERIALS

- (A) PIPE CLAMP HEAVY DUTY HOT-DIPPED GALVANIZED PIPE CLAMP, COOPER B-LINE B3132 OR EQUAL, WITH OPENINGS TO ACCOMMODATE ANCHOR ROD DIAMETER
- (B) ANCHOR ROD ALL-THREAD ROD, ASTM A242 CORTEN, ZINC-PLATED OR HOT-DIPPED GALVANIZED, SIZE PER STD PLAN 330.2 AND STD PLAN 330.3
- (C) NUT HEAVY HEX NUT, ASTM A563 GRADE C3 OR ZINC-PLATED, SIZE TO MATCH ANCHOR ROD DIAMETER, TIGHTEN TOP NUTS TO TENSION BOLTS AND LOWER NUTS TO COMPRESS CLAMP SNUG
- (D) WASHER ROUND FLAT STRUCTURAL WASHER, ASTM F436 ZINC-PLATED OR HOT-DIPPED GALVANIZED, SIZE TO MATCH ANCHOR ROD DIAMETER



PUBLIC WORKS
DEPARTMENT

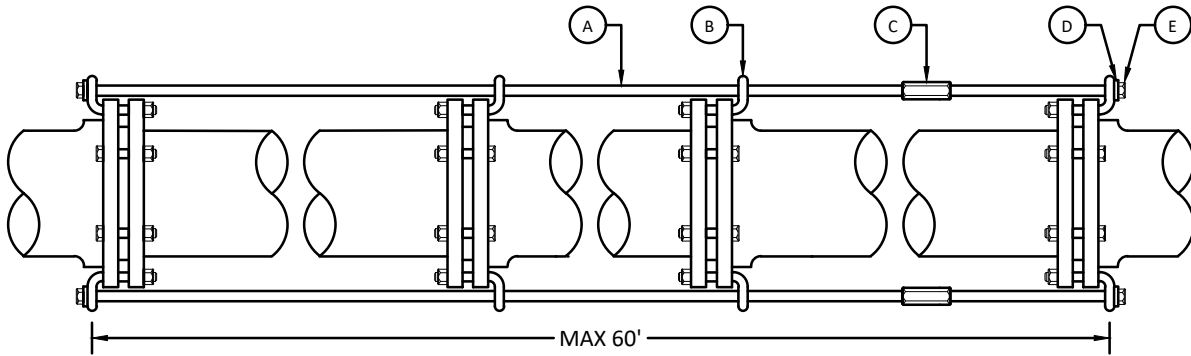
**CONCRETE BLOCKING
PIPE CLAMP AND ANCHOR RODS**

STD. PLAN - 330.4

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. SHACKLE RODS SHALL BE USED AS A JOINT RESTRAINT SYSTEM WHERE INDICATED IN THE PLANS OR SPECIFICATIONS OR WHERE OTHERWISE REQUIRED BY THE ENGINEER.
2. INSTALL THE JOINT RESTRAINT SYSTEM IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS TO ENSURE ALL JOINTS ARE MECHANICALLY LOCKED TOGETHER.
3. EYE BOLTS SHALL BE INSTALLED TO PULL AGAINST THE MJ BODY AND NOT THE MJ FOLLOWER. TORQUE NUTS AT 75-90 FT-LB.
4. INSTALL RODS AT EQUAL THREAD DEPTH INTO COUPLING NUTS. ARRANGE RODS SYMMETRICALLY AROUND THE PIPE.
5. WHERE A MJ VALVE OR FITTING IS SUPPLIED WITH SLOTS FOR "T" BOLTS INSTEAD OF HOLES, AN ADAPTER (FLXMJ) SHALL BE USED TO PROVIDE ADEQUATE SPACE FOR TIE BOLT INSTALLATION.
6. NO RUN OF RESTRAINED PIPE SHALL BE GREATER THAN 60' IN LENGTH BETWEEN FITTINGS. INSTALL LONG BODY SLEEVES WHERE A CONTINUOUS RUN OF PIPE GREATER THAN 60' IS REQUIRED TO BE RESTRAINED.
7. CONTINUOUSLY RESTRAINED RUNS SHALL USE MJ PIPE WITH EYE BOLTS INSTALLED AS ROD GUIDES AT EACH JOINT.

MATERIALS

(A) ROD 3/4" ALL-THREAD ROD, ASTM A242 CORTEN, ZINC-PLATED OR HOT-DIPPED GALVANIZED, SIZE AS FOLLOWS:

MAIN DIAMETER	NUMBER OF RODS
4", 6"	2
8", 10", 12"	4
16", 18"	8
20"	10

(B) EYE BOLT 3/4" 90° EYE BOLT, CORTEN, WITH EYE TO ACCOMMODATE 3/4" ROD, ROMAC OR EQUAL

(C) COUPLING NUT 3/4" FULL HEX COUPLING NUT WITH CENTER STOP, ASTM A563 GRADE C3 OR ZINC-PLATED, OR ASTM A563 GRADE A HOT-DIPPED GALVANIZED (IF C3 NOT AVAILABLE)

(D) WASHER 3/4" ROUND FLAT STRUCTURAL WASHER, ASTM F436 ZINC-PLATED OR HOT-DIPPED GALVANIZED

(E) NUT 3/4" HEAVY HEX NUT, ASTM A563 GRADE C3 OR ZINC-PLATED



PUBLIC WORKS
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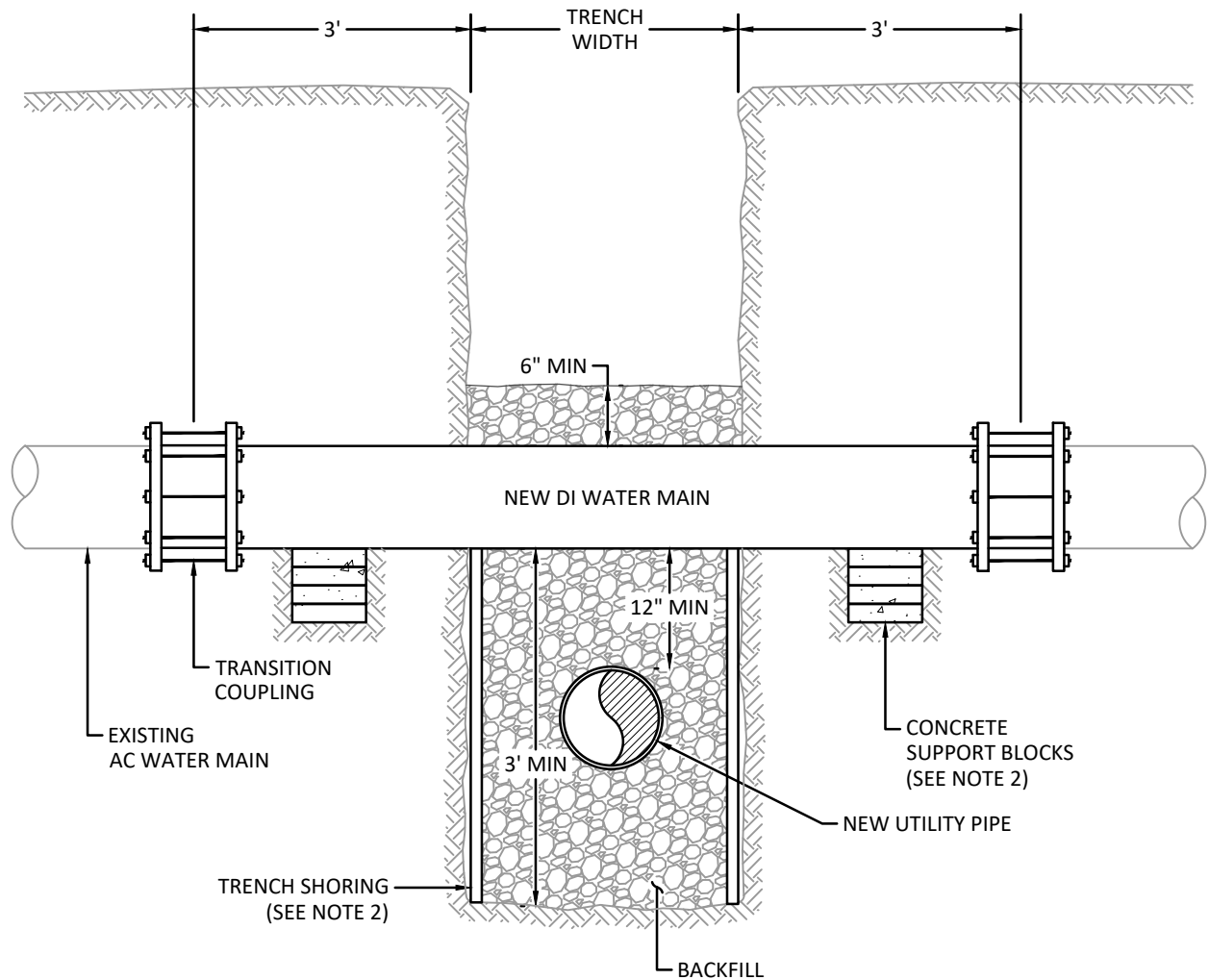
**SHACKLE ROD
JOINT RESTRAINT SYSTEM**

STD. PLAN - 330.5

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. NEW WATER MAIN SHALL BE CLASS 52 DI PIPE WITH 8-MIL POLYETHYLENE ENCASEMENT AROUND PIPE AND TRANSITION COUPLINGS IN ACCORDANCE WITH AWWA C105.
2. NEW WATER MAIN SHALL BE SUPPORTED BY FIRM BEARING EARTH. INSTALL CONCRETE BLOCKS (8"x16"x2") UNDER NEW WATER MAIN AS REQUIRED OR SHORE TRENCH WALL UNDER WATER MAIN AS SHOWN.
3. AC PIPE SHALL BE CUT WITH A HAND-OPERATED CARBIDE BLADE CUTTER WITH CONTROLLED FLOWING WATER.
4. AC PIPE SEGMENTS SHALL BE FILLED WITH CDF AND LEFT TO BE BURIED IN THE TRENCH.
5. CONTAMINATED CLOTHING SHALL BE LEFT AND BURIED IN TRENCH, OR TRANSPORTED IN SEALED IMPERMEABLE BAGS AND LABELED IN ACCORDANCE WITH WAC 296-62-07721.
6. ALL WORK ON AC PIPE SHALL BE PERFORMED BY A LICENSED ASBESTOS ABATEMENT CONTRACTOR.
7. THE CONTRACTOR IS REQUIRED TO MAINTAIN WORKERS' EXPOSURE TO ASBESTOS MATERIAL AT OR BELOW THE LIMIT PRESCRIBED IN WAC 296-62-07705.



PUBLIC WORKS
DEPARTMENT

**ASBESTOS CEMENT WATER MAIN
REPLACEMENT AT NEW UTILITY CROSSING**

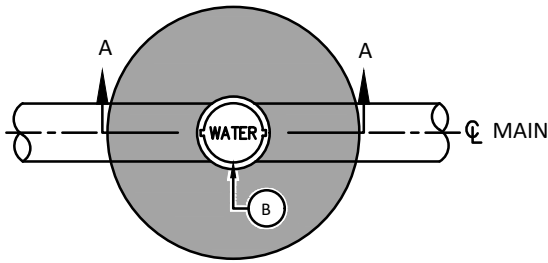
STD. PLAN - 330.6

APPROVED:

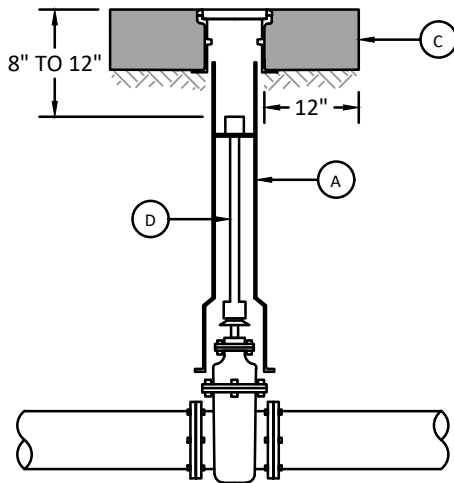
Martin Pastucha
Public Works Administrator

DATE

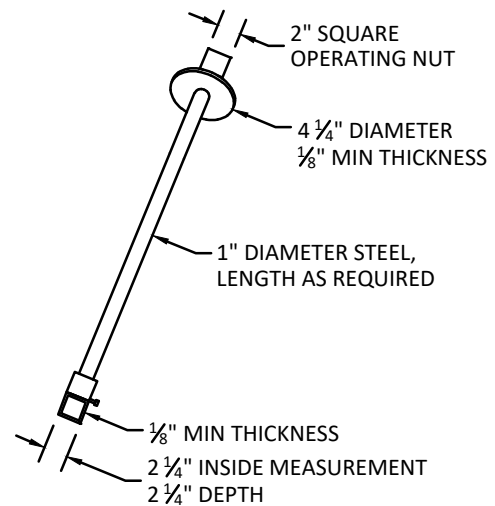
VALVE BOX AND LID



SECTION A-A



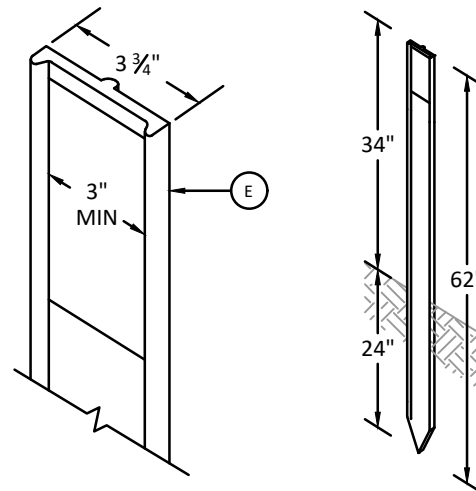
VALVE OPERATING NUT EXTENSION



NOTES:

- EXTENSIONS ARE REQUIRED WHEN VALVE NUT IS MORE THAN 3' BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF 1' LONG. ONLY ONE EXTENSION TO BE USED PER VALVE.
- ALL EXTENSIONS ARE TO BE MADE OF STEEL, SIZED AS NOTED, AND PAINTED WITH TWO COATS OF METAL PAINT.

VALVE MARKER POST



NOTES:

- VALVE MARKER POST TO BE USED FOR ALL MAIN LINE VALVES OUTSIDE PAVED AREAS.
- DISTANCE TO VALVE SHALL BE NEATLY STENCILED ON THE POST WITH 2" NUMERALS.

MATERIALS

- | | | |
|-----|-------------------------|--|
| (A) | VALVE BOX | TWO-PIECE VALVE BOX WITH REGULAR BASE SECTION TO FIT AND STANDARD 8" TOP SECTION, OLYMPIC FOUNDRY INC 940 OR RICH #045 (NON-LOCKING) |
| (B) | VALVE BOX LID | COVER TO MATCH VALVE BOX MANUFACTURER, TO READ "WATER", WITH EARS IN DIRECTION OF WATER MAIN |
| (C) | HMA COLLAR | 8" THICK HMA FOR VALVE IN PAVED AREA OR 3'x3'x6" CONCRETE PAD IN UNPAVED AREA |
| (D) | OPERATING NUT EXTENSION | SEE DETAIL, THIS SHEET |
| (E) | MARKER POST | WHITE MARKER POST WITH ANCHOR BARB AND BLUE LABEL TO READ "WATER", CARSONITE UTILITY MARKER CRM3-066-08 OR EQUAL |



PUBLIC WORKS
DEPARTMENT

VALVE BOX, OPERATING NUT EXTENSION, AND MARKER POST

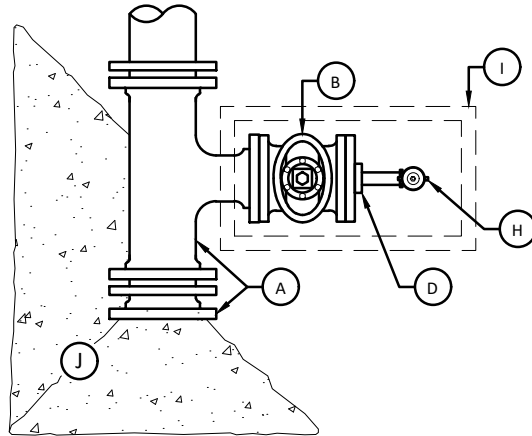
STD. PLAN - 330.7

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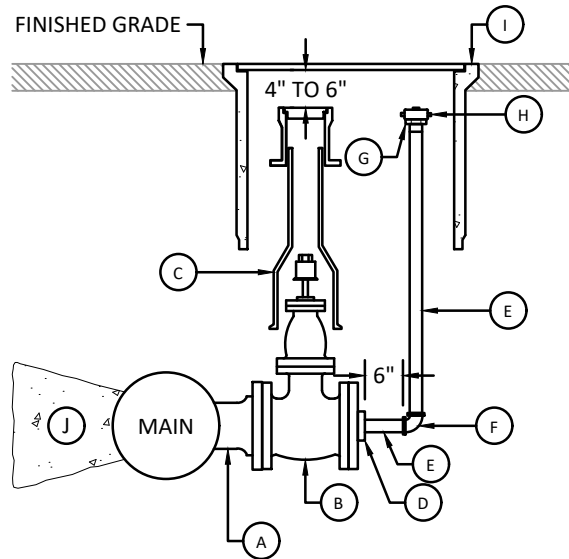
Martin Pastucha
Public Works Administrator

DATE

PLAN



PROFILE



MATERIALS

<p>(A) TEE</p> <p>(B) GATE VALVE</p> <p>(C) VALVE BOX AND LID</p> <p>(D) FLANGE</p> <p>(E) PIPE</p> <p>(F) BEND</p> <p>(G) ADAPTER</p> <p>(H) CAP</p> <p>(I) METER BOX AND LID</p> <p>(J) BLOCKING</p>	<p>MAIN LINE TEE WITH 4" SIDE OUTLET (MJxFL) WITH PLUG (MJ)</p> <p>4" GATE VALVE WITH 2" SQUARE OPERATING NUT AND VALVE OPERATING NUT EXTENSION AS REQUIRED PER STD PLAN 330.1</p> <p>VALVE BOX AND LID PER STD PLAN 330.8</p> <p>4"x2" TAPPED FLANGE (FLxFIPT)</p> <p>2" BRASS OR BRONZE NIPPLE, LENGTH TO FIT</p> <p>2" 90° BRASS BEND (FIPT x PACK JOINT), FORD C14-77-Q-NL OR EQUAL</p> <p>2"x2 1/2" BRASS ADAPTER (FIPTxMNST)</p> <p>2 1/2" CAP (FNST) WITH GASKET, NOT VENTED</p> <p>METER BOX, ARMORCAST A6001640PCX18, WITH METER BOX LID, ARMORCAST A6001947RCI-H7, TO READ "RENTON WATER", EXPANSION JOINTS MUST BE INSTALLED 12" MINIMUM ON BOTH SIDES OF METER BOX</p> <p>CONCRETE BLOCKING PER STD PLAN 330.1</p>
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PUBLIC WORKS
DEPARTMENT

**2" BLOW-OFF ASSEMBLY
(PERMANENT)**

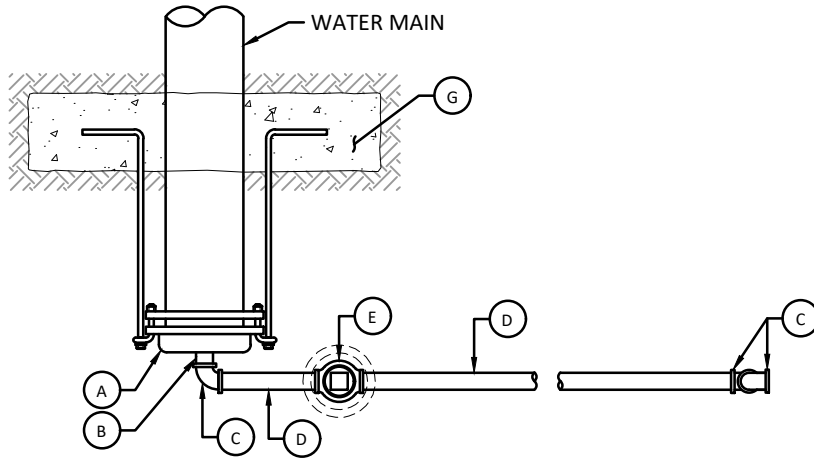
STD. PLAN - 340.1

APPROVED:

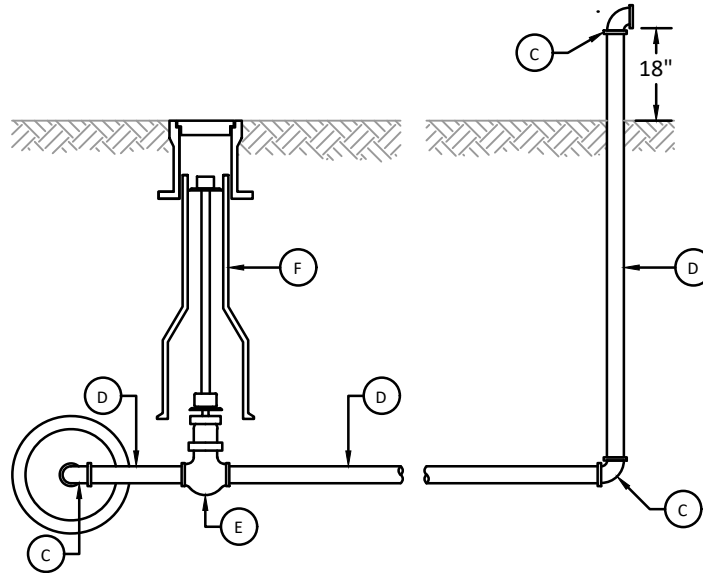
Martin Pastucha
Public Works Administrator

DATE

PLAN



PROFILE



MATERIALS

- | | | |
|-----|-------------------|---|
| (A) | PLUG OR CAP | MAIN LINE PLUG OR CAP WITH 2" TAP (FIPT) |
| (B) | PIPE | 2" CLOSE NIPPLE |
| (C) | BEND | 2" 90° BRASS BEND (FIPTxFIPT) |
| (D) | PIPE | 2" BRASS OR BRONZE NIPPLE, LENGTH TO FIT |
| (E) | GATE VALVE | 2" GATE VALVE (FIPTxFIPT) WITH SQUARE OPERATING NUT AND VALVE OPERATING NUT EXTENSION AS REQUIRED PER STD PLAN 330.1 |
| (F) | VALVE BOX AND LID | VALVE BOX AND LID PER STD PLAN 330.8 |
| (G) | BLOCKING | CONCRETE DEAD MAN BLOCKING WITH SHACKLE RODS TO CAP, BLOCK SHALL BE POURED AGAINST UNDISTURBED EARTH, SIZE OF BLOCK TO BE DETERMINED BASED ON TEST PRESSURE OF WATER LINE AND SOIL CHARACTERISTICS. |



PUBLIC WORKS
DEPARTMENT

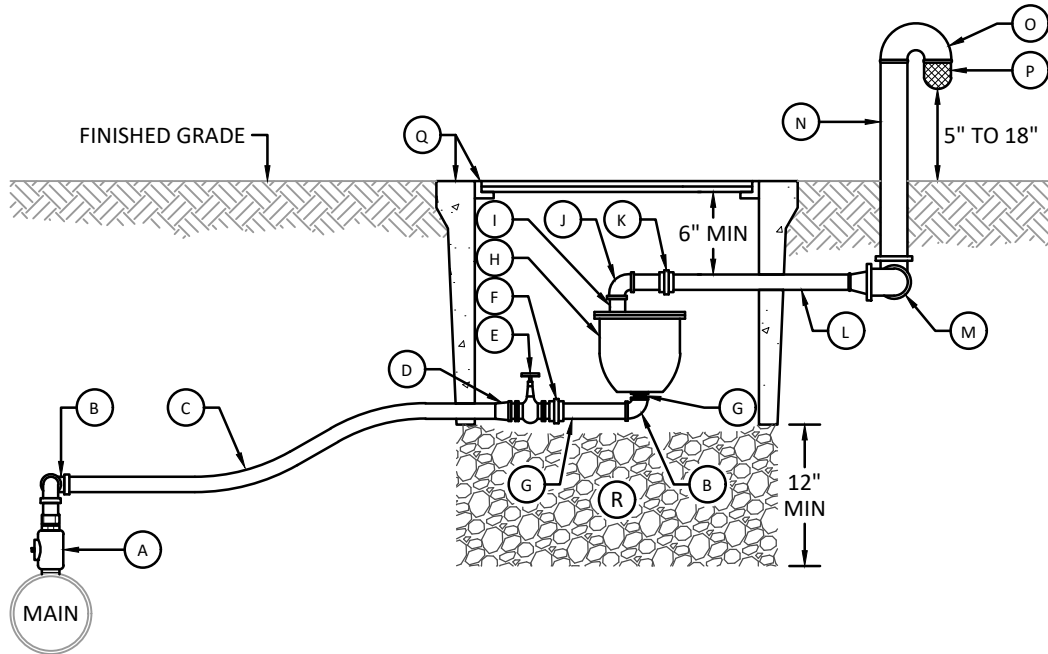
**2" BLOW-OFF ASSEMBLY
(TEMPORARY)**

STD. PLAN - 340.2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. AIR AND VACUUM RELEASE VALVE ASSEMBLY MUST BE INSTALLED AT THE HIGHEST POINT IN THE WATER MAIN. IF THE HIGH POINT FALLS IN A LOCATION WHERE THE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH OF MAIN TO CREATE THE HIGH POINT AT A LOCATION WHERE THE ASSEMBLY CAN BE INSTALLED.
2. LOCATE METER BOX OUTSIDE OF TRAFFIC AREAS, BEHIND THE CURB.

MATERIALS

(A)	CORPORATION STOP	1" BALLCORP WITH AWWA TAPERED (CC) INLET AND COPPER THREAD OUTLET, FORD FB600-4-NL OR EQUAL
(B)	SWING JOINT	1" BRASS SWING JOINT
(C)	PIPE	1" TYPE "K" SOFT COPPER TUBING
(D)	COUPLING	1" STRAIGHT COUPLING (MIPT x PACK JOINT), FORD C84-44, MUELLER H15428, OR EQUAL
(E)	GATE VALVE	1" BRONZE GATE VALVE, THREADED, RED-WHITE VALVE NO. 280, OHIO BRASS NO. 2500, OR EQUAL
(F)	UNION	1" BRASS UNION
(G)	PIPE	1" BRASS NIPPLE
(H)	AIR & VACUUM RELEASE VALVE ASSEMBLY	1" AIR AND VACUUM RELEASE VALVE ASSEMBLY, APCO NO. 143-C, VAL-MATIC NO. 201-C, OR CRISPIN UL10, OR EQUAL
(I)	PIPE	1" GALVANIZED IRON NIPPLE
(J)	BEND	1" 90° GALVANIZED IRON BEND
(K)	UNION	1" GALVANIZED IRON UNION
(L)	PIPE	1" GALVANIZED IRON PIPE, LENGTH TO FIT
(M)	SWING JOINT	(1) 2"x1" BELL REDUCER (2) 2" 90° STREET ELLS
(N)	PIPE	2" GALVANIZED IRON PIPE, LENGTH TO FIT, FIELD LOCATE
(O)	BEND	2" 180° RETURN BEND, OPEN PATTERN
(P)	STRAINER	2" BEEHIVE STRAINER
(Q)	METER BOX AND LID	METER BOX, ARMORCAST A6001946PCX18, WITH METER BOX LID, ARMORCAST A6001969RCI-H7, TO READ "RENTON WATER"
(R)	GRAVEL	1 ¼" WASHED GRAVEL



PUBLIC WORKS
DEPARTMENT

**1" AIR AND VACUUM RELEASE
VALVE ASSEMBLY**

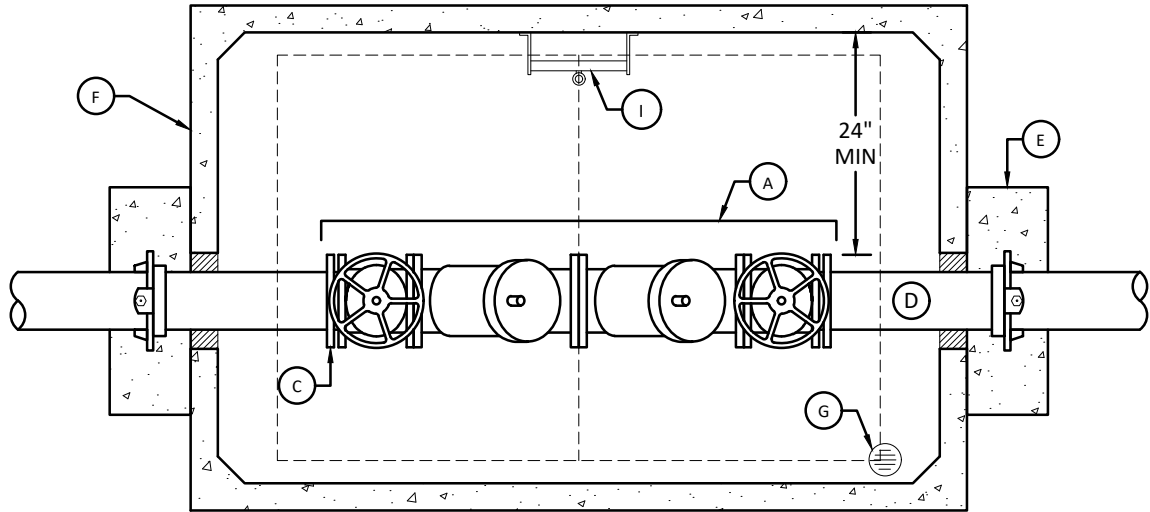
STD. PLAN - 340.3

APPROVED:

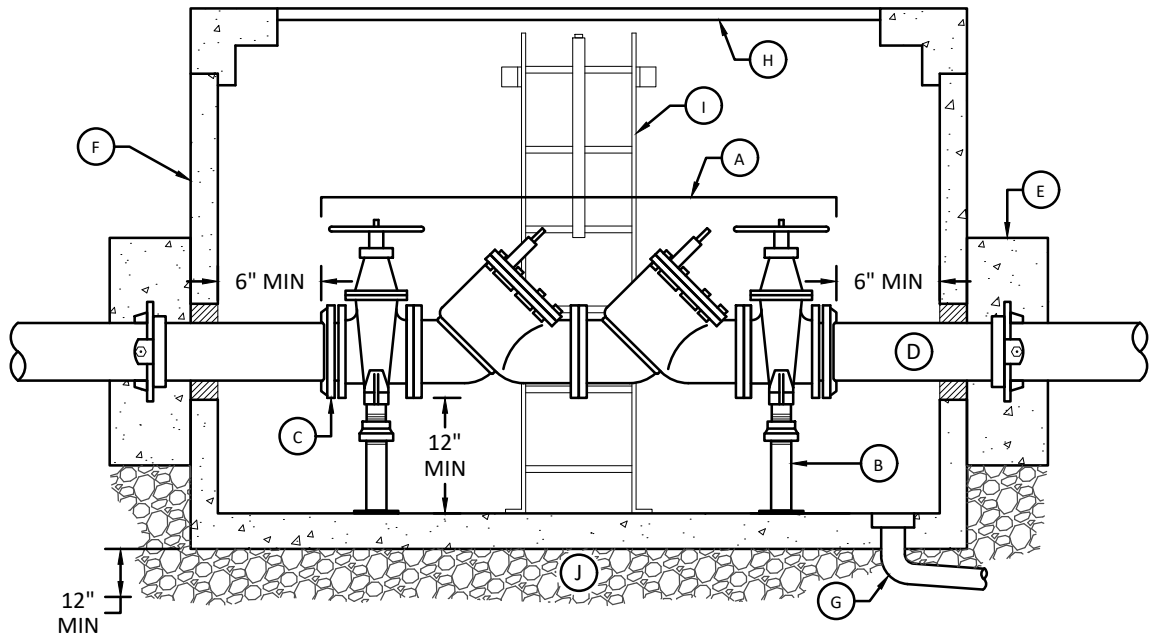
Martin Pastucha
Public Works Administrator

DATE

PLAN



ELEVATION



PUBLIC WORKS
DEPARTMENT

**3" TO 10" DCVA
VAULT INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

STD. PLAN - 350.1 Sht. 1 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

NOTES:

1. THE DCVA MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE DCVA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. VAULTS SHALL NOT BE INSTALLED IN AREAS WITH VEHICLE TRAFFIC.
4. VAULT AND HATCH MODELS ARE PROVIDED AS REFERENCE. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY FOR APPROVAL.
5. TEE AND GATE VALVE REQUIRED ON MAIN.
6. PROVIDE MINIMUM 2' OF LEVEL, UNOBSTRUCTED AREA AROUND HATCHES.
7. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER WITH DESIGNATION OF RESILIENT SEAT: SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS OF EPOXY OR EQUIVALENT POLYMERIZED COATING.

MATERIALS

- | | |
|--|--|
| <ul style="list-style-type: none"> (A) DOUBLE CHECK VALVE ASSEMBLY (B) PIPE SUPPORT (C) ADAPTER (D) WATER MAIN (E) WALL FLANGE (F) CONCRETE VAULT (G) DRAIN (H) ACCESS HATCH (I) LADDER (J) GRAVEL | <p>LINE-SIZED WASHINGTON STATE-APPROVED DCVA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS, DCVA SHALL BE INSTALLED EQUIDISTANT FROM THE ENDS OF THE CONCRETE VAULT, TWO (2) VALVE SUPERVISORY SWITCHES (ONE PER VALVE) PER RRFA REQUIREMENTS</p> <p>ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR</p> <p>RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL</p> <p>CLASS 52 DI PIPE (PEXFL) WITH RESTRAINED JOINTS</p> <p>MIDSPAN PIPE RESTRAINT WITH CONCRETE BLOCKING PER STD PLAN 350.7, SEAL PIPE PENETRATIONS WITH WATER-TIGHT GROUT</p> <p>OLDCASTLE PRECAST VAULT, MODEL NUMBERS PER TABLE ABOVE, OR EQUAL</p> <p>MINIMUM 6" PVC FLOOR DRAIN, SLOPE TO STORM DRAIN OR DAYLIGHT TO DRAINAGE DITCH WITH WIRE MESH RODENT SCREEN AT DRAIN OUTLET, SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT</p> <p>TWO LOCKING HINGED ALUMINUM DOORS, TRAFFIC-RATED, WITH SLIP-RESISTANT TREATMENT, MARKED "WATER", LW PRODUCTS MODEL NUMBERS PER TABLE ABOVE, OR EQUAL</p> <p>GALVANIZED STEEL LADDER SECURED TO VAULT PER STD PLAN 350.8</p> <p>FOUNDATION GRAVEL PER WSDOT STANDARD SPECIFICATIONS, 12" MINIMUM ALL DIRECTIONS</p> |
|--|--|

VAULT MODEL NUMBERS					
DCVA SIZE	VAULT	BASE PIECE	CENTER PIECE	TOP PIECE	ACCESS HATCH
3"	644-LA	NO. 644-B	N/A	NO. 64-352P	HHD-1C
4"	575-LA	NO. 575-BL	N/A	NO. 57-2-33F	HHD-1C
6"	577-LA	NO. 588-BL	N/A	NO. 57-2-33F	HHD-1C
8"	4484-LA	NO. 4484-BL	NO. 4484-ML	NO. 4484-TL-2-332P	HHD-2D
10"	5106-LA	NO. 5106-BL	NO. 5106-ML	NO. 5106-TL3-332	HHD-2D



PUBLIC WORKS
DEPARTMENT

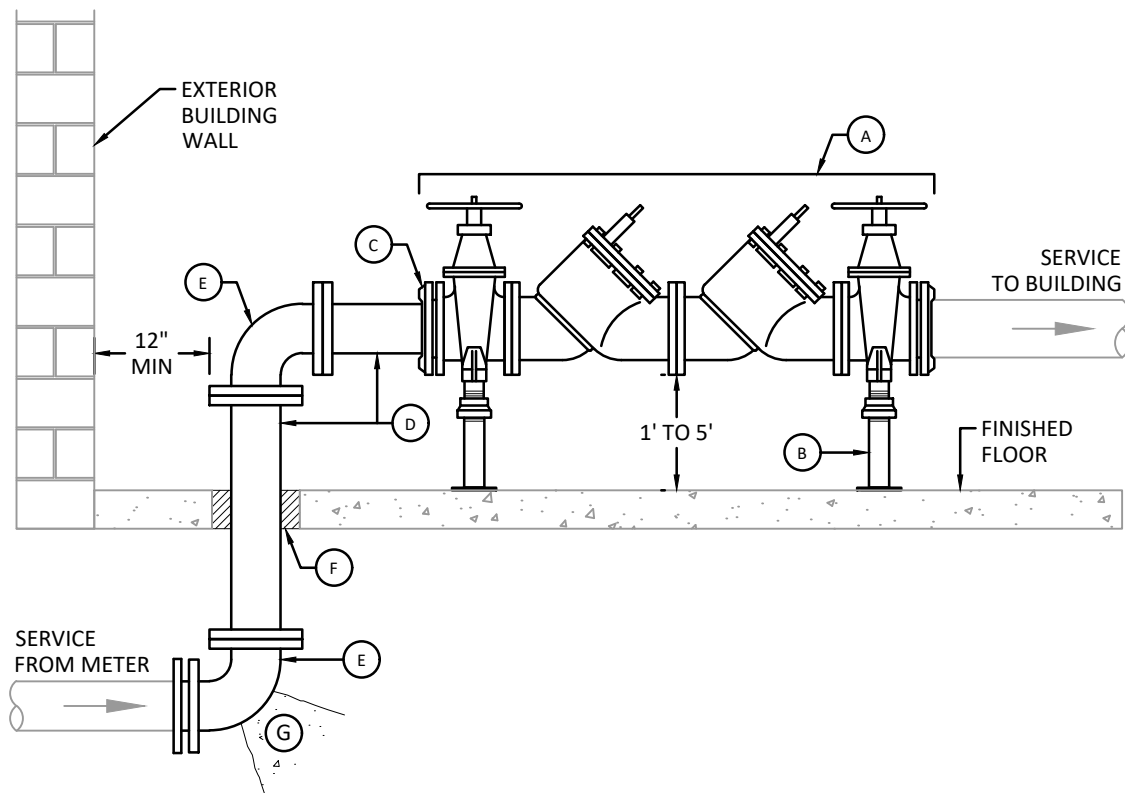
**3" TO 10" DCVA
VAULT INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

STD. PLAN - 350.1 Sht. 2 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. THE DCVA MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE DCVA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. TEE AND GATE VALVE REQUIRED ON MAIN.
4. PROTECT AGAINST FREEZING OR DAMAGE. USE HEAT-TAPE IF AREA IS SUBJECT TO FREEZING.
5. DCVA INSTALLATIONS THAT DIFFER FROM THE STANDARD PLAN MUST BE APPROVED BY THE CITY OF RENTON WATER UTILITY AND WILL BE REVIEWED ON A CASE-BY-CASE BASIS TO ENSURE THEY MEET CURRENT MINIMUM REQUIREMENTS FOR INSTALLATION AND FREEZE PROTECTION.
6. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER AND DESIGNATION OF RESILIENT SEAT, SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS-BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS EPOXY OR EQUIVALENT POLYMERIZED COATING.
7. INTERIOR WATER APPURTENANCES MUST CONFORM TO UPC REQUIREMENTS.

MATERIALS

<p>(A) DOUBLE CHECK VALVE ASSEMBLY</p> <p>(B) PIPE SUPPORT</p> <p>(C) ADAPTER</p> <p>(D) WATER MAIN</p> <p>(E) BEND</p> <p>(F) PIPE PENETRATION</p> <p>(G) BLOCKING</p>	<p>LINE-SIZED WASHINGTON STATE-APPROVED DCVA, INCLUDES TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST-COCKS, BRASS PLUGS INSTALLED ON TEST-COCKS</p> <p>ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR</p> <p>RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL</p> <p>CLASS 52 DI PIPE (PExFL OR FLxFL)</p> <p>90° BEND (FLxFL OR FLxMJ WITH RESTRAINED JOINTS)</p> <p>SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT</p> <p>CONCRETE THRUST BLOCKING PER STD PLAN 330.1</p>
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PUBLIC WORKS
DEPARTMENT

**3" TO 10" DCVA
INTERIOR INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

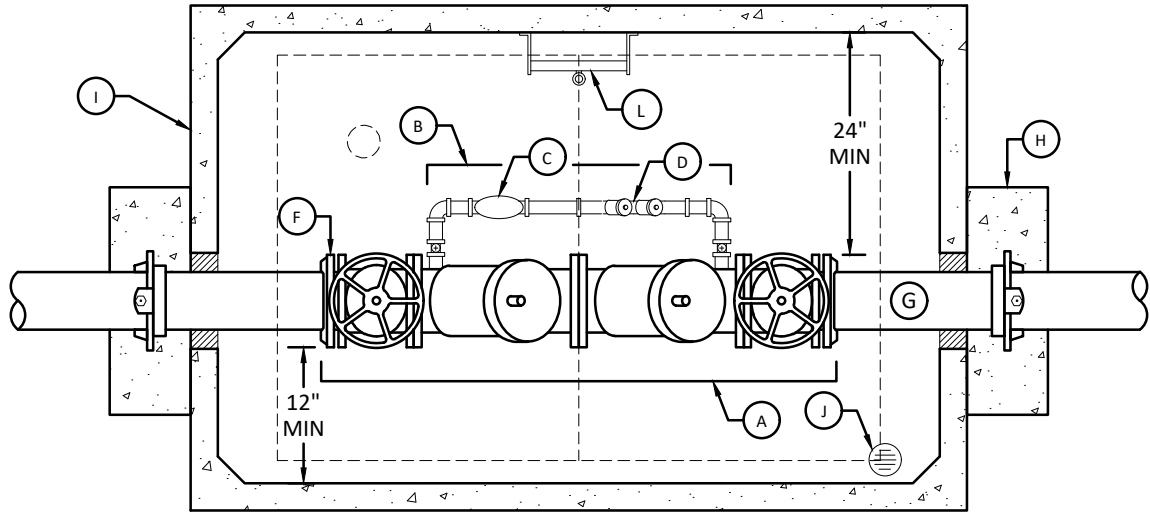
STD. PLAN - 350.2

APPROVED:

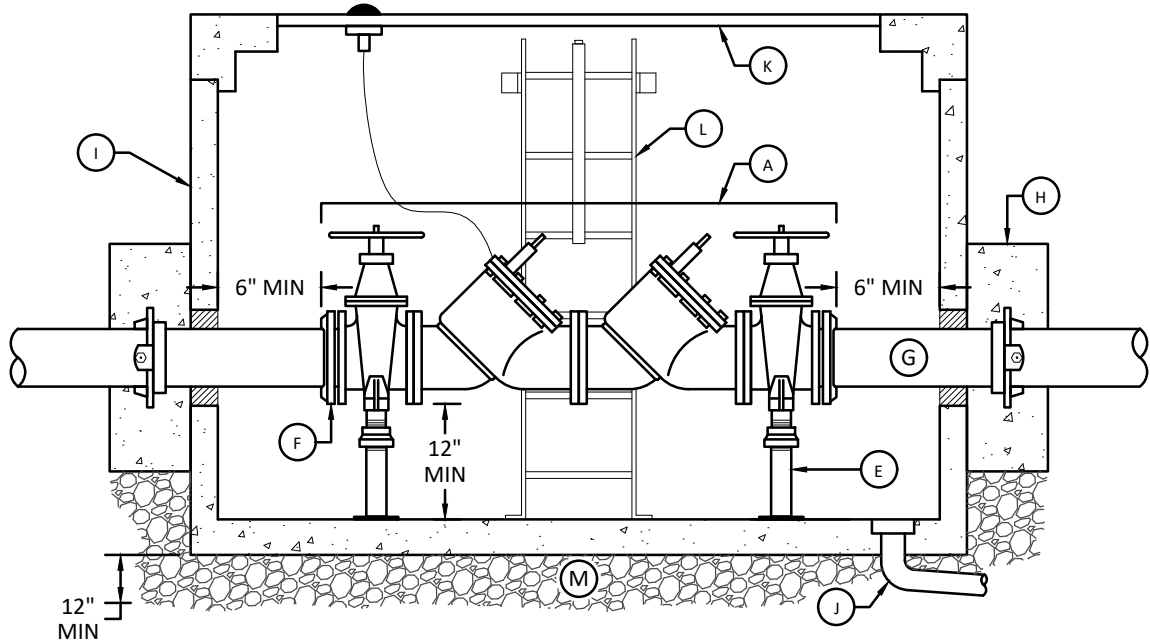
Martin Pastucha
Public Works Administrator

DATE

PLAN



ELEVATION



PUBLIC WORKS
DEPARTMENT

**3" TO 10" DCDA
VAULT INSTALLATION
FIRE SPRINKLER SYSTEMS**

STD. PLAN - 350.3 Sht. 1 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

NOTES:

1. THE DCDA MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE DCDA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. VAULTS SHALL NOT BE INSTALLED IN AREAS WITH VEHICLE TRAFFIC.
4. VAULT AND HATCH MODELS ARE PROVIDED AS REFERENCE. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY FOR APPROVAL.
5. TEE AND GATE VALVE REQUIRED ON MAIN.
6. WHEN DCDA IS USED IN THE SAME LINE AS THE DOMESTIC BUILDING METER, THE METERED BYPASS SHALL BE OMITTED.
7. MINIMUM 2' OF LEVEL, UNOBSTRUCTED AREA AROUND HATCHES.
8. FDC TO BE LOCATED DOWNSTREAM OF DCDA. FDC LINE AND CHECK VALVE MAY BE ROUTED INSIDE THE DCDA VAULT PROVIDED THE VAULT IS ADEQUATELY SIZED AND ALL PROVISIONS OF STD PLAN 360.5 ARE MET.
9. LONGER VALVE ASSEMBLIES MAY REQUIRE A LARGER VAULT TO MEET REQUIRED CLEARANCES. SUBMIT FOR APPROVAL.
10. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER WITH DESIGNATION OF RESILIENT SEAT: SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS OF EPOXY OR EQUIVALENT POLYMERIZED COATING.

MATERIALS

- | | | |
|-----|--------------------------------|---|
| (A) | DOUBLE CHECK DETECTOR ASSEMBLY | LINE-SIZED WASHINGTON STATE-APPROVED DCDA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS, DCDA SHALL BE INSTALLED EQUIDISTANT FROM THE ENDS OF THE CONCRETE VAULT, TWO (2) VALVE SUPERVISORY SWITCHES (ONE PER VALVE) PER RRFA REQUIREMENTS |
| (B) | BYPASS | ¾" DETECTOR BYPASS, ALL MATERIALS TO BE BRASS OR COPPER |
| (C) | BYPASS METER | ¾" AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE PROVIDED BY THE CITY |
| (D) | DOUBLE CHECK VALVE ASSEMBLY | ¾" WASHINGTON STATE-APPROVED DCVA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS |
| (E) | PIPE SUPPORT | ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG. 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR |
| (F) | ADAPTER | RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL |
| (G) | WATER MAIN | CLASS 52 DI PIPE (PEXFL) WITH RESTRAINED JOINTS |
| (H) | WALL FLANGE | MIDSPAN PIPE RESTRAINT WITH CONCRETE BLOCKING PER STD PLAN 350.7, SEAL PIPE PENETRATIONS WITH WATER-TIGHT GROUT |
| (I) | CONCRETE VAULT | OLDCASTLE PRECAST VAULT, MODEL NUMBERS PER TABLE BELOW, OR EQUAL |
| (J) | DRAIN | MINIMUM 6" PVC FLOOR DRAIN, SLOPE TO STORM DRAIN OR DAYLIGHT TO DRAINAGE DITCH WITH WIRE MESH RODENT SCREEN AT DRAIN OUTLET, SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT |
| (K) | ACCESS HATCH | TWO LOCKING HINGED ALUMINUM DOORS, TRAFFIC-RATED, WITH SLIP-RESISTANT TREATMENT, MARKED "WATER", LW PRODUCTS MODEL NUMBERS PER TABLE BELOW, OR EQUAL |
| (L) | LADDER | GALVANIZED STEEL LADDER SECURED TO VAULT PER STD PLAN 350.8 |
| (M) | GRAVEL | FOUNDATION GRAVEL PER WSDOT STANDARD SPECIFICATIONS, 12" MINIMUM ALL DIRECTIONS |

VAULT MODEL NUMBERS					
DCVA SIZE	VAULT	BASE PIECE	CENTER PIECE	TOP PIECE	ACCESS HATCH
3"	675-WA	NO. 675-BL	NO. 675-MLW	NO. 675-TL-2-332P	HHD-1C
4"	675-WA	NO. 675-BL	NO. 675-MLW	NO. 675-TL-2-332P	HHD-1C
6"	675-WA	NO. 675-BL	NO. 675-MLW	NO. 675-TL-2-332P	HHD-1C
8"	687-LA	NO. 687-BL	NO. 687-ML	NO. 687-TL-2-332P	HHD-2D
10"	5106-LA	NO. 5106-BL	NO. 5106-ML	NO. 5106-TL3-332	HHD-2D



PUBLIC WORKS
DEPARTMENT

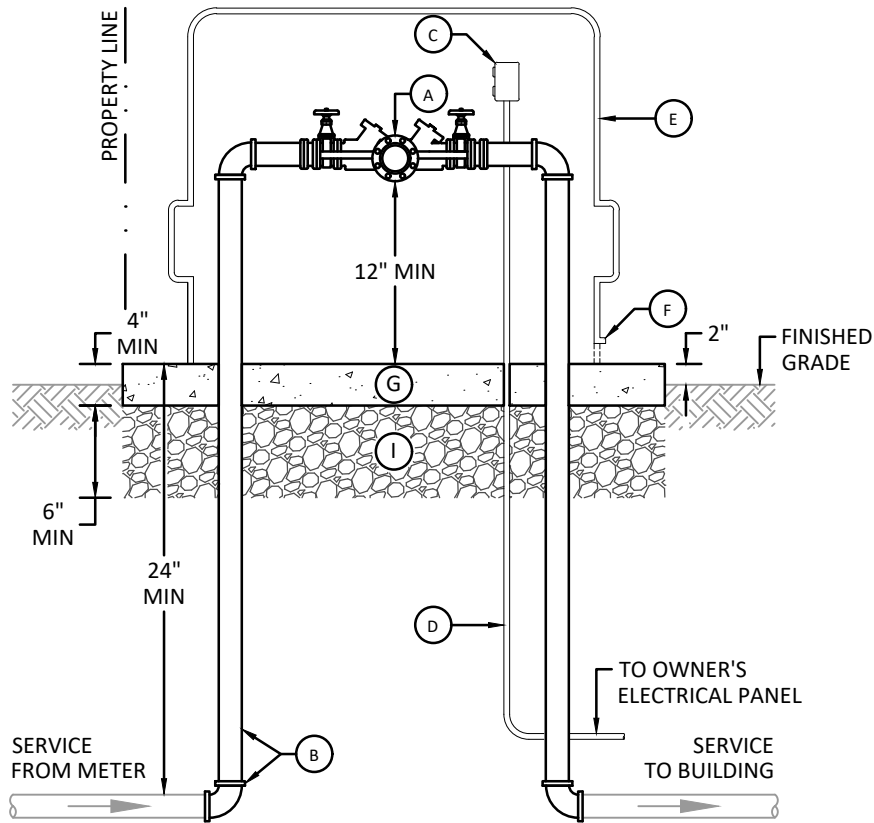
**3" TO 10" DCDA
VAULT INSTALLATION
FIRE SPRINKLER SYSTEMS**

STD. PLAN - 350.3 Sht. 2 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. THE RPBA MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPBA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. RPBA AND ENCLOSURE SHALL BE LOCATED ON PRIVATE PROPERTY AND AS NEAR AS POSSIBLE TO THE WATER METER.

MATERIALS

<p>(A) REDUCED PRESSURE BACKFLOW ASSEMBLY</p> <p>(B) PIPE AND FITTINGS</p> <p>(C) ELECTRICAL OUTLET</p> <p>(D) ELECTRICAL CONDUIT</p> <p>(E) ENCLOSURE</p> <p>(F) DRAIN</p> <p>(G) CONCRETE SLAB</p> <p>(H) BOLTS</p> <p>(I) GRAVEL</p>	<p>LINE-SIZED WASHINGTON STATE-APPROVED RPBA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS. RPBA SHALL BE INSTALLED CENTERED IN THE HEATED ENCLOSURE WITH MINIMUM 3" CLEARANCE IN ALL DIRECTIONS</p> <p>SIZE AND MATERIALS AS REQUIRED PER UPC REQUIREMENTS</p> <p>120-VOLT OUTDOOR ELECTRICAL OUTLET WITH COVER, INSTALL HEAT TAPE FOR FREEZE PROTECTION</p> <p>RIGID CONDUIT PER ELECTRICAL PERMIT REQUIREMENTS</p> <p>INSULATED ENCLOSURE SIZE TO FIT RPBA, ASSE 1060 CERTIFIED, SAFE-T-COVER OR EQUAL</p> <p>ENCLOSURE DRAIN SIZED IN ACCORDANCE WITH AWWA CROSS CONNECTION CONTROL MANUAL STANDARDS: ≤1" RPBA = 3" DRAIN, 1 1/2" & 2" RPBA = 4" DRAIN</p> <p>CONCRETE SLAB SIZED TO FIT RPBA AND ENCLOSURE PER MANUFACTURER</p> <p>3/8"X4" ANCHOR BOLTS PER MANUFACTURER</p> <p>1 1/4" WASHED GRAVEL</p>
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PUBLIC WORKS DEPARTMENT

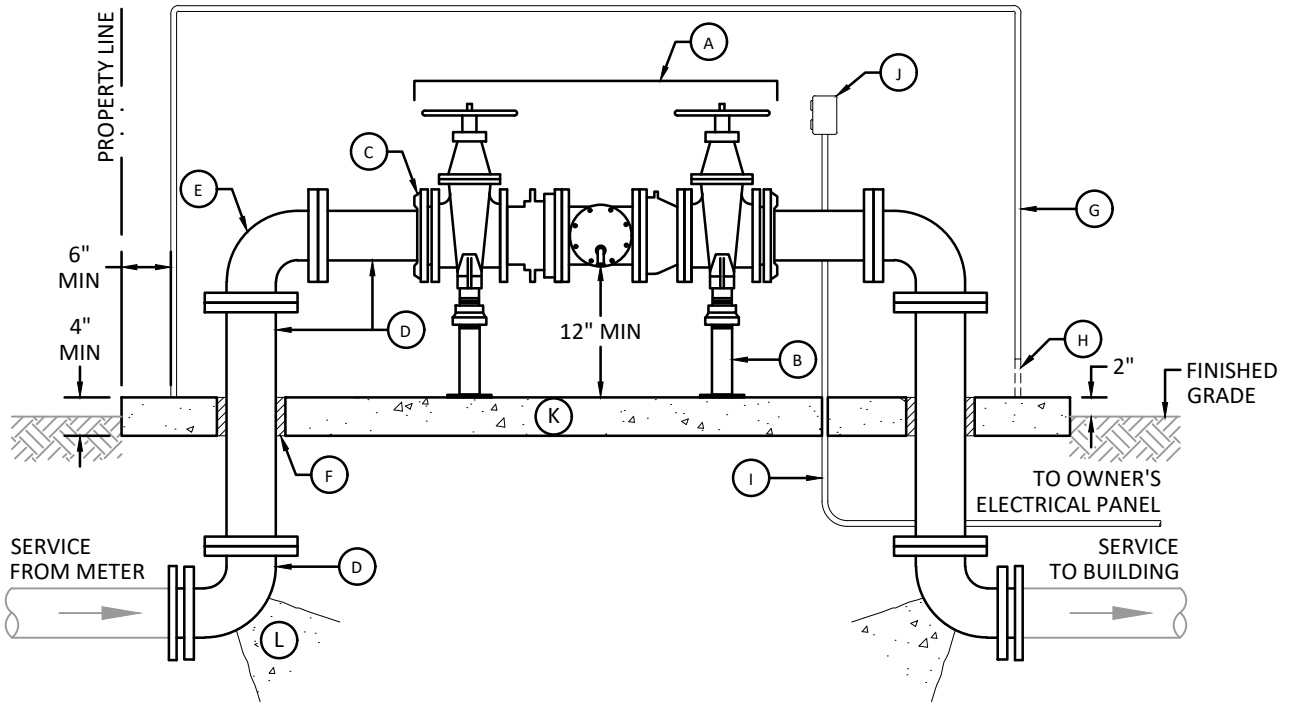
**3/4" TO 2" RPBA
HEATED ENCLOSURE INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

STD. PLAN - 360.1

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. ALL RPBA'S MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPBA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. RPBA AND ENCLOSURE SHALL BE LOCATED ON PRIVATE PROPERTY AND AS NEAR AS POSSIBLE TO THE WATER METER.
4. PROVIDE MINIMUM 24" LEVEL, UNOBSTRUCTED AREA AROUND ENCLOSURE.
5. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER AND DESIGNATION OF RESILIENT SEAT, SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS-BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS EPOXY OR EQUIVALENT POLYMERIZED COATING.

MATERIALS

(A)	REDUCED PRESSURE BACKFLOW ASSEMBLY	LINE-SIZED WASHINGTON STATE-APPROVED RPBA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS. RPBA SHALL BE INSTALLED CENTERED IN THE HEATED ENCLOSURE WITH MINIMUM 3" CLEARANCE TO ALL SIDES AND MINIMUM 3" CLEARANCE TO CEILING WHEN VALVES ARE FULLY OPEN
(B)	PIPE SUPPORT	ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR
(C)	ADAPTER	RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL
(D)	WATER MAIN	CLASS 52 DI PIPE (PEXFL OR FLXFL)
(E)	BEND	90° BEND (FLXFL OR FLXMJ WITH RESTRAINED JOINTS)
(F)	PIPE PENETRATION	SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT
(G)	ENCLOSURE	INSULATED ENCLOSURE SIZED TO FIT RPBA, ASSE 1060 CERTIFIED, SAFE-T-COVER OR EQUAL (NOTE: BURIED VAULT IS NOT PERMITTED FOR RPBA)
(H)	DRAIN	ENCLOSURE DRAIN SIZED IN ACCORDANCE WITH AWWA CROSS CONNECTION CONTROL MANUAL
(I)	ELECTRICAL CONDUIT	RIGID CONDUIT PER ELECTRICAL PERMIT REQUIREMENTS
(J)	ELECTRICAL OUTLET	120-VOLT OUTDOOR ELECTRICAL OUTLET WITH COVER, INSTALL HEAT TAPE FOR FREEZE PROTECTION
(K)	CONCRETE SLAB	CONCRETE SLAB (MINIMUM 2,000 PSI) SIZED TO FIT RPBA AND ENCLOSURE PER MANUFACTURER, REINFORCED WITH 6x6 W2.9x2.9 WELDED WIRE FABRIC
(L)	BLOCKING	CONCRETE BLOCKING PER STD PLAN 330.1



PUBLIC WORKS
DEPARTMENT

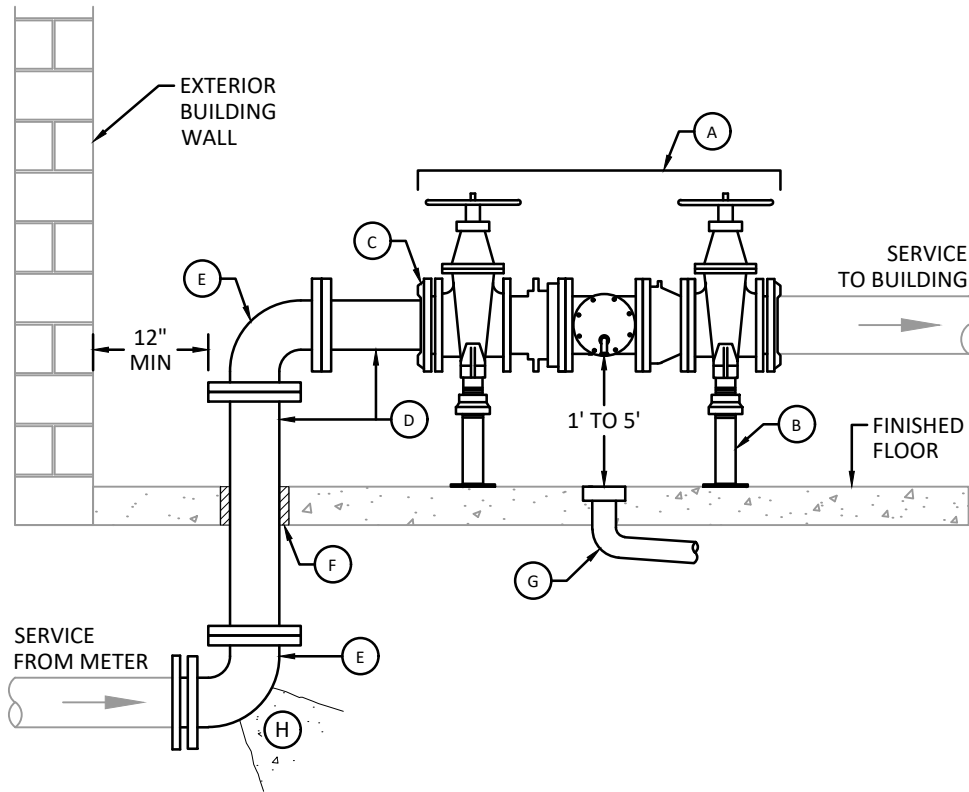
**3" TO 10" RPBA
HEATED ENCLOSURE INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

STD. PLAN - 360.2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. THE RPBA MUST BE LISTED ON LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE", PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPBA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL M HOLTE@RENTONWA.GOV.
3. PROTECT AGAINST FREEZING OR DAMAGE. USE HEAT-TAPE IF AREA IS SUBJECT TO FREEZING.
4. RPBA INSTALLATIONS THAT DIFFER FROM THE STANDARD PLAN MUST BE APPROVED BY THE CITY OF RENTON WATER UTILITY AND WILL BE REVIEWED ON A CASE-BY-CASE BASIS TO ENSURE THEY MEET CURRENT MINIMUM REQUIREMENTS FOR INSTALLATION AND FREEZE PROTECTION.
5. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER AND DESIGNATION OF RESILIENT SEAT, SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS-BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS EPOXY OR EQUIVALENT POLYMERIZED COATING.
6. INTERIOR WATER APPURTENANCES MUST CONFORM TO UPC REQUIREMENTS.

MATERIALS

(A)	REDUCED PRESSURE BACKFLOW ASSEMBLY	LINE-SIZED WASHINGTON STATE-APPROVED RPBA, INCLUDES (2) RESILIENT-SEATED SHUT-OFF VALVES AND (4) RESILIENT-SEATED TEST-COCKS, BRASS PLUGS INSTALLED ON TEST-COCKS
(B)	PIPE SUPPORT	ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 364 OR EQUAL, WITH BASE, BOLTED TO FLOOR
(C)	ADAPTER	RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL
(D)	WATER MAIN	CLASS 52 DI PIPE (PexFL OR FLxFL)
(E)	BEND	90° BEND (FLxFL OR FLxMJ WITH RESTRAINED JOINTS)
(F)	PIPE PENETRATION	PVC SLEEVE THROUGH SLAB WITH WATER-TIGHT GROUT
(G)	DRAIN	FLOOR DRAIN FOR RELIEF PORT WITH APPROVED AIR GAP
(H)	BLOCKING	CONCRETE THRUST BLOCKING PER STD PLAN 330.1



PUBLIC WORKS
DEPARTMENT

**3" TO 10" RPBA
INTERIOR INSTALLATION
DOMESTIC AND IRRIGATION SERVICES**

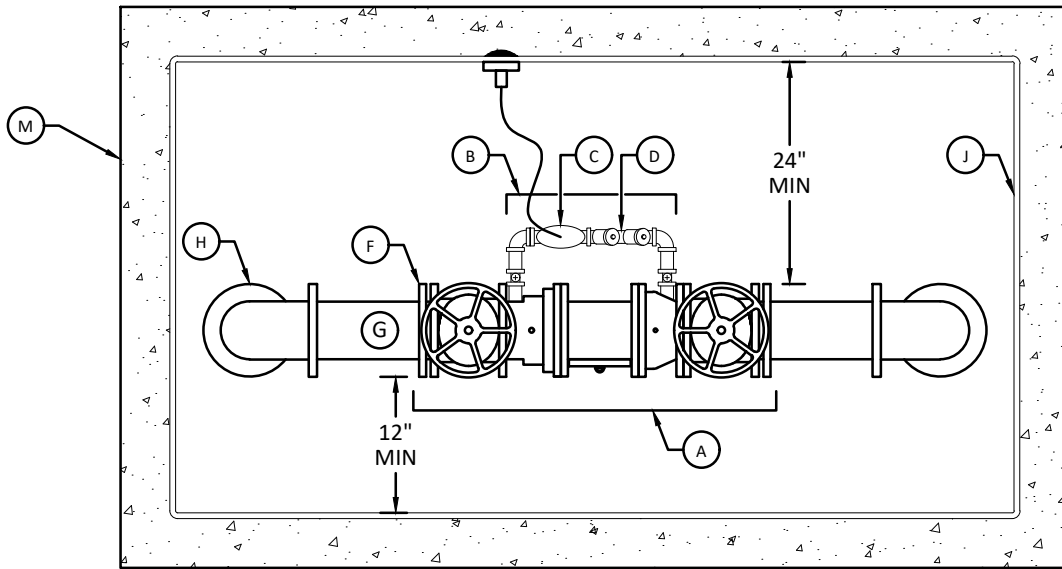
STD. PLAN - 360.3

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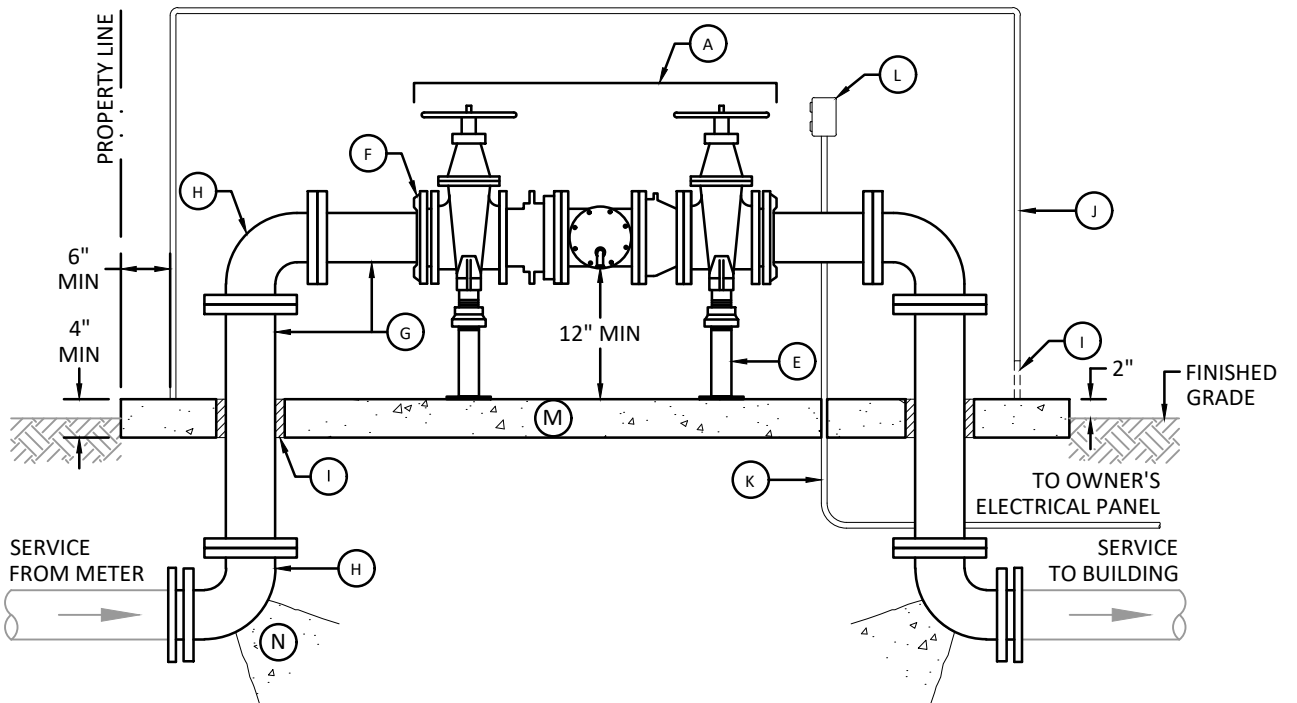
Martin Pastucha
Public Works Administrator

DATE

PLAN



ELEVATION



PUBLIC WORKS
DEPARTMENT

**3" TO 10" RPDA
HEATED ENCLOSURE INSTALLATION
FIRE SPRINKLER SYSTEMS**

STD. PLAN - 360.4 Sht. 1 of 2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

NOTES:

1. THE RPDA AND DCVA MUST BE LISTED ON THE LATEST VERSION OF "BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION IN WASHINGTON STATE," PUBLISHED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPDA AND DCVA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.
3. EACH VALVE SHALL BE MARKED WITH MODEL NUMBER AND DESIGNATION OF RESILIENT SEAT, SUCH AS "RS" OR "R", WHICH MUST BE CAST, MOLDED, OR AFFIXED ONTO THE BODY OR BONNET OF THE VALVE. ALL FERROUS-BODIED VALVES SHALL BE COATED WITH A MINIMUM OF 4 MILS EPOXY OR EQUIVALENT POLYMERIZED COATING.
4. RPDA AND ENCLOSURE SHALL BE LOCATED ON PRIVATE PROPERTY AND AS NEAR AS POSSIBLE TO THE WATER METER.
5. PROVIDE MINIMUM 24" OF LEVEL, UNOBSTRUCTED AREA AROUND HATCH.

MATERIALS

(A)	REDUCED PRESSURE DETECTOR ASSEMBLY	LINE-SIZED WASHINGTON STATE-APPROVED RPDA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS. RPBA SHALL BE INSTALLED EQUIDISTANT FROM ENDS OF CONCRETE VAULT; TWO (2) VALVE SUPERVISORY SWITCHES (ONE PER VALVE) PER RRFA REQUIREMENTS
(B)	BYPASS	3/4" DETECTOR BYPASS, ALL MATERIALS TO BE BRASS OR COPPER
(C)	BYPASS METER	3/4" AMI WATER METER WITH RADIO AND BATTERY UNIT, TO BE PROVIDED BY THE CITY
(D)	DOUBLE CHECK VALVE ASSEMBLY	3/4" WASHINGTON STATE-APPROVED DCVA WITH TWO (2) RESILIENT-SEATED SHUT-OFF VALVES AND FOUR (4) RESILIENT-SEATED TEST COCKS
(E)	PIPE SUPPORT	ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG 264 OR EQUAL, WITH BASE, BOLTED TO FLOOR
(F)	ADAPTER	RESTRAINED FLANGE ADAPTER, EBAA IRON SERIES 2100 MEGAFLANGE OR EQUAL
(G)	WATER MAIN	CLASS 52 DI PIPE WITH RESTRAINED JOINTS
(H)	BEND	90° BEND (FLxFL OR FLxMJ WITH RESTRAINED JOINTS)
(I)	PIPE PENETRATION	SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT
(J)	ENCLOSURE	INSULATED ENCLOSURE SIZED TO FIT RPDA, ASSE 1060 CERTIFIED, SAFE-T-COVER OR EQUAL (NOTE: BURIED VAULT IS NOT PERMITTED FOR RPDA)
(K)	ELECTRICAL CONDUIT	RIGID CONDUIT PER ELECTRICAL PERMIT REQUIREMENTS
(L)	ELECTRICAL OUTLET	120-VOLT OUTDOOR ELECTRICAL OUTLET WITH COVER, INSTALL HEAT TAPE FOR FREEZE PROTECTION
(M)	CONCRETE SLAB	CONCRETE SLAB (MINIMUM 2,000 PSI) SIZED TO FIT RPDA AND ENCLOSURE PER MANUFACTURER, REINFORCED WITH 6x6 W2.9xW2.9 WELDED WIRE FABRIC
(N)	BLOCKING	CONCRETE BLOCKING PER STD PLAN 330.1

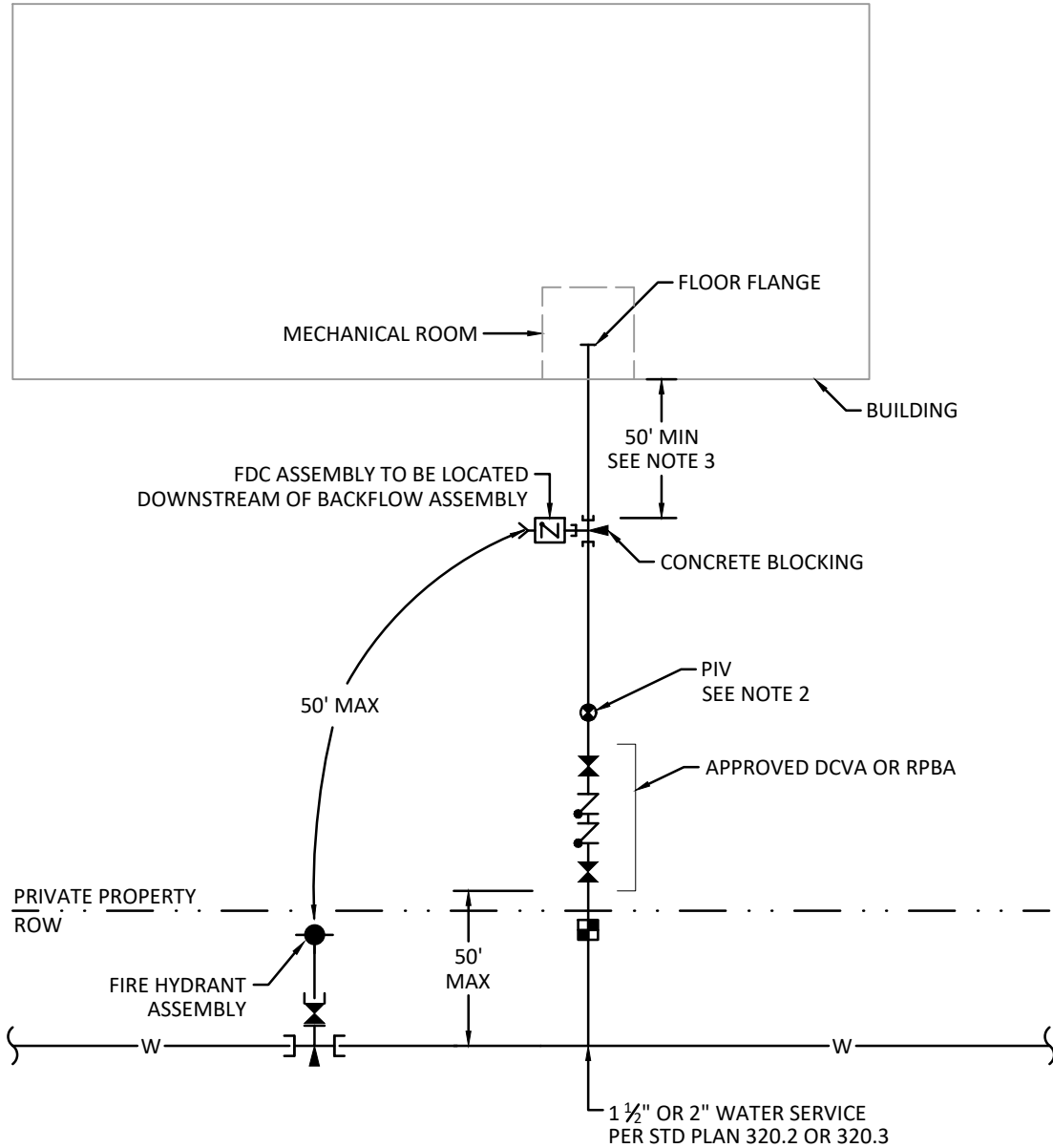


PUBLIC WORKS DEPARTMENT

**3" TO 10" RPDA
HEATED ENCLOSURE INSTALLATION
FIRE SPRINKLER SYSTEMS**

STD. PLAN - 360.4 Sht. 2 of 2

APPROVED: _____
Martin Pastucha
Public Works Administrator _____
DATE _____



NOTES:

1. FIRE SPRINKLER SYSTEM SHALL BE LOCATED ON DEDICATED FIRE SERVICE SEPARATE FROM DOMESTIC SERVICE TO THE BUILDING.
2. PIV MUST BE LOCATED ON THE FIRE SERVICE BETWEEN THE ROW AND THE FDC.
3. FIRE MARSHAL SHALL APPROVE FDC AND/OR PIV LOCATION IF LESS THAN 50' FROM BUILDING.
4. THE DCVA OR RPBA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAIL MHOLTE@RENTONWA.GOV.



PUBLIC WORKS
DEPARTMENT

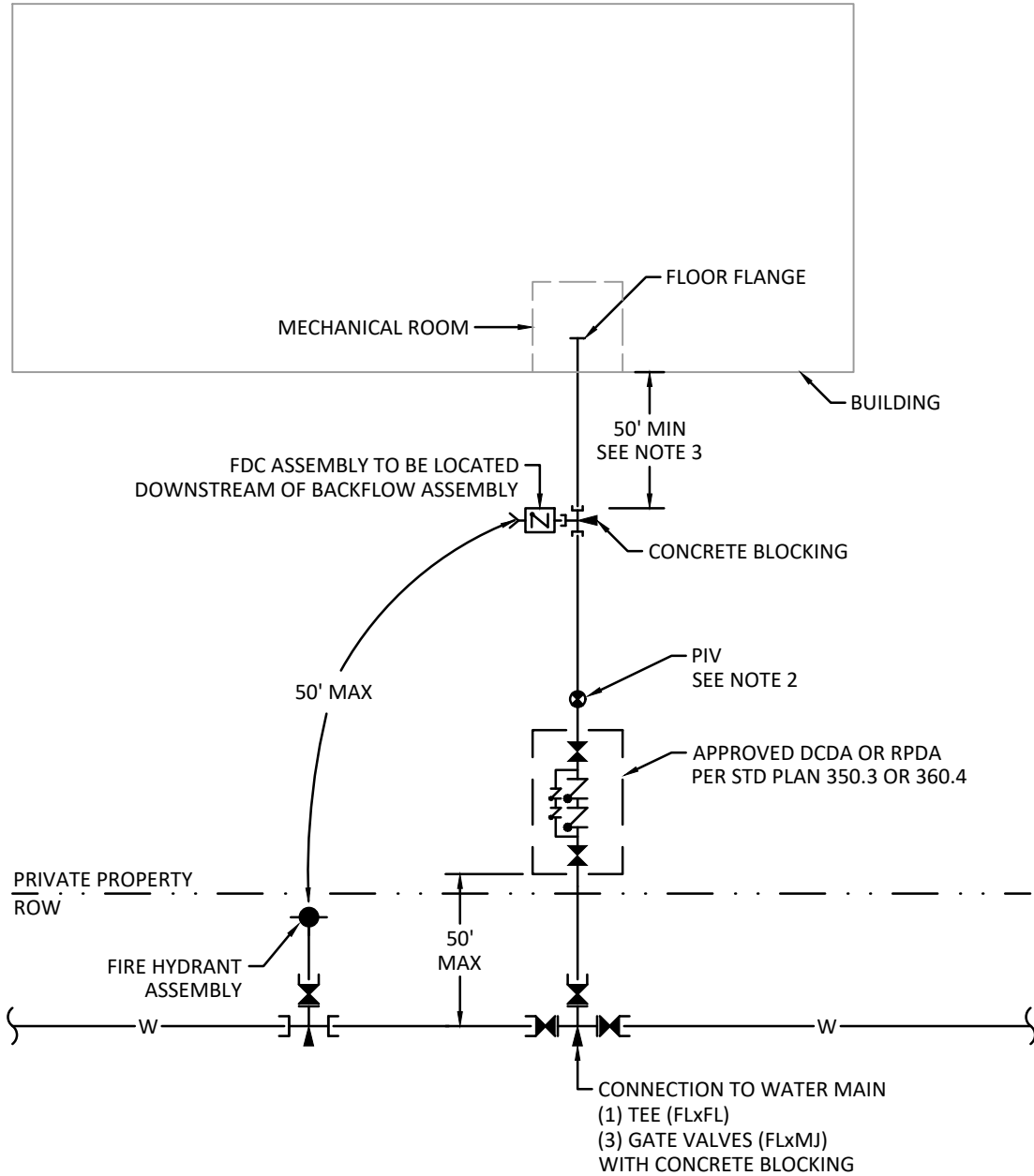
**COMMERCIAL FIRE SPRINKLER SYSTEM
1 1/2" AND 2" DCVA OR RPBA
OUTSIDE INSTALLATION**

STD. PLAN - 370.1

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. FIRE SPRINKLER SYSTEM SHALL BE LOCATED ON DEDICATED FIRE SERVICE SEPARATE FROM DOMESTIC SERVICE TO THE BUILDING.
2. PIV MUST BE LOCATED ON THE FIRE SERVICE BETWEEN THE ROW AND THE FDC.
3. FIRE MARSHAL SHALL APPROVE FDC AND/OR PIV LOCATION IF LESS THAN 50' FROM BUILDING.
4. THE DCDA OR RPDA MUST BE TESTED BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. ASSEMBLY TO BE MAINTAINED BY PROPERTY OWNER. A COPY OF THE TEST REPORT SHALL BE SENT TO THE CITY OF RENTON WATER UTILITY CROSS CONNECTION CONTROL SPECIALIST, FAX 425-430-7241, EMAILMHOLTE@RENTONWA.GOV.
5. THE FDC AND PIV MAY BE LOCATED WITHIN THE VAULT WITH THE BACKFLOW ASSEMBLY PER STD PLAN 370.3.



PUBLIC WORKS
DEPARTMENT

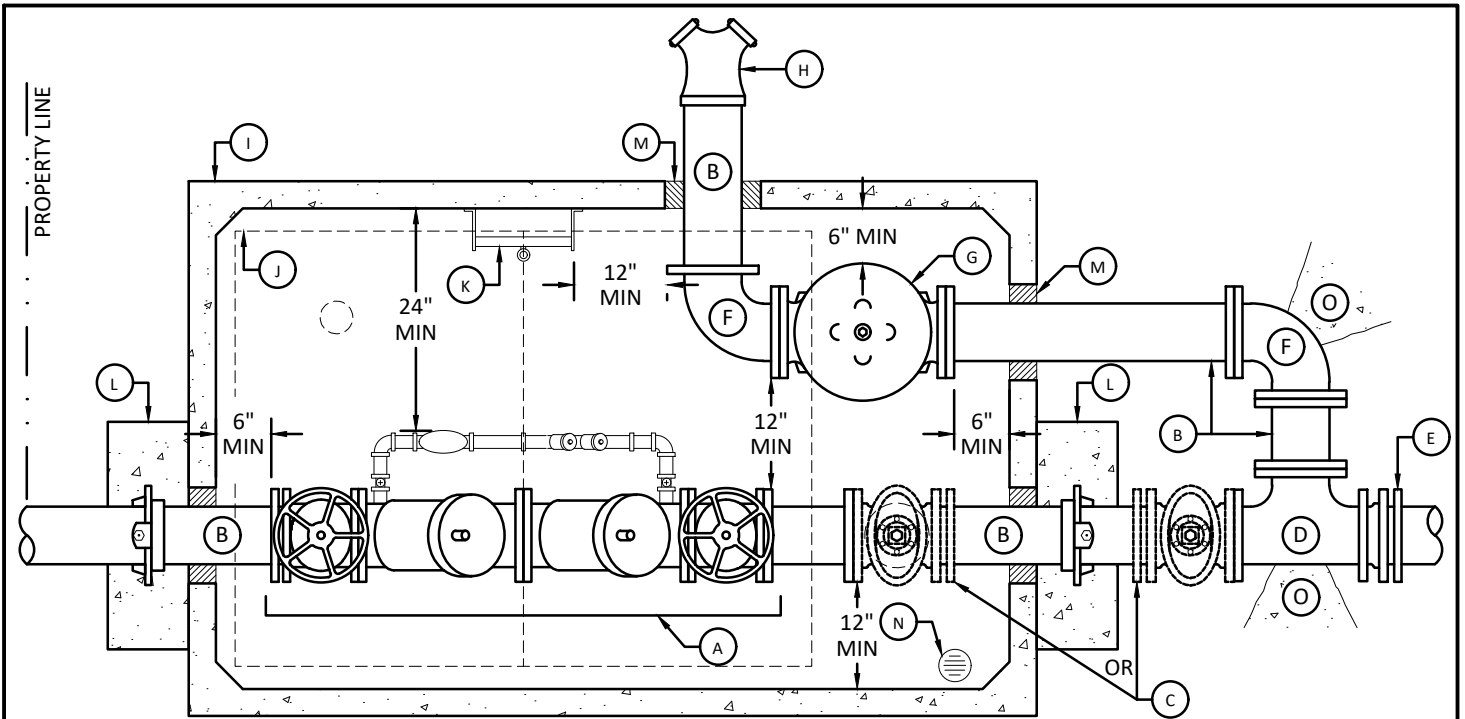
**COMMERCIAL FIRE SPRINKLER SYSTEM
3" TO 10" DCDA OR RPDA
OUTSIDE INSTALLATION**

STD. PLAN - 370.2

APPROVED:

Martin Pastucha
Public Works Administrator

DATE



NOTES:

1. WHERE PIV IS LOCATED INSIDE THE VAULT, THE VAULT LID SHALL BE CORE DRILLED WITH LINK SEAL OR GROUT TO SEAL THE PIPE PENETRATION. ALTERNATIVE PIV LOCATION SHALL BE APPROVED BY THE FIRE MARSHAL.
2. MINIMUM CLEARANCE OF 6" SHALL BE MAINTAINED BETWEEN VALVES, FITTINGS, AND VAULT WALL.
3. ALL PIPE JOINTS SHALL BE RESTRAINED AND CONCRETE BLOCKING IS REQUIRED AT CHANGES IN DIRECTION.
4. CORE DRILL (O.D. +2") CONCRETE VAULT IF KNOCK-OUTS ARE NOT PROVIDED.

MATERIALS

(A)	BACKFLOW ASSEMBLY	DCDA PER STD PLAN 350.3, POSITIONED WITHIN ACCESS HATCH TO ALLOW FOR VERTICAL REMOVAL
(B)	PIPE	CLASS 52 DI PIPE
(C)	POST INDICATOR VALVE	PIV BETWEEN LAST VALVE ON BACKFLOW ASSEMBLY AND FDC, IN ONE OF TWO POSITIONS SHOWN
(D)	TEE	TEE (FLxFL)
(E)	ADAPTER	ADAPTER (FLxMJ)
(F)	BEND	90° BEND (FLxFL)
(G)	VALVE	CHECK VALVE (FLxFL)
(H)	FIRE DEPARTMENT CONNECTION	FDC PER RRFA REQUIREMENTS, LOCATED DOWNSTREAM OF BACKFLOW ASSEMBLY, INSTALLED ON THE SIDE OF THE VAULT WITH THE LARGEST AVAILABLE SPACE AS SHOWN
(I)	CONCRETE VAULT	OLDCASTLE PRECAST VAULT OR EQUAL, SIZED TO ACCOMMODATE FDC, PIV, AND CHECK VALVE INSIDE THE VAULT AND MAINTAIN REQUIRED MINIMUM CLEARANCES
(J)	ACCESS HATCH	TWO LOCKING HINGED ALUMINUM DOORS, TRAFFIC-RATED, WITH SLIP RESISTANT TREATMENT, MARKED "WATER", LW PRODUCTS OR EQUAL
(K)	LADDER	GALVANIZED STEEL LADDER SECURED TO VAULT PER STD PLAN 350.8
(L)	WALL FLANGE	MIDSPAN PIPE RESTRAINT WITH CONCRETE BLOCKING PER STD PLAN 350.7, SEAL PIPE PENETRATIONS WITH WATER-TIGHT GROUT
(M)	PIPE PENETRATION	SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT
(N)	DRAIN	FLOOR DRAIN, MINIMUM 6" PVC, SLOPED TO STORM SEWER OR DAYLIGHT TO DRAINAGE DITCH WITH WIRE MESH RODENT SCREEN AT DRAIN OUTLET, SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT
(O)	BLOCKING	CONCRETE BLOCKING PER STD PLAN 330.1



PUBLIC WORKS
DEPARTMENT

**FDC AND CHECK VALVE
ROUTED THROUGH
BACKFLOW ASSEMBLY VAULT**

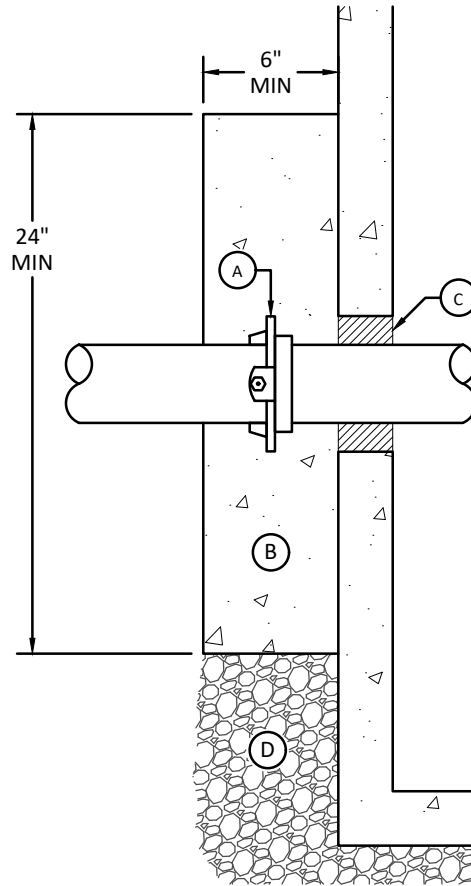
STD. PLAN - 370.3

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

PROFILE



MATERIALS

- | | | |
|-----|------------------|--|
| (A) | WALL FLANGE | MIDSPAN PIPE RESTRAINT, EBAA IRON SERIES 1100SDB MEGALUG OR EQUAL, WRAP WITH POLYETHYLENE ENCASEMENT PRIOR TO PLACEMENT OF CONCRETE BLOCKING |
| (B) | BLOCKING | CONCRETE THRUST BLOCKING, CAST-IN-PLACE CONCRETE (MINIMUM 3,000 PSI), TO BE SIZED BY DESIGN ENGINEER (MINIMUM 24"x24"x6") |
| (C) | PIPE PENETRATION | CORE DRILL (O.D. +2") VAULT IF KNOCKOUTS ARE NOT PROVIDED, SEAL PIPE PENETRATION WITH WATER-TIGHT GROUT |
| (D) | GRAVEL | FOUNDATION GRAVEL PER WSDOT STANDARD SPECIFICATIONS, 12" MINIMUM ALL DIRECTIONS |



PUBLIC WORKS
DEPARTMENT

CONCRETE BLOCKING ADJACENT TO VAULT

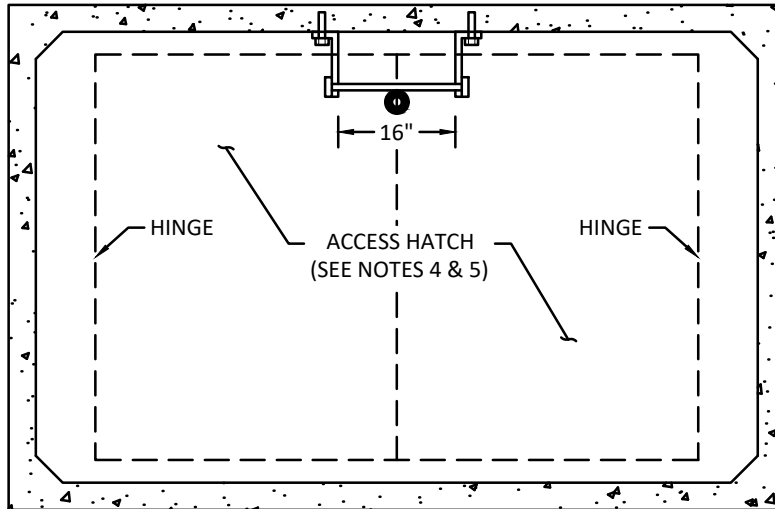
STD. PLAN - 370.4

APPROVED:

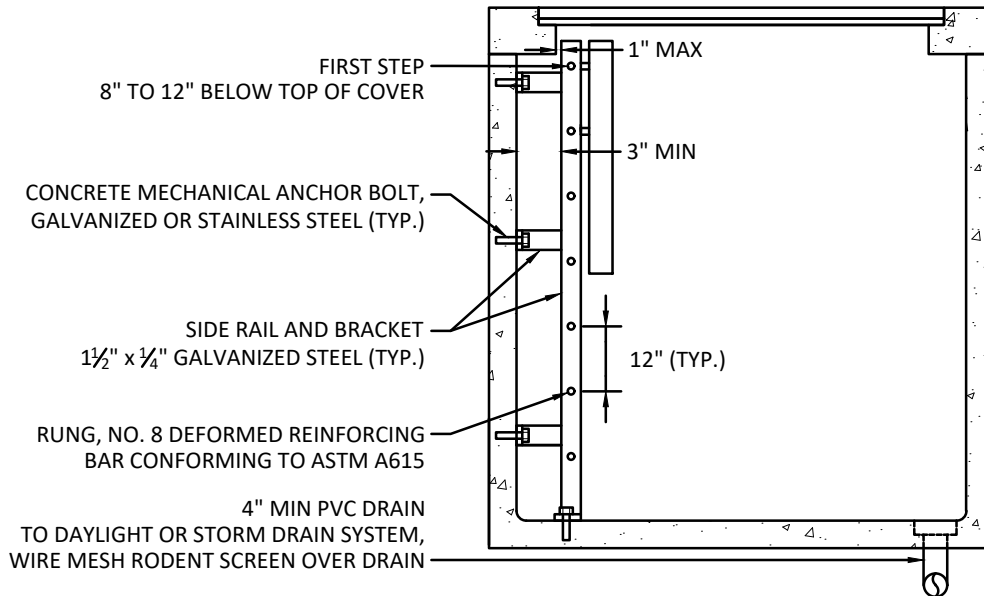
Martin Pastucha
Public Works Administrator

DATE

PLAN



PROFILE



NOTES:

1. VAULTS SHALL ONLY BE INSTALLED IN SHOULDERS, SIDEWALKS, OR LANDSCAPED AREAS. VAULTS SHALL NOT BE INSTALLED IN AREAS WITH VEHICULAR TRAFFIC. VAULT COVER SHALL READ "WATER".
2. LADDER TO BE SECURED TO VAULT WALL AT THREE LOCATIONS: TOP, MIDDLE, AND BOTTOM.
3. ALL LADDER PARTS TO BE GALVANIZED CONFORMING TO ASTM A123.
4. ACCESS HATCH SHALL BE LOCKING ALUMINUM DOUBLE DOORS, LW PRODUCTS CO. MODEL HHD-1C OR HHD-2D AS REQUIRED, RATED FOR H-30 LOADING WITH A SLIP RESISTANT TREATMENT AS FOLLOWS:
 - THERMION, SAFTRAX TH604 GRADE #2 MODERATE TEXTURE
 - SLIPNOT, GRIP PLATE GRADE 2 (MEDIUM) STEEL
 - HARSCO IKG, MEBAC #1
 - GRATING PACIFIC, ALGRIP SLIP-RESISTANT FLOOR PLATE
5. HATCHES SHALL INCLUDE RECESSED PADLOCK HASP SIZED FOR CITY OF RENTON WATER UTILITY PADLOCKS (CONTACT LW PRODUCTS).
6. LADDER-UP ATTACHMENT REQUIRED ON ALL VAULT LADDERS, BILCO LADDERUP TYPE LU-2.



PUBLIC WORKS
DEPARTMENT

VAULT LADDER

STD. PLAN - 370.5

APPROVED:

Martin Pastucha
Public Works Administrator

DATE

APPENDIX B APPROVED MATERIALS LIST



APPROVED PRODUCTS FOR WATER MAIN CONSTRUCTION

01 OVERVIEW

- A. The manufacturers and products in this document have been approved for use for construction by the City of Renton Water Utility.
- B. Where specific manufacturers and products are listed, equal manufacturers and products shall be considered on a case-by-case basis and shall require approval by the City of Renton Water Utility prior to installation.
- C. Within this document, materials are identified in the format of “[Manufacturer], [Model]”
- D. All material that comes in contact with potable water shall be NSF 61 approved and “lead-free” in compliance with EPA standards.
- E. This document is updated on a regular basis. Refer to the City of Renton website for the most recent version.

02 WATER MAINS

02.1 DUCTILE IRON PIPE

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

02.2 POLYETHYLENE ENCASEMENT

- A. Christy’s®, Polywrap (Polyethylene Encasement Tubing)
- B. U.S. Pipe, Polyethylene Encasement
- C. U.S. Pipe, V-BIO® Enhanced Polywrap

02.3 DETECTABLE MARKING TAPE

- A. Christy’s®, Detectable Marking Tape (TA.DT.6.BW or TA.DT.12.BW)

02.4 DENSE FOAM PAD

- A. DOW Chemical Company, ETHAFOAM™ HS 600

03 FITTINGS AND CONNECTIONS

03.1 DUCTILE IRON FITTINGS

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

03.2 RESTRAINED JOINT PIPE

- A. American Ductile Iron Pipe, Flex-Ring®
- B. U.S. Pipe, TR FLEX®
- C. Griffin Pipe Products Company, SNAP-LOK™
- D. Griffin Pipe Products Company, BOLT-LOK™
- E. Pacific States Cast Iron Pipe Co., THRUST-LOCK™

03.3 MECHANICAL JOINT RESTRAINT

- A. EBAA Iron, MEGALUG® Series 1100
- B. Romac Industries, GripRing™
- C. Star® Pipe Products, Stargrip® Series
- D. Ford Meter Box Co., Uni-Flange® Series 1400

03.4 PIPE RESTRAINING SYSTEM

- A. Romac Industries, 600 Series
- B. Romac Industries, RomaGrip™
- C. Ford Meter Box Co., Uni-Flange® Series 1450

03.5 FLANGE COUPLING ADAPTER

- A. EBAA Iron, MEGAFLANGE® Series 2100
- B. Romac Industries, Style FCA501

03.6 COUPLINGS

- A. Romac Industries, 400 Series
- B. Romac Industries, 501 Series
- C. Smith-Blair, OMNI™ Coupling 440 Series
- D. Smith-Blair, Quantum Coupling 460 Series
- E. Mueller Co., Maxi-Range™

03.7 REPAIR CLAMPS

- A. Romac Industries, Style SS1 (NSF61-certified)
- B. Romac Industries, Style SS2 (NSF61-certified)

03.8 BOLTS

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

03.9 GASKETS

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

03.10 PIPE CLAMPS (FOR THRUST BLOCKING AT VERTICAL BENDS)

- A. Cooper B-Line™, B3132 Series
- B. Eaton B-Line, B3132 Series

04 VALVES

04.1 GATE VALVES

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

04.2 BUTTERFLY VALVES

- A. All manufacturers that meet the requirements specified in “Chapter 4 – Water Materials” of the Water Utility Design and Construction Standards.

04.3 AIR AND VACUUM RELEASE VALVE ASSEMBLIES

- A. APCO No. 143-C
- B. Val-matic No. 201-C
- C. Crispin UL10
- D. Bronze Gate Valve (1-inch)
 - Red-White Valve No. 280
 - Ohio Brass No. 2500

04.4 INDIVIDUAL PRESSURE REDUCING VALVE ASSEMBLIES

- A. Zurn® Wilkins, Model 600XL

05 VALVE BOXES

05.1 VALVE BOXES

- A. Olympic Foundry Inc., Part No. 940
- B. Star® Pipe Products, Item VBST045 (Non-Locking)

05.2 VALVE MARKER POST

- A. Carsonite®, Utility Marker CRM3-066-08

06 VAULTS

06.1 LARGE METER VAULTS

- A. Oldcastle Precast®, Model Numbers as follows.

<u>Meter</u>	<u>Vault</u>	<u>Base Piece</u>	<u>Center Piece</u>	<u>Top Piece</u>
3"	676-WA	No. 676-BL	No. 676-MLW	No. 676-TL-2-332P
4"	676-WA	No. 676-BL	No. 676-MLW	No. 676-TL-2-332P
6"	4484-LA	No. 4484-BL	No. 4484-ML	No. 4484-TL-2-332P

06.2 DCVA VAULTS (DOMESTIC AND IRRIGATION SERVICES)

- A. Oldcastle Precast®, Model Numbers as follows.

<u>DCVA</u>	<u>Vault</u>	<u>Base Piece</u>	<u>Center Piece</u>	<u>Top Piece</u>
3"	644-LA	No. 644-B	n/a	No. 64-352P
4"	575-LA	No. 575-BL	n/a	No. 57-2-33F
6"	577-LA	No. 577-BL	n/a	No. 57-2-33F
8"	4484-LA	No. 4484-BL	No. 4484-ML	No. 4484-TL-2-332P
10"	5106-LA	No. 5106-BL	No. 5106-ML	No. 5106-TL3-332

06.3 DCDA VAULTS (FIRE SPRINKLER SYSTEMS)

- A. Oldcastle Precast®, Model Numbers as follows.

<u>DCDA</u>	<u>Vault</u>	<u>Base Piece</u>	<u>Center Piece</u>	<u>Top Piece</u>
3"	675-WA	No. 675-BL	No. 675-MLW	No. 675-TL-2-332P
4"	675-WA	No. 675-BL	No. 675-MLW	No. 675-TL-2-332P
6"	675-WA	No. 675-BL	No. 675-MLW	No. 675-TL-2-332P
8"	687-LA	No. 687-BL	No. 687-ML	No. 687-TL-2-332P
10"	5106-LA	No. 5106-BL	No. 5106-ML	No. 5106-TL3-332

06.4 RPBA VAULTS (DOMESTIC AND IRRIGATION SERVICES)

- A. Oldcastle Precast®, Model Numbers as follows.

<u>RPBA</u>	<u>Vault</u>	<u>Base Piece</u>	<u>Center Piece</u>	<u>Top Piece</u>
3"	575-LA	No. 575-BL	n/a	No. 57-2-33F
4"	577-LA	No. 577-BL	n/a	No. 57-2-33F
6"	4484-LA	No. 4484-BL	No. 4484-ML	No. 4484-TL-2-332P
8"	687-LA	No. 687-BL	No. 687-ML	No. 687-TL-2-332P
10" *	5106-LA	No. 5106-BL	No. 5106-ML	No. 5106-TL3-332

* Include Extension Piece No. 5106-2X for 10" RPBA Vault.

06.5 ACCESS HATCH

- A. LW Products Co., Model HHD-1C
- B. LW Products Co., Model HHD-2D
- C. Include recessed padlock hasp sized to accept City of Renton Water Utility padlocks.

06.6 NON-SLIP TREATMENT

- A. Thermion®, SafTrax TH604 Grade #2 Moderate Texture
- B. SlipNOT®, Grip Plate® Grade 2 (Medium) Steel
- C. Harsco IKG, MEBAC® #1
- D. Grating Pacific, ALGRIP™ Slip-Resistant Floor Plate

06.7 LADDER SAFETY POST

- A. Bilco®, LadderUP® Type LU-2

06.8 EXPANSION ANCHOR BOLTS INTO CONCRETE

- A. Hilti, Kwik Bolt 3 HDG
- B. Hilti, Kwik Bolt 3 SS 316

06.9 VAULT INTERIOR COATING

- A. Tnemec, Hi-Build Epoxoline® Series 66 (Tnemec White, 00WH)

06.10 ANTI-CORROSIVE COATING FOR DUCTILE IRON PIPE AND FITTINGS

- A. Tnemec, Enduratone® Series 1029 (True Blue/Safety Blue, 11SF)

06.11 VAULT EXTERIOR COATING

- A. Tnemec, Hi-Build Tneme-Tar® Series 46H-413 (Black)

06.12 ADJUSTABLE PIPE SADDLE SUPPORT

- A. Grinnell Fig 264

06.13 VAULT WALL PIPE PENETRATION SEALS

- A. GPT, Link Seal® Model C with EPDM seal elements and stainless steel bolts and nuts

07 HYDRANTS

07.1 HYDRANTS

- A. Clow Valve Co., Medallion Hydrant Assembly
- B. M&H Valve Co., 129 Hydrant
- C. M&H Valve Co., Style 929 Reliant

- D. Mueller Co., Super Centurion® 250™ A-423
- E. AMERICAN Flow Control, American-Darling®, B-26-B-5
- F. EJ Group, Inc., WaterMaster® 5CD250
- G. Kennedy Valve Co., Guardian K81-D

07.2 DTM PAINT FOR HYDRANTS AND GUARD POSTS

- A. Kelly-Moore® Paints, 5885 DTM Interior/Exterior Semi-Gloss Enamel (Safety Yellow)
- B. Rust-Oleum, 3700 System Acrylic Enamel (Safety Yellow)
- C. Sherwin-Williams®, Pro Industrial™ DTM Acrylic Coating (Safety Yellow)
- D. Krylon® Industrial, Iron Guard® Water-Based Acrylic Enamel (OSHA Yellow)

07.3 REFLECTIVE PAVEMENT MARKER

- A. Stimsonite®, Reflective Road / Pavement Marker Model C88
- B. Apex®, Model 921 Type BB

08 WATER SERVICES

08.1 CORPORATION STOPS (1-INCH)

- A. Ford Meter Box Co., FB1000-4-Q-NL
- B. A.Y. McDonald Mfg. Co., Model 74701BQ

08.2 METER SETTERS

- A. 1-inch (1") Setters
 - 1. Ford Meter Box Co., VBH74-15W-44-44-Q-NL
 - 2. A.Y. McDonald Mfg. Co., Model No. 721-415WCQQ 44
 - 3. Mueller Co.®, B-24701-6AN, for 1-inch (1") meter with 15-inch (15") riser height
- B. 1 ½-inch (1 ½") Setters with Bypass
 - 1. Ford Meter Box Co., VBH86-12B-11-66-Q-NL
 - 2. A.Y. McDonald Mfg. Co., Model No. 730B-612WDFF 665
 - 3. Mueller Co.®, B-2427N for 1 ½-inch (1 ½") meter with 12-inch (12") riser height
- C. 2-inch (2") Setters with Bypass
 - 1. Ford Meter Box Co., VBH87-12B-11-77-Q-NL
 - 2. A.Y. McDonald Mfg. Co., Model No. 730B-712WDFF 775
 - 3. Mueller Co.®, B-2427N for 2-inch (2") meter with 12-inch (12") riser height

08.3 BRASS WATER SERVICE FITTINGS AND VALVES

- A. A.Y. McDonald Mfg. Co.
- B. Ford Meter Box Co.
- C. Jones®
- D. Mueller Co.®

08.4 WATER METERS (2-INCH OR SMALLER)

- A. To be supplied by the City of Renton.

08.5 WATER METERS (3-INCH OR LARGER)

- A. Sensus, OMNI™ Compound (C²)

08.6 SERVICE SADDLE FOR BYPASS ON WATER METERS (3-INCH OR LARGER)

- A. Smith-Blair Model 313

08.7 METER BOXES

- A. Armorcast®, A6001946PCX18 (for 3/4" and 1" services)
- B. Armorcast®, A6001640PCX18 (for 1 ½" and 2" services)

08.8 METER BOX LIDS

- A. Armorcast®, A6001969RCI-H7 to read "RENTON WATER" (for 3/4" and 1" services)
- B. Armorcast®, A6001947RCI-H7 to read "RENTON WATER" (for 1 ½" and 2" services)

09 CASING PIPES

09.1 CASING SPACERS

- A. Pipeline Seal and Insulator Co. (PSI), Model C8G-2
- B. Pipeline Seal and Insulator Co. (PSI), Model C12G-2
- C. Cascade Waterworks Mfg. Co., All Stainless Steel Casing Spacers
- D. Advance Products & Systems, Inc., Model SSI8 or SSI12 (Stainless Steel)
- E. Advance Products & Systems, Inc., Model SI8 or SI12 (Steel with Fusion-Bonded Coating)

09.2 CASING END SEALS

- A. Pipeline Seal and Insulator Co. (PSI), Model S
- B. Pipeline Seal and Insulator Co. (PSI), Model C
- C. Cascade Waterworks Mfg. Co., Model CCES
- D. Advance Products & Systems, Inc., Model AC
- E. Advance Products & Systems, Inc., Model AM

09.3 ANTI-CORROSIVE COATING FOR CASING EXTERIOR

- A. Tnemec, Hi-Build Tneme-Tar® Series 46H-413 (Black)

10 BACKFLOW ASSEMBLIES

10.1 BACKFLOW ASSEMBLIES

- A. As approved on the most current DOH list of approved backflow assemblies.
- B. Vaults for backflow assemblies – refer to Section 06.

11 POLYPIGS

11.1 POLYPIGS

- A. Girard Industries™, Model YBS or YBS-B

**APPENDIX C CONSTRUCTION COMPLETION REPORT FORM FOR
DISTRIBUTION MAIN PROJECTS (DOH FORM 331-147)**



CONSTRUCTION COMPLETION REPORT FORM FOR DISTRIBUTION MAIN PROJECTS

In accordance with WAC 246-290-120(5), a **Construction Completion Report** is required for all construction projects. Under the submittal exception process for distribution main projects, designed by a professional engineer but not submitted to the Department of Health (DOH) for approval, the report does not need to be submitted. **However, the purveyor must keep the Construction Completion Report on file and make it available for review upon request by DOH in accordance with WAC 246-290-125 (2)(b).** Furthermore:

- (1) The report form **must** bear the seal, date and signature of a professional engineer (PE) licensed in the state of Washington; and
- (2) Per WAC 246-290-120(5)(c), the amount of change in the physical capacity of a system must be documented, if the project results in a change in physical capacity.

Name of Water System	DOH System ID No.: _____
Name of Purveyor (Owner or System Contact)	Date Water System Plan that includes Standard Construction Specifications
Mailing Address	Date Standard Specifications Approved by DOH: _____
City	State
Zip	

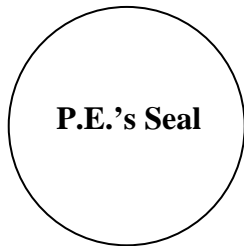
PROJECT NAME AND DESCRIPTIVE TITLE:

(Include the name of any development project and number of services.) _____ Date Project or Portions Thereof Completed _____

PROFESSIONAL ENGINEER'S ACKNOWLEDGMENT

The undersigned professional engineer (PE), or his/her authorized agent, has inspected the above-described project that, as to layout, size and type of pipe, valves and materials, and other designed physical facilities, has been constructed and is substantially completed in accordance with construction documents reviewed by the purveyor's engineer. In the opinion of the undersigned engineer, the installation, physical testing procedures, water quality tests, and disinfection practices were carried out in accordance with state regulations and principles of standard engineering practice.

I have reviewed the disinfection procedures, pressure test results, and results of the bacteriological test(s) for this project and certify that they comply with the requirements of the construction standards/specifications approved by DOH.



Date Signed
Name of Engineering Firm
Name of PE Acknowledging Construction
Mailing Address
City
State
Zip
Engineer's Signature
State/Federal Funding Type (if any) _____

Please keep a completed, signed, and stamped copy on file.

Northwest Drinking Water
 Department of Health
 20425 72nd Ave S, Suite 310
 Kent, WA 98032-2358
 Phone: (253) 395-6750
 Fax: (253) 395-6760

Southwest Drinking Water
 Department of Health
 PO Box 47823
 Olympia, WA 98504-7823
 Phone: (360) 236-3030
 Fax: (360) 664-8058

Eastern Drinking Water
 Department of Health
 16201 E Indiana Ave, Suite 1500
 Spokane Valley, WA 99216
 Phone: (509) 329-2100
 Fax: (509) 329-2104

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD call (800) 833-6388.

Appendix L
CROSS CONNECTION CONTROL PLAN



City of Renton
Water System Plan Update

APPENDIX L

CROSS CONNECTION CONTROL PLAN

I. Introduction

Providing safe, clean drinking water is one of Renton's highest priorities. Our municipal water system produces an average of 7.3 million gallons of water each day and serves over 68,000 customers. A cross connection is created when municipal drinking water supply piping connects to various plumbing fixtures or equipment. If improperly protected, contamination of the water supply can result when a backflow event occurs. To ensure public health protection, the City of Renton (City) requires backflow prevention and has established a Cross Connection Control Program. The City has a certified Cross Connection Specialist that administers the program and manages compliance for over 4,000 backflow assemblies.

The City has prepared this Cross Connection Control Plan in accordance with Washington Administrative Code (WAC) 246-290-490. This document summarizes the planning, implementation, codes, and policies of the City's Cross Connection Control Program.

II. Program Elements

The City's program follows and complies with the minimum elements of a Cross Connection Control Program as identified in WAC 246-290-490(3). All definitions are detailed in WAC 246-290-010.

Element 1: The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument...

Ordinance 4312 was adopted by City Council on May 13, 1991, amending City codes on "Water, Health and Sanitation" by adding a Cross Connection Control section. The ordinance established the City's legal authority for implementing the Cross Connection Control Program.

The following summarizes Renton Municipal Code (RMC) regarding the City's Cross Connection Control Program.

RMC 4-6-020 CROSS CONNECTION CONTROL STANDARDS:

A. Purpose

1. National standards of safe drinking water have been established. The City, as a water purveyor, has the primary responsibility for preventing water from unapproved sources, or any other substances, from entering the public potable water system. (Ord. 4312, 5-13-1991)
2. This Section is to protect the health of the water customers and the water quality in the distribution system. This shall be accomplished by a Cross Connection Control Program that relies on premise isolation. The water purveyor will be responsible for eliminating or controlling all actual (direct) and potential (indirect) cross connections. The water purveyor shall ensure these cross connections will be eliminated or controlled by installing Washington State approved backflow assemblies commensurate with the degree of hazard.

B. Applicability

This Chapter applies throughout the water service area of the City. It applies to all systems installed prior to or after its enactment. Therefore, anyone wanting or using water from the City is responsible for compliance with these regulations and shall be strictly liable for all damage incurred as a result of failure to comply with the express terms and provisions contained herein.

C. Authority

The Administrator of the Department of Public Works will administer the provisions of the Chapter. He/she will designate Cross Connection Specialists and propound all needful rules and regulations to implement these provisions. The Water Utility Section of the Utility Systems Division will be responsible for monitoring and inspecting all existing backflow assemblies and for keeping all records generated by the Cross Connection Control Program. The Plan Review Section of the Development Services Division of the Department of Community and Economic Development will be responsible for reviewing all new and revised plans for cross connections. (Ord. 5450, 3-2-2009)

D. Installation of Backflow Assemblies

Backflow assemblies required by this Chapter must be installed and be readily accessible for maintenance and testing. All backflow assemblies shall be connected at the water meter or the property line. When water meters are not used, or within any premises where, in the judgment of the City Cross Connection Specialist, the nature and extent of activity on the premises or the materials used or stored on the premises could present a health hazard should a cross connection occur. This includes:

1. Premises having an auxiliary water supply.
2. Premises having internal cross connections that are not correctable, or complex plumbing arrangements which make it impractical to ascertain whether or not cross connections exist.
3. Premises where entry is restricted so that inspections for cross connections cannot be made with sufficient frequency or at sufficient short notice to assure that cross connections do not exist.
4. Premises having a repeated history of cross connections being established or re-established.
5. Premises on which any substance is handled under pressure so as to permit entry into the public water system, or where a cross connection could reasonably be expected to occur. This includes the handling of process waters and cooling waters.
6. Premises where materials of a toxic or hazardous nature are handled such that if backpressure or backsiphonage should occur, a health hazard may result.
7. Hospitals, mortuaries, clinics.
8. Laboratories.
9. Piers and docks.
10. Sewage treatment plants.
11. Food or beverage processing plants.
12. Chemical plants using a water process.
13. Metal plating industries.
14. Petroleum processing or storage plants.
15. Radioactive material processing plants or nuclear reactors.
16. Car washes.
17. Process waters or cooling towers.
18. Fire sprinkler systems.
19. Irrigation systems.
20. Solar hot water systems.
21. Others specified by the Administrator of the Department of Planning/Building/Public Works.

E. Specific Types of Backflow Assemblies Required in the Following Conditions

1. An Air Gap separation or Reduced Pressure Backflow Assembly (RPBA) shall be installed where the water supply may be contaminated by industrial waste of a toxic nature or any other contaminant which would cause a health or system hazard. All of these premises are detailed in Table 9 of WAC 246-290-490 as severe or high-hazard facilities and will have premise isolation at the water service connection.
2. An Air Gap must be used between a potable water supply and sewer connected wastes.
3. Lawn sprinkler or irrigation systems, which are supplied by City water only, shall be required to have a Pressure Vacuum Breaker Assembly (PVBA) or a Double Check Valve Assembly (DCVA). If such system contains an auxiliary pump or is subject to chemical additives an, Air Gap separation or a RPBA will be required.

F. Responsibilities of Owner and Utility

1. Water Utilities Section:
 - a. The Water Utilities Section will perform evaluations and inspections of plans/or premises of all existing facilities. The water purveyor will inform the owner, by letter, of any corrective action deemed necessary, the method of achieving the correction and the time allowed for the correction to be made.
 - b. The Water Utilities Section shall insure that all backflow assemblies are tested annually to insure satisfactory operation.
 - c. The Water Utilities Section shall inform the owner, by letter, of any failure to comply by the time of the first inspection. An additional 15 days will be allowed for the correction. In the event the owner fails to comply with the necessary correction by the time of the second inspection, the Water Utilities Section will inform the owner, by letter, that the water service to the owner's premises will be terminated within a period not to exceed 5 days.
 - d. If the Water Utilities Section determines at any time that a serious threat to the public health exists, the water service will be terminated immediately and without notice.
2. Plan Review Section:

On new installations the Plan Review Section will provide on-site evaluation and/or inspection of plans in order to determine if cross connections exist and what type of backflow assembly, if any, will be required before a water meter permit can be issued.
3. Owner:
 - a. The owner shall be responsible for the elimination or protection of all cross connections on his/her property.
 - b. The owner, whether notified by the City or not, shall at his/her expense install, maintain and have tested by a Washington State certified Backflow Assembly Tester any and all backflow assemblies on his/her premises.
 - c. The owner shall return to the City the backflow assembly test reports within 30 days after receipt of the annual test notification.

- d. The owner shall inform the Water Utility of any proposed or modified cross connections.
- e. Owners who cannot shut down operation for testing of assemblies must provide bypass piping with an additional backflow assembly at their expense.
- f. The owner shall only install backflow assemblies which are approved by the Washington State Department of Health.
- g. The owner shall install backflow assemblies only in a manner approved by the Washington State Department of Health.
- h. The owner may be required to install a backflow assembly at the service entrance if a private water source is maintained on his premises, even if it is not cross connected to the City's system.
- i. Failure of the owner to cooperate in the installation, maintenance, repair, inspection and testing of backflow assemblies required by this Section shall be grounds for the termination of water service or the requirements of an Air Gap separation.

G. Annual Inspection and Testing Requirements

All RPBA, DCVA, PVBA, and Air Gaps shall be inspected and tested annually or more often when successive inspections indicate failure. All inspections and testing will be performed by a Washington State certified Backflow Assembly Tester. The backflow assembly test reports shall be returned to the City within 30 days after receipt of the annual test notification. (Ord. 4312, 5-13-1991)

Element 2: The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the customer's premises to the purveyor's distribution system and notifying the customer within a reasonable time frame of the hazard evaluation results...

New Installations:

As part of the City's review of an application for water service and for the issuance of a water meter permit for domestic, landscape irrigation, fire sprinkler system, or for other water uses:

1. The Water Utility section reviews all plans for development and redevelopment projects including plans for tenant improvements of existing and new buildings and evaluates the cross connection hazards. All new multi-family, commercial, and industrial development and redevelopment projects are required to have premise isolation by having an approved RPBA installed behind the domestic meter and as close as possible to the water meter, conforming to the City's Water Utility Standards Details. The Water Utility may allow the installation of an approved DCVA for premise isolation, after the review of the building plumbing plans and after verification that the use of the building is not considered as severe or high-hazard facilities per Table 9 of WAC 246-290-490. A DCVA is required on a landscape irrigation meter and a Double Check Detector Assembly (DCDA) is required for a fire protection service.
2. The City's Building/Plumbing inspector evaluates the cross connection hazards from the building internal plumbing and requires the installation of proper backflow assemblies for in-premise isolation. The Water Utility coordinates its review of the plans with the Building/Plumbing inspector when the backflow assemblies are used both for premise and for in-premise isolation.
3. The Public Works Utility Inspector inspects the installation of all backflow assemblies installed outside of the buildings. The Building/Plumbing Inspector inspects all backflow assemblies installed inside the buildings.
4. Satisfactory backflow assembly test reports must be submitted to the Water Utility for review prior to the final occupancy of the building.

Periodic reevaluations:

The Water Utility Cross Connection Control Program Manager periodically reevaluates connections and assess hazards as part of the preparation and submittal of the Annual Summary Report to the Washington State Department of Health. Connections are also evaluated and hazards assessed when they are brought to the attention of the Cross Connection Control Program Manager, for example during a tenant improvement project or when a Building/Plumbing Inspector notices something of concern.

Element 3: The purveyor shall develop and implement procedures and schedules for ensuring that:

- i. Cross connections are eliminated whenever possible;*
- ii. When cross connections cannot be eliminated, they are controlled by installation of approved backflow assembly commensurate with the degree of hazard; and*
- iii. Approved backflow assemblies are installed in accordance with the requirements of [WAC 246-290-490(6)].*

The City's Cross Connection Control Program endeavors to eliminate all actual or potential physical cross connections where possible.

An approved Air Gap is required for a severe hazard facility such as the King County Wastewater Treatment Plant. RPBA are required for premise isolation on all high-hazard facilities and on all facilities listed in Table 9 of WAC 246-290-490.

The City has adopted codes and published standards details and procedures for the installation and testing of backflow assemblies consistent with the latest edition of the "Cross-Connection Control Manual Accepted Procedure and Practice."

Element 4: The purveyor shall ensure that personnel, including at least one person certified as a Cross Connection Specialist, are provided to develop and implement the Cross Connection Control Program.

The City's Cross Connection Control Program Manager is a Washington State certified Cross Connection Specialist. Several staff in the Water Maintenance Services section are also Washington State certified Cross Connection Specialists and Washington State certified Backflow Assembly Testers.

Element 5: The purveyor shall develop and implement procedures to ensure Washington State approved backflow assemblies relied upon to protect the public water system are inspected and/or tested (as applicable) under [WAC 246-290-490(7)].

The Cross Connection Control Program Manager maintains a current database of backflow assemblies installed within the water customers' premises and at the water meters. The Cross Connection Control Program Manager sends an annual Backflow Assembly Test Notice to owners of backflow assemblies and reviews the backflow assembly test reports submitted by a Washington State certified Backflow Assembly Tester. The Cross Connection Control Program Manager notifies the owners, by letter, when a backflow assembly fails the test and requires the backflow assembly be repaired or replaced. A satisfactory backflow assembly test report must be submitted to the City.

The Cross Connection Control Program Manager inspects all new installation of backflow assemblies for premise isolation. The Building/Plumbing Inspector inspects the installation of backflow assemblies inside the buildings. A hazard assessment is conducted as part of the inspection to ensure that protection is provided commensurate with the degree of hazard. A Washington State certified Backflow Assembly Tester inspects Air Gaps, RPBA's, DCVAs, DCDAs, and all other approved backflow assemblies and sends the backflow assembly test reports to the City.

Element 6: The purveyor shall develop and implement a backflow assembly testing quality control assurance program, including, but not limited to, documentation of a Washington State certified Backflow Assembly Tester certification and test kit calibration, backflow assembly test report contents, and time frames for submitting completed backflow assembly test reports.

The Cross Connection Control Program Manager reviews the backflow assembly test reports for completeness and accuracies. Backflow assembly test reports must be submitted within 30 days of completing the test. If information is missing on the backflow assembly test report, or errors are found, the Cross Connection Control Program Manager notifies the Washington State certified Backflow Assembly Tester to resubmit a revised backflow assembly test report. The Cross Connection Control Program Manager may also inspect the backflow assembly in question.

The Cross Connection Control Program Manager requires the Washington State certified Backflow Assembly Tester submit copies of their current Washington State certification and their current test kit calibration reports. This information is entered into the City database. A partial list of Washington State certified Backflow Assembly Testers in Western Washington is kept in the Cross Connection Control Program files. Copies of this partial list are available to the public. A current list of backflow assemblies approved for installation in Washington State is also kept in the program's files. Both of these lists are updated on a regular basis.

Element 7: The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.

This element is covered in the City of Renton Water System Emergency Response Plan and also in the Security-Terrorism Appendix. Each backflow incident is investigated by the City upon its discovery or knowledge. Reports of investigations and findings are sent to the Washington State Department of Health for each actual backflow incident. The City Public Works staff has been trained on response to various emergencies including a contamination of the water distribution system through cross connections.

Element 8: The purveyor shall include information on Cross Connection Control in the purveyor's existing program for educating customers about water distribution system operation. The public education program may include periodic bill inserts, public service announcements, pamphlet distribution, notification of new consumers, and consumer confidence reports.

The City provides information on cross connection through its website and the annual Water Quality Report (also known as the Consumer Confidence Report). Public outreach and education are conducted through special events, such as Renton River Days and through regional participation with other water purveyors.

Element 9: The purveyor shall develop and maintain Cross Connection Control records including, but not limited to, the following:

- i. A master list of service connections and/or customer's premises where the purveyor relies upon Washington State approved backflow assemblies to protect the public water distribution system from contamination, the assessed hazard level of each, and the required backflow assembly/assemblies;*
- ii. Inventory information on backflow assemblies that protect the public water system including:*
 - A. Approved Air Gaps installed in lieu of approved backflow assemblies including exact Air Gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;*
 - B. Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and*
 - C. Approved Atmospheric Vacuum Breakers (AVB) used for irrigation system applications including location, description (manufacturer, model, and size), installation date, history of inspection(s), and person performing inspection(s).*
- iii. Cross Connection Control Program summary reports and backflow incident reports required under [WAC 246-290-490(8)].*

The City's Cross Connection Control Program currently uses XC2 software and track the following information on each backflow assembly and facility served with City water: level of hazard, type of backflow assembly used, premise or in-premise use, location of assembly or Air Gap, installation date, inspection history, test and repair history, test results, tester's information, and inspection of assembly.

The City keeps records of all backflow incident investigations and Annual Summary Reports.

Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional Cross Connection Control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

The King County Wastewater Treatment Plant uses reclaimed water produced by the plant. There is an approved Air Gap between the City's water supply and the domestic water tank owned by King County.

The Boeing Customer Training Center has a support facility that uses reclaimed water for its cooling system, and there is an approved DCVA at the City's domestic meter to the facility and a RPBA at the service branch to the cooling system.

Appendix M
WATER RIGHTS DOCUMENTS

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions: This permit is issued subject to existing rights; if for irrigation, permittee shall construct and maintain at his own expense a weir or other suitable device for measuring the water granted herein and this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Supervisor of Hydraulics; AND it is further

provided that Permittee, in the use of water under this permit, shall comply with all fisheries and game laws now in force or hereafter enacted, this provision being in accordance with Chap. 127, Laws of 1939

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed 1.0 cubic feet per second, or its equivalent in case of rotation. The priority date of this permit is April 26, 1939

Actual construction work shall begin on or before October 1, 1941 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1942

Complete application of the water to the proposed use shall be made on or before October 1, 1944

Given under my hand and the seal of this office at Olympia, Washington, this 13th day of February, 1940

Chas. J. Martzoller
State Supervisor of Hydraulics.

Application No. 4798

Permit No. 1112

PERMIT

To Appropriate Public Waters of the State of Washington

County King
Northwest Water Company
Issued to E-B-A-Gnew, Inc. for
benefit of Kennedy Water-60.
of Seattle, Washington

This instrument was first received in the office of the State Supervisor of Hydraulics, Olympia, Washington, on the 26th day of April, 1939, at 11:00 o'clock A. M.

Approved February 13, 1940
Recorded in Book No. 12 of
Permits, on Page 2942

CHAS. J. MARTZOLLER
State Supervisor of Hydraulics.

CERTIFICATE OF WATER RIGHT

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the rules and regulations of the State Supervisor of Hydraulics thereunder.)

This is to certify, that North West Water Co., Inc. of Seattle, State of Washington, has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of Cedar River, a tributary of Lake Washington, for the purposes of Domestic supply for community under Appropriation Permit No. 2942 issued by the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume 5, at Page 2147, on the 21st day of February, 1945, that the right hereby confirmed dates from April 26, 1939; that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed One (1.0) cubic foot per second.

A description of the lands under such right to which the water hereby confirmed is appurtenant, and the place where such water is put to beneficial use, is as follows:

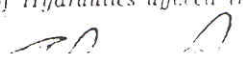
PLACE OF USE			LEGAL SUBDIVISION	FOR IRRIGATION	
Section	Township	Range		No. Acres Described in Permit	No. Acres Actually Irrigated

LOCATION OF FOWER PLANT			LEGAL SUBDIVISION	FOR POWER	
Section	Township	Range		H. P. Described in Permit	H. P. Actually Developed

Section	Township	Range	LEGAL SUBDIVISION	FOR OTHER USES
			<u>Lands embraced within the district of the Northwest Water Company</u>	<u>Domestic supply for community</u>

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 21st day



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

7504160616

CERTIFICATE NUMBER G1-20605C	PERMIT NUMBER G1-20605P	APPLICATION NUMBER G1-20605	PRIORITY DATE May 3, 1973
---------------------------------	----------------------------	--------------------------------	------------------------------

NAME CITY OF RENTON			
ADDRESS (STREET) Municipal Building, 200 Mill Avenue South, Renton	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Infiltration Gallery (unnamed springs)

TRIBUTARY OF (IF SURFACE WATERS)
Springbrook Creek

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1050.0	MAXIMUM ACRE-FEET PER YEAR 1680.0
-------------------------------	--------------------------------------	--------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
640 feet North and 40 feet West of the East quarter corner of Sec. 6

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NE $\frac{1}{4}$	SECTION 6	TOWNSHIP N. 22	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 9	COUNTY King
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RECORDED PLATTED PROPERTY

LOT Tracts 7 & 9	BLOCK 9	OF (GIVE NAME OF PLAT OR ADDITION) Springbrook Acre Tracts
---------------------	------------	---

LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by City of Renton.

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

7504160516

APR-16-75 00557 7504160516 E R 3.00

DIRECTOR
RECORDS & ELECTIONS
KING COUNTY, WASH.

APR 16 PM 4 02

RECORDED
OF
REQUEST IN

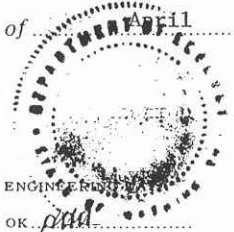
FILED for Record at Request of

Name City of Renton
Address 208 Mill Ave. So.
Renton, Wash. 98055

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

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

Given under my hand and the seal of this office at Olympia, Washington, this 15th day of April, 1975



JOHN A. BIGGS, Director
Department of Ecology

by R. Jerry Bollen
R. JERRY BOLLEN, Assistant Director

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

SURFACE WATER GROUND WATER

APPLICATION NO. G1-20605	PRIORITY DATE OF APPLICATION May 3, 1973
-----------------------------	---

NAME CITY OF RENTON			
ADDRESS (STREET) Municipal Building, 200 Mill Avenue South, Renton	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

Date of field examination: December 4, 1973

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Infiltration Gallery (unnamed springs)		
TRIBUTARY OF (IF SURFACE WATERS) Springbrook Creek		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1050.0	MAXIMUM ACRE-FEET PER YEAR 1680.0
QUANTITY, TYPE OF USE, PERIOD OF USE Municipal supply - continuously		

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL 640 feet North and 40 feet West of the East quarter corner of Sec. 6
--

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NE $\frac{1}{4}$	SECTION 6	TOWNSHIP N. 22	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 9	COUNTY King
--	--------------	-------------------	--------------------------------	---------------	----------------

RECORDED PLATTED PROPERTY

LOT Tracts 7&9	BLOCK 7&9	OF (GIVE NAME OF PLAT OR ADDITION) Springbrook Acre Tracts
-------------------	--------------	---

LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by City of Renton

DESCRIPTION OF PROPOSED WORKS

Infiltration pipes, collection well and gravity transmission system.

DEVELOPMENT SCHEDULE

BEGINNING DATE	COMPLETION DATE	DATE COMPLETE APPLICATION OF WATER TO BE MADE
Started		

PROVISIONS AND RECOMMENDATIONS

The request for 1050.0 gallons per minute is granted with an annual quantity of 1680.0 acre-feet per year for municipal supply.

Applicant is advised that notice of proof of appropriation of water (under which final certificate of water right issues) should not be filed until the permanent diversion facilities have been installed together with a mainline system capable of delivering the recommended quantity of water to an existing or proposed distribution system within the area to be served.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Assistant Secretary, Division of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Division of Health, Public Health Building No. 4, Thurston Airdustrial Center, Olympia, with regard to the need for compliance.

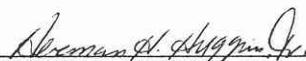
"A suitable measuring device shall be installed and maintained in accordance with WAC 508-64-020 through WAC 508-64-040." (Installation, operation and maintenance requirements attached hereto.)

It is noted that the well site and/or water transmission facilities are not wholly located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land. Copy(ies) of easement agreement(s) must be furnished this Department prior to issuance of Certificate of Water Right.

Additionally, the permit when issued shall carry the following provision: "Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971."

Signed at Redmond, Washington,

this 16 day of August, 1974.


HERMAN H. HUGGINS, JR.
Hydraulics Engineer
Department of Ecology

CERTIFICATE RECORD No. 1, PAGE No. 463

STATE OF WASHINGTON, COUNTY OF King

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

This is to certify, that City of Renton, of Renton, State of Washington, has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of Springbrook Creek, a tributary of Duwamish River, for the purposes of municipal water supply, under Appropriation Permit No. 1555, of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume 1, at Page 463, on the 17th day of December, 1930; that the right hereby confirmed dates from May 17th, 1930; that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 2.3 cubic feet per second.

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or if for other purposes, the place where such water is put to beneficial use, is as follows:

PLACE OF USE			LEGAL SUBDIVISION	No. Acres Described in Permit	No. Acres Actually Irrigated
Section	Township	Range			
			City of Renton, King County		

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 17th day of December, 1930.


 State Supervisor of Hydraulics.

RECORDING DATA


(COPY)

APPLICATION NO. 2983

CITY OF RENTON

Examination made October 17, 1930.

This application is for 2.3 c.f.s. from Springbrook Creek for municipal water supply.

A council man for the City of Renton took me out and explained this application.

I find that the City of Renton wishes to increase their supply from this creek. No use is made of the creek other than possibly for stock purposes. Just below the point of diversion there is a county road crossing which causes a fall of about 18 or 20 feet. There is 0.94 c.f.s. or 607,616 gallons per day flowing over the weir at this point of diversion. There is also seepage and leakage at the dam of possibly one-half this amount, or 1.5 c.f.s. available at the lower point of diversion.

I find public water available and the purpose to which it is to be applied a beneficial use. A permit should issue subject to existing rights.

CLARENCE E. DOUGLASS

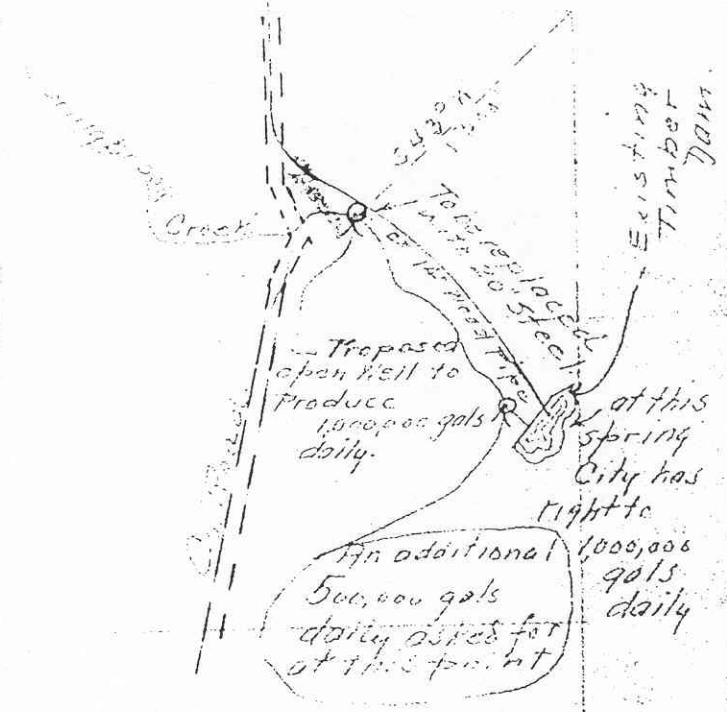
Signed this 20th day of Oct 1930.

O. K.

C. J. B.

SECTION PLAT

Sec. 6 Twp. 22 N R. 5 E



2983

Be sure to show distance and bearing of point of diversion from nearest 40-acre corner. Also traveling directions from nearest town on main highway.

Proof of Appropriation of Water



Application No.

- Name of applicant. The CITY OF RENTON, a municipal corporation
- Postoffice address. Renton, King County, Washington
- Source of appropriation. Spring brook tributary of Duwamish River
- For what purpose or purposes is water used? Domestic use for the City of Renton.
- Give date of beginning of construction. June 15, 1930.
- Give date of completion of construction work. November 15, 1930.
- When was all the water completely applied to proposed use? August 1, 1930.
- Fill in the following carefully, according to use. If for irrigation, fill in the number of acres described in permit and the number of acres actually irrigated (Water should be applied to the full number of acres to be irrigated before certificate can issue). If for power, give location of power plant and the theoretical horse power described in permit. If for domestic supply, municipal, manufacturing or other uses, simply give the description of place of use.

PLACE OF USE			LEGAL SUBDIVISION	FOR IRRIGATION FILL IN FOLLOWING	
Section	Township	Range		No. Acres Described in Permit	No. Acres Actually Irrigated

LOCATION OF POWER PLANT			LEGAL SUBDIVISION	FOR POWER FILL IN FOLLOWING	
Section	Township	Range		H. P. Described in Permit	H. P. Actually Developed

FOR ALL OTHER USES

Section	Township	Range	LEGAL SUBDIVISION

City of Renton; approximately S. 43°W. a distance 1300 feet from the NE corner of Sec. 6, Twp. 22, N.R. 5 E., and from this point upstream to the existing dam of City's water supply, being within the SE 1/4 of the NE 1/4 of Sec. 6, Twp. 22 N.R. 5 E. W.M., in King County

9. During what months is water used? City of Renton, King County
all of the year.

10. Does map filed with your permit show correctly the location of diverting work and area of land where water is used? Yes. If not, state wherein such map is in error.

11. If the dimensions of your ditch or dam do not correspond to those described in your permit and the plans and specifications now on file in the office of the State Supervisor of Hydraulics, state what changes have been made, giving dimensions of ditch or other distributing works. The same.



PUBLIC WORKS DEPARTMENT

RICHARD C. HOUGHTON ● DIRECTOR

MUNICIPAL BUILDING 200 MILL AVE. SO. RENTON, WASH. 98055

206 235-2569

BARBARA Y. SHINPOCH
MAYOR

August 10, 1987

Mr. Don Gallagher
Springbrook Trout Farm
19225 Springbrook Road
Renton, Washington 98055

Dear Mr. Gallagher:

Apparently you or your son inferred that the city of Renton is required to flow 2.5 cubic feet of water into Springbrook Creek and that we were not doing it.

I submit the following for your information:

1. Certificate of Water Right, dated December 17, 1930, for surface water of 2.3 cubic feet per second or 1050 gallons per minute.
2. Certificate of Additional Water Right, for ground water, dated May 3, 1973, in the amount of 1050 gallons per minute.

It should be noted, that neither of these certificates require flow in Springbrook Creek.

At one time the City of Renton applied for additional surface water rights under application No. 19590 (on April 14, 1966) which required flow in Springbrook Creek, but this application was cancelled on June 7, 1971.

Also attached are copies of your water right, Certificate of Surface Water Right No. 3421, which was originally granted to Halvor Fluen in November of 1949. This water right was in the amount of .40 cubic feet per second (3 gallons per second, or 180 gallons per minute) from Springbrook Creek. An additional amount, .20 cubic feet, was given for other springs on your property.

A Certificate of Change of Place of Use of Water was granted on January 18, 1957 through Certification of Change form No. 489.

August 10, 1987

Don Gallagher

Page 2

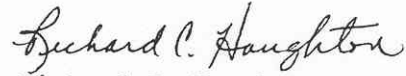
From the above rights it appears that you have 180 gallons per minute water rights from Springbrook Creek. If you have any other water rights, surface or ground water, please send us a copy of them.

At the present time the City of Renton is taking approximately 540 gallons per minute from the Springs. This is approximately one-half of our allotted right under the 1930 water right. For some reason the Springs have not produced the water volumes that they once did.

As long as the City is not short of water supplies from its other sources, the City has, and will, allow additional flows down the creek to help you. This is done in the form of a good neighbor policy. These additional flows are not meant to imply that the Utility views the granting of them as a requirement.

Your earliest response to this letter would be appreciated.

Very truly yours,



Richard C. Houghton
Public Works Director

2H.01.23.rlo:jlm

Enclosures

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE January 1944	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 886-D
-------------------------------	--------------------	---------------	-----------------------------

NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 1

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,040	MAXIMUM ACRE-FEET PER YEAR 1,676
-------------------------------	-------------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
65 feet north and 945 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (Moved 60 feet south and 40 feet east of original Well 1)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ NW¼	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
--	---------------	-------------------	------------------------------	---------------	----------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

33010167

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130167

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK _____

by *Stephen J. Hirschey*
Stephen J. Hirschey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE January 1944	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 886-D
-------------------------------	--------------------	---------------	-----------------------------

NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 1

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,040	MAXIMUM ACRE-FEET PER YEAR 1,676
-------------------------------	-------------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
65 feet north and 945 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (Moved 60 feet south and 40 feet east of original Well 1)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 24" diameter, 96' deep

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Complete	COMPLETE PROJECT BY THIS DATE: Complete	WATER PUT TO FULL USE BY THIS DATE: In use
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REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace well) for Water Right Certificate No. 886-D which issued for 1,040 gallons per minute (GPM); 1,676 acre-feet per year (AF/YR) for Municipal supply from the City of Renton's Well No. 1. This Certificate has a priority date of January 1944 based on a Declaration of Claim No. 816 (see list under GENERAL INFORMATION below for other changes this source).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Numerous site visits were made, including on-site observations during aquifer tests. Also, Ecology staff attended several meetings which involved this and other Renton applications.

General Information

This is the first of five Applications For Change of Water Right relating to three wells located near the center of the City of Renton in Liberty Park. Wells No. 1 & 2 were drilled and put to use in 1944. Withdrawal rates in these two wells were increased in 1966, at which time Well No. 3 was drilled. As a result, Well No. 1 has two certificated rights with instantaneous withdrawals totaling 2,000 GPM; Well No. 2 has two rights totaling 3,000 GPM, and Well No. 3 has one right for 1,600 GPM. All five rights total 6,600 GPM (see the following listing).

Cert.No.	Well No.	Priority	GPM	AF/YR
886-D*	1	January 1944	1,040	1,676
5838-A	1	April 14, 1966	960	1,536 Supplemental
887-D	2	January 1944	1,040	838
5836-A	2	April 14, 1966	1,960	3,136 Supplemental
5835-A	3	April 14, 1966	1,600	2,560 Supplemental

6,600 Total

*Identifies this application

By 1987 wells 1 and 2 needed to be replaced as casings were showing signs of potential collapse and surface seals did not meet current standards. Well 3 was located next to a gas station and needed to be relocated for a greater degree of protection from contamination. Plans called for the replacement wells to be put under one roof and pumping rates for each well equalized to increase overall system efficiency. Therefore, in addition to replacing the three wells, Renton also requested that their water rights be changed to allow equal pumping from each well.

Permitting this equalization can be accomplished by changing the point of withdrawal on Certificate No. 5836-A from old Well 2 to three new points of withdrawal from new wells 1, 2 & 3. This is an acceptable water right change as all wells will tap the same source of water in a confined aquifer within the Cedar River Basin and will be located within the same 1/4 section and drilled to similar depths.

Also under this change the place of use will be updated to include vested interties approved by Ecology (Bucknell letter June 22, 1992).

Report Continued

A 72 hour aquifer test was performed on June 24, 25 and 26, 1987. Both old and new wells were used to stress the aquifer. Wells were pumped at 11,400 GPM for 24 hours then increased to 14,700 GPM for 25 hours (total instantaneous withdrawal of all five certificates equals 6,600 GPM). Renton hired the USGS to measure Cedar River flows both above and below the well sites, during and following the test. The consultant's hydrogeologic profile shows approximately 15 feet of drawdown occurred at the main well heads, 5 feet within 500 feet and full recovery within eight hours. No effect could be measured to flows in the Cedar River.

On September 21, 1987, a Temporary Permit was issued to remain in effect during the pendency of the applications.

Application Specific Information

This report is specific to Water Right Certificate No. 886-D with a priority date of January 1944. This right authorizes a withdrawal of 1,040 GPM and 1,676 AF/YR from Renton's Well No. 1 for a Municipal Supply.

New well No. 1 was drilled in March 1987 to a depth of 96'. It is cased to 57' and screened from 57' to 91'. A cement grout surface seal extends to 22'. The well was pump tested by the driller on March 27, 1987 at 2,000 GPM with four feet of drawdown after four hours of pumping.

The following relates to the original and replacement Well No. 1 :

OLD WELL # 1	NEW WELL # 1
82' deep; 26" diameter	96' deep; 24" diameter
SWL 22' - ground surface	SWL 27' - top of well
125' North & 985' West of	65' North & 945' West of
Center of Section 17 within	Center of Section 17
SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17	Same legal as old Well No. 1
Township 23 north Range 5 east	
Willamette Meridian	
but 60' south and 40' east	

A review of Ecology's water right files and the drillers' Water Well Report files show that other water rights in this area are those of the applicant, the City of Renton.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No. 11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979 under Chapter 173-508 WAC which identified instream flow values for the Cedar River. The Seattle Water Department and others have long contended that Renton's wells are in hydraulic continuity with the river. Renton and their consultants, RH2 Engineering, contend that the confined aquifer in this area moves south into the old Black River channel and into the lower Duwamish and Elliott Bay. As the rights on these wells preceded the regulation, none of this should be relevant except that Seattle's claimed right from the river precedes Renton's certificates on their wells. Also, Renton has expressed interest in obtaining additional water from these wells.

The 72 hour aquifer test described earlier in this report was intended to first, quantify the capacity of the aquifer but was also done in the attempt to dismiss the false assertions that Renton's wells sucked the river dry whenever their pumps kicked on. Also, they hoped to prove their theory on directional movement of ground water in this area. Without monitoring ground water in the old Black River channel during the test, Renton's theory remains only a theory. The test did show, however, that pumping the aquifer at double certificated quantities had no measurable effect on the river.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use to these existing certificates will complete the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

A superseding certificate should be issued as original for 1,040 GPM and 1,676 AF/YR; with the same priority date of January, 1944; with the change being in the point of withdrawal (new well) and the place of use (current service area including interties) and subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY: Troy Bushby DATE: 6-24-93

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5838-A
---------------------------------	--------------------	---------------	------------------------------

NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 1

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 960	MAXIMUM ACRE-FEET PER YEAR 1,536*
-------------------------------	-----------------------------------	--------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal water supply - continuously
*Supplemental to existing rights

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
65 feet north and 945 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.
(Moved 60 feet south and 40 feet east of original Well #1)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE 1/4 NW 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

City of Renton
200 Mill Avenue South
Renton, WA 98055

9308130168
8910818086

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130168

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK 

by 
Stephen J. Hirschey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5838-A
---------------------------------	--------------------	---------------	------------------------------

NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well No. 1
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 960	MAXIMUM ACRE-FEET PER YEAR 1,536*
-------------------------------	-----------------------------------	--------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously
*Supplemental to existing rights

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
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(Moved 60 feet south and 40 feet east of original Well #1)

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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

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DESCRIPTION OF PROPOSED WORKS

Well #1 24" diameter, 96' deep

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:

Complete

COMPLETE PROJECT BY THIS DATE:

Complete

WATER PUT TO FULL USE BY THIS DATE:

In use

REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace well) for the City's Liberty Park Well No. 1 for Water Right Certificate No. 5838-A with a priority date of April 14, 1966. This is the second right issued on this well and this right issued for 960 gallons per minute (GPM); 1,536 acre-feet per year (AF/YR) supplemental to Renton's other rights for Municipal supply (see list under GENERAL INFORMATION).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Numerous site visits were made, including on-site observations during aquifer tests. Also, Ecology staff attended several meetings which involved this and other Renton applications.

General Information

This is one of five Applications For Change Of Water Right relating to 3 wells located near the center of the City of Renton in Liberty Park. Wells No. 1 & 2 were drilled and put to use in 1944. Withdrawal rates in these two wells were increased in 1966, at which time Well No. 3 was drilled. As a result, Well No. 1 has two certificated rights with instantaneous withdrawals totaling 2,000 GPM; Well No. 2 has two rights totaling 3,000 GPM and Well No. 3 has one right for 1,600 GPM. All five rights total 6,600 GPM (see the following listing).

Cert. No.	Well No.	Priority	GPM	AF/YR
886-D	1	January 1944	1,040	1,676
5838-A*	1	April 14, 1966	960	1,536 Supplemental
887-D	2	January 1944	1,040	838
5836-A	2	April 14, 1966	1,960	3,136 Supplemental
5835-A	3	April 14, 1966	1,600	2,560 Supplemental
			6,600	Total

*Identifies this change

By 1987 wells 1 and 2 needed to be replaced as casings were showing signs of potential collapse and surface seals did not meet current standards. Well 3 was located next to a gas station and needed to be relocated for a greater degree of protection from contamination. Plans called for the replacement wells to be put under one roof and pumping rates for each well equalized to increase overall system efficiency. Therefore, in addition to replacing the three wells, Renton also requested that their water rights be changed to allow equal pumping from each well.

Permitting this equalization can be accomplished by changing the point of withdrawal on Certificate No. 5836-A from old Well 2 to three new points of withdrawal to new wells 1, 2 & 3 (see report 5836-A for more information). This is an acceptable water right change as all wells will tap the same source of water in a confined aquifer within the Cedar River Basin and will be located within the same 1/4 section and drilled to similar depths.

Report Continued

Also under this change, the place of use will be updated to include vested interties approved by Ecology (Bucknell June 22, 1992).

A 72 hour aquifer test was performed on June 24, 25 and 26, 1987. Both old and new wells were used to stress the aquifer. Wells were pumped at 11,400 GPM for 24 hours then increased to 14,700 GPM for 25 hours (total instantaneous withdrawal of all five certificates equal 6,600 GPM). Renton hired the USGS to measure Cedar River flows both above and below the well sites, during and following the test. The consultant's hydrogeologic profile shows approximately 15 feet of drawdown occurring at the main well heads, 5 feet within 500 ft. and full recovery within eight hours after pump shut-down. No measurable effect occurred to flows in the Cedar River.

On September 21, 1987, a Temporary Permit was issued to remain in effect during the pendency of the applications.

Application Specific Information

This report is specific to Water Right Certificate No. 5838-A with a priority date of April 14, 1966 from Well No. 1 for a Municipal Supply. This right authorizes a withdrawal of 960 GPM and 1536 AF/YR supplemental to Renton's other rights .

New Well No. 1 was drilled in March 1987 to a depth of 96'. It is cased to 57' and screened from 57' to 91'. A cement grout surface seal extends to 22'. The well was pump tested by the driller on March 27, 1987 at 2,000 GPM with four feet of drawdown after four hours of pumping.

The following relates to the original and replacement Well No. 1 :

OLD WELL # 1	NEW WELL # 1
82' deep; 26" diameter	96' deep; 24" diameter
SWL 22' - ground surface	SWL 27' - top of well
125' north & 985' west of	65' north & 945' west of
Center of Section 17 within	center of Section 17
SE¼ NW¼ Section 17	Same legal as old Well # 1
Township 23 north Range 5 east	but 60' south and 40' east
Willamette Meridian	

A review of Ecology's water right files and the drillers' Water Well Report files show that other water rights in this area are those of the applicant, the City of Renton.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No.11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979 under Chapter 173-508 WAC which identified instream flow values for the Cedar River. The Seattle Water Department and others have long contended that Renton's wells are in hydraulic continuity with the river. Renton and their consultants, RH2 Engineering, contend that the confined aquifer in this area moves south into the old Black River channel and into the lower Duwamish and Elliott Bay. As the rights on these wells preceded the regulation, none of this should be relevant except that Seattle's claimed right from the river precedes Renton's certificates on their wells. Also Renton has expressed interest in obtaining additional water from these wells.

The 72 hour aquifer test described earlier in this report was intended to first, quantify the capacity of the aquifer but was also done in the attempt to dismiss the false assertions that Renton was sucking the river dry whenever their pumps kicked on. Also, they hoped to prove their theory on directional movement of ground water in this area. Without monitoring ground water in the old Black River channel during the test, Renton's theory remains

only a theory. The test did show, however, that pumping the aquifer at double certificated quantities had no measurable effect on the river.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use to these existing certificates will complete the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

A superseding certificate should be issued as original for 960 GPM and 1,536 AF/YR supplemental to existing rights and with the same priority date of April 14, 1966. This change includes the point of withdrawal (new well) and the place of use (current service area including interties) and is subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY: Roy Bush DATE: 6-24-93

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE January 1944	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 887-D
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NAME
City of Renton

ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055
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This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 2

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,040	MAXIMUM ACRE-FEET PER YEAR 838
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
70 feet north and 970 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (Moved 60 feet south and 30 feet east of original Well 2)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE 1/4 NW 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

9308130164

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130164

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK

by Stephen J. Hirschey
Stephen J. Hirschey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

Surface Water

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

Ground Water

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

PRIORITY DATE January 1944	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 887-D
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NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well No. 2
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,040	MAXIMUM ACRE-FEET PER YEAR 838
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
70 feet north and 970 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (Moved 60 feet south and 30 feet east of original Well 2)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 24" diameter, 74' deep

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:

Complete

COMPLETE PROJECT BY THIS DATE:

Complete

WATER PUT TO FULL USE BY THIS DATE:

In use

REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace well) for Water Right Certificate No. 887-D which issued for 1,040 gallons per minute (GPM); 838 acre-feet per year (AF/YR) for Municipal supply from the City of Renton's Well No. 1. This Certificate has a priority date of January 1944 based on a Declaration of Claim No. 817 (see list under GENERAL INFORMATION below for other changes this source).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Numerous site visits were made, including on-site observations during aquifer tests. Also, Ecology staff attended several meetings which involved this and other Renton applications.

General Information

This is one of five applications for changes to water rights relating to three wells located near the center of the City of Renton in Liberty Park. Wells No. 1 & 2 were drilled and put to use in 1944. Withdrawal rates in these two wells were increased in 1966 at which time Well No. 3 was drilled. As a result, Well No. 1 has two certificated rights with instantaneous withdrawals totaling 2,000 GPM.; Well No. 2 has two rights totaling 3,000 GPM and Well No. 3 has one right for 1,600 GPM. All five rights total 6,600 GPM (see the following listing).

Cert. No.	Well No.	Priority	GPM	AF/YR
886-D	1	January 1944	1,040	1,676
5838-A	1	April 14, 1966	960	1,536 Supplemental
887-D*	2	January 1944	1,040	838
5836-A	2	April 14, 1966	1,960	3,136 Supplemental
5835-A	3	April 14, 1966	1,600	2,560 Supplemental
			6,600	Total

*Identifies this application

By 1987 wells 1 and 2 needed to be replaced as casings were showing signs of potential collapse and surface seals did not meet current standards. Well 3 was located next to a gas station and needed to be relocated for a greater degree of protection from contamination. Plans called for the replacement wells to be put under one roof and pumping rates for each well equalized to increase overall system efficiency. Therefore, in addition to replacing the three wells, Renton also requested that their water rights be changed to allow equal pumping from each well.

Permitting this equalization can be accomplished by changing the point of withdrawal on Certificate No. 5836-A from old well 2 to three new points of withdrawal from new wells 1, 2 & 3. This is an acceptable water right change as all wells will tap the same source of water in a confined aquifer within the Cedar River Basin and will be located within the same 1/4 section and drilled to similar depths.

Also under this change the place of use will be updated to include vested interties approved by Ecology (Bucknell letter June 22, 1992).

Report Continued

A 72 hour aquifer test was performed on June 24, 25 and 26, 1987. Both old and new wells were used to stress the aquifer. Wells were pumped at 11,400 GPM for 24 hours then increased to 14,700 GPM for 25 hours (total instantaneous withdrawal of all five certificates equal 6,600 GPM). Renton hired the USGS to measure Cedar River flows both above and below the well sites, during and following the test. The consultant's hydrogeologic profile shows approximately 15 feet of drawdown occurred at the main well heads, 5 feet within 500 feet and full recovery within eight hours. No effect could be measured to flows in the Cedar River.

On September 21, 1987 a Temporary Permit was issued to remain in effect during the pendency of the applications.

Application Specific Information

This report is specific to Water Right Certificate No. 887-D with a priority date of January 1944. This right authorizes a withdrawal of 1,040 GPM and 838 AF/YR from Renton's Well No. 2 for a Municipal Supply.

New Well No. 2 was completed on June 21, 1987 to a depth of 74'. It is cased to 50' and screened from 50' to 70'. A cement grout surface seal extends to 22'. The well was pump tested by the driller on April 8, 1987 at 2,325 GPM with five feet of drawdown after four hours of pumping.

The following relates to the original and replacement Well No. 2 :

OLD WELL # 2	NEW WELL # 2
82' deep; 26" diameter	74' deep; 24" diameter
SWL 22' - ground surface	SWL 24' - top of well
130' north & 1,000' west of center of Section 17 within SE¼ NW¼ Section 17	70' North & 970' West of center of Section 17
Township 23 north Range 5 east Willamette Meridian	Same legal as old Well # 1 but 60' south and 30' east

A review of Ecology's water right files and the drillers' Water Well Report files show that other water rights in this area are those of the applicant, the City of Renton.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No.11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979 under Chapter 173-508 WAC which identified instream flow values for the Cedar River. The Seattle Water Department and others have long contended that Renton's wells are in hydraulic continuity with the river. Renton and their consultants, RH2 Engineering, contend that the confined aquifer in this area moves south into the old Black River channel and into the lower Duwamish and Elliott Bay. As the rights on these wells preceded the regulation, none of this should be relevant except that Seattle's claimed right from the river precedes Renton's certificates on their wells. Also Renton has expressed interest in obtaining additional water from these wells.

The 72 hour aquifer test described earlier in this report was intended to first, quantify the capacity of the aquifer but was also done in the attempt to dismiss the false assertions that Renton's wells suck the river dry whenever their pumps kicked on. Also, they hoped to prove their theory on directional movement of ground water in this area. Without monitoring ground water in the old Black River channel during the test, Renton's theory remains only a theory. The test did show, however, that pumping the aquifer at certificated quantities has no measurable effect on the river.

Report Continued

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use to these existing certificates will complete the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

A superseding certificate should be issued as original for 1,040 GPM and 838 AF/YR; with the same priority date of January, 1944; with the change being in the point of withdrawal (new well) and the place of use (current service area including interties) and subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY:  DATE: 6-24-93

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5835-A
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NAME
City of Renton

ADDRESS (STREET) (CITY) (STATE) (ZIP CODE)
200 Mill Avenue South Renton Washington 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 3

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,600	MAXIMUM ACRE-FEET PER YEAR 2,560*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously
*Supplemental to existing rights

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
Original Well #3: 1,000 feet north and 400 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian.

New Well #3: 100 feet north and 900 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (New Well #3 850 feet south and 490 feet west of original Well #3)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE 1/4 NW 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

City of Renton
200 Mill Avenue South
Renton, WA 98055

9308130162

PROVISIONS

Original Well No. 3 will be maintained primarily as a contaminant interceptor and, should other systems fail, may be used as an emergency backup after notifying Ecology.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130162

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK 

by 
Stephen J. Hirschey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5835-A
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NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well No. 3
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,600	MAXIMUM ACRE-FEET PER YEAR 2,560*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously
*Supplemental to existing rights

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
Original Well #3: 1,000 feet north and 400 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian.
New Well #3: 100 feet north and 900 feet west of the center of Section 17, Township 23 north, Range 5 east Willamette Meridian. (New Well #3 850 feet south and 490 feet west of original Well #3)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ NW¼	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 24" diameter, 96' deep

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Complete	COMPLETE PROJECT BY THIS DATE: Complete	WATER PUT TO FULL USE BY THIS DATE: In use
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REPORT

BACKGROUND

This application for change was received from the City of Renton to add a point of withdrawal (new well) for the City's Liberty Park Well No. 3 for Water Right Certificate No. 5835-A with a priority date of April 14, 1966. This right issued for 1,600 gallons per minute (GPM); 2,560 acre-feet per year (AF/YR) supplemental to Renton's other rights for Municipal supply (see list under GENERAL INFORMATION).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Numerous site visits were made, including on-site observations during aquifer tests. Also, Ecology staff attended several meetings which involved this and other Renton applications.

General Information

This is one of five Applications For Change Of Water Right relating to three wells located near the center of the City of Renton in Liberty Park. Wells No. 1 & 2 were drilled and put to use in 1944. Withdrawal rates in these two wells were increased in 1966 at which time this well, Well No. 3, was drilled. As a result, Well No. 1 has two certificated rights with instantaneous withdrawals totaling 2,000 GPM; Well No. 2 has two rights totaling 3,000 GPM, and Well No. 3 has one right for 1,600 GPM. All five rights total 6,600 GPM. (See the following listing).

Cert. No.	Well No.	Priority	GPM	AF/YR
886D	1	January 1944	1,040	1,676
5838-A	1	April 14, 1966	960	1,536 Supplemental
887-D	2	January 1944	1,040	838
5836-A	2	April 14, 1966	1,960	3,136 Supplemental
5835-A*	3	April 14, 1966	1,600	2,560 Supplemental

			6,600	Total

*Identifies this change

By 1987 wells 1 and 2 needed to be replaced as casings were showing signs of potential collapse and surface seals did not meet current standards. Well 3 was located next to a gas station and needed to be relocated for a greater degree of protection from contamination. Plans called for the replacement wells to be put under one roof and pumping rates for each well equalized to increase overall system efficiency. Therefore, in addition to replacing the three wells, Renton also requested that their water rights be changed to allow equal pumping from each well.

Permitting this equalization can be accomplished by changing the point of withdrawal on Certificate No. 5836-A from old Well 2 to three new points of withdrawal to new wells 1, 2 & 3 (see report for 5836-A for more information). This is an acceptable water right change as all wells will tap the same source of water in a confined aquifer within the Cedar River Basin and will be located within the same 1/4 section and drilled to similar depths.

Report Continued

Also under this change, the place of use will be updated to include vested interties approved by Ecology (Bucknell June 22, 1992).

A 72 hour aquifer test was performed on June 24, 25 and 26, 1987. Both old and new wells were used to stress the aquifer. Wells were pumped at 11,400 GPM for 24 hours then increased to 14,700 GPM for 25 hours (total instantaneous withdrawal of all five certificates equal 6,600 GPM). Renton hired the USGS to measure Cedar River flows both above and below the well sites, during and following the test. The consultant's hydrogeologic profile shows approximately 15 feet of drawdown occurring at the main well heads, 5 feet within 500 ft. and full recovery within eight hours after pump shut-down. No measurable effect occurred to flows in the Cedar River.

On September 21, 1987, a Temporary Permit was issued to remain in effect during the pendency of the applications.

Application Specific Information

This report is specific to Water Right Certificate No. 5835-A with a priority date of April 14, 1966 from Well No. 3 for a Municipal Supply. This right authorizes a withdrawal of 1,600 GPM and 2,560 AF/YR supplemental to Renton's other rights. Old Well 3 will not be abandon but maintained as a contaminant interceptor well, but also will be kept operational as an emergency standby source.

New Well No. 3 was drilled in March and April 1987 to a depth of 84', completed to 76', cased to 52' and screened from 52' to 72'. A cement grout surface seal extends to 22'. The well was pump tested by the driller on May 28, 1987 at 2,300 GPM with five feet of drawdown after four hours of pumping. The following relates to the original and replacement Well No. 3 :

OLD WELL # 3	NEW WELL # 3
95' deep; 12" diameter	76' deep; 24" diameter
SWL unknown	SWL 27' - top of well
1000' north & 400' west of center of Section 17 within SE¼ NW¼ Section 17	100' north & 900' west of center of Section 17
Township 23 north Range 5 east Willamette Meridian	Same legal as old Well # 3 but 850' south & 490' west

Well locations +/- 50'

A review of Ecology's water right files and the drillers' Water Well Report files show that other water rights in this area are those of the applicant, the City of Renton.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No.11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979 under Chapter 173-508 WAC which identified insteam flow values for the Cedar River. The Seattle Water Department and others have long contended that Renton's wells are in hydraulic continuity with the river. Renton and their consultants, RH2 Engineering, contend that the confined aquifer in this area moves south into the old Black River channel and into the lower Duwamish and Elliot Bay. As the rights on these wells preceded the regulation, none of this should be relevant except that Seattle's claimed right from the river precedes Renton's certificates on their wells. Also Renton has expressed interest in obtaining additional water from these wells.

The 72 hour aquifer test described earlier in this report was intended to first, quantify the capacity of the aquifer but was also done in the attempt to dismiss the false assertions that Renton's wells suck the river dry whenever

their pumps kick on. Also, they hoped to prove their theory on directional movement of ground water in this area. Without monitoring ground water in the old Black River channel during the test, Renton's theory remains only a theory. The test did show, however, that pumping the aquifer at double certificated quantities had no measurable effect on the river.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use to these existing certificates will complete the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well will be maintained as a contaminant interceptor and may be used as an emergency backup source.
3. This will not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

A superseding certificate should be issued as original for 1,600 GPM and 2,560 AF/YR supplemental to existing rights and with the same priority date of April 14, 1966. This change includes the point of withdrawal (new well) and the place of use (current service area including interties) and is subject to the following recommendations and provisions:

Original Well No. 3 will be maintained primarily as a contaminant interceptor and, should other systems fail, may be used as an emergency backup after notifying Ecology.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY: Royal Bushop DATE: 6-24-93

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5836-A
---------------------------------	--------------------	---------------	------------------------------

NAME
City of Renton

ADDRESS (STREET) (CITY) (STATE) (ZIP CODE)
200 Mill Avenue South Renton Washington 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells 1, 2, & 3

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,960**	MAXIMUM ACRE-FEET PER YEAR 3,136*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal water supply - continuously
*Supplemental to existing rights
**Moved from original Well #2 - 200 gpm to new Well #1;
1,160 gpm to new Well #2 and 600 gpm to new Well #3

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Well #1 65 feet north and 945 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.
Well #2 70 feet north and 970 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.
Well #3 100 feet north and 900 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE 1/4 NW 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

9308130166

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130166

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK. 

by 
Stephen J. Hirshey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5836-A
---------------------------------	--------------------	---------------	------------------------------

NAME
City of Renton

ADDRESS (STREET) (CITY) (STATE) (ZIP CODE)
200 Mill Avenue South Renton Washington 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells 1, 2, & 3

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,960**	MAXIMUM ACRE-FEET PER YEAR 3,136*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal water supply - continuously
*Supplemental to existing rights
**Moved from original Well #2 - 200 gpm to new Well #1;
1,160 gpm to new Well #2 and 600 gpm to new Well #3

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
Well #1 65 feet north and 945 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.
Well #2 70 feet north and 970 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.
Well #3 100 feet north and 900 feet west of the center of Section 17, Township 23 north, Range 5 east W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE 1/4 NW 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well #1 24" diameter, 76' deep
Well #2 24" diameter, 74' deep
Well #3 24" diameter, 96' deep

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Complete	COMPLETE PROJECT BY THIS DATE: Complete	WATER PUT TO FULL USE BY THIS DATE: In use
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REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace wells) on Water Right Certificate No. 5836-A with a priority date of April 14, 1966. This change is from the City's Liberty Park Well No. 2 to three new withdrawal points - new wells 1, 2 & 3. This, the second right issued on this well, issued for 1,960 gallons per minute (GPM); 3,136 acre-feet per year (AF/YR) supplemental to Renton's other rights for Municipal supply (see list under GENERAL INFORMATION).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Numerous site visits were made, including on-site observations during aquifer tests. Also, Ecology staff attended several meetings which involved this and other Renton applications.

General Information

This is one of five Applications For Change Of Water Right relating to three wells located near the center of the City of Renton in Liberty Park. Wells No. 1 & 2 were drilled and put to use in 1944. Withdrawal rates in these two wells were increased in 1966, at which time Well No. 3 was drilled. As a result, Well No. 1 has two certificated rights with instantaneous withdrawals totaling 2,000 GPM; Well No. 2 has two rights totaling 3,000 GPM, and Well No. 3 has one right for 1,600 GPM. All five rights total 6,600 GPM (see the following listing).

Cert. No.	Well No.	Priority	GPM	AF/YR
886-D	1	January 1944	1,040	1,676
5838-A	1	April 14, 1966	960	1,536 Supplemental
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5835-A	3	April 14, 1966	1,600	2,560 Supplemental
			<hr style="width: 10%; margin: 0 auto;"/>	
			6,600	Total

*Identifies this application

By 1987 wells 1 and 2 needed to be replaced, as casings were showing signs of potential collapse and surface seals did not meet current standards. Well 3 was located next to a gas station and needed to be relocated for a greater degree of protection from contamination. Plans called for the replacement wells to be put under one roof and pumping rates for each well equalized to increase overall system efficiency. Therefore, in addition to replacing the three wells, Renton also requested that their water rights be changed to allow equal pumping (2,200 GPM) from each well.

Permitting this equalization can be accomplished by changing the point of withdrawal on this certificate (No. 5836-A) from old Well 2 to three new points of withdrawal to new wells 1, 2 & 3 (see discussion following under APPLICATION SPECIFIC INFORMATION). This change is possible, as all wells will tap the same source of water in a confined aquifer within the Cedar River Basin and will be located within the same 1/4 section and drilled to similar depths.

Report Continued

Also under this change, the place of use will be updated to include vested interties approved by Ecology (Bucknell June 22, 1992).

A 72 hour aquifer test was performed on June 24, 25 and 26, 1987. Both old and new wells were used to stress the aquifer. Wells were pumped at 11,400 GPM for 24 hours then increased to 14,700 GPM for 25 hours (total instantaneous withdrawal of all five certificates equal 6,600 GPM). Renton hired the USGS to measure Cedar River flows both above and below the well sites, during and following the test. The consultant's hydrogeologic profile shows approximately 15 feet of drawdown occurred at the main well heads, 5 feet within 500 feet and full recovery within eight hours. No effect could be measured to flows in the Cedar River.

On September 21, 1987, a Temporary Permit was issued to remain in effect during the pendency of the applications.

Application Specific Information

This report is specific to Water Right Certificate No. 5836-A with a priority date of April 14, 1966 from Liberty Park Well No. 2 for a municipal supply. This right authorizes a withdrawal of 1,960 GPM and 3,136 AF/YR, supplemental to Renton's other rights. Old well No. 2 has two rights totaling 3,000 GPM. To equalize the pumping between the three new wells at 2,200 GPM, as requested, the certificated withdrawal from this right, 5836-A, for 1,960 GPM, will need to be split between the three new wells as described below:

1. 200 GPM to new Well No. 1, located 60' south and 50' east of the original Well No. 2;
2. 1,160 GPM to new Well No. 2, located 60' south and 30' east of the original Well No. 2;
3. 600 GPM to new Well No. 3, located 50', south and 10' east of the original Well No. 2;

New wells 1, 2 & 3 were completed in June 1987. Each is surface sealed with cement grout to 22'. The following relates to the original and replacement wells:

	From	To		
	Old # 2	New # 1	New # 2	New # 3
Depth	82'	96'	74'	76'
Diameter	26"	24"	24"	24"
SWL	22'*	27'**	27'**	27'**
Screen	perforated	57' to 91'	50' to 70'	52' to 72'

* Measured from ground surface

** Measured from top of casing

A review of Ecology's water right files and the drillers' Water Well Report files show that other water rights in this area are those of the applicant, the City of Renton.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No. 11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979 under Chapter 173-508 WAC which identified instream flow values for the Cedar River. The Seattle Water Department and others have long contended that Renton's wells are in hydraulic continuity with the river. Renton and their consultants, RH2 Engineering, contend that the confined aquifer in this area moves south into the old Black River channel and into the lower Duwamish and Elliott Bay. As the rights on these wells preceded the regulation, none of this should be relevant except that Seattle's claimed right from the river precedes Renton's certificates on their wells. Also Renton has expressed interest in obtaining additional water from these wells.

Report Continued

The 72 hour aquifer test described earlier in this report was intended to first, quantify the capacity of the aquifer but was also done in the attempt to dismiss the false assertions that Renton's wells were sucking the river dry whenever their pumps kicked on. Also, they hoped to prove their theory on directional movement of ground water in this area. Without monitoring ground water in the old Black River channel during the test, Renton's theory remains only a theory. The test did show, however, that pumping the aquifer at double certificated quantities had no measurable effect on the river.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use to these existing certificates will complete the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

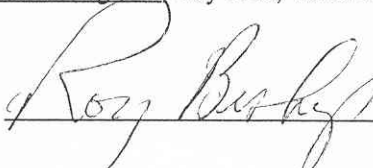
A superseding certificate should be issued as original for 1,960 GPM and 3,136 AF/YR supplemental to existing rights and with the same priority date of April 14, 1966. This change includes three new points of withdrawal and change in place of use (current service area including interties) and is subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY:



DATE:

6-24-93

CERTIFICATE RECORD No. 2 PAGE No. 884-D UNDER DECLARATION OF CLAIM No. 814

STATE OF WASHINGTON, COUNTY OF King

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and the rules and regulations of the State Supervisor of Hydraulics thereunder.

THIS IS TO CERTIFY That THE CITY OF RENTON
of Renton, Washington has filed
in the office of the State Supervisor of Hydraulics of Washington Declaration of Claim No. 814
to withdraw ground waters of the State from a Pump Well
located within the NE 1/4 of NW 1/4 of Sec. 9, Twp. 23 N., Rge. 5 E.W.M.

for the purpose of Municipal supply

The right to the use of said ground waters has been sustained and approved by the Supervisor of Hydraulics in accordance with Chapter 263, Laws of Washington for 1945, and is hereby entered of record in Volume 2 of Ground Water Certificates at page 884-D; the right approved has a priority of November, 1942; the amount of water which the Declarant is entitled to withdraw for the aforesaid purpose is limited to the amount actually beneficially used and shall not exceed 170 gallons per minute; 273.5 acre-feet per year; and is appurtenant to the following described lands or place of use:

City of Renton, King County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 14th day
of March, 19 49

H. W. POLLOCK
State Supervisor of Hydraulics

PERFORATED CASINGS OR SCREENS:

10" inner casing perforated (size not known) from 92 to 175
 (Number per foot and size of perforations, or describe screen)

from to
 from to
 from to

LOG OF WELL: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

MATERIAL	Thickness (Feet)	Depth to Bottom (Feet)
Gravel and sand from surface to	68	68
Gravel and water	16	84
Clay and cement gravel	14	98
Shale	12	110
Gravel and some water	8	118
Cement gravel	10	128
Gravel and water	6	134
Sand and gravel	18	152
Hard pan	6	158
Clay	6	164
Gravel and water	4	168
Clay	7	175

(b) INFILTRATION TRENCH: Covered or open

Dimensions: Length ft. Minimum depth ft. Maximum depth ft.

Bottom width ft. Discharge g.p.m. Date of test

(c) TUNNEL: Type of lining

Dimensions: (Length, course, and cross sectional size)

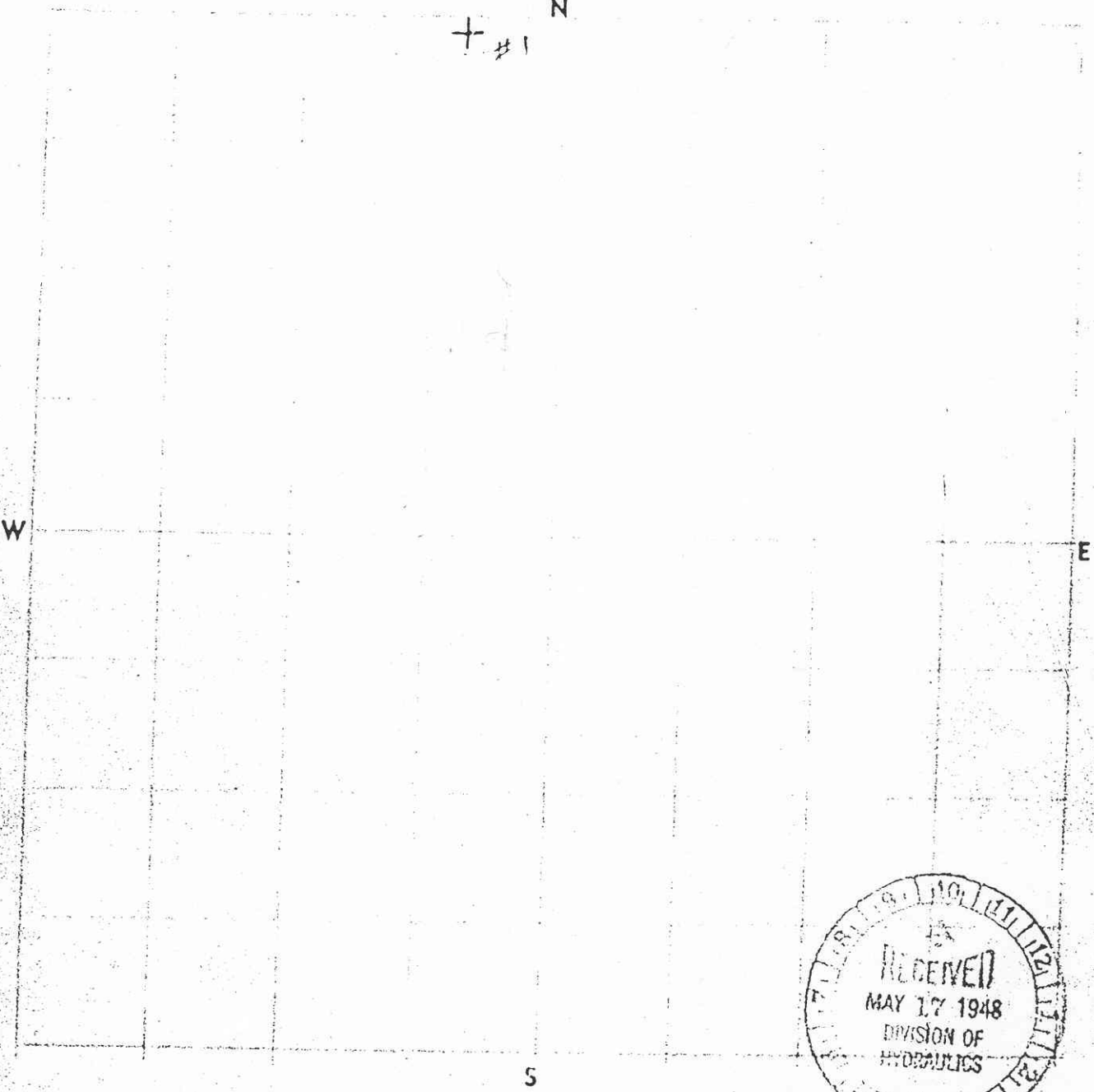
Position of water bearing stratum with reference to portal of tunnel

Log of tunnel: (Preceding table for log of well may be used, if desired. Give footage from portal and character of materials, as pertinent.)

SECTION PLAT

Sec. 9 Twp. 23 N. R. 5 E. W.M.

+ #1 N



Show by a cross (X) the location of the well or other works covered by the application or declaration. Show by circle (O) the locations of other wells or works within a quarter of a mlle. Also traveling directions from nearest town on main highway.

Scale: 1. inch = 800 feet.

Well # 1 Renton Highlands is 490 feet West and 60 feet south of the North quarter Corner of Section 9 Twp. 23 North Range 5 East W.M.

814

STATE OF WASHINGTON
OFFICE OF SUPERVISOR OF HYDRAULICS

Olympia

NOTICE OF DECLARATIONS OF CLAIM OF RIGHT TO WITHDRAW GROUND WATER
NO. 814, 815, 816 and 817.

To Whom It May Concern: Notice is hereby given that The City of Renton, Washington, on May 17, 1948, filed with the State Supervisor of Hydraulics, Olympia, Washington, four (4) declarations of claim of vested rights existing prior to June 7, 1945 to withdraw public ground waters in King County, continuously each year for municipal supply as follows: Declaration No. 814 to withdraw 170 gallons per minute, 273.5 acre-foot per year, by means of a pump well located within the NE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 9, Twp. 23 N., Rge. 5 E.W.M. with priority (date of first beneficial use of water) as of November, 1942; Declaration No. 815 to withdraw 900 gallons per minute, 1446 acre-foot per year, by means of a pump well located within the SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 9, Twp. 23 N., Rge. 5 E.W.M., with priority of September 5, 1943; Declaration No. 816 to withdraw 1040 gallons per minute, 1676 acre-foot per year, by means of a pump well located within the SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec. 17, Twp. 23 N., Rge. 5 E.W.M., with priority of January, 1944; Declaration No. 817 to withdraw 1040 gallons per minute, 1676 acre-foot per year, by means of a pump well located within the NW $\frac{1}{4}$ of Sec. 17, Twp. 23 N., Rge. 5 E.W.M., with priority of January, 1944, and Claimant has requested Certificates of Ground Water Rights under such claims. Any person, firm or corporation disputing such claims or protesting that the rights claimed are not vested rights to be recognized under Chap. 263 of the 1945 Session Laws of the State of Washington, may file with the State Supervisor of Hydraulics, at Olympia, Washington, such objections or representations, in writing, as he may desire to make within(30) thirty days after date of last publication, which date is

Witness my hand and official seal this 20th day of May, 1948

H. W. POLLOCK, Supervisor of Hydraulics

By _____, Secretary

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE February 18, 1953	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 3591-A
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NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,300	MAXIMUM ACRE-FEET PER YEAR 2,000
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
1255 feet north and 134 feet west of the center of Section 5, Township 23 north, Range 5 east Willamette Meridian (moved 10 feet south and 2 feet east of original Well #5).

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ NW¼	SECTION 5	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

9308130163

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130163

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK 

by Stephen J. Hirsche
Stephen J. Hirsche, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE February 18, 1953	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 3591-A
------------------------------------	--------------------	---------------	------------------------------

NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well No. 5
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,300	MAXIMUM ACRE-FEET PER YEAR 2,000
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
1255 feet north and 134 feet west of the center of Section 5, Township 23 north, Range 5 east Willamette Meridian (moved 10 feet south and 2 feet east of original Well #5).

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 5	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well drilled 407' deep, 14" diameter
Static water level 137.75'

DEVELOPMENT SCHEDULE

<small>BEGIN PROJECT BY THIS DATE:</small> Complete	<small>COMPLETE PROJECT BY THIS DATE:</small> Complete	<small>WATER PUT TO FULL USE BY THIS DATE:</small> In use
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REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace well) for Water Right Certificate No. 3591-A which issued for 1,300 gallons per minute (GPM); 2,000 acre-feet per year (AF/YR) for municipal supply from the City of Renton's Well No. 5. This Certificate has a priority date of February 18, 1953 (see discussion and list under GENERAL INFORMATION below for other rights and changes from this source).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Site visits and meetings occurred, involving this and other Renton applications.

General Information

This Application For Change Of Water Right relates to a well located in the north end of the City of Renton just east of I-405 and approximately one-quarter mile east of Lake Washington in the Kennydale area. Land surface elevation at the well site is 236' above mean sea level. This well (referenced as ex-Kennydale Well # 1) was certificated as Renton Well No. 5 with priority date February 18, 1953. Withdrawal rates from this well were increased in 1966. As a result, this well has two certificated rights (see the following listing).

Cert. No.	Priority	GPM	AF/YR
3591-A*	February 18, 1953	1,300	2000
5834-A	April 14, 1966	200	320
	Total	1,500	2320

*Identifies this application

Also under this change the place of use will be updated to include vested interties approved by Ecology (Bucknell letter June 22, 1992).

Original Well No. 5 was completed on September 28, 1953 at a depth of 386' with a 20" diameter casing. Renton's 1992 Comprehensive Water System Plan states that this well operated satisfactorily from 1953 to 1959 when it began producing sand. The plan also states that in 1965, when water quality complaints on taste and odor were received, the use of this well was discontinued. Our records show, however, that Renton filed for a second right, to increase pumping, in 1966. In discussions with Mr. Ron Olsen, Renton's Utility Engineer, it appears the well was not decommissioned but maintained on standby. Then when a later 1965 study showed the need and the capability of the well exceeding that of the right, Renton filed and perfected this additional right. Water Well Report records support that the original well was not decommissioned until 1988 when the well was permanently and properly abandon.

On August 31, 1987 Ecology issued a Temporary Permit to remain in effect during the pendency of the applications. During that time, Ecology issued Temporary Permits for drilling, developing and use.

New Well No. 5 was completed on March 3, 1988 to a depth of 407'. The casing from + 2.5' to 65' is 20" diameter; from + 2.5' to 285' is 16" diameter and from 277' to 407' is 14" diameter. Stainless steel screens are

Report Continued

located in the bottom 100' of the well. The cement grout surface seal extends from the surface to 100'. The well was pump tested by CH2M HILL on March 16, 1988 at 1,250 GPM with 62.4' of drawdown after 48 hours of pumping.

The following relates to the original and replacement Well No. 5:

OLD WELL # 5	NEW WELL # 5
386' deep; 22" diameter	407' deep; 14" diameter
SWL 134.8' - ground surface	SWL 137.75' - top of well
1265' north & 136' west of center of Section 5 within SE¼ NW¼ Section 5	1255' north & 134' west of center of Section 5
Township 23 north Range 5 east Willamette Meridian	Same legal as old Well # 5 but 10' south and 2' east

The original well was properly abandon on April 12, 1988 as identified on the Abandonment Water Well Report available in Ecology files.

A review of Ecology's water right files and the drillers' Water Well Report files located no other water rights in the area.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No. 11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979. Under Chapter 173-508 WAC, Lake Washington (including ground water in continuity with the lake) is closed to further consumptive use. As this use from Well No. 5 was certificated prior to enactment of this code, and as the drilling of this replacement well (10' distant from original well) will not increase the potential for hydraulic continuity, this change is acceptable under the regulation.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use on this existing certificate completes the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

A superseding certificate should be issued as original for a withdrawal of 1,300 GPM and 2,000 AF/YR; with the same priority date of February 18, 1953; with the change being in the point of withdrawal (new well) and the place of use (current service area including interties); and the right is subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY:



DATE:

6-24-93

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING CERTIFICATE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5834-A
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NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 200	MAXIMUM ACRE-FEET PER YEAR 320
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
1255 feet north and 134 feet west of the center of Section 5, Township 23 north, Range 5 east Willamette Meridian (moved 10 feet south and 2 feet east of original Well #5)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ NW¼	SECTION 5	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

9308130165

PROVISIONS

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

This superseding certificate is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

9308130165

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

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

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

this 30th day of July, 1993.

Department of Ecology

ENGINEERING DATA
OK 

by 
Stephen J. Hirschey, Section Supervisor, Water Resources

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

APPLICATION FOR CHANGE OF WATER RIGHT

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

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

PRIORITY DATE April 14, 1966	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER 5834-A
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NAME City of Renton			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 5

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 200	MAXIMUM ACRE-FEET PER YEAR 320
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal water supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
1255 feet north and 134 feet west of the center of Section 5, Township 23 north, Range 5 east Willamette Meridian (moved 10 feet south and 2 feet east of original Well #5)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ NW¼	SECTION 5	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service area in Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well drilled 407' deep, 14" diameter
Static water level 137.75'

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Complete	COMPLETE PROJECT BY THIS DATE: Complete	WATER PUT TO FULL USE BY THIS DATE: In use
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REPORT

BACKGROUND

This application for change was received from the City of Renton to change the point of withdrawal (replace well) for Water Right Certificate No. 5834-A which issued for 200 gallons per minute (GPM); 320 acre-feet per year (AF/YR) for Municipal supply from the City of Renton's well No. 5. This Certificate has a priority date of April 14, 1966. (see discussion and list under GENERAL INFORMATION below for other rights and changes from this source).

Legal notice was published in the Valley Daily News on September 30 and October 7, 1987. No protests were received.

INVESTIGATION

Investigation consists of office research which includes review of water right records, well pumping data, consultant's reports and Renton's Conservation and Comprehensive Water System Plans. Site visits and meetings occurred, involving this and other Renton applications.

General Information

This Applications For Change Of Water Right relates to a well located in the north end of the City of Renton just east of I-405 and approximately one-quarter mile east of Lake Washington in the Kennydale area. Land surface elevation at the well site is 236' above mean sea level. This well (referenced as ex-Kennydale Well # 1) was originally certificated in 1953 as Renton Well No. 5. Withdrawal rates were increased in 1966 through this certificate. As a result, Well No. 5 has two certificated rights. (See the following listing).

Cert. No.	Priority	GPM	AF/YR
3591-A	February 18, 1953	1,300	2000
5834-A*	April 14, 1966	200	320
	Total	1,500	2320

*Identifies this application

Also under this change the place of use will be updated to include vested interties approved by Ecology (Bucknell letter June 22, 1992).

Original Well No. 5 was completed on September 28, 1953 at a depth of 386' with a 20" diameter casing. Renton's 1992 Comprehensive Water System Plan states that this well operated satisfactorily from 1953 to 1959 when it began producing sand. The plan also states that in 1965, when water quality complaints on taste and odor were received the use of this well was discontinued. Our records show, however, that Renton filed for this right to increase pumping in April, 1966 and put that water to full use on December 1, 1966. In discussions with Mr. Ron Olsen, Renton's Utility Engineer, it appears the well was not decommissioned but maintained on standby. Then when a later 1965 study showed the need for water and the capability of this well exceeding that of the right, Renton filed and perfected this additional right. Water Well Report records support that the original well was not decommissioned until 1988 when the well was permanently and properly abandon.

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New Well No. 5 was completed on March 3, 1988 to a depth of 407'. The casing from + 2.5' to 65' is 20" diameter; from + 2.5' to 285' is 16" diameter and from 277' to 407' is 14" diameter. Stainless steel screens are

Report Continued

located in the bottom 100' of the well. The cement grout surface seal extends from the surface to 100'. The well was pump tested by CH2M HILL on March 16, 1988 at 1,250 GPM with 62.4' of drawdown after 48 hours of pumping.

The following relates to the original and replacement Well No. 5:

OLD WELL # 5	NEW WELL # 5
386' deep; 22" diameter	407' deep; 14" diameter
SWL 134.8' - ground surface	SWL 137.75' - top of well
1265' north & 136' west of center of Section 5 within SE¼ NW¼ Section 5	1255' north & 134' west of center of Section 5
Township 23 north Range 5 east Willamette Meridian	Same legal as old Well # 5 but 10' south and 2' east

The original well was properly abandon on April 12, 1988 as identified on the Abandonment Water Well Report available in Ecology files.

A review of Ecology's water right files and the drillers' Water Well Report files located no other water rights in the area.

Consistency With Plans, Policies & Laws

Renton has an updated Water Conservation Plan (1990) and a Comprehensive Water System Plan (1992). More detail on these and a complete listing of all Renton's water rights and water allocations can be found in files G1-24781P, G1-25396P and G1-25397P on permits issued for wells No.11 & 17.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology is developing the Interim Solutions to Public Water Supply Needs policy. These solutions involve considering alternatives in lieu of developing new water sources. As this application involves a change in the point of withdrawal (replacement well) and a change in place of use (intertie) and no new water source, it is consistent with this Interim Solutions policy.

The Instream Resource Protection Program (IRPP) for the Cedar/Sammamish Basin was adopted in September, 1979. Under Chapter 173-508 WAC, Lake Washington (including ground water in continuity with the lake) is closed to further consumptive use. As this use from Well No. 5 was certificated prior to enactment of this code, and as the drilling of this replacement well (10' distant from original well) will not increase the potential for hydraulic continuity, this change is acceptable under the regulation.

This application is consistent with the State Surface and Ground Water Code, Chapters 90.03 and 90.44 RCW, as described below.

This change meets requirements of RCW 90.03.383 (Interties), in that by letter (Bucknell, June 22, 1992), Ecology accepted Renton's interties that had been in place prior to January 1, 1991 as vested. Changing the place of use on this existing certificate completes the required process.

This change also meets requirements defined in RCW 90.44.100 for approving an amendment to a certificate for a change in the point(s) of withdrawal in that:

1. The new well taps the same body of public ground water as the original well.
2. The original well has been properly abandon.
3. The changes do not enlarge the right conveyed by the original certificate.
4. Existing rights will not be impaired.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find that the certificate holder has perfected this right by putting the water to full beneficial use. This change will not enlarge the right conveyed on the original certificate, nor will the granting of this change impair existing rights or be detrimental to the public welfare. Therefore, a superseding certificate should be issued subject to existing rights and indicated provisions.

RECOMMENDATIONS

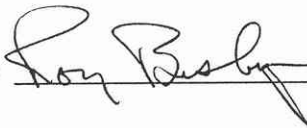
A superseding certificate should be issued as original for a withdrawal of 200 GPM and 320 AF/YR; with the same priority date of April 14, 1966; with the change being in the point of withdrawal (new well) and the place of use (current service area including interties); and the right is subject to the following recommendations and provisions:

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through 508-64-040 (Installation, operation and maintenance requirements enclosed). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

In order to monitor the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are enclosed.

REPORT BY: _____



DATE: _____

6-24-93

CERTIFICATE RECORD No. 14, PAGE No. 6775-A

STATE OF WASHINGTON, COUNTY OF King

CERTIFICATE OF GROUND WATER RIGHT

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

THIS IS TO CERTIFY That CITY OF RENTON 10 72

of Renton, Washington, has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well located within Cedar River Park (Government Lot 4) City of Renton of Sec. 17, Twp. 23 N., R. 5 E. W.M., for the purpose(s) of municipal supply under and specifically subject to provisions contained in Ground Water Permit No. 8913 issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page 6775-A; that the priority of the right hereby confirmed dates from April 1, 1968; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3000 gallons per minute, 4839 acre-feet per year, during entire year, for municipal supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by the City of Renton.

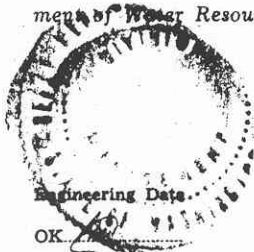
4.38 MGd
.72

5.1 MGd

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

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

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of March, 1970



Edward J. Logan
Assistant Director
Division of Water Management
Department of Water Resources

Filed for Record May 18 1970 10:4
Request of City of Renton
EDWARD J. LOGAN, Recorder

6630945
07-91-24
41009
102

Ground Water Permit No. 8913

Certificate of Ground Water Right

Recorded in the Department of Water Resources, Olympia, Washington, in Book No. 14 of Ground Water Right

Certificates, on page 6775-A, on the 17th day of March 1970.

STATE OF WASHINGTON, } ss.
County of _____

I certify that the within was received and duly recorded by me in Volume _____ of Book of Water Right Certificates, at page _____ on the _____ day of _____, 19____.

STATE PRINTING PLANT, OLYMPIA, WASHINGTON

W-2
R-2

RECORDED
VOL. 313 records
PAGE 534 REQUEST OF

1970 MAR 18 AM 10 46

FILED for Record at Request of
Name City of Renton
Address _____

ROBERT A. MORRIS
KING COUNTY CLERK
DEPUTY

Report of Examination on Groun Water

Received date April 1, 1968 Date of exam. November 21, 1968 Appli. No. 9349
Name City of Renton Address City Hall, Cedar River Park, Renton, Wn.
Type of works a well Dimensions 24" x 102'
Progress of works Complete
Quantity applied for 3000 g.p.m. acre-feet per year
River Park (Gov't Lot 4,) City of Renton
Legal sub. Cedar / Sec. 17 Twp. 23 N. Rge. 5 E. County King
Use Municipal supply

Irrigation-acreage: Present Planned - Feasible
Municipal: Population 84,000 as of 1971
Industrial
Time pump will be operated Continuously

Other water rights appurtenant to this land See below
Proximity to existing works, springs, wells, or streams City of Renton (Well #1), west 590'; City of Renton (Well #2), west 600'; City of Renton (Well #3), north 790'

Area Sub-area Zone

RECOMMENDATIONS

Approved for 3000 g.p.m. 4839 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the State Director of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Department of Health, 304 Public Health Building, Olympia, with regard to the need for compliance.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may, for his own convenience, wish to install an air-line and gage in addition to the access port.

Studies of water usage in the Renton area reveal a demand of 120 gallons per capita per day. For the projected population of 84,000 as of 1971, the annual requirement would be 11,289.5 acre-feet. The quantity of 4839 acre-feet granted under this application represents the maximum that could be withdrawn at a continuous pumping at 3000 gallons per minute.

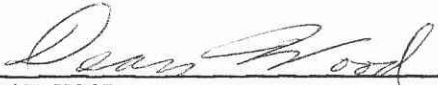
Following is a tabulation of all rights held by the City of Renton:

<u>Filing Number</u>	<u>Gallons Per Minute</u>	<u>Acre Feet Per Year (Primary)</u>	<u>Acre Feet Per Year (Supplemental)</u>
Surface Water Cert. #463	1032 (2.3 cubic foot per sec.)	1650.0	
Ground Water Cert. #884-D	170	273.5	
Ground Water Cert. #886-D	1040	1676.0	
Ground Water Cert. #887-D	1040	838.0	
Ground Water Cert. #3591-A	1300	2000.0	
Ground Water Cert. #5834-A	200	320.0	
Ground Water Cert. #5835-A	1600		2560.0
Ground Water Cert. #5836-A	1960		3136.0
Ground Water Cert. #5838-A	960		1536.0
Surface Water Per. #14579	4165 (9.28 cfs)		6681.6
Total	13,467	6757.5	13,913.6

Therefore, the permit shall issue as follows: "Issued as a primary right for 4532 acre-feet per year and as a supplemental right for 307 acre-feet per year, the total annual withdrawal shall not exceed 11,289.5 acre-feet under all rights."

As provided under RCW 43.21.130, 90.03.360, 90.44.250 and 90.44.020, a master meter shall be installed in this system to measure the total amount of the withdrawal.

Signed at Olympia, Washington
this 10 day of December, 1968


 DEAN WOOD
 Water Resources Inspector
 Division of Water Management

CERTIFICATE RECORD No. 14, PAGE No. 6776-A

STATE OF WASHINGTON, COUNTY OF King

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Water Resources thereunder)

THIS IS TO CERTIFY That CITY OF RENTON

of Renton, Washington has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well located within Cedar River Park, in Government Lot 4, within the City of Renton Sec. 17, Twp. 23 N., R. 5 E. W.M., for the purpose(x) of municipal supply under and specifically subject to provisions contained in Ground Water Permit No. 9087 issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page 6776-A; that the priority of the right hereby confirmed dates from January 21, 1969; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 500 gallons per minute, 800 acre-feet per year, continuously each year, for municipal supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by City of Renton.

0.72 A.C.D.

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

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

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of March, 1970



Engineering Data

OK

John H. Liddle Assistant Director Division of Water Management Department of Water Resources

Filed for Record March 18 1970 10 A.M. Request of City of Renton EDWARD J. LOGAN, Recorder

6630944

Ground Water Permit No. 9087

Certificate of Ground Water Right

Recorded in the Department of Water Resources, Olympia, Washington, in Book

No. 14 of Ground Water Right

Certificates, on page 6776-A, on the

17th day of March

1970

STATE OF WASHINGTON, }
County of } ss.

I certify that the within was received and duly recorded by me in Volume of Book of Water Right Certificates, at page on the day of

, 19

STATE PRINTING PLANT, OLYMPIA, WASHINGTON

W.C. / R-20

RECORDED 313 records
VOL 533 REQUEST OF

1970 MAR 18 AM 10 46

FILED for Record at Request of

Name *City of Renton*
Address *200 - Mill Ave. So.
Renton, Wash. 98055*

ROBERT A. MORRIS, ASSISTANT
KING COUNTY WASH. DEPUTY

Springbrook
Springs

S.W.C. No. 463 &
S.W.P. No. 14579

Purchased from City of Seattle

1770
477

Total: 6209

With a present population of 36,000, the average water use for 1968 was 154 gallons per capita per day. Allowing for an increase in water usage, the average demand will be based on 170 gallons per capita per day. For the projected population of 84,000 as of 1980 to be served by this system, the water requirement would be 15,996 acre-feet per year.

The well under this application is the same well as Ground Water Permit No. 8913 and is Well No. 8. Wells No. 6 and 7 have been abandoned and the rights thereto have been relinquished.

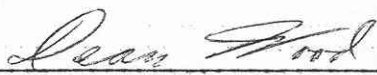
Following is a tabulation of the rights held by the City of Renton:

<u>FILING NUMBER</u>	<u>GALLONS PER MINUTE</u>	<u>ACRE-FEET PER YEAR (Primary)</u>	<u>ACRE-FEET PER YEAR (Supplemental)</u>
G.W.C. No. 886-D	1040	1676	-
G.W.C. No. 5838-A	960	-	1536
G.W.C. No. 887-D	1040	838	-
G.W.C. No. 5836-A	1960	-	3136
G.W.C. No. 5835-A	1600	-	2560
G.W.C. No. 884-D	170	273.5	-
G.W.C. No. 3591-A	1300	2000	-
G.W.C. No. 5834-A	200	320	-
G.W.P. No. 8913	3000	4532	307
S.W.C. No. 463 and S.W.P. No. 14579	4176 (9.28 cubic foot per second)	-	6681.6
Total:	<u>15,446</u>	<u>9,639.5</u>	<u>14,220.6</u>

The recommended quantity of 800 acre-feet represents the maximum quantity that can be withdrawn at 500 gallons per minute.

The quantities approved under this application will be for primary rights.

Signed at Olympia, Washington
this 4 day of April, 1969.


DEAN WOOD, Water Resources Inspector
Division of Water Management

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE October 18, 1982	APPLICATION NUMBER G1-24191	PERMIT NUMBER G1-24191P	CERTIFICATE NUMBER G1-24191C
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NAME
City of Renton

ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055
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This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATER TO BE APPROPRIATED

SOURCE Well	TRIBUTARY OF (IF SURFACE WATERS)		
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MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1,300	MAXIMUM ACRE-FEET PER YEAR 1,040
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QUANTITY, TYPE OF USE, PERIOD OF USE Municipal supply - continuously	BY THE DIVISION OF RECORDS & RELATIONS KING COUNTY	JUL 18 10 40 AM '85	RECEIVED THIS DAY

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL 180 feet east, 920 feet north of center of Section 17

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SW 1/4 NE 1/4	SECTION 17	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 9	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION) Cedar River Park
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Renton.

86/07/18 #0672 B
RECD F 6.00
CASHSL *****6.00

FILED for Record at Request of

Name City of Renton
Address 200 Mill Ave. S.
Renton, Wa. 98055

PROVISIONS

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

8607180672

CHARGE
FEE
DATE

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

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

Given under my hand and the seal of this office at Redmond, Washington, this 15 day of July, 19 86.



Department of Ecology

by Joan K. Thomas
Joan K. Thomas, Regional Manager

FOR COUNTY USE ONLY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

G-1-24783P

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24783	PERMIT NUMBER G1-24783 P	CERTIFICATE NUMBER
----------------------------------	--------------------------------	-----------------------------	--------------------

NAME
City of Renton Public Works Attn: Ron Olsen

ADDRESS (STREET) (CITY) (STATE) (ZIP CODE)
200 Mill Avenue South Renton Washington 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #10

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE-FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal Supply

*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NW¼ NW¼	SECTION 22	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: September 30, 1993	COMPLETE PROJECT BY THIS DATE: September 30, 1995	WATER PUT TO FULL USE BY THIS DATE: September 30, 1998
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PROVISIONS

Total annual withdrawal from this allocation (G1-24783) and all rights held by Renton shall not exceed 14,809 acre feet.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and place of use specified.

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

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

The aquifer test shall be conducted under the supervision of a professional ground water consultant. The well shall be tested at a constant rate no less than the maximum design rate at which the well source will be used. WRIS Information Bulletin 30 shall be used as a guideline for designing and conducting the aquifer test. For water table aquifers, pumped water produced during the test shall be routed away from all wells and discharged such that this water will not recharge the drawdown cone during the test.

Pumping during the test shall be conducted for a **minimum** of 24 hours, with stabilization of the pumping well water level occurring for at least the last 4 of those hours. Stabilization is defined as a drop in water level of less than or equal to 0.1 feet drawdown per hour during pumping. For **water table** (unconfined) aquifer conditions, the test shall be conducted for **72 hours or until** a minimum of 4 hours of drawdown has been detected in an observation well, whichever is shorter.

At the completion of pumping, recovery data shall be collected from all wells until the pumped well achieves either 95% recovery, or its water level is within 0.5 feet of static water level, whichever takes longer. The test must be designed and conducted to determine the following:

- The distance and time drawdown response within the producing aquifer to the proposed ground water withdrawal. To accomplish this, an observation well completed in the same aquifer and within a reasonable distance, shall be shut off and monitored for drawdown and recovery during the aquifer test.
- Aquifer transmissivity.
- Aquifer storage coefficient or specific yield.

Provisions Continued

- d. The effect of the proposed ground water withdrawal on existing ground water and surface water users. This shall include the potential effect of the withdrawal on local wetlands, springs, stream and lakes.

Specifically it must be shown that the proposed ground water withdrawal will have no effect upon Cedar River flows.

The following outlines sampling and analysis requirements specified by the Washington State Department of Health. This section has been included to decrease the likelihood that applicants will need to perform a second test in order to comply with requirements of that agency.

Water samples must be collected from the well using proper sampling procedures and analyzed by a laboratory certified by the Department of Health. A water sample shall be collected within the last 15 minutes of pumping and analyzed for the water quality test(s) outlined below, as well as any other required by the Department of Health.

<u>Type of system</u>	<u>Test required</u>
Group A Public Water System	Complete Inorganic Chemical Radionuclide Volatile Organic Chemical(VOC) Bacteriological
Group B Public Water System	Complete Inorganic Chemical Volatile Organic Chemical(VOC) Bacteriological

Results of these laboratory analyses should be held by the applicant until requested by the Department of Health. Results need not be included in the completion report sent to the Department of Ecology.

When aquifer testing is complete, the data shall be analyzed and all pertinent information compiled into a completion report submitted to the Department of Ecology, Northwest Regional Office. This report shall address the concerns in Item 5 above and include the following:

- A well construction report (well log) for the pumping well and all monitoring wells. This must include the total depth and screened interval depths for all wells, as well as the pump intake depth for the pumping well.
- Distance, to the nearest foot, from the pumping well to each observation well and a map indicating all well locations.
- Copies of the field data sheets and a discussion of the methods and calculations employed during determination of aquifer characteristics.
- Land surface elevations for all measuring points and method used for determining.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

Provisions Continued

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

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

this 30th day of September, 1992.

Department of Ecology

by Stephen J. Hirschey
Stephen J. Hirschey, Section Supervisor, Water Resources

ENGINEERING DATA

OK

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24783	PERMIT NUMBER	CERTIFICATE NUMBER
----------------------------------	--------------------------------	---------------	--------------------

NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #10

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE-FEET PER YEAR 1792*
-------------------------------	------------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply
*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NW¼ NW¼	SECTION 22	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: 1 year from permit issuance	COMPLETE PROJECT BY THIS DATE: 3 years from permit issuance	WATER PUT TO FULL USE BY THIS DATE: 6 years from permit issuance
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REPORT

BACKGROUND

The application was received on 1-2-86. It requests 1600 gpm (gallons per minute) from a well for Municipal Supply.

Notice was published in the Valley Daily News on February 7 and 14, 1986. No protests were filed within the 30 day protest period.

The well covered by this application is known as well #10. Renton has submitted eight applications which are pending. This report will cover the issues involving five of the applications dealing with wells 10, 11, 12, and 17 as they reflect similar conditions.

On March 9, 1988 Renton requested a Temporary Permit to drill and test wells located within the Maplewood Golf Course. The Temporary Permit was issued on March 14, 1988.

During the time Renton's applications were pending evaluation, several letters of concern were received. The following is a brief summary of the concerns:

1. Seattle Water Department raised questions during the environmental review process of Renton's Water System Plan. They want to know what studies were made to show that the Maplewood Golf Course wells were not hydraulically linked to the Cedar River and how might the wells and delivery facilities impact Seattle's pipeline in the vicinity.
2. Sam Paffile, area developer, wants Renton to document that additional water is really needed and that the wells will not draw from an aquifer interrelated with the Cedar River. Mr. Paffile also wants Renton to take a serious look at conservation measures to curb additional water right acquisitions.
3. The Muckleshoot Indian Tribe requests a thorough analysis of the interaction between the aquifer in which the wells are developed and flows of the Cedar River. They also want to see better conservation measures.

These issues will be addressed in detail later in the report.

Renton has complied with SEPA requirements with regard to the development of wells 10,11,12, and 17.

INVESTIGATION

A field visit was conducted on December 20, 1991 by Jerry Liszak, Regional Hydrogeologist, and Janet Jorg of the Northwest Regional Office. Ron Olsen, Utilities Engineer for Renton, and Geof Clayton, Hydrogeologist for Renton's consulting firm of RH2 Engineering, were present during the visit to Renton's well sites located in the Maplewood Golf Course.

The site for well 10 is two miles east of Renton on the north side of Highway 169 (Maple Valley Rd.) in the Maplewood Golf Course. The application identifies the well as being within the NW1/4 of section 23, township 23N, range 5E and the public notice reflects this location. During evaluation it was found that well 10 is proposed to be in the NW1/4 of section 22. The maps and supporting data for all of Renton's applications in the Maplewood Golf Course show well 10 in section 22. As the intent of notifying area residents of Renton's plans to develop wells within the Maplewood Golf Course was sufficiently documented by all their applications, requiring republication for correct location of well 10 would not serve the purpose of publication any more than what has already been done.

Report Continued

Renton's water system provides water to an area of 16 square miles. The current system consists of 6 wells located in the downtown area and one artesian spring. There are 5 metered interties with Seattle for emergency supply plus emergency intertie with Kent. Renton has one wholesale customer-Lakeridge Bryn Mawr Water District. Six reservoirs currently provide storage for Renton with another under construction.

Applications for wells 10, 11, 12, and 17 are submitted to provide better control of the water supply and more flexibility in operating the system to meet peak demands.

Renton holds water rights totaling 14,809 acre-feet per year. The chart below itemizes the existing rights.

CERT. NO.	SOURCE	QUANTITY	CONDITIONS
S W 463	spring	1035gpm	
G W 884-D	well	170gpm/273 AF	
G W 886-D	well	1040gpm/1676 AF	
G W 887-D	well	1040gpm/838 AF	
G W 3591	well	1300gpm/2000 AF	
G W 5834	well	200gpm/320 AF	
G W 5835	well	1600gpm/2560 AF	
G W 5836	well	1960gpm/3136 AF	total AF supplemental
G W 5838	well	960gpm/1536 AF	total AF supplemental
G W 6775	well	3000gpm/4839 AF	3622.5 AF additional 1216.5 AF supplemental
G W 6776	well	500gpm/800 AF	
G1-02605C	well	1050gpm/1680 AF	
G1-24191C	well	1300gpm/1040 AF	

Including the applications currently under evaluation, Renton has the following applications pending.

FILE NO.	PRIORITY	SOURCE	QUANTITY
G1-24781*	1-2-86	well #11	1600gpm
G1-24782*	1-2-86	well #12	1600gpm
G1-24783*	1-2-86	well #10	1600gpm
G1-25069	8-4-87	well #16	1600gpm
G1-25070	8-4-87	well #15	1600gpm
G1-25071	8-4-87	well #14	1600gpm
G1-25396*	2-23-89	well #11	1400gpm
G1-25397*	2-23-89	well #17	3000gpm

* Denotes applications under evaluation

Regional Hydrogeologist, Jerry Liszak, reviewed data submitted by Renton's consultants, RH2 Engineers, Geo-Engineers Inc., and Pacific Groundwater Group along with other pertinent data concerning hydrogeology of the Maplewood Golf Course area. His report of findings indicate there are three aquifers identified within the Maplewood Golf Course. A shallow or unconfined upper water table aquifer can be encountered to depths of 50 feet. Two deeper confined aquifers (known as the intermediate and the deep aquifers) occur at different locations within the golf course but they are not superimposed over each other. The unconfined water table

Report Continued

and intermediate aquifers are separated by a leaky aquitard making the intermediate aquifer semi-confined. The deep aquifer is encountered at the eastern end of the golf course and is a highly pressurized artesian aquifer. Exploratory drilling and testing did not encounter the deep aquifer under the intermediate aquifer in vicinity of well 11 or 17 or the observation well (OBW-1) nor was the intermediate aquifer encountered in the vicinity of the deep aquifer. Wells 10 and 12 are to be developed in the intermediate aquifer also. Recorded hydrostatic pressures of wells tapping the intermediate aquifer indicate no hydraulic connection with the deep aquifer. Wells 11 and 17 were drilled and developed in the intermediate aquifer. Well 11 was drilled to a depth of 345 feet and well 17 was drilled to a depth of 346 feet.

Based on the information obtained from the observation well (OBW-1) and wells 11 and 17 indicating water is available, Renton plans to drill well 10 and 12 near OBW-1 to be developed in the intermediate aquifer for a maximum quantity of 1600 gpm from each well. Approval of this application would carry conditions for proper well construction and adequate testing.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology implemented interim policies to address short term water needs of larger public water systems in growth areas. Therefore applications for wells 10, 11, 12, and 17 are considered with respect to Renton's needs up to year 2000. The long term water needs for Renton will be evaluated as part of a regional water resources planning process and will be affected by implementation of the Growth Management Act.

To evaluate an application for water right, the applicant must provide documentation as to need and availability of water on an instantaneous basis and demonstrate the amount of water needed on an annual basis to satisfy all uses. Renton's Comprehensive Water System Plan (released in March 1992) addresses their need to satisfy Department of Health(DOH) peak demand requirements. Renton shows they are 8,577 gpm short of DOH requirements, thus the instantaneous quantities associated with wells 10,11, 12, and 17 are requested to reduce deficiencies. The Water System Plan doesn't address needs based on actual consumption per capita or yearly consumption rates. By request, Renton provided water consumption figures for 1989 and 1991 which show they used less than 8,000 af/yr (acre feet per year). The population for 1991 as reported to DOH was 35,360 and the number of connections was 11,735.

Figuring current consumption (8000 af/yr) plus adding annual growth rate of 1.8% (from King County Annual Growth Report for Renton area) up to the year 2000 places the annual quantity at 9088 acre-feet which is below the yearly amount already granted by existing rights (14,809 acre-feet). Therefore the applications concerning wells 10, 11, 12, and 17 will not be considered for any additional annual quantity. Ecology's interim policies do allow public water systems to increase the ability and flexibility of the systems to meet demands within existing yearly amounts for that interim period until regional water resources plans are accepted. Ecology will monitor Renton's consumption and growth over the next six to eight years for possible adjustments through future permitting actions.

As well 11 is recommended for a reduced quantity of 2500 gpm, the quantities considered for the applications pertaining to well 11 are 1600 gpm for G1-24781 and 900 gpm for G1-25396. Application G1-25397 for well 17 will be considered for a reduced quantity of 1500 gpm. Application G1-24783 for well 10 is considered for a maximum quantity of 1600 gpm and application G1-24782 for well 12 is considered for a maximum of 1600 gpm. The yearly volume that could be allocated from each application would be calculated at 70% of continuous pumping, with the stipulation that total withdrawal from all Renton's sources could not exceed the city's existing water right certificates (14,809 af/yr).

Ecology's interim policies also require public water systems to make the maximum use of conservation. Renton's current conservation plan identifies a 6.5% reduction in water use with implementation of the various components. Many measures are already in effect with the remainder scheduled for implementation within the coming year. The conservation plan and implementation is consistent with Ecology's Interim Guidelines for Public Water Systems. Ecology needs to monitor the effects of conservation measures on water consumption over the next few years.

Review of office records indicates three downstream rights on the Cedar River which total 3.02 cfs (cubic feet per second). One right was issued to Northwest Water Co. in the amount of 1.0 cfs for the community of Kenneydale, which is now served by Renton.

Field and office investigation show no wetlands in the area that would be adversely affected by the proposed withdrawals from well 10.

CONSIDERATION OF OBJECTIONS

All three proponents submitting concerns on Renton's new applications request analysis of interaction between the Maplewood Golf Course wells and flows in the Cedar River.

The hydrogeologist's review indicates that wells 10, 11, 12, and 17 should be considered in hydraulic continuity with the Cedar River. The wells are developed in the semi-confined intermediate aquifer and pumping from the wells will induce leakage from the unconfined shallow aquifer. As rate of leakage has not been quantified and the interrelationship is complex, our hydrogeologist recommends long term monitoring of the shallow and intermediate aquifers. Renton must show that pumping the wells will not decrease Cedar River flows to be in compliance with the intent of the Cedar-Sammamish Instream Resource Protection Program (WAC 173-508). Renton would be required to prepare an interim management plan detailing procedures for monitoring pumping and assuring that flows in the river are not decreased by use of wells 10, 11, 12, and 17. The plan would need to be approved by Water Resources prior to beneficial use of water from the wells. An ongoing management plan would be required before a certificate of water right could issue. To aid monitoring of Cedar River flows, the USGS gage 12119000 located in downtown Renton would be permanently maintained plus Renton would be required to establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

A second issue raised is whether Renton really needs additional water rights. As earlier stated in the report Renton is not currently meeting DOH peak flow requirements; therefore Renton does need additional water rights for peak instantaneous quantities. Approval of the applications for wells 10, 11, 12, and 17 would help Renton toward meeting DOH requirements. Renton would also have the flexibility to better manage their entire system for peak daily demands while providing alternate sources of water should contamination occur in the downtown well field. Our analysis indicates that Renton has been granted sufficient water rights in terms of annual quantities to meet consumption demands beyond the year 2000. Consequently the applications covering wells 10, 11, 12, and 17 are only being considered for additional instantaneous quantities and not additional annual quantities.

A third concern involves Renton's Comprehensive Water System Plan and Conservation Plan. It is felt that Renton is not conserving water to offset the need for additional water. Renton has provided information showing that conservation measures have and are being implemented which will reduce but not completely eliminate the need for additional water. The water system plan illustrates the effect of full conservation implementation on reduction of water consumption. In evaluating the applications for wells 10, 11, 12, and 17, instantaneous quantities and total consumption figures used to forecast Renton's needs until the year 2000 were based on average daily demands including aggressive conservation measures. Approval of Renton's applications would carry conditions to monitor actual consumption quantities, population, and service connections to be analyzed prior to certificate of water right issuance for effective conservation implementation and growth projections.

In order to approve an application for permit, the following tests must be met: water is available for appropriation, water must be for a beneficial use, water use is not detrimental to public interest, and the use will not adversely affect existing rights. Taking into account the concerns expressed by the City of Seattle, Mr. Paffile, and the Muckleshoot Indian Tribe all four tests are answered in the affirmative. The quantities as recommended in this report are adequately conditioned to assure protection of existing rights including instream flows and to assure that the proposed use will not be detrimental to the public interest. The tests conducted on observation wells, and wells 11 and 17, show water is available for appropriation and that the use for municipal supply is a beneficial use.

CONCLUSION

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

RECOMMENDATIONS

A permit should issue for well 10 for a maximum quantity of 1600 gpm 1792 af/yr (based on 70% continuous pumping) and not cumulative to existing rights for municipal supply.

Report Continued

Total annual withdrawal from this allocation (G1-24783) and all rights held by Renton shall not exceed 14,809 acre feet.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and place of use specified.

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

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. See enclosed form.

The aquifer test shall be conducted under the supervision of a professional ground water consultant. The well shall be tested at a constant rate no less than the maximum design rate at which the well source will be used. WRIS Information Bulletin 30 (copy enclosed) shall be used as a guideline for designing and conducting the aquifer test. For water table aquifers, pumped water produced during the test shall be routed away from all wells and discharged such that this water will not recharge the drawdown cone during the test.

Pumping during the test shall be conducted for a **minimum** of 24 hours, with stabilization of the pumping well water level occurring for at least the last 4 of those hours. Stabilization is defined as a drop in water level of less than or equal to 0.1 feet drawdown per hour during pumping. For **water table** (unconfined) aquifer conditions, the test shall be conducted for **72 hours or until** a minimum of 4 hours of drawdown has been detected in an observation well, whichever is shorter.

At the completion of pumping, recovery data shall be collected from all wells until the pumped well achieves either 95% recovery, or its water level is within 0.5 feet of static water level, whichever takes longer. The test must be designed and conducted to determine the following:

- a. The distance and time drawdown response within the producing aquifer to the proposed ground water withdrawal. To accomplish this, an observation well completed in the same aquifer and within a reasonable distance, shall be shut off and monitored for drawdown and recovery during the aquifer test.
- b. Aquifer transmissivity.
- c. Aquifer storage coefficient or specific yield.
- d. The effect of the proposed ground water withdrawal on existing ground water and surface water users. This shall include the potential effect of the withdrawal on local wetlands, springs, streams and lakes.

Specifically it must be shown that the proposed ground water withdrawal will have no effect upon Cedar River flows.

Report Continued

The following outlines sampling and analysis requirements specified by the Washington State Department of Health. This section has been included to decrease the likelihood that applicants will need to perform a second test in order to comply with requirements of that agency.

Water samples must be collected from the well using proper sampling procedures and analyzed by a laboratory certified by the Department of Health. A water sample shall be collected within the last 15 minutes of pumping and analyzed for the water quality test(s) outlined below, as well as any other required by the Department of Health.

<u>Type of system</u>	<u>Test required</u>
Group A Public Water System	Complete Inorganic Chemical Radionuclide Volatile Organic Chemical(VOC) Bacteriological
Group B Public Water System	Complete Inorganic Chemical Volatile Organic Chemical(VOC) Bacteriological

Results of these laboratory analyses should be held by the applicant until requested by the Department of Health. Results need not be included in the completion report sent to the Department of Ecology.

When aquifer testing is complete, the data shall be analyzed and all pertinent information compiled into a completion report submitted to the Department of Ecology, Northwest Regional Office. This report shall address the concerns in Item 5 above and include the following:

- a. A well construction report (well log) for the pumping well and all monitoring wells. This must include the total depth and screened interval depths for all wells, as well as the pump intake depth for the pumping well.
- b. Distance, to the nearest foot, from the pumping well to each observation well and a map indicating all well locations.
- c. Copies of the field data sheets and a discussion of the methods and calculations employed during determination of aquifer characteristics.
- d. Land surface elevations for all measuring points and method used for determining.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are attached.

Report Continued

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

REPORT BY: Janet Jorg DATE: 8/27/92

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

Ground Water (Issued in accordance with the provisions of Chapter 283, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24781	PERMIT NUMBER G1-24781 P	CERTIFICATE NUMBER
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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #11
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE-FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal supply
*Yearly quantity is already covered by existing rights totalling 14,809 acre-feet. Use from all sources shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
500 feet west and 450 feet south from the northeast corner of Section 21.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE¼ NE¼	SECTION 21	TOWNSHIP N. 23N	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 feet deep, 16 inch diameter
Static water level 11 feet below top of well
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Started	COMPLETE PROJECT BY THIS DATE: September 30, 1995	WATER PUT TO FULL USE BY THIS DATE: September 30, 1998
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PROVISIONS

Total annual withdrawal from this allocation (G1-24781) and all rights held by Renton shall not exceed 14,809 acre feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

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A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a Certificate of Water Right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines).


This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

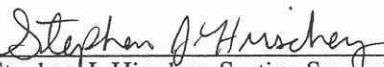
Given under my hand and the seal of this office at Bellevue, Washington,

this 30th day of September, 1992.

Department of Ecology

ENGINEERING DATA

OK 

by 
Stephen J. Hirschey, Section Supervisor, Water Resources

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

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APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
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LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE $\frac{1}{4}$ NE $\frac{1}{4}$	SECTION 21	TOWNSHIP N. 23N	RANGE, (E. OR W.) W.M. 5E	W.R.L.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

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City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 feet deep, 16 inch diameter
Static water level 11 feet below top of well
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Started	COMPLETE PROJECT BY THIS DATE: 3 years from permit issuance	WATER PUT TO FULL USE BY THIS DATE: 6 years from permit issuance
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REPORT

BACKGROUND

The application was received 1-2-86. It requests 1600 gpm (gallons per minute) from a well for Municipal Supply.

Notice was published in the Valley Daily News on February 7 and 14, 1986. No protests were filed within the 30 day protest period.

On March 9, 1988 the applicant requested a Temporary Permit to drill and test the well. The Temporary Permit was issued on March 14, 1988.

The well covered by this application is known as well #11. In 1989 Renton submitted a second application for well #11 (G1-25396) for an additional 1400 gpm. Also in 1989 Renton submitted application G1-25397 for 3000 gpm from a well (well #17) which is within 50 feet from well #11.

As wells 11 and 17 are in close proximity and share similar issues, this report will address and evaluate all three applications (G1-24781, G1-25396, and G1-25397) which pertain to the wells.

During the time Renton's applications were pending evaluation, several letters of concern were received. The following is a brief summary of the concerns:

1. Seattle Water Department raised questions during the environmental review process of Renton's Water System Plan. They want to know what studies were made to show that wells 11 and 17 were not hydraulically linked to the Cedar River and how might the wells and delivery facilities impact Seattle's pipeline in the vicinity.
2. Sam Paffile, area developer, wants Renton to document that they really need additional water and that the wells will not draw from an aquifer interrelated with the Cedar River. He also wants Renton to take a serious look at conservation measures to curb additional water right acquisitions.
3. The Muckleshoot Indian Tribe requests a thorough analysis of the interaction between aquifers the wells are developed into and flows of the Cedar River plus better conservation measures.

Renton has complied with SEPA requirements with regard to the development of wells 11 and 17. A Mitigated Declaration of Non Significance was issued by Renton on May 4, 1988.

INVESTIGATION

A field visit was conducted on December 20, 1991 by Jerry Lyszak, Regional Hydrogeologist, and Janet Jorg of the Northwest Regional Office. Ron Olsen, Utilities Engineer for Renton, and Geof Clayton, Hydrogeologist for Renton's consulting engineering firm of RH2 Engineering, were present during the visit to Renton's well sites.

The site for wells 11 and 17 is 2 miles east of Renton on the north side of Highway 169 (Maple Valley Rd.) in the Maplewood Golf Course. The applications correctly identify the well locations as being within the NE1/4 NE1/4 Section 21, Township 23N, Range 5E of King County.

Renton's water system provides water to an area of 16 square miles. The current system consists of 6 wells located in the downtown area and one artesian spring. There are 5 metered interties with Seattle for emergency supply plus emergency intertie with Kent. Renton has one wholesale customer-Lakeridge Bryn Mawr Water District. Six reservoirs currently provide storage with another under construction.

Report Continued

Applications for wells 11 and 17 are submitted to provide better control of the water supply and more flexibility in operating the system to meet peak demands.

Renton holds water rights totaling 14,809 acre-feet per year. The chart below itemizes the existing rights.

CERT. NO.	SOURCE	QUANTITY	CONDITIONS
S W 463	spring	1035gpm	
G W 884-D	well	170gpm/273 af	
G W 886-D	well	1040gpm/1676 af	
G W 887-D	well	1040gpm/838 af	
G W 3591	well	1300gpm/2000 af	
G W 5834	well	200gpm/320 af	
G W 5835	well	1600gpm/2560 af	
G W 5836	well	1960gpm/3136 af	total af supplemental
G W 5838	well	960gpm/1536 af	total af supplemental
G W 6775	well	3000gpm/4839 af	3622.5 af additional 1216.5 af supplemental
G W 6776	well	500gpm/800 af	
G1-02605C	well	1050gpm/1680 af	
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Including the applications currently under evaluation, Renton has the following applications pending.

FILE NO.	PRIORITY	SOURCE	QUANTITY
G1-24781*	1-2-86	well #11	1600 gpm
G1-24782	1-2-86	well #12	1600 gpm
G1-24783	1-2-86	well #10	1600 gpm
G1-25069	8-4-87	well #16	1600 gpm
G1-25070	8-4-87	well #15	1600 gpm
G1-25071	8-4-87	well #14	1600 gpm
G1-25396*	2-23-89	well #11	1400 gpm
G1-25397*	2-23-89	well #17	3000 gpm

* Applications under evaluation

Well development data for wells 11 and 17 is obtained from the well driller's log, pump test results prepared by Geo Engineers Inc., and hydrogeologic report of the Maplewood Golf Course prepared by Pacific Groundwater Group. Well 11 was drilled in August 1988 to a depth of 345 feet by 16 inches in diameter. Well 17 was constructed at the same time to a similar depth (346 feet) but with a larger casing diameter (20 inches). The two wells are 50 feet apart.

Regional Hydrogeologist, Jerry Liszak, reviewed data submitted by the applicant's consultants and other pertinent data relating to hydrogeology of the area. His review and report of findings indicate that both wells 11 and 17 are developed in the same aquifer (referred to as the intermediate aquifer) and are considered a well field (similar depth, close proximity, and same aquifer). Quoted in part, the hydrogeologist review states:

Wells No. 11 and 17 were each tested using short term step rate and 24 hour constant rate pumping. The test results indicate that the transmissivity of the aquifer is between 45,000 and 60,000 gallons per day per foot of drawdown. The storage coefficient is approximately .005 which indicates the aquifer is confined. A recharge boundary was encountered after approximately 110 minutes of pumping in the 24 hour tests for both wells 11 and 17. Based on this and an understanding of the local geology, the recharge is assumed to

Report Continued

be from leaky conditions in the hydrogeologic strata, or the lower permeability zone known as the aquitard, between the shallow and intermediate aquifers.

Based on the test results, the recommended pumping rate for Well No. 11 is 2,500 gpm and the recommended pumping rate for Well No. 17 is 1,500 gpm. It is calculated that well interference between the two wells will add between 30 and 50 feet of drawdown in each well depending on pumping rates and duration.

Renton has not used either well to date as they are waiting for a decision on the water right applications. If approved, the City will proceed with funding for construction of a pumping station and distribution lines to the wells.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology has implemented interim policies to address short term water needs of larger public water systems in growth areas. Therefore, the applications for wells 11 and 17 are considered with respect to Renton's needs up to year 2000. The long term water needs for Renton will be evaluated as part of a regional water resources planning process and will be affected by implementation of the Growth Management Act.

To evaluate an application for water right, the applicant must provide documentation as to need and availability of water on an instantaneous basis and demonstrate the amount of water needed on an annual basis to satisfy all uses. Renton's Comprehensive Water System Plan (released in March 1992) addresses their need to satisfy Department of Health (DOH) peak demand requirements. Renton shows they are 8,577 gpm short of DOH requirements, thus the instantaneous quantities associated with wells 11 and 17 are to reduce deficiencies. The Water System Plan doesn't address needs based on actual consumption per capita or yearly consumption rates. By request, Renton provided yearly production figures for 1989 and 1991 which show they used less than 8,000 af/yr (acre-feet per year). The population for 1991 as reported to DOH was 35,360 and the number of connections was 11,735.

Figuring current consumption (8000 af/yr) plus adding annual growth rate of 1.8% (from King County Annual Growth Report for Renton area) up to the year 2000 places the annual quantity at 9088 acre-feet which is below the yearly amount already granted by existing rights (14,809 acre-feet). Therefore the applications concerning wells 11 and 17 will not be considered for any additional annual quantity. Ecology's interim policies do allow public water systems to increase the ability and flexibility of the system to meet demands within existing yearly amounts for that interim period until regional water resources plans are accepted. Ecology will monitor Renton's consumption and growth over the next six to eight years for possible adjustments on future actions.

As well 11 is recommended for a reduced quantity of 2500 gpm, the quantities considered for the applications pertaining to well 11 are 1600 gpm for G1-24781 and 900 gpm for G1-25396. Application G1-25397 for well 17 will be considered for a reduced quantity of 1500 gpm. The yearly volume that could be pumped from each application would be calculated at 70% of continuous pumping, but the total consumptive allocation would not exceed the city's existing rights.

Ecology's interim policies also require public water systems to make the maximum use of conservation. Renton's current water conservation plan identifies a 6.5% reduction with implementation of the various components. Many measures are already in effect with the remainder scheduled to be implemented within the coming year. The conservation plan and implementation is consistent with Ecology's Interim Guidelines for Public Water Systems. Ecology needs to monitor the effects of conservation measures on water consumption over the next few years.

Review of office records indicates three downstream rights on the Cedar River which total 3.02 cfs (cubic feet per second). One right was issued to Northwest Water Co. in the amount of 1.0 cfs for the community of Kenneydale, which is now served by Renton.

Field and office investigation show no wetlands in the area that would be adversely affected by the proposed withdrawals from wells 11 and 17.

CONSIDERATION OF OBJECTIONS

All three proponents submitting concerns on Renton's new applications request analysis of interaction between wells 11 and 17 and flows in the Cedar River.

The hydrogeologist's review indicates that wells 11 and 17 should be considered in hydraulic continuity with the Cedar River. The wells are developed in the semi-confined intermediate aquifer and pumping from the wells

will induce leakage from the unconfined shallow aquifer. As the rate of leakage has not been quantified, our hydrogeologist recommends long term monitoring of the shallow and intermediate aquifers. Renton must show that pumping the wells will not decrease Cedar River flows to be in compliance with the intent of the Cedar-Sammamish Instream Resource Program (WAC 173-508). Renton would be required to prepare an interim management plan detailing procedures for monitoring pumping and assuring that flows in the river are not decreased by the use of wells 11 and 17. The plan would need to be approved by Water Resources prior to beneficial use of water from the wells. An ongoing management plan would be required before a certificate of water right could issue. To aid monitoring of Cedar River flows, the USGS gage 12119000 located in downtown Renton would be permanently maintained plus Renton would be required to establish and permanently maintain at least two additional upstream gaging stations - one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

A second issue raised is whether Renton really needs additional water rights. As earlier stated in the report Renton is not currently meeting DOH peak flow requirements; therefore Renton does need additional water rights for peak instantaneous quantities. Approval of the applications for wells 11 and 17 would help Renton toward meeting DOH requirements. Renton would also have the flexibility to better manage their entire system for peak daily demands while providing alternate sources of water should contamination occur in the downtown well field. Analysis indicates that Renton has been granted sufficient water rights in terms of annual quantities to meet consumption demands beyond the year 2000. Consequently the applications covering wells 11 and 17 are only being considered for additional instantaneous quantities and not additional annual quantities.

A third concern involves Renton's Comprehensive Water System Plan and Conservation Plan. It is felt that Renton is not conserving water to offset the need for additional water. Renton has provided information showing that conservation measures have and are being implemented which will reduce but not completely eliminate the need for additional water. The comprehensive water system plan illustrates the effect of full conservation implementation on reduction of water consumption. In evaluating the applications for wells 11 and 17, instantaneous quantities and total consumption figures used to forecast Renton's needs until the year 2000 were based on average daily demands including aggressive conservation measures. Approval of applications concerning wells 11 and 17 would carry conditions to monitor actual consumption quantities, population, and service connections to be analyzed prior to certificate of water right issuance for effective conservation implementation and growth projections.

In order to approve an application for permit, the following tests must be met: water is available for appropriation, water must be for a beneficial use, water use is not detrimental to public interest, and the use will not adversely effect existing rights. Taking into account the concerns expressed by the City of Seattle, Mr. Paffle, and the Muckleshoot Indian Tribe all four tests can be answered in the affirmative. The quantities as recommended in this report are adequately conditioned to assure protection of existing rights including instream flows and to assure that the proposed use will not be detrimental to the public interest. The pump tests show water is available for appropriation and that the use for municipal supply is a beneficial use.

CONCLUSION

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

RECOMMENDATIONS

A permit should issue for 1600 gpm 1792 af/yr (based on 70% continuous pumping and not cumulative to existing rights) from well 11 for municipal supply.

Total annual withdrawal from this allocation (G1-24781) and all rights held by Renton shall not exceed 14,809 acre feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. See enclosed form.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and

Report Continued

made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a Certificate of Water Right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are attached.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines).

REPORT BY: Janet Jorg DATE: 8/27/92

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE February 23, 1989	APPLICATION NUMBER G1-25396	PERMIT NUMBER G1-25396 P	CERTIFICATE NUMBER
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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #11		
TRIBUTARY OF (IF SURFACE WATERS)		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 900	MAXIMUM ACRE-FEET PER YEAR 1008*

QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply

*Total annual withdrawal from this allocation and all water rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

500 feet west and 450 feet south from the northeast corner of Section 21

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE¼ NE¼	SECTION 21	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 deep, 16" diameter
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Started	COMPLETE PROJECT BY THIS DATE: September 30, 1995	WATER PUT TO FULL USE BY THIS DATE: September 30, 1998
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PROVISIONS

Total annual withdrawal from this allocation (G1-25396) and all rights held by Renton shall not exceed 14,809 acre feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.


This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

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

this 30th day of September, 1992.

Department of Ecology

ENGINEERING DATA

OK 

by 
Stephen J. Hirschey, Section Supervisor, Water Resources

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #11
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 900	MAXIMUM ACRE-FEET PER YEAR 1008*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply
*Total annual withdrawal from this allocation and all water rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

500 feet west and 450 feet south from the northeast corner of Section 21

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE¼ NE¼	SECTION 21	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 deep, 16" diameter
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:

Started

COMPLETE PROJECT BY THIS DATE:

3 years from permit issuance

WATER PUT TO FULL USE BY THIS DATE:

6 years from permit issuance

REPORT

BACKGROUND

The application was received on 2-23-89. It requests 1400gpm (gallons per minute) from a well for Municipal Supply.

Notice was published in the Valley Daily News on March 29 and April 5, 1989. No protests were filed within the 30 day protest period.

On March 9, 1988 Renton requested a Temporary Permit to drill and test wells located within the Maplewood Golf Course. The Temporary Permit was issued on March 14, 1988.

During the time Renton's applications were pending evaluation, several letters of concern were received. The following is a brief summary of the concerns:

1. Seattle Water Department raised questions during the environmental review process of Renton's Water System Plan. They want to know what studies were made to show that wells 11 and 17 were not hydraulically linked to the Cedar River and how might the wells and delivery facilities impact Seattle's pipeline in the vicinity.
2. Sam Paffile, area developer, wants Renton to document that additional water is really needed and that the wells will not draw from an aquifer interrelated with the Cedar River. Mr. Paffile also wants Renton to take a serious look at conservation measures to curb additional water acquisitions.
3. The Muckleshoot Indian Tribe requests a thorough analysis of the interaction between the aquifer in which the wells are developed and flows of the Cedar River. They also want to see better conservation measures.

These issues will be addressed in detail later in the report.

Renton has complied with SEPA requirements with regard to the development of wells 11 and 17. A Mitigated Declaration of Non Significance was issued by Renton on May 4, 1988.

The well covered by this application is known as well #11. Renton has another pending application on well 11 (G1-24781) filed in 1986 for 1600 gpm. Also pending review is application G1-25397 requesting 3000 gpm from well #17 which is within 50 feet from well 11.

As wells 11 and 17 are in close proximity and share similar issues, this report will address and evaluate all three applications (G1-24781, G1-25396, and G1-25397) which pertain to the wells.

INVESTIGATION

A field visit was conducted on December 20, 1991 by Jerry Liszak, Regional Hydrogeologist, and Janet Jorg of the Northwest Regional Office. Ron Olsen, Utilities Engineer for Renton, and Geof Clayton, Hydrogeologist for Renton's consulting firm of RH2 Engineering, were present during the visit to Renton's well sites located in the Maplewood Golf Course.

The site for wells 11 and 17 is two miles east of Renton on the north side of Highway 169 (Maple Valley Rd.) in the Maplewood Golf Course. The applications correctly identify the well locations as being within the NE1/4 NE1/4 Section 21, Township 23N, Range 5E of King County.

Renton's water system provides water to an area of 16 square miles. The current system consists of 6 wells located in the downtown area and one artesian spring. There are 5 metered interties with Seattle for emergency

Report Continued

supply plus emergency intertie with Kent. Renton has one wholesale customer-Lakeridge Bryn Mawr Water District. Six reservoirs currently provide storage for Renton with another under construction.

Applications for wells 11 and 17 are submitted to provide better control of the water supply and more flexibility in operating the system to meet peak demands.

Renton holds water rights totaling 14,809 acre-feet per year. The chart below itemizes the existing rights.

CERT. NO.	SOURCE	QUANTITY	CONDITIONS
S W 463	spring	1035gpm	
G W 884-D	well	170gpm/273 AF	
G W 886-D	well	1040gpm/1676 AF	
G W 887-D	well	1040gpm/838 AF	
G W 3591	well	1300gpm/2000 AF	
G W 5834	well	200gpm/320 AF	
G W 5835	well	1600gpm/2560 AF	
G W 5836	well	1960gpm/3136 AF	total AF supplemental
G W 5838	well	960gpm/1536 AF	total AF supplemental
G W 6775	well	3000gpm/4839 AF	3622.5 AF additional 1216.5 AF supplemental
G W 6776	well	500gpm/800 AF	
G1-02605C	well	1050gpm/1680 AF	
G1-24191C	well	1300gpm/1040 AF	

Including the applications currently under evaluation, Renton has the following applications pending.

FILE NO.	PRIORITY	SOURCE	QUANTITY
G1-24781*	1-2-86	well #11	1600gpm
G1-24782	1-2-86	well #12	1600gpm
G1-24783	1-2-86	well #10	1600gpm
G1-25069	8-4-87	well #16	1600gpm
G1-25070	8-4-87	well #15	1600gpm
G1-25071	8-4-87	well #14	1600gpm
G1-25396*	2-23-89	well #11	1400gpm
G1-25397*	2-23-89	well #17	3000gpm

* Denotes applications under evaluation

Well development data for wells 11 and 17 is obtained from the well driller's log, pump test results prepared by Geo Engineers Inc., and hydrogeologic report of the Maplewood Golf Course prepared by Pacific Groundwater Group. Well 11 was drilled in August 1988 to a depth of 345 feet by 16 inches in diameter. Well 17 was constructed at the same time to a similar depth (346 feet) but with a larger casing diameter (20 inches). The two wells are 50 feet apart.

Regional Hydrogeologist, Jerry Liszak, reviewed data submitted by the applicant's consultants and other pertinent data relating to hydrogeology of the area. His review and report of findings indicate that both wells

Report Continued

11 and 17 are developed in the same aquifer (referred to as the intermediate aquifer) and are considered a well field (similar depth, close proximity, and same aquifer). Quoted in part, the hydrogeologist review states:

Wells No. 11 and 17 were each tested using short term step rate and 24 hour constant rate pumping. The test results indicate that the transmissivity of the aquifer is between 45,000 and 60,000 gallons per day per foot of drawdown. The storage coefficient is approximately .005 which indicated the aquifer is confined. A recharge boundary was encountered after approximately 110 minutes of pumping in the 24 hour tests for both wells 11 and 17. Based on this and an understanding of the local geology, the recharge is assumed to be from leaky conditions in the hydrogeologic strata, or the lower permeability zone known as the aquitard, between the shallow and intermediate aquifers.

Based on the test results, the recommended pumping rate for Well No. 11 is 2,500 gpm and the recommended pumping rate for Well No. 17 is 1,500 gpm. It is calculated that well interference between the two wells will add between 30 and 50 feet of drawdown in each well depending on pumping rates and duration.

Renton has not used either well to date as they are waiting for a decision on the water right applications. If approved, the City will proceed with funding for construction of a pumping station and distribution lines to the wells.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology implemented interim policies to address short term water needs of larger public water systems in growth areas. Therefore applications for wells 11 and 17 are considered with respect to Renton's needs up to year 2000. The long term water needs for Renton will be evaluated as part of a regional water resources planning process and will be affected by implementation of the Growth Management Act.

To evaluate an application for water right, the applicant must provide documentation as to need and availability of water on an instantaneous basis and demonstrate the amount of water needed on an annual basis to satisfy all uses. Renton's Comprehensive Water System Plan (released in March 1992) addresses their need to satisfy Department of Health(DOH) peak demand requirements. Renton shows they are 8,577 gpm short of DOH requirements, thus the instantaneous quantities associated with wells 11 and 17 are requested to reduce deficiencies. The Water System Plan doesn't address needs based on actual consumption per capita or yearly consumption rates. By request, Renton provided water consumption figures for 1989 and 1991 which show they used less than 8,000 af/yr (acre feet per year). The population for 1991 as reported to DOH was 35,360 and the number of connections was 11,735.

Figuring current consumption (8000 af/yr) plus adding annual growth rate of 1.8% (from King County Annual Growth Report for Renton area) up to the year 2000 places the annual quantity at 9088 acre-feet which is below the yearly amount already granted by existing rights (14,809 acre-feet). Therefore the applications concerning wells 11 and 17 will not be considered for any additional annual quantity. Ecology's interim policies do allow public water systems to increase the ability and flexibility of the systems to meet demands within existing yearly amounts for that interim period until regional water resources plans are accepted. Ecology will monitor Renton's consumption and growth over the next six to eight years for possible adjustments through future permitting actions.

As well 11 is recommended for a reduced quantity of 2500 gpm, the quantities considered for the applications pertaining to well 11 are 1600 gpm for G1-24781 and 900 gpm for G1-25396. Application G1-25397 for well 17 will be considered for a reduced quantity of 1500 gpm. The yearly volume that could be pumped from each application would be calculated at 70% of continuous pumping, with the stipulation that total withdrawal from all Renton's sources could not exceed the city's existing water right certificates (14,809 af/yr).

Ecology's interim policies also require public water systems to make the maximum use of conservation. Renton's current conservation plan identifies a 6.5% reduction in water use with implementation of the various components. Many measures are already in effect with the remainder scheduled for implementation within the coming year. The conservation plan and implementation is consistent with Ecology's Interim Guidelines for Public Water Systems. Ecology needs to monitor the effects of conservation measures on water consumption over the next few years.

Review of office records indicates three downstream rights on the Cedar River which total 3.02 cfs (cubic feet per second). One right was issued to Northwest Water Co. in the amount of 1.0 cfs for the community of Kenneydale, which is now served by Renton.

Field and office investigation show no wetlands in the area that would be adversely affected by the proposed withdrawals from wells 11 and 17.

CONSIDERATION OF OBJECTIONS

All three proponents submitting concerns on Renton's new applications request analysis of interaction between wells 11 and 17 and flows in the Cedar River.

The hydrogeologist's review indicates that wells 11 and 17 should be considered in hydraulic continuity with the Cedar River. The wells are developed in the semi-confined intermediate aquifer and pumping from the wells will induce leakage from the unconfined shallow aquifer. As rate of leakage has not been quantified, our hydrogeologist recommends long term monitoring of the shallow and intermediate aquifers. Renton must show that pumping the wells will not decrease Cedar River flows to be in compliance with the intent of the Cedar-Sammamish Instream Resource Protection Program (WAC 173-508). Renton would be required to prepare an interim management plan detailing procedures for monitoring pumping and assuring that flows in the river are not decreased by the use of wells 11 and 17. The plan would need to be approved by Water Resources prior to beneficial use of water from the wells. An ongoing management plan would be required before a certificate of water right could issue. To aid monitoring of Cedar River flows, the USGS gage 12119000 located in downtown Renton would be permanently maintained plus Renton would be required to establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

A second issue raised is whether Renton really needs additional water rights. As earlier stated in the report Renton is not currently meeting DOH peak flow requirements; therefore Renton does need additional water rights for peak instantaneous quantities. Approval of the applications for wells 11 and 17 would help Renton toward meeting DOH requirements. Renton would also have the flexibility to better manage their entire system for peak daily demands while providing alternate sources of water should contamination occur in the downtown well field. Our analysis indicates that Renton has been granted sufficient water rights in terms of annual quantities to meet consumption demands beyond the year 2000. Consequently the applications covering wells 11 and 17 are only being considered for additional instantaneous quantities and not additional annual quantities.

A third concern involves Renton's Comprehensive Water System Plan and Conservation Plan. It is felt that Renton is not conserving water to offset the need for additional water. Renton has provided information showing that conservation measures have and are being implemented which will reduce but not completely eliminate the need for additional water. The water system plan illustrates the effect of full conservation implementation on reduction of water consumption. In evaluating the applications for wells 11 and 17, instantaneous quantities and total consumption figures used to forecast Renton's needs until the year 2000 were based on average daily demands including aggressive conservation measures. Approval of Renton's applications would carry conditions to monitor actual consumption quantities, population, and service connections to be analyzed prior to certificate of water right issuance for effective conservation implementation and growth projections.

In order to approve an application for permit, the following tests must be met: water is available for appropriation, water must be for a beneficial use, water use is not detrimental to public interest, and the use will not adversely affect existing rights. Taking into account the concerns expressed by the City of Seattle, Mr. Paffile, and the Muckleshoot Indian Tribe all four tests are answered in the affirmative. The quantities as recommended in this report are adequately conditioned to assure protection of existing rights including instream flows and to assure that the proposed use will not be detrimental to the public interest. The pump tests show water is available for appropriation and that the use for municipal supply is a beneficial use.

CONCLUSION

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

RECOMMENDATIONS

A permit should issue for a reduced quantity of 900 gpm (1008 acre feet per year based on 70% continuous pumping and not cumulative to existing held rights) from a well (#11) for municipal supply.

Report Continued

Total annual withdrawal from this allocation (G1-25396) and all rights held by Renton shall not exceed 14,809 acre feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. See enclosed form.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are attached.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

REPORT BY: Janet Jarg DATE: 8/27/92

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24782	PERMIT NUMBER G1-24782 P	CERTIFICATE NUMBER
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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #12	TRIBUTARY OF (IF SURFACE WATERS)		
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MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE-FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply
*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ SE¼	SECTION 16	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M.	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: September 30, 1993	COMPLETE PROJECT BY THIS DATE: September 30, 1995	WATER PUT TO FULL USE BY THIS DATE: September 30, 1998
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PROVISIONS

Total annual withdrawal from this allocation (G1-24782) and all rights held by Renton shall not exceed 14,809 acre feet.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and place of use specified.

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

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. form.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

The aquifer test shall be conducted under the supervision of a professional ground water consultant. The well shall be tested at a constant rate no less than the maximum design rate at which the well source will be used. WRIS Information Bulletin 30 shall be used as a guideline for designing and conducting the aquifer test. For water table aquifers, pumped water produced during the test shall be routed away from all wells and discharged such that this water will not recharge the drawdown cone during the test.

Pumping during the test shall be conducted for a **minimum** of 24 hours, with stabilization of the pumping well water level occurring for at least the last 4 of those hours. Stabilization is defined as a drop in water level of less than or equal to 0.1 feet drawdown per hour during pumping. For **water table** (unconfined) aquifer conditions, the test shall be conducted for **72 hours or until** a minimum of 4 hours of drawdown has been detected in an observation well, whichever is shorter.

At the completion of pumping, recovery data shall be collected from all wells until the pumped well achieves either 95% recovery, or its water level is within 0.5 feet of static water level, whichever takes longer. The test must be designed and conducted to determine the following:

- a. The distance and time drawdown response within the producing aquifer to the proposed ground water withdrawal. To accomplish this, an observation well completed in the same aquifer and within a reasonable distance, shall be shut off and monitored for drawdown and recovery during the aquifer test.
- b. Aquifer transmissivity.
- c. Aquifer storage coefficient or specific yield.

Provisions Continued

- d. The effect of the proposed ground water withdrawal on existing ground water and surface water users. This shall include the potential effect of the withdrawal on local wetlands, springs, streams and lakes.

Specifically it must be shown that the proposed ground water withdrawal will have no effect upon Cedar River flows.

The following outlines sampling and analysis requirements specified by the Washington State Department of Health. This section has been included to decrease the likelihood that applicants will need to perform a second test in order to comply with requirements of that agency.

Water samples must be collected from the well using proper sampling procedures and analyzed by a laboratory certified by the Department of Health. A water sample shall be collected within the last 15 minutes of pumping and analyzed for the water quality test(s) outlined below, as well as any other required by the Department of Health.

<u>Type of system</u>	<u>Test required</u>
Group A Public Water System	Complete Inorganic Chemical Radionuclide Volatile Organic Chemical(VOC) Bacteriological
Group B Public Water System	Complete Inorganic Chemical Volatile Organic Chemical(VOC) Bacteriological

Results of these laboratory analyses should be held by the applicant until requested by the Department of Health. Results need not be included in the completion report sent to the Department of Ecology.

When aquifer testing is complete, the data shall be analyzed and all pertinent information compiled into a completion report submitted to the Department of Ecology, Northwest Regional Office. This report shall address the concerns in Item 5 above and include the following:

- a. A well construction report (well log) for the pumping well and all monitoring wells. This must include the total depth and screened interval depths for all wells, as well as the pump intake depth for the pumping well.
- b. Distance, to the nearest foot, from the pumping well to each observation well and a map indicating all well locations.
- c. Copies of the field data sheets and a discussion of the methods and calculations employed during determination of aquifer characteristics.
- d. Land surface elevations for all measuring points and method used for determining.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

Provisions Continued

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

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

this 30th day of September, 1992.

Department of Ecology

by Stephen J. Hirsche
Stephen J. Hirschey, Section Supervisor, Water Resources

ENGINEERING DATA

OK

PERMIT -

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24782	PERMIT NUMBER	CERTIFICATE NUMBER
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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #12

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE-FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply
*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE¼ SE¼	SECTION 16	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M.	W.R.L.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
1 year from permit issuance	3 years from permit issuance	6 years from permit issuance

REPORT

BACKGROUND

The application was received on 1-2-86. It requests 1600 gpm (gallons per minute) from a well for Municipal Supply.

Notice was published in the Valley Daily News on February 7 and 14, 1986. No protests were filed within the 30 day protest period.

The well covered by this application is known as well #12. Renton has submitted eight applications which are pending. This report will cover the issues involving five of the applications dealing with wells 10, 11, 12, and 17 as they reflect similar conditions.

On March 9, 1988 Renton requested a Temporary Permit to drill and test wells located within the Maplewood Golf Course. The Temporary Permit was issued on March 14, 1988.

During the time Renton's applications were pending evaluation, several letters of concern were received. The following is a brief summary of the concerns:

1. Seattle Water Department raised questions during the environmental review process of Renton's Water System Plan. They want to know what studies were made to show that the Maplewood Golf Course wells were not hydraulically linked to the Cedar River and how might the wells and delivery facilities impact Seattle's pipeline in the vicinity.
2. Sam Paffile, area developer, wants Renton to document that additional water is really needed and that the wells will not draw from an aquifer interrelated with the Cedar River. Mr. Paffile also wants Renton to take a serious look at conservation measures to curb additional water right acquisitions.
3. The Muckleshoot Indian Tribe requests a thorough analysis of the interaction between the aquifer in which the wells are developed and flows of the Cedar River. They also want to see better conservation measures.

These issues will be addressed in detail later in the report.

Renton has complied with SEPA requirements with regard to the development of wells 10,11,12, and 17.

INVESTIGATION

A field visit was conducted on December 20, 1991 by Jerry Lyszak, Regional Hydrogeologist, and Janet Jorg of the Northwest Regional Office. Ron Olsen, Utilities Engineer for Renton, and Geof Clayton, Hydrogeologist for Renton's consulting firm of RH2 Engineering, were present during the visit to Renton's well sites located in the Maplewood Golf Course.

The site for well 12 is two miles east of Renton on the north side of Highway 169 (Maple Valley Rd.) in the Maplewood Golf Course. The well location described on the application correctly identified as being within the SE1/4 SE1/4 of Section 16, Township 23N, Range 5E in King County.

Renton's water system provides water to an area of 16 square miles. The current system consists of 6 wells located in the downtown area and one artesian spring. There are 5 metered interties with Seattle for emergency supply plus emergency intertie with Kent. Renton has one wholesale customer-Lakeridge Bryn Mawr Water District. Six reservoirs currently provide storage for Renton with another under construction.

Report Continued

Applications for wells 10, 11, 12, and 17 are submitted to provide better control of the water supply and more flexibility in operating the system to meet peak demands.

Renton holds water rights totaling 14,809 acre-feet per year. The chart below itemizes the existing rights.

CERT. NO.	SOURCE	QUANTITY	CONDITIONS
S W 463	spring	1035gpm	
G W 884-D	well	170gpm/273 AF	
G W 886-D	well	1040gpm/1676 AF	
G W 887-D	well	1040gpm/838 AF	
G W 3591	well	1300gpm/2000 AF	
G W 5834	well	200gpm/320 AF	
G W 5835	well	1600gpm/2560 AF	
G W 5836	well	1960gpm/3136 AF	total AF supplemental
G W 5838	well	960gpm/1536 AF	total AF supplemental
G W 6775	well	3000gpm/4839 AF	3622.5 AF additional 1216.5 AF supplemental
G W 6776	well	500gpm/800 AF	
G1-02605C	well	1050gpm/1680 AF	
G1-24191C	well	1300gpm/1040 AF	

Including the applications currently under evaluation, Renton has the following applications pending.

FILE NO.	PRIORITY	SOURCE	QUANTITY
G1-24781*	1-2-86	well #11	1600gpm
G1-24782*	1-2-86	well #12	1600gpm
G1-24783*	1-2-86	well #10	1600gpm
G1-25069	8-4-87	well #16	1600gpm
G1-25070	8-4-87	well #15	1600gpm
G1-25071	8-4-87	well #14	1600gpm
G1-25396*	2-23-89	well #11	1400gpm
G1-25397*	2-23-89	well #17	3000gpm

* Denotes applications under evaluation

Regional Hydrogeologist, Jerry Liszak, reviewed data submitted by Renton's consultants, RH2 Engineers, Geo-Engineers Inc., and Pacific Groundwater Group along with other pertinent data concerning hydrogeology of the Maplewood Golf Course area. His report of findings indicate there are three aquifers identified within the Maplewood Golf Course. A shallow or unconfined upper water table aquifer can be encountered to depths of 50 feet. Two deeper confined aquifers (known as the intermediate and the deep aquifers) occur at different locations within the golf course but they are not superimposed over each other. The unconfined water table and intermediate aquifers are separated by a leaky aquitard making the intermediate aquifer semi-confined. The deep aquifer is encountered at the eastern end of the golf course and is a highly pressurized artesian aquifer. Exploratory drilling and testing did not encounter the deep aquifer under the intermediate aquifer in vicinity of well 11 or 17 or the observation well (OBW-1) nor was the intermediate aquifer encountered in the vicinity of the deep aquifer. Wells 10 and 12 are to be developed in the intermediate aquifer also. Recorded hydrostatic pressures of wells tapping the intermediate aquifer indicate no hydraulic connection with the deep

Report Continued

aquifer. Wells 11 and 17 were drilled and developed in the intermediate aquifer. Well 11 was drilled to a depth of 345 feet and well 17 was drilled to a depth of 346 feet.

Based on the information obtained from the observation well (OBW-1) and wells 11 and 17 indicating water is available, Renton plans to drill well 10 and 12 near OBW-1 to be developed in the intermediate aquifer for a maximum quantity of 1600 gpm from each well. Approval of this application would carry conditions for proper well construction and adequate testing.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology implemented interim policies to address short term water needs of larger public water systems in growth areas. Therefore applications for wells 10, 11, 12, and 17 are considered with respect to Renton's needs up to year 2000. The long term water needs for Renton will be evaluated as part of a regional water resources planning process and will be affected by implementation of the Growth Management Act.

To evaluate an application for water right, the applicant must provide documentation as to need and availability of water on an instantaneous basis and demonstrate the amount of water needed on an annual basis to satisfy all uses. Renton's Comprehensive Water System Plan (released in March 1992) addresses their need to satisfy Department of Health(DOH) peak demand requirements. Renton shows they are 8,577 gpm short of DOH requirements, thus the instantaneous quantities associated with wells 10,11, 12, and 17 are requested to reduce deficiencies. The Water System Plan doesn't address needs based on actual consumption per capita or yearly consumption rates. By request, Renton provided water consumption figures for 1989 and 1991 which show they used less than 8,000 af/yr (acre feet per year). The population for 1991 as reported to DOH was 35,360 and the number of connections was 11,735.

Figuring current consumption (8000 af/yr) plus adding annual growth rate of 1.8% (from King County Annual Growth Report for Renton area) up to the year 2000 places the annual quantity at 9088 acre-feet which is below the yearly amount already granted by existing rights (14,809 acre-feet). Therefore the applications concerning wells 10, 11, 12, and 17 will not be considered for any additional annual quantity. Ecology's interim policies do allow public water systems to increase the ability and flexibility of the systems to meet demands within existing yearly amounts for that interim period until regional water resources plans are accepted. Ecology will monitor Renton's consumption and growth over the next six to eight years for possible adjustments through future permitting actions.

As well 11 is recommended for a reduced quantity of 2500 gpm, the quantities considered for the applications pertaining to well 11 are 1600 gpm for G1-24781 and 900 gpm for G1-25396. Application G1-25397 for well 17 will be considered for a reduced quantity of 1500 gpm. Application G1-24783 for well 10 is considered for a maximum quantity of 1600 gpm and application G1-24782 for well 12 is considered for a maximum of 1600 gpm. The yearly volume that could be allocated from each application would be calculated at 70% of continuous pumping, with the stipulation that total withdrawal from all Renton's sources could not exceed the city's existing water right certificates (14,809 af/yr).

Ecology's interim policies also require public water systems to make the maximum use of conservation. Renton's current conservation plan identifies a 6.5% reduction in water use with implementation of the various components. Many measures are already in effect with the remainder scheduled for implementation within the coming year. The conservation plan and implementation is consistent with Ecology's Interim Guidelines for Public Water Systems. Ecology needs to monitor the effects of conservation measures on water consumption over the next few years.

Review of office records indicates three downstream rights on the Cedar River which total 3.02 cfs (cubic feet per second). One right was issued to Northwest Water Co. in the amount of 1.0 cfs for the community of Kenneydale, which is now served by Renton.

Field and office investigation show no wetlands in the area that would be adversely affected by the proposed withdrawals from well 12.

CONSIDERATION OF OBJECTIONS

All three proponents submitting concerns on Renton's new applications request analysis of interaction between the Maplewood Golf Course wells and flows in the Cedar River.

The hydrogeologist's review indicates that wells 10, 11, 12, and 17 should be considered in hydraulic continuity with the Cedar River. The wells are developed in the semi-confined intermediate aquifer and pumping from the wells will induce leakage from the unconfined shallow aquifer. As rate of leakage has not been quantified

and the interrelationship is complex, our hydrogeologist recommends long term monitoring of the shallow and intermediate aquifers. Renton must show that pumping the wells will not decrease Cedar River flows to be in compliance with the intent of the Cedar-Sammamish Instream Resource Protection Program (WAC 173-508). Renton would be required to prepare an interim management plan detailing procedures for monitoring pumping and assuring that flows in the river are not decreased by use of wells 10, 11, 12, and 17. The plan would need to be approved by Water Resources prior to beneficial use of water from the wells. An ongoing management plan would be required before a certificate of water right could issue. To aid monitoring of Cedar River flows, the USGS gage 12119000 located in downtown Renton would be permanently maintained plus Renton would be required to establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

A second issue raised is whether Renton really needs additional water rights. As earlier stated in the report Renton is not currently meeting DOH peak flow requirements; therefore Renton does need additional water rights for peak instantaneous quantities. Approval of the applications for wells 10, 11, 12, and 17 would help Renton toward meeting DOH requirements. Renton would also have the flexibility to better manage their entire system for peak daily demands while providing alternate sources of water should contamination occur in the downtown well field. Our analysis indicates that Renton has been granted sufficient water rights in terms of annual quantities to meet consumption demands beyond the year 2000. Consequently the applications covering wells 10, 11, 12, and 17 are only being considered for additional instantaneous quantities and not additional annual quantities.

A third concern involves Renton's Comprehensive Water System Plan and Conservation Plan. It is felt that Renton is not conserving water to offset the need for additional water. Renton has provided information showing that conservation measures have and are being implemented which will reduce but not completely eliminate the need for additional water. The water system plan illustrates the effect of full conservation implementation on reduction of water consumption. In evaluating the applications for wells 10, 11, 12, and 17, instantaneous quantities and total consumption figures used to forecast Renton's needs until the year 2000 were based on average daily demands including aggressive conservation measures. Approval of Renton's applications would carry conditions to monitor actual consumption quantities, population, and service connections to be analyzed prior to certificate of water right issuance for effective conservation implementation and growth projections.

In order to approve an application for permit, the following tests must be met: water is available for appropriation, water must be for a beneficial use, water use is not detrimental to public interest, and the use will not adversely affect existing rights. Taking into account the concerns expressed by the City of Seattle, Mr. Paffile, and the Muckleshoot Indian Tribe all four tests are answered in the affirmative. The quantities as recommended in this report are adequately conditioned to assure protection of existing rights including instream flows and to assure that the proposed use will not be detrimental to the public interest. The tests conducted on observation wells, and wells 11 and 17, show water is available for appropriation and that the use for municipal supply is a beneficial use.

CONCLUSION

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

RECOMMENDATIONS

A permit should issue for well 12 for a maximum quantity of 1600 gpm 1792 af/yr (based on 70% continuous pumping) and not cumulative to existing rights for municipal supply.

Total annual withdrawal from this allocation (G1-24782) and all rights held by Renton shall not exceed 14,809 acre feet.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and place of use specified.

A well log of the completed well shall be submitted by the driller to the Department of Ecology within thirty (30) days of completion of this well. This well log shall be complete and all information

Report Continued

concerning the static water level in the completed well, in addition to any pump test data, shall be submitted as it is obtained.

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified

if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. See enclosed form.

The aquifer test shall be conducted under the supervision of a professional ground water consultant. The well shall be tested at a constant rate no less than the maximum design rate at which the well source will be used. WRIS Information Bulletin 30 (copy enclosed) shall be used as a guideline for designing and conducting the aquifer test. For water table aquifers, pumped water produced during the test shall be routed away from all wells and discharged such that this water will not recharge the drawdown cone during the test.

Pumping during the test shall be conducted for a **minimum** of 24 hours, with stabilization of the pumping well water level occurring for at least the last 4 of those hours. Stabilization is defined as a drop in water level of less than or equal to 0.1 feet drawdown per hour during pumping. For **water table** (unconfined) aquifer conditions, the test shall be conducted for **72 hours or until** a minimum of 4 hours of drawdown has been detected in an observation well, whichever is shorter.

At the completion of pumping, recovery data shall be collected from all wells until the pumped well achieves either 95% recovery, or its water level is within 0.5 feet of static water level, whichever takes longer. The test must be designed and conducted to determine the following:

- a. The distance and time drawdown response within the producing aquifer to the proposed ground water withdrawal. To accomplish this, an observation well completed in the same aquifer and within a reasonable distance, shall be shut off and monitored for drawdown and recovery during the aquifer test.
- b. Aquifer transmissivity.
- c. Aquifer storage coefficient or specific yield.
- d. The effect of the proposed ground water withdrawal on existing ground water and surface water users. This shall include the potential effect of the withdrawal on local wetlands, springs, streams and lakes.

Specifically it must be shown that the proposed ground water withdrawal will have no effect upon Cedar River flows.

The following outlines sampling and analysis requirements specified by the Washington State Department of Health. This section has been included to decrease the likelihood that applicants will need to perform a second test in order to comply with requirements of that agency.

Water samples must be collected from the well using proper sampling procedures and analyzed by a laboratory certified by the Department of Health. A water sample shall be collected within the last 15 minutes of pumping and analyzed for the water quality test(s) outlined below, as well as any other required by the Department of Health.

Report Continued

<u>Type of system</u>	<u>Test required</u>
Group A Public Water System	Complete Inorganic Chemical Radionuclide Volatile Organic Chemical(VOC) Bacteriological
Group B Public Water System	Complete Inorganic Chemical Volatile Organic Chemical(VOC) Bacteriological

Results of these laboratory analyses should be held by the applicant until requested by the Department of Health. Results need not be included in the completion report sent to the Department of Ecology.

When aquifer testing is complete, the data shall be analyzed and all pertinent information compiled into a completion report submitted to the Department of Ecology, Northwest Regional Office. This report shall address the concerns in Item 5 above and include the following:

- a. A well construction report (well log) for the pumping well and all monitoring wells. This must include the total depth and screened interval depths for all wells, as well as the pump intake depth for the pumping well.
- b. Distance, to the nearest foot, from the pumping well to each observation well and a map indicating all well locations.
- c. Copies of the field data sheets and a discussion of the methods and calculations employed during determination of aquifer characteristics.
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The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are attached.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

Report Continued

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

REPORT BY: Janet Jorg DATE: 8/27/92

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE February 23, 1989	APPLICATION NUMBER G1-25397	PERMIT NUMBER G1-25397 P	CERTIFICATE NUMBER
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NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #17
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1500	MAXIMUM ACRE-FEET PER YEAR 1680*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal supply
*Total annual withdrawal from this allocation and all water rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
450 feet west and 450 feet south from the northeast corner of Section 21.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE 1/4 NE 1/4	SECTION 21	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

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

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

PRIORITY DATE February 23, 1989	APPLICATION NUMBER G1-25397	PERMIT NUMBER	CERTIFICATE NUMBER
------------------------------------	--------------------------------	---------------	--------------------

NAME City of Renton Public Works Attn: Ron Olsen			
ADDRESS (STREET) 200 Mill Avenue South	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #17

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1500	MAXIMUM ACRE-FEET PER YEAR 1680*
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QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal supply
*Total annual withdrawal from this allocation and all water rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
450 feet west and 450 feet south from the northeast corner of Section 21.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE¼ NE¼	SECTION 21	TOWNSHIP N. 23	RANGE, (E. OR W.) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 346 feet deep, 20 inch diameter

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	3 years from permit issuance	6 years from permit issuance

REPORT

BACKGROUND

The application was received on 2-23-89. It requests 3000 gpm (gallons per minute) from a well for Municipal Supply.

Notice was published in the Valley Daily News on March 29 and April 5, 1989. No protests were filed within the 30 day protest period.

On March 9, 1988 Renton requested a Temporary Permit to drill and test wells located within the Maplewood Golf Course. The Temporary Permit was issued on March 14, 1988.

During the time Renton's applications were pending evaluation, several letters of concern were received. The following is a brief summary of the concerns:

1. Seattle Water Department raised questions during the environmental review process of Renton's Water System Plan. They want to know what studies were made to show that wells 11 and 17 were not hydraulically linked to the Cedar River and how might the wells and delivery facilities impact Seattle's pipeline in the vicinity.
2. Sam Paffile, area developer, wants Renton to document that additional water is really needed and that the wells will not draw from an aquifer interrelated with the Cedar River. Mr. Paffile also wants Renton to take a serious look at conservation measures to curb additional water right acquisitions.
3. The Muckleshoot Indian Tribe requests a thorough analysis of the interaction between the aquifer in which the wells are developed and flows of the Cedar River. They also want to see better conservation measures.

These issues will be addressed in detail later in the report.

Renton has complied with SEPA requirements with regard to the development of wells 11 and 17. A Mitigated Declaration of Non Significance was issued by Renton on May 4, 1988.

The well covered by this application is known as well #17. Renton has two pending applications for a well (known as well #11) located within 50 feet from well 17. Application G1-24781 for well 11 was filed in 1986 for 1600 gpm and G1-25396 requesting 1400 gpm was filed in 1989.

As wells 11 and 17 are in close proximity and share similar issues, this report will address and evaluate all three applications (G1-24781, G1-25396, and G1-25397) which pertain to the wells.

INVESTIGATION

A field visit was conducted on December 20, 1991 by Jerry Liszak, Regional Hydrogeologist, and Janet Jorg of the Northwest Regional Office. Ron Olsen, Utilities Engineer for Renton, and Geof Clayton, Hydrogeologist for Renton's consulting firm of RH2 Engineering, were present during the visit to Renton's well sites located in the Maplewood Golf Course.

The site for wells 11 and 17 is two miles east of Renton on the north side of Highway 169 (Maple Valley Rd.) in the Maplewood Golf Course. The applications correctly identify the well locations as being within the NE1/4 NE1/4 Section 21, Township 23N, Range 5E of King County.

Renton's water system provides water to an area of 16 square miles. The current system consists of 6 wells located in the downtown area and one artesian spring. There are 5 metered interties with Seattle for emergency

Report Continued

supply plus emergency intertie with Kent. Renton has one wholesale customer-Lakeridge Bryn Mawr Water District. Six reservoirs currently provide storage for Renton with another under construction.

Applications for wells 11 and 17 are submitted to provide better control of the water supply and more flexibility in operating the system to meet peak demands.

Renton holds water rights totaling 14,809 acre-feet per year. The chart below itemizes the existing rights.

CERT. NO.	SOURCE	QUANTITY	CONDITIONS
S W 463	spring	1035gpm	
G W 884-D	well	170gpm/273 AF	
G W 886-D	well	1040gpm/1676 AF	
G W 887-D	well	1040gpm/838 AF	
G W 3591	well	1300gpm/2000 AF	
G W 5834	well	200gpm/320 AF	
G W 5835	well	1600gpm/2560 AF	
G W 5836	well	1960gpm/3136 AF	total AF supplemental
G W 5838	well	960gpm/1536 AF	total AF supplemental
G W 6775	well	3000gpm/4839 AF	3622.5 AF additional 1216.5 AF supplemental
G W 6776	well	500gpm/800 AF	
G1-02605C	well	1050gpm/1680 AF	
G1-24191C	well	1300gpm/1040 AF	

Including the applications currently under evaluation, Renton has the following applications pending.

FILE NO.	PRIORITY	SOURCE	QUANTITY
G1-24781*	1-2-86	well #11	1600gpm
G1-24782	1-2-86	well #12	1600gpm
G1-24783	1-2-86	well #10	1600gpm
G1-25069	8-4-87	well #16	1600gpm
G1-25070	8-4-87	well #15	1600gpm
G1-25071	8-4-87	well #14	1600gpm
G1-25396*	2-23-89	well #11	1400gpm
G1-25397*	2-23-89	well #17	3000gpm

* Denotes applications under evaluation

Well development data for wells 11 and 17 is obtained from the well driller's log, pump test results prepared by Geo Engineers Inc., and hydrogeologic report of the Maplewood Golf Course prepared by Pacific Groundwater Group. Well 11 was drilled in August 1988 to a depth of 345 feet by 16 inches in diameter. Well 17 was constructed at the same time to a similar depth (346 feet) but with a larger casing diameter (20 inches). The two wells are 50 feet apart.

Regional Hydrogeologist, Jerry Liszak, reviewed data submitted by the applicant's consultants and other pertinent data relating to hydrogeology of the area. His review and report of findings indicate that both wells

Report Continued

11 and 17 are developed in the same aquifer (referred to as the intermediate aquifer) and are considered a well field (similar depth, close proximity, and same aquifer). Quoted in part, the hydrogeologist review states:

Wells No. 11 and 17 were each tested using short term step rate and 24 hour constant rate pumping. The test results indicate that the transmissivity of the aquifer is between 45,000 and 60,000 gallons per day per foot of drawdown. The storage coefficient is approximately .005 which indicated the aquifer is confined. A recharge boundary was encountered after approximately 110 minutes of pumping in the 24 hour tests for both wells 11 and 17. Based on this and an understanding of the local geology, the recharge is assumed to be from leaky conditions in the hydrogeologic strata, or the lower permeability zone known as the aquitard, between the shallow and intermediate aquifers.

Based on the test results, the recommended pumping rate for Well No. 11 is 2,500 gpm and the recommended pumping rate for Well No. 17 is 1,500 gpm. It is calculated that well interference between the two wells will add between 30 and 50 feet of drawdown in each well depending on pumping rates and duration.

Renton has not used either well to date as they are waiting for a decision on the water right applications. If approved, the City will proceed with funding for construction of a pumping station and distribution lines to the wells.

Until Regional Water Plans are established as set forth by the Chelan Agreement, Ecology implemented interim policies to address short term water needs of larger public water systems in growth areas. Therefore applications for wells 11 and 17 are considered with respect to Renton's needs up to year 2000. The long term water needs for Renton will be evaluated as part of a regional water resources planning process and will be affected by implementation of the Growth Management Act.

To evaluate an application for water right, the applicant must provide documentation as to need and availability of water on an instantaneous basis and demonstrate the amount of water needed on an annual basis to satisfy all uses. Renton's Comprehensive Water System Plan (released in March 1992) addresses their need to satisfy Department of Health (DOH) peak demand requirements. Renton shows they are 8,577 gpm short of DOH requirements, thus the instantaneous quantities associated with wells 11 and 17 are requested to reduce deficiencies. The Water System Plan doesn't address needs based on actual consumption per capita or yearly consumption rates. By request, Renton provided water consumption figures for 1989 and 1991 which show they used less than 8,000 af/yr (acre feet per year). The population for 1991 as reported to DOH was 35,360 and the number of connections was 11,735.

Figuring current consumption (8000 af/yr) plus adding annual growth rate of 1.8% (from King County Annual Growth Report for Renton area) up to the year 2000 places the annual quantity at 9088 acre-feet which is below the yearly amount already granted by existing rights (14,809 acre-feet). Therefore the applications concerning wells 11 and 17 will not be considered for any additional annual quantity. Ecology's interim policies do allow public water systems to increase the ability and flexibility of the systems to meet demands within existing yearly amounts for that interim period until regional water resources plans are accepted. Ecology will monitor Renton's consumption and growth over the next six to eight years for possible adjustments through future permitting actions.

As well 11 is recommended for a reduced quantity of 2500 gpm, the quantities considered for the applications pertaining to well 11 are 1600 gpm for G1-24781 and 900 gpm for G1-25396. Application G1-25397 for well 17 will be considered for a reduced quantity of 1500 gpm. The yearly volume that could be pumped from each application would be calculated at 70% of continuous pumping, with the stipulation that total withdrawal from all Renton's sources could not exceed the city's existing water right certificates (14,809 af/yr).

Ecology's interim policies also require public water systems to make the maximum use of conservation. Renton's current conservation plan identifies a 6.5% reduction in water use with implementation of the various components. Many measures are already in effect with the remainder scheduled for implementation within the coming year. The conservation plan and implementation is consistent with Ecology's Interim Guidelines for Public Water Systems. Ecology needs to monitor the effects of conservation measures on water consumption over the next few years.

Review of office records indicates three downstream rights on the Cedar River which total 3.02 cfs (cubic feet per second). One right was issued to Northwest Water Co. in the amount of 1.0 cfs for the community of Kenneydale, which is now served by Renton.

Field and office investigation show no wetlands in the area that would be adversely affected by the proposed withdrawals from wells 11 and 17.

CONSIDERATION OF OBJECTIONS

All three proponents submitting concerns on Renton's new applications request analysis of interaction between wells 11 and 17 and flows in the Cedar River.

The hydrogeologist's review indicates that wells 11 and 17 should be considered in hydraulic continuity with the Cedar River. The wells are developed in the semi-confined intermediate aquifer and pumping from the wells will induce leakage from the unconfined shallow aquifer. As rate of leakage has not been quantified, our hydrogeologist recommends long term monitoring of the shallow and intermediate aquifers. Renton must show that pumping the wells will not decrease Cedar River flows to be in compliance with the intent of the Cedar-Sammamish Instream Resource Protection Program (WAC 173-508). Renton would be required to prepare an interim management plan detailing procedures for monitoring pumping and assuring that flows in the river are not decreased by the use of wells 11 and 17. The plan would need to be approved by Water Resources prior to beneficial use of water from the wells. An ongoing management plan would be required before a certificate of water right could issue. To aid monitoring of Cedar River flows, the USGS gage 12119000 located in downtown Renton would be permanently maintained plus Renton would be required to establish and permanently maintain at least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

A second issue raised is whether Renton really needs additional water rights. As earlier stated in the report Renton is not currently meeting DOH peak flow requirements; therefore Renton does need additional water rights for peak instantaneous quantities. Approval of the applications for wells 11 and 17 would help Renton toward meeting DOH requirements. Renton would also have the flexibility to better manage their entire system for peak daily demands while providing alternate sources of water should contamination occur in the downtown well field. Our analysis indicates that Renton has been granted sufficient water rights in terms of annual quantities to meet consumption demands beyond the year 2000. Consequently the applications covering wells 11 and 17 are only being considered for additional instantaneous quantities and not additional annual quantities.

A third concern involves Renton's Comprehensive Water System Plan and Conservation Plan. It is felt that Renton is not conserving water to offset the need for additional water. Renton has provided information showing that conservation measures have and are being implemented which will reduce but not completely eliminate the need for additional water. The water system plan illustrates the effect of full conservation implementation on reduction of water consumption. In evaluating the applications for wells 11 and 17, instantaneous quantities and total consumption figures used to forecast Renton's needs until the year 2000 were based on average daily demands including aggressive conservation measures. Approval of Renton's applications would carry conditions to monitor actual consumption quantities, population, and service connections to be analyzed prior to certificate of water right issuance for effective conservation implementation and growth projections.

In order to approve an application for permit, the following tests must be met: water is available for appropriation, water must be for a beneficial use, water use is not detrimental to public interest, and the use will not adversely affect existing rights. Taking into account the concerns expressed by the City of Seattle, Mr. Paffile, and the Muckleshoot Indian Tribe all four tests are answered in the affirmative. The quantities as recommended in this report are adequately conditioned to assure protection of existing rights including instream flows and to assure that the proposed use will not be detrimental to the public interest. The pump tests show water is available for appropriation and that the use for municipal supply is a beneficial use.

CONCLUSION

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

RECOMMENDATIONS

A permit should issue for well 17 at a reduced quantity of 1500 gpm (1680 acre feet per year based on 70% continuous pumping and not cumulative to existing rights) for municipal supply.

Report Continued

Total annual withdrawal from this allocation (G1-25397) and all rights held by Renton shall not exceed 14,809 acre feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 (Installation, operation and maintenance requirements attached hereto). Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request. See enclosed form.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year. See enclosed form.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained plus Renton shall establish and permanently maintain a least two additional upstream gaging stations- one in the Narrows area downstream of the golf course and another gaging station upstream of the influence of the Maplewood Golf Course aquifers.

Renton shall notify the Department of Ecology NWRO Water Resources whenever a decrease in Cedar River flows is recorded between the upstream gage and any subsequent downstream gage.

Prior to use of waters from the new wells, the gaging stations shall be in operation and an interim management plan detailing procedures for monitoring pumping and assuring that flows in the Cedar River are not decreased from pumping shall be submitted to NWRO Water Resources and approved.

A long term management plan shall be submitted to NWRO Water Resources after 3 years of operating under the interim plan. The final management plan shall be approved by Water Resources prior to issuance of a certificate of water right.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, which are attached.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data (as outlined in the Interim Guidelines) to this office.

REPORT BY: Janet Jang DATE: 8/27/92

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

SURFACE WATER GROUND WATER

APPLICATION NO. G1-20605	PRIORITY DATE OF APPLICATION May 3, 1973
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NAME CITY OF RENTON			
ADDRESS (STREET) Municipal Building, 200 Mill Avenue South, Renton	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

Date of field examination: December 4, 1973

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Infiltration Gallery (unnamed springs)		
TRIBUTARY OF (IF SURFACE WATERS) Springbrook Creek		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1050.0	MAXIMUM ACRE-FEET PER YEAR 1680.0
QUANTITY, TYPE OF USE, PERIOD OF USE Municipal supply - continuously		

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL 640 feet North and 40 feet West of the East quarter corner of Sec. 6
--

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NE $\frac{1}{4}$	SECTION 6	TOWNSHIP N. 22	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 9	COUNTY King
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RECORDED PLATTED PROPERTY

LOT Tracts 7&9	BLOCK 7&9	OF (GIVE NAME OF PLAT OR ADDITION) Springbrook Acre Tracts
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LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by City of Renton

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

CERTIFICATE NUMBER G1-20605C	PERMIT NUMBER G1-20605P	APPLICATION NUMBER G1-20605	PRIORITY DATE May 3, 1973
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NAME CITY OF RENTON			
ADDRESS (STREET) Municipal Building, 200 Mill Avenue South, Renton	(CITY) Renton	(STATE) Washington	(ZIP CODE) 98055

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

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Infiltration Gallery (unnamed springs)

TRIBUTARY OF (IF SURFACE WATERS)
Springbrook Creek

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1050.0	MAXIMUM ACRE-FEET PER YEAR 1680.0
-------------------------------	--------------------------------------	--------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Municipal Supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
640 feet North and 40 feet West of the East quarter corner of Sec. 6

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE $\frac{1}{4}$ NE $\frac{1}{4}$	SECTION 6	TOWNSHIP N. 22	RANGE, (E. OR W.) W.M. 5 E.	W.R.I.A. 9	COUNTY King
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RECORDED PLATTED PROPERTY

LOT Tracts 7 & 9	BLOCK 9	OF (GIVE NAME OF PLAT OR ADDITION) Springbrook Acre Tracts
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LEGAL DESCRIPTION OF PROPERTY WATER TO BE USED ON

Area served by City of Renton.

7504160616

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

7504160516

APR-16-75 00557 7504160516 E R 3.00

DIRECTOR
RECORDS & ELECTIONS
KING COUNTY, WASH.

1975 APR 16 PM 4 02

RECORDED
OF
REQUEST IN

FILED for Record at Request of

Name City of Renton
Address 208 Mill Ave. So.
Renton, Wash. 98055

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

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

Given under my hand and the seal of this office at Olympia, Washington, this 15th day of April, 1975



JOHN A. BIGGS, Director
Department of Ecology

by R. Jerry Bollen
R. JERRY BOLLEN, Assistant Director

FOR COUNTY USE ONLY

DESCRIPTION OF PROPOSED WORKS

Infiltration pipes, collection well and gravity transmission system.

DEVELOPMENT SCHEDULE

BEGINNING DATE	COMPLETION DATE	DATE COMPLETE APPLICATION OF WATER TO BE MADE
Started		

PROVISIONS AND RECOMMENDATIONS

The request for 1050.0 gallons per minute is granted with an annual quantity of 1680.0 acre-feet per year for municipal supply.

Applicant is advised that notice of proof of appropriation of water (under which final certificate of water right issues) should not be filed until the permanent diversion facilities have been installed together with a mainline system capable of delivering the recommended quantity of water to an existing or proposed distribution system within the area to be served.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Assistant Secretary, Division of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Division of Health, Public Health Building No. 4, Thurston Airdustrial Center, Olympia, with regard to the need for compliance.

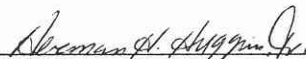
"A suitable measuring device shall be installed and maintained in accordance with WAC 508-64-020 through WAC 508-64-040." (Installation, operation and maintenance requirements attached hereto.)

It is noted that the well site and/or water transmission facilities are not wholly located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land. Copy(ies) of easement agreement(s) must be furnished this Department prior to issuance of Certificate of Water Right.

Additionally, the permit when issued shall carry the following provision: "Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971."

Signed at Redmond, Washington,

this 16 day of August, 1974.


HERMAN H. HUGGINS, JR.
Hydraulics Engineer
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24781	PERMIT NUMBER G1-24781P	CERTIFICATE NUMBER
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NAME City of Renton Public Works			
ADDRESS (STREET) 1055 South Grady Way	(CITY) Renton	(STATE) WA	(ZIP CODE) 98057

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #11		
TRIBUTARY OF (IF SURFACE WATERS)		

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply
*Yearly quantity is already covered by existing rights totaling 14,809 acre-feet. Use from all sources shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

500 feet west and 450 feet south from the northeast corner of Section 21.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE1/4 NE1/4	SECTION 21	TOWNSHIP N 23N	RANGE, (E OR W) W.M. 5E	W.R.I.A. 8	COUNTY King
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 feet deep, 16-inch diameter
Static water level 11 feet below top of well
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE Completed	COMPLETE PROJECT BY THIS DATE Completed	WATER PUT TO FULL USE BY THIS DATE September 30, 2021
---	--	--

PROVISIONS

Total annual withdrawal from this allocation (G1-24781) and all rights held by Renton shall not exceed 14,809 acre-feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 and as updated. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained.

Prior to using the instantaneous portion of this water right as additive to existing rights, a management plan shall be submitted to NWRO Water Resources and approved. The management plan shall provide detailed procedures for monitoring, pumping, and assuring that instream flows in the Cedar River will not be impaired by pumping.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 3rd day of November, 2011.

REVIEWED BY
OKAY ✓

Department of Ecology

By Jerry L. Liszak
Jerry L. Liszak, Acting Section Manager, Water Resources



RECEIVED

NOV 04 2011

CITY OF RENTON
UTILITY SYSTEMS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

NOV 03 2011

Lys Hornsby
Utility Systems Director
City of Renton
1055 South Grady Way
Renton WA 98057

Re: Water Right No. G1-24781P

Dear Lys Hornsby:

Enclosed is your Superseding Permit to be retained for your records. Please read the enclosed information sheet, as well as your entire superseding permit.

You must meet the provisions of your superseding permit before we will issue a final *Certificate of Water Right*.

Our information indicates your system has been completed. We are enclosing a *Proof of Appropriation of Water form* which is to be filed when the water has actually been put to full beneficial use. This form will need to include your County Assessor's Parcel Number and must be notarized.

If you cannot put the water to full beneficial use by **September 30, 2021**:

- You may submit the *Proof of Appropriation* for a lesser quantity, or
- You must contact this office to apply for an extension.

If you have any questions, please contact Jerry Lyszak at 425-649-7013.

Sincerely,

Jerry L. Lyszak
Acting Section Manager
Water Resources Program

JL/ng

Enclosures: Superseding Permit
Proof of Appropriation of Water
Important Information About Your Water Right





RECEIVED

NOV 04 2011

CITY OF RENTON
UTILITY SYSTEMS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

NOV 03 2011

Lys Hornsby
Utility Systems Director
City of Renton
1055 South Grady Way
Renton WA 98057

Re: Water Right No. G1-24782P

Dear Lys Hornsby:

Enclosed is your Superseding Permit to be retained for your records. Please read the enclosed information sheet, as well as your entire superseding permit.

You must meet the provisions of your superseding permit before we will issue a final *Certificate of Water Right*.

Our information indicates your system has been completed. We are enclosing a *Proof of Appropriation of Water form* which is to be filed when the water has actually been put to full beneficial use. This form will need to include your County Assessor's Parcel Number and must be notarized.

If you cannot put the water to full beneficial use by **September 30, 2021**:

- You may submit the *Proof of Appropriation* for a lesser quantity, or
- You must contact this office to apply for an extension.

If you have any questions, please contact Jerry Lyszak at 425-649-7013.

Sincerely,

Jerry L. Lyszak
Acting Section Manager
Water Resources Program

JL/ng

Enclosures: Superseding Permit
Proof of Appropriation of Water
Important Information About Your Water Right



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE January 2, 1986	APPLICATION NUMBER G1-24782	PERMIT NUMBER G1-24782P	CERTIFICATE NUMBER
----------------------------------	--------------------------------	----------------------------	--------------------

NAME City of Renton Public Works			
ADDRESS (STREET) 1055 South Grady Way	(CITY) Renton	(STATE) WA	(ZIP CODE) 98057

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #12		
TRIBUTARY OF (IF SURFACE WATERS)		

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1600	MAXIMUM ACRE FEET PER YEAR 1792*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply

*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SE1/4 SE1/4	SECTION 16	TOWNSHIP N 23N	RANGE, (E*OR W) W/M 5E	W.R.I.A. 8	COUNTY King
--	---------------	-------------------	---------------------------	---------------	----------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE Completed	COMPLETE PROJECT BY THIS DATE Completed	WATER PUT TO FULL USE BY THIS DATE. September 30, 2021
---	--	---

PROVISIONS

Total annual withdrawal from this allocation (G1-24782) and all rights held by Renton shall not exceed 14,809 acre-feet.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used.

Installation and maintenance of an access port as described in Ground Water Bulletin No. 1 is required. An air line and gauge may be installed in addition to the access port.

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

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 and as updated. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained.

Prior to using the instantaneous portion of this water right as additive to existing rights, a management plan shall be submitted to NWRO Water Resources and approved. The management plan shall provide detailed procedures for monitoring, pumping, and assuring that instream flows in the Cedar River will not be impaired by pumping.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 3rd day of November, 2011.

Department of Ecology

REVIEWED BY
OKAY BA

By Jerry L. Liszak
Jerry L. Liszak, Acting Section Manager, Water Resources



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

NOV 03 2011

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NOV 04 2011

CITY OF RENTON
UTILITY SYSTEMS

Lys Hornsby
Utility Systems Director
City of Renton
1055 South Grady Way
Renton WA 98057

Re: Water Right No. G1-25396P

Dear Lys Hornsby:

Enclosed is your Superseding Permit to be retained for your records. Please read the enclosed information sheet, as well as your entire superseding permit.

You must meet the provisions of your superseding permit before we will issue a final *Certificate of Water Right*.

Our information indicates your system has been completed. We are enclosing a *Proof of Appropriation of Water form* which is to be filed when the water has actually been put to full beneficial use. This form will need to include your County Assessor's Parcel Number and must be notarized.

If you cannot put the water to full beneficial use by **September 30, 2021**:

- You may submit the *Proof of Appropriation* for a lesser quantity, or
- You must contact this office to apply for an extension.

If you have any questions, please contact Jerry Liszak at 425-649-7013.

Sincerely,

Jerry L. Liszak
Acting Section Manager
Water Resources Program

JL/ng

Enclosures: Superseding Permit
Proof of Appropriation of Water
Important Information About Your Water Right



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE February 23, 1989	APPLICATION NUMBER G1-25396	PERMIT NUMBER G1-25396P	CERTIFICATE NUMBER
------------------------------------	--------------------------------	----------------------------	--------------------

NAME City of Renton Public Works			
ADDRESS (STREET) 1055 South Grady Way	(CITY) Renton	(STATE) WA	(ZIP CODE) 98057

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #11	TRIBUTARY OF (IF SURFACE WATERS)		
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MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 900	MAXIMUM ACRE FEET PER YEAR 1008*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply

*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

500 feet west and 450 feet south from the northeast corner of Section 21

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE1/4 NE1/4	SECTION 21	TOWNSHIP N 23N	RANGE, (E OR W) W.M. 5E	W.R.I.A. 8	COUNTY King
--	---------------	-------------------	----------------------------	---------------	----------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 345 deep, 16" diameter
Connection to reservoirs

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE Completed	COMPLETE PROJECT BY THIS DATE Completed	WATER PUT TO FULL USE BY THIS DATE September 30, 2021
---	--	--

PROVISIONS

Total annual withdrawal from this allocation (G1-25396) and all rights held by Renton shall not exceed 14,809 acre-feet.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 and as updated. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained.

Prior to using the instantaneous portion of this water right as additive to existing rights, a management plan shall be submitted to NWRO Water Resources and approved. The management plan shall provide detailed procedures for monitoring, pumping, and assuring that instream flows in the Cedar River will not be impaired by pumping.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

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This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 3rd day of November, 2011.

REVIEWED BY
OKAY JS

Department of Ecology

By Jerry L. Liszak
Jerry L. Liszak, Acting Section Manager, Water Resources



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

RECEIVED

NOV 04 2011

CITY OF RENTON
UTILITY SYSTEMS

NOV 03 2011

Lys Hornsby
Utility Systems Director
City of Renton
1055 South Grady Way
Renton WA 98057

Re: Water Right No. G1-25397P

Dear Lys Hornsby:

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You must meet the provisions of your superseding permit before we will issue a final *Certificate of Water Right*.

Our information indicates your system has been completed. We are enclosing a *Proof of Appropriation of Water form* which is to be filed when the water has actually been put to full beneficial use. This form will need to include your County Assessor's Parcel Number and must be notarized.

If you cannot put the water to full beneficial use by **September 30, 2021**:

- You may submit the *Proof of Appropriation* for a lesser quantity, or
- You must contact this office to apply for an extension.

If you have any questions, please contact Jerry Liszak at 425-649-7013.

Sincerely,

Jerry L. Liszak
Acting Section Manager
Water Resources Program

JL/ng

Enclosures: Superseding Permit
Proof of Appropriation of Water
Important Information About Your Water Right



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SUPERSEDING PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE February 23, 1989	APPLICATION NUMBER G1-25397	PERMIT NUMBER G1-25397P	CERTIFICATE NUMBER
------------------------------------	--------------------------------	----------------------------	--------------------

NAME City of Renton Public Works			
ADDRESS (STREET) 1055 South Grady Way	(CITY) Renton	(STATE) WA	(ZIP CODE) 98057

The applicant is hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well #17	TRIBUTARY OF (IF SURFACE WATERS)		
--------------------	----------------------------------	--	--

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 1500	MAXIMUM ACRE FEET PER YEAR 1680*
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QUANTITY, TYPE OF USE, PERIOD OF USE

Municipal supply
*Total annual withdrawal from this allocation and all rights held by Renton shall not exceed 14,809 acre-feet.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

450 feet west and 450 feet south from the northeast corner of Section 21

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE1/4 NE1/4	SECTION 21	TOWNSHIP N. 23N	RANGE, (E OR W) W.M. 5E	W R I A. 8	COUNTY King
--	---------------	--------------------	----------------------------	---------------	----------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Renton Municipal Water Supply service area within Township 23 north, Range 4 and 5 east and Township 24 north, Range 5 east along with wholesale water to Lakeridge/Bryn-Mawr Water District through an intertie. Emergency interties for exchange of water exists between Renton and the following service areas: Seattle and Kent.

DESCRIPTION OF PROPOSED WORKS

Well 346 feet deep, 20 inch diameter

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE Completed	COMPLETE PROJECT BY THIS DATE Completed	WATER PUT TO FULL USE BY THIS DATE September 30, 2021
---	--	--

PROVISIONS

Total annual withdrawal from this allocation (G1-25397) and all rights held by Renton shall not exceed 14,809 acre-feet.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through WAC 508-64-040 and as updated. Meter readings shall be recorded monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off and the water level in the well has been stabilized. The data shall be maintained and made available to Ecology upon request. However, Ecology's Water Resources Section (NWRO) shall be notified if the SWL is determined to be below the level normally recorded at that time of year.

Renton shall monitor the shallow and intermediate aquifers at least monthly to determine the best approach for maintaining Cedar River flows in the reach associated with the Maplewood Golf Course aquifers.

The USGS gage 12119000 (located in downtown Renton) shall be permanently maintained.

Prior to using the instantaneous portion of this water right as additive to existing rights, a management plan shall be submitted to NWRO Water Resources and approved. The management plan shall provide detailed procedures for monitoring, pumping, and assuring that instream flows in the Cedar River will not be impaired by pumping.

An estimate of water conservation savings as a percent reduction in average daily per capita consumption shall be provided to NWRO Water Resources. This estimate of water conservation savings will be replaced by evidence of actual water use reduction before a final water right certificate will be issued by the Department.

A certificate of water right will not be issued until a final investigation is made. As part of the investigation Renton shall submit collected data to this office.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 3rd day of November, 2011.

Department of Ecology

REVIEWED BY
OKAY RL

By 
Jerry L. Liszak, Acting Section Manager, Water Resources

Appendix N

DRINKING WATER QUALITY MONITORING PLAN



City of Renton
Water System Plan Update

APPENDIX N

DRINKING WATER QUALITY MONITORING PLAN

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Appendix A	Coliform Monitoring Manual
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I. INTRODUCTION

Providing safe, clean drinking water is one of Renton's highest priorities. Our municipal water system produces an average of 7.3 million gallons of water each day and serves over 98,000 customers. To ensure public health protection, the City of Renton (City) has established a monitoring program that covers operational parameters, regulatory requirements, and aquifer protection.

This Plan supplements the City's 2019 Water System Plan and updates the 2012 Drinking Water Quality Monitoring Plan. The document is divided into five sections. The first section describes the water system and treatment process for each source. The second section describes water quality monitoring for operations. The third section describes water quality compliance monitoring per state and federal regulations, such as Chapter 246-290 of the Washington Administrative Code (WAC) and the Safe Drinking Water Act. The fourth section describes aquifer management monitoring, which is part of the City's Aquifer Protection Program. The fifth section discusses current drinking water regulations that have a significant impact on water utility operations.

The City's Coliform Monitoring Manual and Stage 2 Disinfectants and Disinfection Byproducts Monitoring Plan are presented in Appendix A and B, respectively.

II. WATER SYSTEM OVERVIEW

The City's water system provides service to an area of approximately 17.25 square miles that is largely coincident with the city limits. The water distribution system serves the valley floor and parts of five surrounding hills: West Hill, the Highlands, Scenic Hill (also known as Renton Hill), Talbot Hill, and Rolling Hills. The City currently serves 17,830 customers (service connections) within an elevation range of 11 to 475 feet. The City supplies wholesale water to Skyway Water and Sewer District through a single-metered connection.

The City owns and operates a multi-source municipal water system including supply, treatment, storage, and distribution of potable water to residential, commercial, industrial, and wholesale customers. The City's water distribution system consists of more than 300 miles of pipeline. Water supply sources include five downtown wells (RW-1, RW-2, RW-3, PW-8, and PW-9) and one artesian spring (Springbrook Springs) that are used for normal supply. The production wells draw from a relatively shallow aquifer (Cedar Valley Aquifer), which is an underground layer of sand and gravel that runs 3 1/2 miles long and at some points is only 23 feet below ground surface. The aquifer is fed by rain and snow falling on the aquifer and higher adjacent ground, as well as by groundwater flow from the Cedar Valley. As the City's primary water source, the Cedar Valley Aquifer has been designated a "sole source" by the U.S. Environmental Protection Agency. There are also three production wells (PW-11, PW-12, and PW-17) located east of the downtown area at the Maplewood Golf Course that provide an alternate source of supply in the event of the contamination of the Downtown Wellfield. A secondary purpose of the Maplewood Wellfield is to provide supplementary (non-additive) supply during high demand periods. In addition, the City is a wholesale customer of SPU, which gets its supply from the Cedar and Tolt Rivers. The City currently only buys wholesale water from SPU to sell directly to Boeing, but the City has a long-term supply contract for backup supply during summer peak use periods and for future water demands.

As a result of the City's topography and geography, the City has 16 hydraulically distinct pressure zones. Pumping throughout the water system is accomplished by 12 booster pump stations (BPS) that are located throughout the City. Currently there are 10 reservoirs in the system, strategically located to provide adequate equalizing and fire flow reserves for all pressure zones. Pressure reducing valves (PRVs) are used to supply

lower pressure zones from higher pressure zones that contain water storage reservoirs. The City has seven metered interties with the SPU transmission mains and three additional emergency supply interties with other neighboring water systems.

Each source is currently designed with primary disinfection using chlorine (gaseous chlorine or sodium hypochlorite). Sodium fluoride is also added at each source to prevent dental caries. The City treats the water from the Downtown Wells and Springbrook Springs with sodium hydroxide (NaOH) to raise the pH of the water, which decreases the corrosivity of the water. The Maplewood Treatment Plant treats water by: (1) removes hydrogen sulfide by converting it to sulfate by adding oxygen (granular activated carbon is used as a catalyst), (2) removes manganese using green sand filters, and (3) converts ammonia in the water to nitrogen gas by reacting it with sodium hypochlorite in a contact basin.

A corrosion inhibitor and sequestering agent is used in Well PW-5A to treat for naturally-occurring iron and manganese. Since there is also naturally-occurring ammonia in the water, the chlorine dosage is set to create monochloramines for disinfection. With existing treatment, aesthetic-related problems (taste, odor, and staining) still remain; therefore this source is only used as a back-up source of supply at this time.

The City also adds Aqua Mag[®] blended phosphates to the water in areas of the distribution system that contain a high number of unlined cast iron water mains. It acts to control the corrosion of the interior surfaces of water mains. Ortho-polyphosphates are added at the Mt. Olivet BPS and West Hill BPS.

III. MONITORING FOR OPERATIONS

Operational monitoring is used to check that treatment plants and other water facilities are operating effectively to deliver water that meets standards and to provide early warning that source water quality may be deteriorating or a treatment process may be failing. Operational monitoring samples are analyzed in laboratories located in the City's treatment plants, as approved by WAC 246-290-300(1)(c).

A. Chlorine

Parameters: Free chlorine residuals are measured in milligrams per liter (mg/L). Chlorine demand is calculated in mg/L. The City maintains a free chlorine residual between 0.6 and 1 mg/L throughout the distribution system.

Sampling and Analysis Methods: The City continuously measures the free chlorine residual in the treated water from each source using fixed in-line Hach CL17 analyzers (colorimetric DPD analysis, EPA Method 334.0). The analyzer data is recorded by supervisory control and data acquisition (SCADA) and the results are stored in the SCADA System History database.

Water quality maintenance staff also measure for free chlorine residuals on a daily basis from each source that is operating when staff is present and at nine sampling stations located throughout the distribution system. Each grab sample is manually collected in a glass bottle and analyzed using a Chlorine Reagent with a portable Hach Pocket Colorimeter II (Hach Method 8021).

Per regulatory requirements, water quality maintenance staff measure for free chlorine residuals during compliance total coliform bacteria (Bac-T) sampling (see the Coliform Monitoring Plan in Appendix A for the locations of the coliform sampling sites).

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Well RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Maplewood 565 Treated Water SA#14	PS010
Well EW-3R Treated Water	PS024
Springbrook Springs Sampling Station	POE13
311 Chelan Ave SE Sampling Station	MS030
1622 Hoquiam PL NE Sampling Station	MS034
City Shops Sampling Station	MS054
Highlands BPS 565 Zone Tap	PS001
2510 Meadow Ave N Sampling Station	MS033
North Talbot BPS 490 Zone Tap	PS005
S 180th & W Valley Hwy Sampling Station	MS028
West Hill BPS 495 Zone Tap	PS009
806 High Ave S Sampling Station	MS026

Recording and Reporting: Water quality maintenance staff record raw data on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. Data from this field form is used to complete the forms sent to DOH.

Chlorine demand is calculated based on volume of water produced and pounds of chlorine consumed. The combined chlorine demand is calculated daily for all the chlorine gas supplied sources (Springbrook Springs; RW-1, 2 & 3; PW-8 & 9; and EW-3R) and for the sodium hypochlorite supplied sources (PW-11, 12 & 17). Each calculated value is recorded on the DOH form, *Chlorination Plant & Turbidity Report*, which is sent to DOH on a monthly basis. The number of samples, the highest concentration, the lowest concentration, and the average concentration of free chlorine are also recorded daily on the DOH form per each chlorine type (combined chlorine gas supplied sources and combined sodium hypochlorite supplied sources). The chlorine residual concentration at each operating source is recorded daily on the DOH form, *Ground Water Treatment Plant Report*, which is sent to DOH on a monthly basis. Copies of these DOH reports are provided to water utility engineering staff.

The free chlorine residual concentrations, which are measured during Bac-T sample collection, are recorded on the coliform sample report forms that are submitted to the commercial laboratory for compliance purposes ¹.

¹ Sources: WAC 246-290-300(3)(a)(ii)

B. Fluoride

Parameters: Fluoride is measured in mg/L. Fluoride demand is calculated in mg/L. The City maintains a fluoride concentration of 0.7 mg/L with an operating tolerance of 0.5 and 0.9 mg/L.

Sampling and Analysis Methods: Water quality maintenance staff measure for fluoride on a daily basis from each source that is operating when staff is present and at three sampling stations located throughout the distribution system. Each grab sample is manually collected in a plastic bottle and analyzed at the City Shops laboratory by the SPADNS 2 colorimetric method (Hach Method 10225) using a Fluoride Reagent with a Hach DR2700 Spectrophotometer.

Once a month, the water quality maintenance staff collect two fluoride grab samples at every source that was operational during that month. One sample is tested at the City Shops laboratory using the City-owned testing equipment (see above). The result of the test along with the second sample are sent to a commercial laboratory for analyses (see Inorganic Chemical and Physical for fluoride compliance monitoring). Both results are submitted to the DOH for comparison to ensure proper calibration of the City's testing equipment.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Well RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Maplewood 565 Treated Water SA#14	PS010
Well EW-3R Treated Water	PS024
Springbrook Springs Sampling Station	POE13
1622 Hoquiam PL NE Sampling Station	MS034
2510 Meadow Av N Sampling Station	MS033
North Talbot BPS 490 Zone Tap	PS005

Recording and Reporting: Water quality maintenance staff record raw data on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. Data from this field form is used to complete the forms sent to DOH.

Fluoride demand is calculated based on volume of water produced and pounds of sodium fluoride consumed. Daily fluoride concentrations and fluoride demand for each operational source are recorded on the DOH form, *Fluoridation Monthly Operations Report*, which is sent to DOH on a monthly basis. The fluoride concentrations that are measured daily at each operational source are also reported on the DOH form, *Ground Water Treatment Plant Report*, which is sent to DOH on a monthly basis. Copies of the DOH reports are provided to water utility engineering staff.

C. Turbidity

Parameters: Turbidity is measured in Nephelometric Turbidity Units (NTUs).

Sampling and Analysis Method: Water quality maintenance staff measure for turbidity on a daily basis from each source that is operating when staff is present. Turbidity is measured at the source, before treatment (raw sample). Each grab sample is manually collected in a plastic bottle and analyzed at the Corrosion Control Treatment Facility laboratory using a Hach 2100N Turbidimeter (EPA Method 180.1).

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Well RW-1 Raw	472853122115701
Well RW-2 Raw	472853122115601
Well RW-3 Raw	472853122115602
Well PW-8 Raw	472901122114901
Well PW-9 Raw	472858122114201
Well EW-3R Raw	472902122115501
Springbrook Springs Treatment Building Raw	MS016
Wells PW-11-12-17 Raw Water SA#4	PS016

Recording and Reporting: Water quality maintenance staff record the turbidity measurements on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. Data from this field form is used to complete the forms sent to DOH.

The daily high value and low value for turbidity are recorded on the DOH form, *Chlorination Plant & Turbidity Report*, per each chlorine type (combined chlorine gas supplied sources and combined sodium hypochlorite supplied sources). These reports are sent to DOH on a monthly basis, and copies are provided to water utility engineering staff.

D. Temperature

Parameters: Temperature is measured in degrees Celsius.

Sampling and Analysis Method: Water quality maintenance staff measure for temperature on a daily basis from each source that is operating when staff is present. Temperature is measured at the source, before treatment with chlorine and fluoride (raw water sample).

Grab Sample Locations: See Turbidity Grab Sample Locations.

Recording and Reporting: Water quality maintenance staff record the temperature measurements on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. Data from this field form is used to complete the forms sent to DOH.

The daily temperature for each operational source is transferred onto the DOH form, *Ground Water Treatment Plant Report*, which is sent to DOH on a monthly basis. Copies of the DOH reports are provided to water utility engineering staff.

E. Phosphate

Parameters: Phosphate (PO_4^{3-}) is measured in mg/L. The City monitors for phosphate because ortho-polyphosphates are added into the distribution system where there is a potential for corrosion of iron pipes. The optimal range for ortho-polyphosphates is between 1.0 to 2.0 mg/L.

Sampling and Analysis Method: Water quality maintenance staff measure for phosphate on a daily basis at two sampling stations located in areas of the distribution system that contain a high concentration of unlined cast iron water mains. Each grab sample is manually collected in a plastic bottle and analyzed at the City Shops laboratory by the colorimetric method (Hach Method 8048) using a Phosphate Reagent with a Hach DR2700 Spectrophotometer.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
2510 Meadow Av N Sampling Station	MS033
Lind NW & Taylor PI NW Sampling Station	MS032

Recording and Reporting: Water quality maintenance staff record the phosphate concentrations on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. The results are transferred onto the City form, *Iron and Phosphate*, which is provided to water utility engineering staff.

F. Iron

Parameters: Iron (Fe) is measured in mg/L. The City monitors for iron in areas of the distribution system where there is a potential for corrosion of iron pipes and at the Maplewood sources containing naturally occurring iron. Iron concentrations of 0.3 mg/L or greater can cause a metallic taste in the water and reddish brown staining of laundry and plumbing fixtures for customers. To eliminate staining problems, the City has a treatment goal of 0.05 mg/L or less for iron concentrations in the treated water.

Sampling and Analysis Method: Water quality maintenance staff measure for iron on a daily basis at two sampling stations located in areas of the distribution system that contain a high concentration of unlined cast iron water mains. Grab samples are manually collected in a plastic bottle and analyzed at the City Shops laboratory by the colorimetric method (Hach Method 8008) using an Iron Reagent with a Hach DR2700 Spectrophotometer.

When the Maplewood sources are operational (and if time allows), water quality maintenance staff also measure for iron at the Maplewood Treatment Plant. Iron is measured at the raw water intake, mid-point of the Chlorine Contact Chamber, and at the low-lift pump discharge pipe (when running). Each grab sample is manually collected in a plastic bottle and analyzed at the Maplewood Treatment Plant by the colorimetric method (Hach Method 8146) using an Iron Reagent with a Hach DR3900 Spectrophotometer.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
2510 Meadow Av N Sampling Station	MS033
Lind NW & Taylor Pl NW Sampling Station	MS032
Wells PW-11-12-17 Raw Water SA#4	PS016
Maplewood Chlorine Contact Chamber SA#11	PS023
Maplewood Low-Lift Pumps SA#12	MS037

Recording and Reporting: Water quality maintenance staff record the iron concentrations on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. The results are transferred onto the City form, *Iron and Phosphate*, which is provided to water utility engineering staff. Results from the Maplewood Treatment Plant are recorded on the City form, *Maplewood Treatment Plant Operations Log*.

G. Manganese

Parameters: Manganese (Mn) is measured in mg/L. The City monitors for manganese, which occurs naturally in the deep Maplewood Aquifer. Manganese concentrations of 0.05 mg/L or greater can cause a metallic taste in the water and brownish black staining of laundry and plumbing fixtures for customers. To eliminate staining problems, the City has a treatment goal of 0.01 mg/L or less for manganese concentrations in the treated water at the Maplewood Treatment Plant.

Sampling and Analysis Method: When the Maplewood sources are operational (and if time allows), water quality maintenance staff measure for manganese at the Maplewood Treatment Plant. Manganese is measured at the raw water intake, mid-point of the Chlorine Contact Chamber, and at the low-lift pump discharge pipe (when running). Each grab sample is manually collected in a plastic bottle and analyzed at the Maplewood Treatment Plant by the PAN colorimetric method (Hach Method 8149) using a Manganese Reagent Set with a Hach DR3900 Spectrophotometer.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Wells PW-11-12-17 Raw Water SA#4	PS016
Maplewood Chlorine Contact Chamber SA#11	PS023
Maplewood Low-Lift Pumps SA#12	MS037

Recording and Reporting: Results are recorded on the City form, *Maplewood Treatment Plant Operations Log*.

H. Ammonia

Parameters: Ammonia (NH₃-N) is measured in mg/L. At the Maplewood Treatment Plant, breakpoint chlorination is used to remove naturally-occurring ammonia.

Sampling and Analysis Method: When the Maplewood sources are operational (and if time allows), water quality maintenance staff measure for ammonia at the Maplewood Treatment Plant. Ammonia is measured at the raw water intake and at the mid-point of the Chlorine Contact Chamber. Each grab sample is manually collected in a plastic bottle and analyzed at the Maplewood Treatment Plant by the Salicylate colorimetric method (Hach Method 10023) using an Ammonia Salicylate Reagent with a Hach DR3900 Spectrophotometer.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Wells PW-11-12-17 Raw Water SA#4	PS016
Maplewood Chlorine Contact Chamber SA#11	PS023

Recording and Reporting: Results are recorded on the City form, *Maplewood Treatment Plant Operations Log*.

I. Hydrogen Sulfide

Parameters: Hydrogen Sulfide (H₂S) is measured in mg/L. At the Maplewood Treatment Plant, granular activated carbon is used to convert naturally-occurring hydrogen sulfide to sulfate. To improve taste and odor, the City has a treatment goal of 0.001 mg/L or less for hydrogen sulfide concentrations in the treated water.

Sampling and Analysis Method: When the Maplewood sources are operational (and if time allows), water quality maintenance staff measure for hydrogen sulfide at the Maplewood Treatment Plant. Hydrogen sulfide is measured at the raw water intake and at the mid-point of the Chlorine Contact Chamber. Each grab sample is manually collected in a plastic bottle and analyzed at the Maplewood Treatment Plant by the Methylene Blue colorimetric method (Hach Method 8131) using Sulfide Reagents with a Hach DR3900 Spectrophotometer.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Wells PW-11-12-17 Raw Water SA#4	PS016
Maplewood Chlorine Contact Chamber SA#11	PS023

Recording and Reporting: Results are recorded on the City form, *Maplewood Treatment Plant Operations Log*.

J. pH

Parameters: pH is measured on a scale of 0 to 14, with 7 being neutral. pH values less than 7 indicate acidic conditions, which can lead to corrosion and the leaching of metals. As recommended by the DOH, the optimal pH range for the City's treated water is between 7.2 and 10.

Sampling and Analysis Method: The City measures the pH of treated water continuously by analyzer at all sources. The analyzer data is recorded by SCADA and the results are stored in the SCADA System History database.

Water quality maintenance staff also measure for pH on a daily basis at sources operating when they are present (both before and after NaOH injection) and at two sampling stations located throughout the distribution system. Samples are manually collected in a plastic bottle and analyzed at the Corrosion Control Treatment Facility laboratory using a Thermo Electron Corp pH meter.

Grab Sample Locations:

Sampling Station Name	Water Quality Database ID
Well RW-1 Raw (before NaOH injection)	472853122115701
Well RW-2 Raw (before NaOH injection)	472853122115601
Well RW-3 Raw (before NaOH injection)	472853122115602
Well PW-8 Raw (before NaOH injection)	472901122114901
Well PW-9 Raw (before NaOH injection)	472858122114201
Well EW-3R Raw (before NaOH injection)	472902122115501
Springbrook Springs Treatment Building Raw (before NaOH injection)	MS016
Wells PW-11-12-17 Raw Water SA#4	PS016
Well RW-1-2-3 End of CT Pipe Loop (after NaOH injection)	MS040
Wells PW-8-9 Post CT Pipe Chlorine (after NaOH injection)	CTPost02
Maplewood 565 Treated Water SA#14 (after NaOH injection)	PS010
Well EW-3R Treated Water (after NaOH injection)	PS024
Springbrook Springs Sampling Station (after NaOH injection)	POE13
2510 Meadow Av N Sampling Station	MS033
North Talbot BPS 490 Zone Tap	PS005

Recording and Reporting: Water quality maintenance staff record the pH values on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. The measurements are transferred to the City form, *pH*, which is provided to water utility engineering staff. Data from this field form is also used to complete the forms sent to DOH.

Pre- and post-treatment pH values for each operational source are transferred onto the DOH form, *Ground Water Treatment Plant Report*, which is sent to DOH on a monthly basis. Copies of the DOH reports are provided to water utility engineering staff.

K. Well Water Levels

Parameters: Water levels are measured in feet, from the top of the well casing (TOC).

Sampling and Analysis Method: Well transducers measure the water level continuously in each production well. The transducer data is recorded by SCADA and the results are stored in the SCADA System History database.

Water quality maintenance staff also manually measure the water level at each production well with the exception of Well PW-12. Well PW-12 requires confined space entry. Manual measurements are performed on a monthly basis, whether the well is in operation or not.

Locations: Wells RW-1, RW-2, RW-3, PW-8, PW-9, EW-3R, PW-11, and PW-17.

Recording and Reporting: Water quality maintenance staff record the water levels on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. The measurements are transferred to the City form, *Well Level Measurements YYYY*, which is provided to water utility engineering staff. Water utility engineering staff enter the measurements into the City's Water Level database, which stores historical data for the City's production wells and groundwater monitoring (non-pumping) wells.

L. Production Volumes and Flow Rates

Parameters: The volume of water produced is measured in gallons, and the flow rate is calculated in gallons per day.

Sampling and Analysis Method: Flow meters measure the flow rate continuously at each metered location. The flow data is recorded by SCADA and the results are stored in the SCADA System History database.

Water quality maintenance staff also manually record flow meter readings on a daily basis for each source.

Locations: Each source and each BPS with the exception of Tiffany Park and Fred Nelson.

Recording and Reporting: Water quality maintenance staff record the flow meter readings on the field form, *City of Renton Pump/Chemical Feed/Sampling Stations*. The total monthly production volume and average daily flow rate at each location are calculated and recorded on the City form, *Renton Water Utility Monthly Report*, which is provided to water utility engineering staff.

IV. COMPLIANCE MONITORING

Compliance monitoring is used to determine whether water supplies comply with standards and indicator parameters in state and federal regulations. This monitoring is mandatory and compliance monitoring samples are analyzed using EPA-approved methods at State-certified laboratories, with the exception of residual disinfectant concentration.

The State of Washington has primacy over the regulation of public drinking water. This means the DOH has full authority and responsibility for implementing and enforcing both state and federal drinking water laws. Under primacy, the DOH must adopt state rules that are at least as stringent as the rules promulgated by the EPA. Regulatory requirements in this section are referenced to WAC 246-290, unless the WAC directly references the Code of Federal Regulations (CFR) or a federal drinking water law has yet to be included in the WAC.

Adjustments to the monitoring frequency may be granted by the DOH if there is low vulnerability to contamination from a certain chemical or group of chemicals. The DOH has the authority to grant waivers for certain parameters, depending on vulnerability and previous sampling results. The DOH has issued state-wide waivers for insecticides, dioxin, diquat, endothall, glyphosate, polychlorinated biphenyls (PCBs), ethylene dibromide (EDB), and dibromochloropropane (DBCP). The City also has a permanent waiver for asbestos; temporary waivers for inorganic contaminants (IOCs), volatile organic chemicals (VOCs), and synthetic organic chemicals (SOCs); and a reduced monitoring schedule for total trihalomethane (TTHM) and haloacetic acids (HAA5).

A. Bacteriological

Regulatory Requirement: Monitoring for total coliforms and *Escherichia coli* (*E.coli*) is required per state and federal regulations². Systems need only determine the presence or absence of total coliforms and *E.coli*³. Coliform treatment technique triggers, assessment requirements, and violations are specified in WAC 246-290-320(2) and described in the Coliform Monitoring Plan in Appendix A.

Sampling Locations and Frequency: 100 routine samples are required each month. See coliform sampling site locations in the Coliform Monitoring Plan in Appendix A.

Sampling and Analysis Method: Water samples for bacteriological analysis are collected in plastic bottles provided by the commercial laboratory and placed in a chilled cooler. The samples are tested by a State-accredited laboratory using EPA Methods specified in 40 CFR 124.21(f).

Recording and Reporting: The commercial laboratory reports results directly to DOH. A copy of the sample report form is returned to water quality maintenance staff with a “present” or “absent” indication for coliform bacteria.

² Sources: WAC 246-290-300(3), 40 CFR 141.21 & Subpart Y

³ Sources: WAC 246-290-310(2), 40 CFR 141.852(a)(2)

B. Inorganic Chemical and Physical

Regulatory Requirement: Monitoring for IOC and physical substances is required per state and federal regulations⁴. The primary and secondary chemical and physical substances and their respective maximum contaminant levels⁵ (MCLs) are listed below.

Substance	Primary MCL (mg/L)
Antimony (Sb)	0.006
Arsenic (As)	0.01
Asbestos	7 million fibers/liter (longer than 10 microns)
Barium (Ba)	2
Beryllium (Be)	0.004
Cadmium (Cd)	0.005
Chromium (Cr)	0.1
Copper (Cu)	1.3*
Cyanide (HCN)	0.2
Fluoride (F)	4
Lead (Pb)	0.015*
Mercury (Hg)	0.002
Nickel (Ni)	0.1
Nitrate (as N)	10
Nitrite (as N)	1
Selenium (Se)	0.05
Sodium (Na)	20**
Thallium (Tl)	0.002

Substance	Secondary MCL (mg/L)
Chloride (Cl)	250
Fluoride (F)	2
Iron (Fe)	0.3
Manganese (Mn)	0.05
Silver (Ag)	0.1
Sulfate (SO ₄)	250
Zinc (Zn)	5

*For lead and copper, the EPA has established distribution system related levels (action levels) at which a system is required to consider corrosion control

**recommended level is a level of concern for those consumers that may be restricted for daily sodium intake in their diets

Substance	Secondary MCL
Color	15 Color Units
Specific Conductivity	700 umhos/cm
Total Dissolved Solids (TDS)	500 mg/L

The IOC analytes are covered by *DOH TEST PANEL: IOC*. Direct the laboratory to analyze for IOC analytes and physical characteristics for drinking water compliance monitoring.

⁴ Sources: WAC 246-290-300(4), 40 CFR 141.23&88

⁵ Sources: WAC 246-290-310 (Tables 5 and 6)

Sampling Locations: From a point representative of the source, after treatment and prior to entry to the distribution system⁶.

Source Name	Sampling Station Name	Water Quality Database ID
Wells RW-1, RW-2, RW-3	Wells RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8 and PW-9	Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Well PW-5A	Well PW-5A Treated Water FH NE668	POE14
Wells PW-11, PW-12, PW-17	Maplewood 565 Treated Water SA#14	PS010
Well EW-3R	Well EW-3R Treated Water	PS024
Springbrook Springs	Springbrook Springs Sampling Station	POE13

Sampling and Analysis Method: Treated source water samples are collected in glass bottles provided by the commercial laboratory and placed in a chilled cooler. The samples are tested by a State-accredited laboratory using EPA Methods specified in 40 CFR 124.23(k).

Sampling Frequency: Nitrate must be sampled annually (there is no waiver for nitrate). Other IOCs are sampled once per every 3 years, unless waived by DOH⁷. The City currently has waivers to reduce monitoring for IOC to once per every 9 years.

Recording and Reporting: The commercial laboratory reports results directly to DOH and sends a copy to the water quality maintenance staff. A copy of the laboratory report is also provided to water utility engineering staff, who enters the analytical results into the City’s Water Quality database.

C. Residential Tap Sampling for Lead and Copper

Regulatory Requirement: Monitoring at residential taps for lead and copper is required per state and federal regulations⁸. The action levels for lead and copper are 0.015 and 1.3 mg/L, respectively⁹. As part of the lead and copper tap sampling program, the City also collects pH samples within the distribution system. The optimal water quality parameter requirement is pH greater than or equal to 7.2 in the distribution system.

Sampling Locations: The City is required to sample 30 sites (single-family homes)¹⁰ for lead and copper. There are 159 qualified sites in the City’s Water Quality database (identified by the designation “LS***”). The City is also required to sample for pH at seven locations within the distribution system. The pH levels are collected from dedicated sampling stations used for routine coliform samples.

⁶ Sources: WAC 246-290-300 (Table 4), 40 CFR 124.23(a)(1)

⁷ Sources: WAC 246-290-300(4), 40 CFR 141.23(b-e)

⁸ Sources: WAC 246-290-300(5), 40 CFR 141.86-88

⁹ Sources: WAC 246-290-310(Table 5), 40 CFR 141.80(c)

¹⁰ Sources: WAC 246-290-300(5), 40 CFR 141.86(c)&(d)(4)(v)

Sampling and Analysis Method: Lead and copper samples are collected by residents from the cold water side of their kitchen or bathroom faucets. The samples are collected in plastic bottles provided by the commercial laboratory. Residents are instructed not to run the water for 6 hours prior to taking the sample. Water utility engineering staff collect the filled bottles and deliver the samples to the commercial laboratory for analysis. The pH levels are field measured using a Hach Pocket Pro+ pH meter.

Sampling Frequency: Once per every 3 years¹¹ for lead and copper. Lead and copper samples must be collected between June 1 and September 30. The pH samples must be collected twice every 3 years.

Recording and Reporting: The commercial laboratory reports lead and copper compliance results directly to DOH and sends a copy to the water quality engineering staff who manage the lead and copper tap sampling program. The analytical results are entered into the City's Water Quality database and letters are distributed to participants with the results.

D. Disinfectant Residuals and Disinfection Byproducts

Regulatory Requirement: Monitoring for disinfectant residuals (chlorine) and disinfection byproducts (TTHM and HAA5) is required per state and federal regulations¹². The MCLs for TTHM and HAA5 are 0.080 and 0.060 mg/L, respectively¹³. The maximum residual disinfectant level (MRDL) for chlorine is 4 mg/L (as Cl₂)¹⁴. As of January 2017, the DOH requires a detectable residual disinfectant concentration of at least 0.2 mg/L in all active parts of the distribution system¹⁵. In order to maintain the chlorination requirements of 4-log virus treatment (CT=6), the City has minimum chlorine residuals required at the end of each CT pipeline:

- Springbrook Springs = 0.80 mg/L
- Wells RW-1, RW-2, and RW-3 = 0.62 mg/L
- Wells PW-8 and PW-9 = 0.70 mg/L
- Well EW-3R = 0.85 mg/L

At the Maplewood Treatment Plant, water in the Chlorine Contact Basin and Clearwell have a contact time of at least 4 hours before the treated water enters the distribution system. The City maintains a chlorine residual of 1.0 mg/L for the Maplewood Wellfield.

Distribution monitoring for TTHM and HAA5 are covered by *DOH TEST PANELS: TTHM and HAA5*. Source water monitoring for TTHM is covered by *DOH TEST PANEL: VOC1*.

Sampling Locations and Frequency: Water quality maintenance staff measure for chlorine residuals on a daily basis from each source that is operating when staff is present and at nine sampling stations located throughout the distribution system (see chlorine sampling locations in Section III - Monitoring for Operations). Water quality maintenance staff also measure for chlorine residuals at coliform sampling stations during compliance Bac-T sampling (see the Coliform Monitoring Plan in Appendix A).

¹¹ Sources: WAC 246-290-300(5), 40 CFR 141.86(d)(4)(v)

¹² Sources: WAC 246-290-300(2),(3)&(6), 246-290-451, 40 CFR 141 Subpart V

¹³ Sources: WAC 246-290-310(4)(b), 40 CFR 141.64

¹⁴ Sources: WAC 246-290-310(5)(b), 40 CFR 141.65

¹⁵ Sources: WAC 246-290-010(80), 246-290-451(7)(b)

The City is currently on a reduced monitoring schedule for TTHM and HAA5. See TTHM and HAA5 sampling frequency and sample locations in the Stage 2 Disinfectants and Disinfection Byproducts Monitoring Plan in Appendix B.

Sampling and Analysis Method: For TTHM and HAA5, treated water samples are collected in glass VOA vials provided by the commercial laboratory and placed in a chilled cooler. The TTHM and HAA5 samples are tested by a State-accredited laboratory using EPA Methods specified in 40 CFR 124.131(b).

For chlorine residuals, grab samples are collected and analyzed by the water quality maintenance staff, as approved by WAC 246-290-300(1)(c). See Section III - Monitoring for Operations for more information on the sampling and analysis method for chlorine residuals.

Recording and Reporting: The commercial laboratory reports results for TTHM and HAA5 directly to DOH and sends a copy to the water quality maintenance staff. A copy of the laboratory report is also provided to water utility engineering staff, who enters the analytical results into the City’s Water Quality database. See Section III - Monitoring for Operations for more information on the recording and reporting for chlorine residuals.

E. Volatile Organic Chemicals

Regulatory Requirement: Monitoring for VOCs is required per state and federal regulations¹⁶. Regulated VOCs and their respective MCLs are listed under 40 CFR 141.61(a).

In addition to the chemicals listed, monitoring is also performed for additional organic chemicals for which MCLs have not been established. The regulated and unregulated VOC analytes are covered by *DOH TEST PANEL: VOC1*. Direct the laboratory to analyze for VOCs for drinking water compliance monitoring.

Sampling Locations: From a point representative of the source, after treatment and prior to entry to the distribution system¹⁷.

Source	Sampling Station Name	Water Quality Database ID
Wells RW-1, RW-2, RW-3	Well RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8 and PW-9	Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Well PW-5A	Well PW-5A Treated Water FH NE668	POE14
Wells PW-11, PW-12, PW-17	Maplewood 565 Treated Water SA#14	PS010
Well EW-3R	Well EW-3R Treated Water	PS024
Springbrook Springs	Springbrook Springs Sampling Station	POE13

¹⁶ Sources: WAC 246-290-300(7)&310(7), 40 CFR 141.24

¹⁷ Sources: WAC 246-290-300 (Table 4), 40 CFR 124.24(f)

Sampling and Analysis Method: Treated source water samples are collected in glass VOA vials provided by the commercial laboratory and placed in a chilled cooler. The samples are tested by a State-accredited laboratory using EPA Method 524.2¹⁸.

Sampling Frequency: Once per every 3 years, unless waived by DOH¹⁹. The City currently has a waiver to reduce monitoring for VOCs to once per every 6 years.

Recording and Reporting: The commercial laboratory reports results directly to DOH and sends a copy to the water quality maintenance staff. A copy of the laboratory report is also provided to water utility engineering staff, who enters the analytical results into the City's Water Quality database.

F. Synthetic Organic Chemicals

Regulatory Requirement: Monitoring for SOCs is required per state and federal regulations²⁰. EPA regulated SOCs and their respective MCLs are listed under 40 CFR 141.61(c).

In addition to the chemicals listed, monitoring is also performed for additional SOCs for which MCLs have not been established. The regulated and unregulated SOC analytes are covered by *DOH TEST PANELS: PEST1, HERB1, INSECT1, and FUMIGANT*. Direct the laboratory to analyze for SOCs for drinking water compliance monitoring. DOH may require any or all of the test panels; however, the City currently has state waivers for insecticides, pesticides, and soil fumigants.

Sampling Locations: From a point representative of the source, after treatment and prior to entry to the distribution system²¹.

Source	Sampling Station Name	Water Quality Database ID
Wells RW-1, RW-2, RW-3	Well RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8 and PW-9	Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Well PW-5A	Well PW-5A Treated Water FH NE668	POE14
Wells PW-11, PW-12, PW-17	Maplewood 565 Treated Water SA#14	PS010
Well EW-3R	Well EW-3R Treated Water	PS024
Springbrook Springs	Springbrook Springs Sampling Station	POE13

Sampling and Analysis Method: Treated source water samples are collected in glass VOA vials provided by the commercial laboratory and placed in a chilled cooler. The samples are tested by a State-accredited laboratory using EPA Methods specified in 40 CFR 124.24(e).

¹⁸ Sources: WAC 246-290-300(1)(c), 40 CFR 141.24(e)

¹⁹ Sources: WAC 246-290-300(7), 40 CFR 141.24(f)

²⁰ Sources: WAC 246-290-300(7)&310(7), 40 CFR 141.24

²¹ Sources: WAC 246-290-300 (Table 4), 40 CFR 124.24(h)

Sampling Frequency: Twice per every 3 years, unless waived by DOH²². The City currently has a waiver to reduce monitoring for herbicides to once per every 9 years.

Recording and Reporting: The commercial laboratory reports results directly to DOH and sends a copy to the water quality maintenance staff. A copy of the laboratory report is also provided to water utility engineering staff, who enters the analytical results into the City's Water Quality database.

G. Radionuclides

Regulatory Requirement: Monitoring for radionuclides is required per state and federal regulations²³. The MCLs for gross alpha and radium 228 are 15 and 5 pCi/L, respectively²⁴.

Sampling Locations: From a point representative of the source, after treatment and prior to entry to the distribution system²⁵.

Source	Sampling Station Name	Water Quality Database ID
Wells RW-1, RW-2, RW-3	Well RW-1-2-3 End of CT Pipe Loop	MS040
Wells PW-8 and PW-9	Wells PW-8-9 Post CT Pipe Chlorine	CTPost02
Well PW-5A	Well PW-5A Treated Water FH NE668	POE14
Wells PW-11, PW-12, PW-17	Maplewood 565 Treated Water SA#14	PS010
Well EW-3R	Well EW-3R Treated Water	PS024
Springbrook Springs	Springbrook Springs Sampling Station	POE13

Sampling and Analysis Method: Treated source water samples are collected in plastic bottles provided by the commercial laboratory and placed in a chilled cooler. The samples are tested for gross alpha and radium 228 by a State-accredited laboratory using EPA Method 900.0: RL-GPC-001 and EPA Method 904.0: RL-RA-001, respectively²⁶.

Sampling Frequency: Once per every 6 years, unless waived by DOH²⁷.

Recording and Reporting: The commercial laboratory reports results directly to DOH and sends a copy to the water quality maintenance staff. A copy of the laboratory report is also provided to water utility engineering staff, who enters the analytical results into the City's Water Quality database.

²² Sources: WAC 246-290-300(7), 40 CFR 141.24(h).

²³ Sources: WAC 246-290-300(8)&310(6), 40 CFR 141.26

²⁴ Sources: WAC 246-290-310(6), 40 CFR 141.66

²⁵ Sources: WAC 246-290-300 (Table 4), 40 CFR 124.26(a)

²⁶ Sources: WAC 246-290-300(8), 40 CFR 141.25(a)

²⁷ Sources: WAC 246-290-300(8), 40 CFR 141.26(a)(3)

V. Aquifer Management Monitoring

Groundwater systems undergo short-term and long-term changes in climate, withdrawal, and land use that can affect groundwater recharge and storage. Water level measurements from monitoring (non-pumping) wells allow the City to study how these stresses affect the supplying aquifers²⁸. Water quality monitoring provides an early warning that contaminants may be near the City's production wells. A long-term record of water levels and water quality data allows the City to refine its groundwater model, forecast trends, track climate events, and assist future planning decisions.

A. Aquifer Water Quality Monitoring

Goal: To provide an early warning of contaminants present in the capture zones of the City's production wells.

Program Status: Water utility engineering staff conduct semi-annual groundwater sampling using a network of monitoring wells (different from the City's production wells). In March and September, six monitoring wells are sampled for VOCs. If contaminants are detected, water utility engineering will immediately notify the water quality maintenance supervisor and follow-up sampling will occur.

The groundwater samples are analyzed by a commercial laboratory. A copy of the laboratory report is provided to water utility engineering staff, who enters the analytical results into the City's Water Quality database.

Sampling Locations:

March Sampling Event	September Sampling Event
MW-31S, 31D, 25S, 25D, 4, 34S	MW-42, 26R, 3, 5, 33, OBW-1S

B. Downtown Aquifer Water Levels

Goal: To track short-term (seasonal) and long-term changes in the water table elevation of the downtown aquifer (Cedar Valley Aquifer).

Program Status: Water utility engineering staff measure water levels from 18 monitoring wells located throughout downtown Renton on a monthly basis. Measurements are taken from a marked and surveyed measuring point on each well, with a precision of 0.01 foot. Water utility engineering staff enter the water level measurements into the City's Water Level database, which stores historical data for the City's production wells and groundwater monitoring wells.

Monitoring Locations: Monitoring Wells MW-1, MW-5, MW-10, MW-11, MW-18, MW-20, MW-21, MW-25S & D, MW-26R, MW-27, MW-30S & D, MW-31S & D, MW-33, and MW-34S & D.

²⁸ Sources: Taylor, C. J. and Alley, W. M. (2001). Ground-water-level monitoring and the importance of long-term water-level data. *US Geological Survey Circular, 1217*.

C. Maplewood Aquifer Water Levels

Goal: To track short-term (seasonal) and long-term changes in the water table elevation of the Maplewood Aquifer and to analyze the effects of production well pumping.

Program Status: Water utility engineering staff maintain data recorders (Solinst Levelloggers) in six groundwater monitoring wells located at the Maplewood Golf Course. A barometric data recorder (Solinst Barologger) is also kept at the golf course so that the recorded barometric information can be used to remove the effects of barometric pressure. The data recorders measure pressure and temperature and are programmed to take measurements every 15 minutes. The data is periodically downloaded from the transducers.

Monitoring Locations: MW-36S & D, MW-37S & D, and OBW-1S & D.

VI. WATER QUALITY REGULATIONS OF CURRENT SIGNIFICANCE

The City complies with state and federal regulations to ensure the system's drinking water is safe and reliable. Since the previous Water System Plan Update, the EPA issued one new drinking water rule and revised one existing drinking water rule. The City's monitoring requirements also changed for two existing drinking water rules. The water quality regulations of current significance to the City are summarized below.

A. Revised Total Coliform Rule (RTCR)

The RTCR is the revision to the 1989 Total Coliform Rule (TCR) and is intended to improve public health protection through the reduction of potential pathways of entry for fecal contamination into the distribution system. EPA published the RTCR in the Federal Register in 2013 (minor corrections in 2014), and the rule became effective on April 1, 2016. The RTCR applies to all public water systems (PWSs).

The RTCR establishes a MCL for *E.coli* and requires each total coliform-positive routine sample to be tested for the presence of *E.coli*. The system must also collect three repeat samples for every unsatisfactory routine sample. See the Coliform Monitoring Plan in Appendix A for a detailed description of MCL and treatment technique violations. Public notification is required after drinking water violations. The public notices are issued depending on the tier to which the violation is assigned (Tier 1 - Immediate Notice, Tier 2 - Within 30 days, and Tier 3 - Annual Notice).

The RTCR also requires the system to conduct an assessment to find and correct any sanitary defects after a treatment technique trigger occurs. There are two levels of assessment (Level 1 and Level 2) based on the severity or frequency of the problem. The assessment must be completed within 30 days after the trigger occurs.

City of Renton Action:

Historical bacteriological water quality violations led the City to take steps to greatly improve its response to bacterial contamination in its water supply, and improve its communications with the DOH and analytical laboratory. The City developed a comprehensive Coliform Monitoring Manual (Appendix A) which includes the required Coliform Monitoring Plan; an additional 1-page Reference Guide that concisely summarizes how water quality maintenance staff should respond when a sample tests positive for coliform bacteria; an Emergency Phone List with contact information for water quality maintenance staff, analytical laboratories, and regulatory agencies; and a Self-Assessment Guidance Document that would be completed by water quality maintenance staff during coliform detections to help identify and correct any sanitary defects.

The City also upgraded its infrastructure to provide primary disinfection (4-log virus treatment) at every source. The Downtown Wells are equipped with chlorine contact systems (CT=6 pipelines) installed in Liberty Park and Cedar River Park. At Maplewood, water in the Chlorine Contact Basin and Clearwell has a contact time of at least 4 hours before entering the distribution system. Each source is also equipped with monitoring equipment that measures the chlorine concentration continuously and automatic shut-off if the required minimum chlorine residual is not maintained.

Water quality maintenance staff perform coliform monitoring weekly at 27 sampling sites. The Coliform Monitoring Plan in Appendix A identifies the routine sampling sites. The City has been well within the regulatory requirement of less than 5 percent of samples with detectable total coliform for its distribution system. Over the past 6 years, the City has collected approximately 7,000 coliform samples

and only 2 have been positive for total coliform (both in 2019) and no samples have been positive for *E.coli*. Follow-up sampling in 2019 showed no indication of contamination, and public notification was not required.

B. The Ground Water Rule (GWR)

The GWR builds on the Total Coliform Rule by addressing the health risks of fecal contamination in community PWSs that use groundwater sources. The EPA published the rule in the Federal Register in 2007, and the DOH adopted the rule in 2010.

The GWR applies to all Group A community PWSs that:

- Rely entirely on one or more groundwater sources;
- Receive finished groundwater from another PWS; or
- Operate a mixed system (surface water and groundwater).

The rule's targeted, risk-based approach relies on four major components:

- Periodic sanitary surveys of systems that require the evaluation of eight critical elements of a PWS and the identification of significant deficiencies (e.g., improperly constructed well, unprotected cross-connections, or improper recordkeeping);
- Triggered source water monitoring when a system identifies a positive sample during its routine coliform monitoring or assessment monitoring targeted at high-risk systems;
- Corrective action is required for any system with a significant deficiency or source water fecal contamination; and
- Compliance monitoring to ensure that treatment technology installed to treat drinking water reliably achieves 99.99 percent inactivation of viruses (4-log treatment).

City of Renton Action:

The City continuously monitors the chlorine concentration at each source and also maintains DOH-specified minimum chlorine residual concentrations (see disinfectant residuals and disinfectant byproducts in Section IV – Compliance Monitoring). The City also conducts sanitary surveys once every 5 years to identify any significant deficiencies. The last sanitary survey was completed on March 31, 2017.

Water quality maintenance staff collect source water (raw) samples at the same time they collect routine coliform samples (RTCR compliance monitoring). This allows the City to immediately determine if *E.coli* is present. These source water samples count as triggered source water samples. If an *E.coli*-positive sample is detected in a source water sample, the DOH will direct the City to either take corrective action or take five additional source samples within 24 hours. If *E. coli* continues to be present in source water samples, the DOH will direct the City to take corrective action and issue public notification. The Coliform Monitoring Manual in Appendix A identifies public notification requirements.

C. Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules (D/DBPR)

The purpose of the Stage 1 and Stage 2 D/DBPR is to improve public health protection by reducing the potential risk of adverse health effects associated with disinfectants and disinfection byproducts in the distribution system. The Stage 1 D/DBPR regulates MCL compliance for disinfectants and disinfection byproducts. Stage 2 builds upon Stage 1 by focusing on monitoring and reducing concentrations of two classes of disinfection byproducts (TTHM and HAA5)²⁹. EPA published the Stage 1 and Stage 2 D/DBPR in the Federal Register in 1998 and 2006, respectively, and DOH adopted the rules in 2003 and 2010. Note that the Stage 2 D/DBPR is an extension of the Stage 1 D/DBPR so systems must continue to comply with the requirements of the Stage 1 D/DBPR in addition to meeting the requirements of the Stage 2 D/DBPR.

Overview of Current Monitoring Requirements

- Each water system must conduct an initial system evaluation or qualify for an evaluation waiver.
- Community PWSs must monitor if any water they provide is treated with chlorine disinfection.
- The number of samples served is based on population served and source water type.
- Sample locations are based on locations of highest TTHM and HAA5 averages.
- Use a locational running annual average (LRAA) calculation to determine MCL compliance for TTHM and HAA5 (Note: the MCL values are the same as the Stage 1 MCLs; only the calculation method changed for Stage 2).
- Continue to comply with MRDLs for chlorine or chloramine.

Initial Distribution System Evaluation (IDSE)

The Stage 2 D/DBPR requires PWSs to complete an initial evaluation to characterize disinfection byproduct concentrations in their distribution systems and identify locations to monitor for TTHM and HAA5 compliance³⁰. The Stage 2 D/DBPR requires TTHM and HAA5 compliance on the LRAA calculated at each monitoring location. The IDSE options for the City are: Standard Monitoring, System Specific Study, and 40/30 Certification (no IDSE monitoring requirements). To be eligible for a 40/30 Certification, the PWS must meet all of the following requirements for eight consecutive quarters of monitoring:

- Collected all required Stage 1 D/DBPR samples;
- No individual TTHM samples exceeded 0.040 mg/L and HAA5 samples exceeded 0.030 mg/L; and
- The system has not had any TTHM or HAA5 monitoring violations³¹.

City of Renton Action:

The City chlorinates its drinking water to kill or inactivate harmful microorganisms. The City received a 40/30 Certification in 2007 and therefore was not required to complete an IDSE.

Based on the current TTHM and HAA5 concentrations in the distribution system, the City is eligible for reduced monitoring. Water quality engineering staff perform TTHM and HAA5 compliance monitoring once a year at two sampling sites in the distribution system. See the Stage 2 Disinfectants and Disinfection Byproducts Monitoring Plan in Appendix B for more information.

²⁹ Sources: WAC 246-290-300(6)(b)(i)(A), 40 CFR 141 Subpart V

³⁰ Sources: WAC 246-290-300(6)(b)(i)(F), 40 CFR 141 Subpart U

³¹ Sources: 40 CFR 141.603

D. Unregulated Contaminants Monitoring Rule 4 (UCMR4)

The SDWA establishes periodic monitoring of chemicals and microbes that are suspected to be in drinking water, but not currently subject to drinking water regulations³². The unregulated contaminants are selected from the contaminant candidate list for potential regulatory consideration. The EPA published UCMR4 in the Federal Register in 2016, and it is the fourth cycle of UCMR monitoring.

Under UCMR4, large water systems conduct sampling for Assessment Monitoring "List 1" contaminants: 10 cyanotoxins (surface-water systems only) and 20 additional contaminants (2 metals, 8 pesticides plus 1 pesticide manufacturing byproduct, 3 brominated HAA groups, 3 alcohols, and 3 other semivolatiles). The monitoring period for UCMR4 is 2018 through 2020.

For groundwater systems, sampling is conducted twice in a continuous 12-month period with the sampling events to occur five to seven months apart. Sample collection takes place at every entry point to the distribution system or at representative sampling locations with approval from the EPA. If any unregulated contaminants are detected, the results are required to be reported in the Consumer Confidence Report³³ (CCR).

City of Renton Action:

In 2017, the Water Utility submitted a *Proposed UCMR4 Groundwater Representative Monitoring Plan (GWRMP)* to the EPA. The Water Utility proposed three representative groundwater sample locations for UCMR4 sampling. The EPA approved the GWRMP on January 11, 2018.

The City performed UCMR4 sampling in October 2018 and April 2019. The City was required to sample for the following contaminants:

- Two metals: germanium and manganese.
- Eight pesticides and one pesticide manufacturing byproduct: alpha-hexachlorocyclohexane, profenofos, chlorpyrifos, tebuconazole, dimethipin, total permethrin (cis- & trans-), ethoprop, tribufos, oxyfluorfen.
- Three brominated HAA groups:
 - HAA5 (dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, and trichloroacetic acid)
 - HAA6Br (bromochloroacetic acid, bromodichloroacetic acid, dibromoacetic acid, chlorodibromoacetic acid, monobromoacetic acid, and tribromoacetic acid)
 - HAA9 (bromochloroacetic acid, bromodichloroacetic acid, chlorodibromoacetic acid, dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, tribromoacetic acid, and trichloroacetic acid)
- Three alcohols: 1-butanol, 2-propen-1-ol, and 2-methoxyethanol.
- Three semivolatile organic chemicals: butylated hydroxyanisole, o-toluidine, and quinoline.

Manganese and HAAs were detected during the UCMR4 sampling events. The results will be reported in the 2019 & 2020 Water Quality Reports (CCRs). While these contaminants do not have established drinking water standards, the data collected during UCMR4 provides a basis for potential future regulatory actions by EPA to protect public health.

³² Sources: WAC 246-290-300(10), 40 CFR 141.40

³³ Sources: WAC 246-290-72005, 40 CFR 141.153(d)

Appendix A

COLIFORM MONITORING MANUAL

Coliform Monitoring Manual

Table of Contents

1) Reference Guide

Responding to Bacteria Presence discovered during Routine Water Distribution System Sampling

2) Coliform Monitoring Plan

3) Maps showing Coliform Sampling Site Locations

4) Self-Assessment Guideline for Coliform Detection



Reference Guide

Responding to Bacteria Presence discovered during Routine Water Distribution System Sampling

Response to a Total Coliform-Positive Sample taken during Routine Distribution System Coliform Bacteria Sampling

1. **Analyze for *E.coli*:** Have the lab analyze the sample for *E.coli*. This must be done for each total coliform-positive sample.
2. **Repeat Sample:** Within 24 hours of notification of a positive sample, collect three repeat samples: one sample from the same location as the positive sample, one sample from a site within 5 active services upstream of the positive sample and one from a site within 5 active services downstream of the positive sample. This must be done for each total coliform-positive sample.
3. **Sample Sources:** If source samples were not taken on the same day as the distribution samples, take a raw water sample from each source that was in operation on the day the total coliform-positive distribution sample was taken.
4. **Notify DOH:** Notify DOH within 10 days of being notified by the laboratory of a total coliform-positive sample.

Response to a Total Coliform-Positive Sample taken during Repeat Sampling

1. **Notify DOH:** Notify DOH as soon as possible and ask for instructions on repeat sampling.
2. **Analyze for *E.coli*:** Have the lab analyze the sample for *E.coli*.
3. **Repeat Sample:** If DOH cannot be contacted proceed with repeat sampling. Collect one sample from each site which produced a total coliform-positive sample, one from within 5 services upstream of the positive sample and one from within 5 services downstream of the positive sample. Continue with attempt to contact DOH.

Response to an *E.coli*-Positive Source Sample

1. **Notify DOH:** Notify DOH immediately at: **253-395-6775**
If DOH offices are closed, use the After Hours Emergency Hot Line: **1-877-481-4901**
2. **Repeat Sample:** Within 24 hours of being notified of the positive source sample collect an additional five raw water source samples from the same source.

Response to an *E.coli*-Positive Distribution System Sample

1. **Notify DOH:** Notify DOH immediately at: **253-395-6775**.
If DOH offices are closed use the After Hours Emergency Hot Line: **1-877-481-4901**.

Response to Notification from Skyway Water & Sewer District of a Total Coliform-Positive Sample

1. **Sample Sources:** If Skyway Water & Sewer District notifies the City that it has collected a coliform-positive distribution system sample, the City must take a source sample from all sources running at the time Skyway collected its sample. The samples must be taken within 24 hours of being notified by Skyway and must be analyzed for *E.coli* bacteria.

Public Notification: If DOH indicates the City will have to provide a Tier 1 Public Notice, notify the City of Renton Public Information Officer (PIO) immediately. Public notice should not be made without the PIO's approval unless the PIO cannot be reached. PIO contact during Business Hours: **425-430-7573** After Hours: **206-491-8158**

Public Official Contact Information / EOC Activation: To contact the Mayor, Chief Executive Officer, Public Works Director, other public officials or to request activation of the City of Renton's Emergency Operations Center, contact the EOC Duty Officer: All Hours: **425-766-2720**.

Other Contact Numbers:

Skyway Water & Sewer District: Business Hours: **206-772-7343** After Hours: **844-204-4170**

Water Management Laboratories: Business Hours: **253-531-3121**. After Hours: **253-312-1651** or **253-841-0732**

The City has prepared this Coliform Monitoring Plan in accordance with Washington Administrative Code (WAC) 246-290 Part 4 and 40 CFR 141 Subpart Y. The Plan supplements the City's 2019 Water System Plan and updates the 2012 Coliform Monitoring Plan. The purpose of this plan is to ensure the City's water quality monitoring program meets the regulatory requirements of the Revised Total Coliform Rule (RTCR) and the Ground Water Rule (GWR). The plan identifies coliform sampling sites and provides a schedule for coliform sample collection.

Total coliforms are used as an indicator of possible bacterial contamination in the water system. Total coliform bacteria are usually not harmful themselves, but their presence indicates the possible presence of disease-causing organisms. Routine coliform testing is required on a monthly basis with the number of samples based on the population served. All samples are tested for total coliform. If total coliforms are present, the sample is also tested for *E.coli* and repeat samples are collected from designated sampling locations. In addition, chlorine residual must be measured and reported with each routine coliform sample.

The City provides primary disinfection (4-log virus treatment) at each source. Even though the City is not subject to triggered source water monitoring per the GWR, the City voluntarily collects source water (untreated) samples during the routine coliform monitoring of the distribution system. This allows the City to know immediately if the presence of total coliform in the distribution system is due to fecal contamination in a source of supply. The source water monitoring also provides water quality information that can be used in future planning decisions.

I. SYSTEM INFORMATION

Water System Name: City of Renton

Water System ID#: 71850L

Water System Type: Group A Public Water System – Community

County: King

Total Population Served: 98,350

Total Service Connections: 17,830

Number of Routine Samples Required Monthly: 100

Plan Prepared on: April 30, 2020

Plan Prepared by: Katie Nolan
Civil Engineer III
425-430-7335

Plan Reviewed by: Craig Pray
Water Maintenance Supervisor
425-430-7400

Greg Durbin
Water Quality/Treatment Operator
425-430-7400

Sources of Supply:

DOH Source No.	DOH Source Name	Renton Source Name	Well Depth (feet)	Pumping Capacity (gpm)
S01	Well 1	Well RW-1	57	2,200
S02	Well 2	Well RW-2	52	2,200
S03	Well 3	Well RW-3	50	2,200
S04	Well 5	Well PW-5A (inactive)	276	1,250
S05	Springbrook Springs	Springbrook Springs	N/A	1,050
S06	Well 4	Well 4 (inactive)	92	N/A
S07	Well 8	Well PW-8	66	3,500
S08	77050Y/Seattle	SPU Interties	N/A	N/A
S09	Well 9	Well PW-9	65	1,200
S10	Wellfield	Wells RW-1, RW-2, & RW-3	N/A	6,600
S11	Well 11	Well PW-11	285	2,500
S12	Well 17	Well PW-17	286	1,500
S13	Wellfield	Wells PW-11, PW-12 & PW-17	N/A	3,000
S15	Well 12	Well PW-12	298	1,500
S16	Well EW-3R	Well EW-3R (Emergency)	35	1,500
S17	89500/Tukwila	Tukwila Intertie (Emergency)	N/A	N/A
S18	38150/Kent	Kent Intertie (Emergency)	N/A	N/A
S19	38800/Skyway	Skyway Intertie (Emergency)	N/A	N/A
S20	Wellfield	Wells PW-8 & PW-9	N/A	4,700

Storage:

Reservoir Name	Zone Served	Street Address	Zip Code	Gross Volume (gallons)
North Talbot	Valley 196	1912 Talbot Road S	98055	5,078,381
Mt Olivet	Valley 196	250 Bronson Way NE	98056	2,814,553
Highlands	Highlands 435	3410 NE 12th Street	98056	1,555,223
Highlands	Highlands 435	3410 NE 12th Street	98056	1,947,664
Highlands	Highlands 565	3410 NE 12th Street	98056	747,985
Hazen	Highlands 565	4900 NE 12th Street	98059	4,203,521
Rolling Hills	Rolling Hills 590	2401 Puget Drive SE	98055	300,000
Rolling Hills	Rolling Hills 490	2401 Puget Drive SE	98055	3,036,535
West Hill	West Hill 495	12603 82nd Avenue S	98178	1,394,155
South Talbot	Talbot Hill 350	4300 Main Avenue S	98055	1,586,190
Maplewood Clearwell	Maplewood 79	4030 Maple Valley Hwy	98058	212,846

Source Treatment:

Source	Street Address	Treatment Process	Objective
S05 Springbrook Springs	5750 Talbot Road S	Chlorination (gaseous chlorine) with 4-log virus treatment Fluoridation Sodium Hydroxide	Primary Disinfection & Measurable Chlorine Residual Dental Hygiene Corrosion Control
S10 Wells RW-1, RW-2 & RW-3	1398 Houser Way N	Chlorination (gaseous chlorine) with 4-log virus treatment Fluoridation Sodium Hydroxide	Primary Disinfection & Measurable Chlorine Residual Dental Hygiene Corrosion Control
S13 Wells PW-11, PW-12 & PW-17	4032 Maple Valley Hwy	Chlorination (sodium hypochlorite) minimum 4-hour contact time GAC Filtration Greensand Filtration Fluoridation	Primary Disinfection, Measurable Chlorine Residual & Conversion of Ammonia to Nitrogen Gas Hydrogen Sulfide to Sulfate Conversion Manganese Removal Dental Hygiene
S16 Emergency Well EW-3R	1500 Houser Way N	Chlorination (gaseous chlorine) with 4-log virus treatment Fluoridation Sodium Hydroxide	Primary Disinfection & Measurable Chlorine Residual Dental Hygiene Corrosion Control
S20 Wells PW-8 & PW-9	1707 Maple Valley Hwy	Chlorination (gaseous chlorine) with 4-log virus treatment Fluoridation Sodium Hydroxide	Primary Disinfection & Measurable Chlorine Residual Dental Hygiene Corrosion Control
S04 Well PW-5A (inactive)	2401 NE 24th Street	Chloramination Fluoridation Aqua Mag blended phosphate	Secondary Disinfection Dental Hygiene Iron & Manganese Sequestering

Note: Combined sources are blended and all wells have similar treatment and aquifer characteristics.

The water distribution system serves the valley floor and five surrounding hills: West Hill, Highlands, Renton Hill, Talbot Hill, and Rolling Hills. There are 16 hydraulically distinct pressure zones, and moving water between pressure zones is accomplished by 12 booster pump stations (BPS) and 45 pressure-reducing valve (PRV) stations located throughout the City. There are approximately 308 miles of water main in service.

Pressure Zones:

Pressure Zone	Residential Population Served¹	Service Connections²
Kennydale 218	256	120
Kennydale 320	6,462	1,286
Highlands 435	12,566	3,319
Highlands 565	23,163	5,981
Valley 196	7,716	2,622
West Hill 300	1,274	215
West Hill 495	1,099	418
Earlington 370	873	300
Scenic Hill 370	234	81
Rolling Hills 590	4,892	1,221
Rolling Hills 490	3,933	681
Rolling Hills 395	447	51
Talbot Hill 270	2	9
Talbot Hill 350	4,221	1,098
East Talbot Hill 300	503	26
West Talbot Hill 300	1,023	345
Fire Hydrants (connections only)	-	57
TOTAL	68,664	17,830

Notes: (1) 2017 residential population from Small Area Estimate Program.

(2) Service connections as of December 2017.

II. SAMPLING INFORMATION

The City is responsible for collecting coliform samples from the sources of supply and representative points throughout the distribution system. Samples are collected at regular time intervals each month and during normal system operating conditions. Chlorine residuals within the distribution system are measured at the same time and location as routine and repeat coliform samples.

Routine Samples: Routine samples are used to confirm the effectiveness of treatment and ensure public health protection throughout the distribution system from bacterial contamination.

Per WAC 246-290-300(3), the minimum number of monthly routine samples required by the DOH is 100. On a weekly schedule, the water utility collects 27 samples from the designated routine sampling sites identified in the table below. Routine samples are collected on a Tuesday or Wednesday so that the results will be received by Thursday. This provides time during the work week to respond to positive samples.

If a routine sample is total coliform-positive (and not invalidated):

- 1) the sample must also be analyzed for *E.coli*;
- 2) three repeat samples must be collected within 24 hours of being notified of the positive result;
- 3) verify raw source samples were taken or collect triggered source water samples within 24 hours from each source that was in operation on the day the positive sample was taken; and
- 4) notify the DOH within 10 days of being notified of the positive result.

This must be done for each unsatisfactory routine sample. **If *E.coli* are present upon further analysis, the City must notify the DOH immediately.** The laboratory is not required to notify DOH. Additional treatment must not be started prior to the collection of repeat samples. The DOH may provide guidance on interim treatment options.

Repeat Samples: Repeat samples are used to confirm the original sample results and to help determine the cause of the coliform presence.

If a routine sample is total coliform-positive, at least one repeat sample must be collected from:

- sample tap where the original positive sample was taken;
- sample tap within five active connections upstream of the original sample site; and
- sample tap within five active connections downstream of the original sample site.

Designated upstream and downstream repeat sampling sites are identified in the table below.

When a repeat sample is positive, the DOH should be notified as soon as possible and the City may ask for instructions on repeat sampling. If the DOH cannot be contacted, the same steps should be taken as a positive routine sample. A total coliform-positive repeat sample must also be analyzed for *E.coli* and an additional set of repeats is required. Additional sets of repeat samples should continue to be collected until total coliforms are not detected in one complete set of repeat samples or as directed by DOH.

If a repeat sample is positive for *E.coli*, the City must immediately contact the DOH.

Routine and Repeat Sampling Site Locations: Routine and repeat sampling sites are also shown on the site maps.

WQ Database ID	Routine Sampling Site	Downstream Repeat Sampling Sites	Upstream Repeat Sampling Sites
CTPost02	Wellhouse PW-9, Post-CT Pipeline Northwest corner of Cedar River Park (Sampling Tap)	1820 Maple Valley Highway 200 feet northeast of Well PW-9 (Sampling Station near Hydrant SE-124)	Wellhouse PW-9, Pre-CT Pipeline Northwest corner of Cedar River Park (Sampling Tap, "CTPre02")
MS026	806 High Ave S (Sampling Station)	802 High Ave S (Hose Bib, front of house)	809 High Ave S (Hose Bib, front of house)
		806 High Ave S (Hose Bib, front of house)	813 High Ave S (Hose Bib, front of house)
MS027	Jones Ave NE & NE 43rd St (Sampling Station)	1717 NE 44th St (Hose Bib, southwest corner of building)	4210 Jones Ave NE (Sampling Station)
MS028	S 180th St & W Valley Hwy (Sampling Station)	7120 S 180th St (west) (Sampling Station)	7120 S 180th St (east) (Sampling Station)
MS029	1718 Monroe Ave NE (Sampling Station)	1709 Monroe Ave NE (Hose Bib, front of house)	3324 NE 17th Pl (Hose Bib, front of house)
		3324 NE 17th St (Hose Bib, front of house)	1717 Monroe Ave NE (Hose Bib, front of house)
MS030	SE 4th St & Chelan Ave SE (Sampling Station)	318 Chelan Ave SE (Hose Bib, front of house)	4524 SE 4th St (Hose Bib, front of house)
		312 Chelan Ave SE (Hose Bib, front of house)	4518 SE 4th St (Hose Bib, front of house)
MS032	Lind Ave NW & Taylor Pl NW (Sampling Station)	463 Lind Ave NW (Hose Bib, front of house)	521 Lind Ave NW (Hose Bib, front of house)
		472 Lind Ave NW (Hose Bib, front of house)	520 Taylor Pl NW (Hose Bib, front of house)
MS033	2510 Meadow Ave N (Sampling Station)	2509 Meadow Ave N (Hose Bib, front of house)	2510 Meadow Ave N (Hose Bib, front of house)
		2515 Meadow Ave N (Hose Bib, front of house)	2604 Meadow Ave N (Hose Bib, front of house)
MS034	1622 Hoquiam Pl NE (Sampling Station)	1621 Hoquiam Pl NE (Hose Bib, front of house)	1613 Hoquiam Pl NE (Hose Bib, front of house)
		1625 Hoquiam Pl NE (Hose Bib, front of house)	1617 Hoquiam Pl NE (Hose Bib, front of house)
MS036	432 S 26th St (Sampling Station)	505 S 26th St (Hose Bib, front of house)	432 S 26th St (Hose Bib, front of house)
		511 S 26th St (Hose Bib, front of house)	428 S 26th St (Hose Bib, front of house)

WQ Database ID	Routine Sampling Site	Downstream Repeat Sampling Sites	Upstream Repeat Sampling Sites
MS040	Wells RW-1, RW-2, & RW-3 Post-CT Pipeline South end of Liberty Park (Sampling Tap, inside fluoride room)	Williams Ave S & S Tobin St (Sampling Station)	Wells RW-1, RW-2, & RW-3 Pre-CT Pipeline (Sampling Tap, "pH_Smpl_Site_1")
MS041	Royal Hills Apartments 3000 SE Royal Hills Dr (Sampling Station)	Royal Hills Apartments next to Building 13 (Sampling Station)	Royal Hills Apartments near Hydrant SE-074 (Sampling Station)
MS042	601 Monster Rd SW (Sampling Station)	595 Monster Rd SW (Hose Bib, northeast side of bldg, 24-hr access) ***need square drive socket***	600 Oakesdale Ave SW (Hose Bib, south side of building, 24-hr access) ***need square drive socket***
			1300 SW 7th St (Hose Bib, south side of building, 24-hr access) ***need square drive socket***
MS043	North Coulon Beach Park End of Park Access Road (Sampling Station)	2727 Mountain View Ave N (Hose Bib, front of house)	1756 Lake Washington Blvd N (Hose Bib, north side of Apt B)
		2731 Mountain View Ave N (Hose Bib, front of house)	
MS044	552 Raymond Pl NW (Sampling Station)	540 Raymond Pl NW (Hose Bib, front of house)	12413 84th Ave S (Hose Bib, front of house)
		552 Raymond Pl NW (Hose Bib, front of house)	12433 84th Ave S (Hose Bib, front of house)
MS049	800 SW 27th St (Sampling Station, next to Hydrant SW-415)	800 SW 27th St (Sampling Station, South side of street)	2423 Lind Ave SW (Sampling Station next to Hydrant SW-417)
MS054	City Shops 3555 NE 2nd St (Sampling Station, outside fence)	City Shops Water Lab (Sink Faucet, "PS028")	3407 NE 2nd St (Sampling Station)
MS055	1800 Jones Ave NE (Sampling Station)	1806 Jones Ave NE (Hose Bib, front of house)	1624 Jones Ave NE (Hose Bib, front of house)
MS056	826 S 28th Ct (Sampling Station)	817 S 28th Ct (Hose Bib, front of house)	911 S 28th Ct (Hose Bib, front of house)
MS057	224 Wells Ave N (Sampling Station)	232 Wells Ave N (Hose Bib, front of house)	216 Wells Ave N (Hose Bib, front of house)
MS058	1933 SE 17th Ct (Sampling Station)	1809 Rolling Hills Ave SE (Hose Bib, front of house)	1632 Rolling Hills Ave SE (Hose Bib, front of house)
MS059	1000 Shelton Ave SE (Sampling Station, near Hydrant SE013)	995 Shelton Ave SE (Hose Bib, front of house)	3632 SE 6th St (Hose Bib, front of house)

WQ Database ID	Routine Sampling Site	Downstream Repeat Sampling Sites	Upstream Repeat Sampling Sites
pH_Smpl_Site_8	Williams Ave S & S Tobin St (Sampling Station)	74 Williams Ave S (Hose Bib, front of house)	806 N Riverside Dr (Hose Bib, front of house)
		78 Williams Ave S (Hose Bib, front of house)	100 Williams Ave N (Hose Bib, front of house)
POE13	Springbrook Springs (Sampling Station, near Hydrant S450)	Springbrook Repeat (Sampling Station, near Entrance Gate)	Springbrook Treated Water Sample Tap (Sink Faucet inside Pump Room)
PS009	West Hill BPS West Hill 495 Zone Water Main (Hose bib, inside pump room)	12421 87th Ave S (Hose Bib, front of house)	616 W Perimeter Rd (Hose Bib, front of building, 24-hr access)
		520 Stevens Ave NW (Hose Bib, front of house)	
PS010	Maplewood Treatment Plant Highlands 565 Zone Treated Water SA #14 (Sampling Tap, inside WTP lab)	Sunnydale Mobile Home Park 170 Laurel Dr (Sampling Station)	Maplewood Treatment Plant Chlorine Contact Chamber SA#11 (Sampling Tap, inside WTP lab, "PS023")
RES003	Hazen Reservoir (Sampling Station, lower tap "coliform")	4807 NE 13th Pl (Hose Bib, front of house)	Honey Creek Apartments, 1332 Duvall Ave NE (Sampling Station near Hydrant NE-703)

The water utility installed several replacement sampling stations in November 2019, but will reserve the following sites as backup coliform sampling sites.

WQ Database ID	Backup Coliform Sampling Site	Downstream Repeat Sampling Site	Upstream Repeat Sampling Site
MS031	Maplewood Golf Course (Sampling Station, in clubhouse parking lot)	No Downstream Sites	1000 Shelton Ave SE (Sampling Station)
PS001	Highlands BPS Highlands 565 Zone Water Main (Hose bib, inside pump room)	1204 Monroe Ave NE (Hose bib, front of house)	1203 Pierce Pl NE (Hose bib, front of house)
PS005	North Talbot BPS Rolling Hills 490 Zone Water Main (Hose bib, inside pump room)	1920 S Puget Dr (Hose bib, southwest corner, 24-hr access) ***need square drive socket***	No Upstream Sites
PS011	Houser Way BPS Highlands 435 Zone Water Main (Sampling Station)	1675 N 4th St (Hose bib, northwest corner, 24-hr access)	1530 N Marion St (Hose bib, front of house)
PS025	Rolling Hills BPS Rolling Hills 590 Zone Water Main (Sampling Tap, inside hypo room)	2000 SE 16th Ct (Hose bib, front of townhouse)	No Upstream Sites

Triggered Source Water Samples: Triggered source water samples are used to help determine whether the coliform presence in the distribution system is due to fecal contamination in a groundwater source.

Per WAC 246-290-300(3)(h), triggered source water samples are taken from each groundwater source in use when an unsatisfactory routine sample is collected. As a proactive approach, the water utility collects raw source water samples during all routine coliform monitoring of the distribution system. The source samples are analyzed for *E.coli* presence.

If a source water sample is *E.coli*-positive (and not invalidated), the City must:

- 1) immediately notify the DOH;
- 2) collect five additional raw water source samples from the same source within 24 hours of being notified of the positive result;
- 3) provide Tier 1 public notice; and
- 4) take corrective action, if directed by the DOH.

Triggered Source Water Sampling Site Locations: Source sampling sites are also shown on the site maps.

Source Name	WQ Database ID	WQ Database Description
Springbrook Springs	MS016	Springbrook Springs Trtmt Bldg Raw
Well RW-1	472853122115701	Well RW-1 - Raw
Well RW-2	472853122115601	Well RW-2 - Raw
Well RW-3	472853122115602	Well RW-3 - Raw
Well PW-8	472901122114901	Well PW-8 - Raw
Well PW-9	472858122114201	Well PW-9 - Raw
Emergency Well EW-3R	472902122115501	Well EW-3R Raw Water
Wells PW-11, PW-12 & PW-17	PS016	Wells PW-11-12-17 Raw Water SA#4

Invalid Samples: The DOH or laboratory may determine that a sample is invalid, based on the conditions specified in WAC 246-290-300(3)(d). Follow-up sampling is required within 24 hours of invalidation of the sample. Contact the DOH for guidance.

III. WHOLESALE CUSTOMER NOTIFICATION

Consecutive systems must contact the wholesaler within 24 hours whenever they receive an unsatisfactory routine coliform sample result.

The City currently provides wholesale water to Skyway Water & Sewer District through a single connection located in the West Hill 495 pressure zone. If Skyway notifies the City of an unsatisfactory routine distribution sample, triggered source water samples must be collected immediately from the sources in use. If triggered source monitoring indicates that *E.coli* are present, the City must contact Skyway within 24 hours of being notified of the positive result.

Skyway Water & Sewer District

Address: 6723 S 124th Street
Seattle WA 98178

Phone Number: 206-772-7343

After-Hours Phone Number: 844-204-4170

IV. LABORATORY INFORMATION

The laboratory has been directed to contact water utility maintenance staff immediately by phone if a sample tests positive for coliform bacteria.

Primary Laboratory: Water Management Laboratories, Inc.

Address: 1515 80th Street E
Tacoma, WA 98404

Phone Number: 253-531-3121

Hours of Operation: Monday through Friday: 8:00 a.m. to 5:00 p.m.
Saturday: 9:00 a.m. to 12:00 p.m.*
Sunday: Closed

After-Hours Contacts: 253-312-1651 or 253-841-0732

*The laboratory has agreed to stay open late on Saturday to test repeat coliform bacteria samples if requested by the City.

Emergency Laboratory: AmTEST Laboratories

Address: 13600 NE 126th Pl
Suite C
Kirkland, WA 98034

Phone Number: 425-885-1664

Hours of Operation: Monday through Friday: 7:00 a.m. to 5:00 p.m.
Saturday and Sunday: Closed

After-Hours Contacts: Kathy Fugiel 425-770-7037

V. VIOLATIONS AND PUBLIC NOTIFICATION

Maximum Contaminant Level (MCL) Violation: An *E.coli* MCL violation occurs when

- 1) a repeat sample is positive for *E.coli* following a total coliform-positive routine sample;
- 2) total coliform or *E.coli* in any repeat samples collected as a follow-up to a sample with *E.coli*;
- 3) failure to take all required repeat samples following an *E.coli*-positive routine sample; or
- 4) failure to test for *E.coli* when any repeat samples test positive for total coliform.

<i>E.coli</i> MCL Violation Occurs with the Following Sample Result Combination	
Routine	Repeat
TC+	EC+
EC+	TC+ or EC+
EC+	Any missing sample
TC+	TC+ (but no <i>E.coli</i> analysis performed)

For an *E.coli* MCL violation, the City must provide **Tier 1 public notification** (immediate notice) and perform a **Level 2 assessment**.

Treatment Technique Violation: A treatment technique violation occurs when

- 1) failure to conduct or fully complete a required Level 1 or Level 2 assessment within 30 days of the treatment technique trigger; or
- 2) failure to correct any sanitary defect within the required timeframe.

For a treatment technique violation, the City must provide **Tier 2 public notification** to its customers.

Monitoring Violation: A monitoring violation occurs when

- 1) failure to take all routine samples; or
- 2) failure to have each total coliform-positive routine sample tested for *E.coli*.

For a monitoring violation, the City must provide **Tier 3 public notification** to its customers.

Reporting Violation: A reporting violation occurs when

- 1) failure to submit a monitoring report or completed assessment to DOH in a timely manner; or
- 2) failure to notify DOH of an *E.coli*-positive sample in a timely manner.

For a reporting violations, the City must provide **Tier 3 public notification** to its customers.

Public Notification Requirements
Tier 1: Issued within 24 hours
Tier 2: Issued within 30 days
Tier 3: Issued within 1 year

Complete public notification requirements are listed under Part 7, Subpart A of WAC 246-290. Instructions and templates for issuing public notifications are provided in Section VII.

Information in Each Public Notice: The public notice must include specific information in order to be considered complete by DOH. For each violation requiring notice, a clear and easy-to-understand explanation of the following 10 elements is essential:

1. Description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s).
2. When the violation or situation occurred (e.g., date the sample was collected or was supposed to be collected).
3. Any potential adverse health effects from the violation or situation, using mandatory standard language for health effects provided in Appendix B of 40 CFR 141 Subpart Q or for monitoring or testing procedure violations provided in 40 CFR 141.205(d)(2).
4. The population at risk, including subpopulations that may be particularly vulnerable if exposed to the contaminant in their drinking water.
5. Whether alternate water supplies should be used.
6. Actions consumers should take, including when they should seek medical help, if known.
7. What you are doing to correct the violation or situation.
8. When you expect to return to compliance or resolve the situation.
9. Your name, business address, and phone number, or those of a designee of the public water system as a source of additional information concerning the notice.
10. A statement encouraging notice recipients to distribute the notice to others, where applicable.

The following mandatory language is required to be in all notices as well:

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Notification Content Assistance and Approval: The DOH and City of Renton Public Information Officers should be consulted when issuing Tier 1 public notifications.

Washington State Department of Health

Coordinate with the DOH's Office of Drinking Water - Northwest Regional Office to issue public notifications, unless the urgency is immediate and coordination with DOH is not possible.

DOH Contacts – Coliform Water Quality Monitoring Program

Carol Stuckey
carol.stuckey@doh.wa.gov
253-395-6775

Ingrid Salmon
ingrid.salmon@doh.wa.gov
253-395-6775

After-Hours Emergency Hotline: 1-877-481-4901

City of Renton

Public notification messages should be approved by the Public Information Officer, City of Renton Executive Department, and Communications Division (unless urgency is immediate and coordination with the Communications Division is not possible). The Public Information Officer will assist with message delivery.

Renton Public Information Officer: 425-430-7573

After hours contact for the Mayor, Chief Administrative Officer, Public Works Administrator, Utility Systems Director, and other public officials can be obtained from Emergency Management.

Renton Emergency Management: 425-430-7723

Renton EOC Duty Officer: 425-766-2720 (answered 24/7)

Notification Delivery: There are a variety of methods that can be used for the public notification efforts. Methods to convey public notification include:

- City of Renton website at www.rentonwa.gov
- Renton Current Emergency Information website at www.rentonwa.gov/emergencies
- CodeRED Emergency Notification System
- Social media posting (Facebook, Twitter, etc.)
- Posting information at neighborhood information centers
- Posting information at City facilities
- Government Access Channel (Channel 21)
- Broadcast media (television and radio)
- Newspapers and other print media
- Electronic media
- Community meetings and other outreach activities
- Recording for on-hold callers to utility customer service phone number

Notification Responsibility: It is exclusively the responsibility of the City to comply with the public notification requirements of WAC 246-290 Part 7, Subpart A and 40 CFR 141 Subpart Q. The DOH is not required to issue public notification. The DOH and the City of Renton Public Information Officers are available to assist with public notification.

VI. FOLLOW-UP ACTION

Treatment Technique Triggers: The City must conduct an assessment after exceeding a “treatment technique trigger.” The assessment is used to determine the cause of the coliform bacteria contamination and identify corrective actions for any detected sanitary defects. There are two levels of assessment (Level 1 and Level 2) based on the severity or frequency of the problem. Requirements for the assessments are described in WAC 246-290-320(2)(b).

Level 1 Treatment Technique triggers:

- exceeds 5.0 percent total coliform-positive samples for the month; or
- failure to collect three repeat samples after every total coliform-positive sample.

Level 1 assessments are considered “self-assessments” and will be conducted by the water utility. The water utility has prepared the guidance document “Self-Assessment Guidelines for Coliform Detection” to use during a system evaluation. The guidance document is included in the Coliform Monitoring Manual.

Level 2 Treatment Technique triggers:

- an *E.coli* MCL violation; or
- a second treatment technique trigger within a rolling 12-month period.

Level 2 assessments must be conducted by a state-qualified person or the DOH.

An assessment must be completed within 30 days after the trigger occurs. If corrective actions are not completed by the time of submission of the assessment, the City must consult with the DOH to develop an approved timetable for the corrective actions.

The City shall maintain documentation of any Level 1 or Level 2 assessment, documentation of corrective actions completed as a result of the assessments, or any other summary documentation of the sanitary defects and corrective actions.

**** Make sure to take photos and detailed notes for each corrective action****

VII. TEMPLATES FOR PUBLIC NOTIFICATIONS

The following pages contain instructions and templates for issuing Tier 1, Tier 2, and Tier 3 public notifications.

1. Tier 1 Public Notification Instructions and Templates

The pages that follow contain instructions and templates for issuing Tier 1 public notification for the Revised Total Coliform Rule (RTCR). Along with each template are specific instructions, including the required method of delivery and suggestions for completing individual sections of the notice. The following templates are provided:

- Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice – Template 1-2
- Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice in Spanish – Template 1-2A

Each template also includes the mandatory health effects language from Appendix B to 40 CFR 141 Subpart Q (presented in italics in each notice, with an asterisk on each end). This information must be included as written, without the asterisks, with additional violation or situation specific information added in the brackets.

You must also include the following italicized language in all notices, where applicable [40 CFR 141.205(d)]. This language is included in each template. Use of this language does not relieve you of your obligation to take steps reasonably calculated to notify all persons served:

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Instructions for Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice – Template 1-2

Template Follows Instruction Pages

Description of Violation or Situation

Beginning April 1, 2016, an *E. coli* maximum contaminant level (MCL) violation requires Tier 1 public notification. This violation occurs when any public water system has:

- A total coliform-positive routine sample result followed by an *E. coli*-positive repeat sample result;
- An *E. coli*-positive routine sample result followed by a total coliform-positive repeat sample result;
- An *E. coli*-positive routine sample result and fails to take all required repeat samples; or
- A total coliform-positive repeat sample result and fails to test for *E. coli*.

You must provide public notice to persons served as soon as practical but no more than 24 hours after learning of the MCL violation [40 CFR 141.202(b)]. During this time, you must also contact your state. You should also coordinate with your local health department. You must use one or more of the following methods to deliver the notice to consumers [40 CFR 141.202(c)]:

- Radio
- Television
- Hand or direct delivery
- Posting in conspicuous locations
- Another method approved in writing by the state

You may need to use additional methods (e.g., newspaper or delivery of multiple copies to hospitals, clinics, or apartment buildings) since notice must be provided in a manner reasonably calculated to reach all persons served. If you post or hand deliver, EPA recommends printing your notice on your system's letterhead, if you have it.

The notice on the reverse is appropriate for hand delivery or for publication in a newspaper. However, you may wish to modify it before using it for a radio or television broadcast. If you do modify the notice on the reverse, you must still include all required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Mandatory Language

Mandatory language on health effects (from Appendix B to 40 CFR 141 Subpart Q) must be included as written and is presented in this notice in italics with an asterisk on each end. You will need to update the information presented in brackets with the appropriate information.

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics with an asterisk on each end.

Alternative Sources of Water

If you are selling or providing bottled water, your notice should say where it can be obtained. Remember that bottled water can also be contaminated. If you are providing bottled water, make sure it meets U.S. Food and Drug Administration (FDA) and/or state bottled water safety standards.

Corrective Action

In your notice, you must describe corrective actions you are taking [40 CFR 141.205(a)(7)] and when you expect to return to compliance or resolve the situation [40 CFR 141.205(a)(8)]. Listed below are some steps commonly taken by water systems with the presence of *E. coli*. Depending on the corrective action you are taking, you can use one or more of the following statements, if appropriate, or develop your own text:

- We are completing a comprehensive assessment of our water system and of our monitoring and operational practices to identify and correct any causes of the contamination.
- We are chlorinating and flushing the water system.
- We are switching to an alternate drinking water source.
- We are increasing sampling for coliform bacteria to determine the source of the contamination.
- We are repairing the wellhead seal.

- We are repairing, cleaning, and disinfecting the storage tank.
- We are restricting water intake from the river/lake/reservoir to prevent additional bacteria from entering the water system and restricting water use to emergencies.

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

It is recommended that you notify health professionals in the area of the violation. People may call their doctors with questions about how the violation may affect their health, and the doctors should have the information they need to respond appropriately. In addition, health professionals, including dentists, use tap water during their procedures and need to know about the potential contamination so they can use bottled water.

It is a good idea to inform your consumers when the violation has been resolved. See Template 1-6 of the Revised Public Notification Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010) for a “problem corrected” notice template and Template NC-7 of the Public Notification Handbook for Transient Non-community Water Systems, EPA 816-R-09-009, March 2010.

Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice – Template 1-2

DRINKING WATER WARNING

***E. coli* is present in [Water System Name]’s water**

BOIL YOUR WATER BEFORE USING

[Briefly describe the situation, such as: “*E. coli* bacteria were found in the water supply on [give date]” or “We did not perform required testing of the water system and must assume that *E. coli* bacteria are in the water as of [give date]]. These bacteria can make you sick, and are especially a concern for people with weakened immune systems.

Bacterial contamination can occur when increased run-off enters the drinking water source (for example, following heavy rains). It can also happen due to a break in the distribution system (pipes) or a failure in the water treatment process.

What should I do? What does this mean?

- **DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST.** Bring all water to a boil, let it boil for one minute and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice. Boiling kills bacteria and other organisms in the water.
- **E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.**
- The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice from their healthcare providers about drinking this water.

What is being done?

[Describe corrective action]. We will inform you when tests show no bacteria are present and you no longer need to boil your water. We anticipate resolving the problem within [estimated timeframe].

For more information, please contact [name of contact] at [phone number] or [mailing address]. General guidelines on ways to lessen the risk of infection by bacteria and other disease-causing organisms are available from the EPA Safe Drinking Water Hotline at 1-800-426-4791.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [water system name]. State Water System ID#: _____.

Date distributed: _____.

Instructions for Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice in Spanish – Template 1-2A

Template on Reverse

The template on reverse is a Spanish translation of Template 1-2 for an *E. coli* maximum contaminant level (MCL) violation. All the instructions of Template 1-2 apply. This template is an exact translation of the English template, so if you need to modify the English templates, you should modify this template accordingly. Schools or universities may be able to provide low-cost translations. See the discussion on translations in Chapter 4 of the Revised Public Notification Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010) and Chapter 3 of the Public Notification Handbook for Transient Non-community Water Systems, EPA 816-R-09-009, March 2010 for suggestions on multilingual notices.

Revised Total Coliform Rule (RTCR) *E. coli* MCL Violation Notice in Spanish – Template 1-2A

AVISO SOBRE SU AGUA POTABLE

[*E. coli* está] presente en el agua del Sistema [Water System Name]

HIERVAN EL AGUA ANTES DE USARLA

[Briefly describe the situation in Spanish, such as: “*E. coli* fue encontrada en su servicio de agua el día [given date]” or “No hicimos las pruebas necesarias del servicio de agua y debemos suponer que la bacteria *E. coli* está en la agua a partir de [given date]]. Estas bacterias pueden enfermarle, y son especialmente peligrosas para personas con los sistemas inmunológicos débiles.

Contaminación bacteriana puede ocurrir cuando un exceso de aguas rebasa sus cauces y entran en las fuentes de agua potable (por ejemplo, después de una lluvia fuerte). También, puede ocurrir cuando se rompe un sistema de recolección de aguas negras (por ejemplo una tubería), o cuando hay una falla en el tratamiento de agua.

¿Qué debo hacer? ¿Qué es la signfica de este?

- **NO BEBA EL AGUA SIN HERVIRLA ANTES.** Hierva toda el agua, déjela hervir por un minuto, y déjela reposar antes de usarla, o utilice agua embotellada. Agua hervida o embotellada debe ser usada para beber, hacer hielo, lavarse los dientes, lavar los platos y para preparar la comida hasta próximo aviso. El proceso de hervir mata a bacteria y otros organismos en el agua.
- **E. coli son bacterias cuya presencia indican que el agua está contaminada con desechos humanos o de animales. Los agentes patógenos humanos en estos desechos pueden causar consecuencias a corto plazo, como diarrea, cólicos, náusea, dolores de cabeza u otros síntomas. Pueden representar un peligro más grave para la salud de bebés, niños y niñas de corta edad, los ancianos y personas con sistemas inmunológicos en alto riesgo.**
- Los síntomas descritos arriba no ocurren solamente debido a los microbios; pueden ser resultados de otros factores. Sin embargo, si usted siente estos síntomas y los persisten, usted puede optar por hacer una consulta con su médico. Personas en situaciones de alto riesgo deben consultar con sus proveedores de servicios médicos.

¿Qué se está haciendo al respecto?

[Describe corrective action in Spanish]. Le informaremos cuando las pruebas demuestren que no hay bacterias y cuando usted ya no necesita hervir su agua. Anticipamos que resolveremos el problema el [date of expected resolution in Spanish day-month-year].

Para obtener más información, contacte a [name of contact] al [phone number] o [mailing address]. Reglas generales sobre las maneras de reducir el riesgo de infección por bacterias y otros organismos causantes de enfermedades están disponibles de la línea directa de Agua Potable Segura de EPA (1-800-426-4791).

Por favor, comparta esta información con otros que toman de esta fuente de agua, especialmente con aquellos que no hayan recibido el aviso directamente, por ejemplo: personas en apartamentos, hospitales, hogares de infantes, escuelas o comunidades de negocios. Usted puede compartirlo en un lugar público o distribuyendo unas copias a mano o por correo.

Este aviso ha sido enviado a usted por [water system name]. Número de Identificación: _____.

Fecha de distribución: _____.

2. Tier 2 Public Notification Instructions and Templates

The pages that follow contain instructions and templates for issuing Tier 2 public notification. Along with each template are specific instructions, including the required method of delivery and suggestions for completing individual sections of the notice. The following templates are provided:

- ~~Revised Total Coliform Rule (RTCR) Failure of a Seasonal System to Complete Start-Up Procedures – Template 2-16~~
- Revised Total Coliform Rule (RTCR) Failure to Perform any Level 1 Assessment or a Level 2 Assessment that is Not Triggered by *E. coli* MCL violations or the Related Corrective Actions – Template 2-21 (use after March 31, 2016)
- Revised Total Coliform Rule (RTCR) Failure to Perform a Level 2 Assessment Triggered by an *E. coli* MCL violation or the Related Corrective Actions – Template 2-22 (use after March 31, 2016)

Each template also includes the mandatory health effects language from Appendix B to 40 CFR 141 Subpart Q (presented in italics in each notice, with an asterisk on each end). This information must be included as written, without the asterisks, with additional violation or situation specific information added in the brackets.

You must also include the following italicized language in all notices, where applicable [40 CFR 141.205(d)]. This language is included in each template. Use of this language does not relieve you of your obligation to take steps reasonably calculated to notify all persons served:

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Instructions for Revised Total Coliform Rule (RTCR) Failure to Perform any Level 1 Assessment or a Level 2 Assessment that is Not Triggered by *E. coli* MCL Violations or the Related Corrective Actions – Template 2-21

Template Follows Instruction Pages

Description of Violation or Situation

Beginning April 1, 2016, a public water system triggers a Level 1 assessment when:

- For systems taking 40 or more samples (including routine and repeat samples) per month, the public water system exceeds 5.0 percent total coliform-positive samples for the month;
- For systems taking fewer than 40 samples (including routine and repeat samples) per month, the public water system has two or more total coliform-positive samples in the same month; or
- The public water system fails to take every required repeat sample after any single routine total coliform-positive sample.

Also beginning April 1, 2016, a public water system triggers a Level 2 assessment when:

- The public water system has a second Level 1 assessment treatment technique (TT) trigger within a rolling 12-month period unless the state has determined a likely reason for the total coliform-positive samples that caused the initial Level 1 assessment TT trigger, and the state establishes that the system has fully corrected the problem; or,
- For public water systems with approved reduced annual monitoring, the system has a Level 1 assessment TT trigger in two consecutive years.

Treatment technique (TT) violations related to triggered assessments occur when any public water system has:

- Failed to conduct the triggered Level 1 or Level 2 assessment within 30 days after learning that it has exceeded the trigger; or
- Failed to correct any sanitary defect found through a Level 1 or Level 2 assessment within 30 days or in accordance with a schedule acceptable to the state.

TT violations related to any Level 1 assessment or to a Level 2 assessment that is *not* triggered by an *E. coli* MCL violation require similar Tier 2 public notice. TT violations for Level 2 assessments that are triggered by *E. coli* MCL violations require different mandatory health effects language and are addressed in Template 2-22.

You must provide public notice to persons served as soon as practical but no later than 30 days after you learn of the violation [40 CFR 141.203(b)]. You must issue a repeat notice every three months for as long as the violation persists. Check with your state to make sure you meet all its requirements.

Community water systems (CWSs) must use one of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Hand or direct delivery
- Mail, as a separate notice or included with the bill (if delivered within 30 days of the violation)
- Another method approved in writing by the state

Non-community water systems (NCWSs) must use one of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Posting in conspicuous locations
- Hand delivery
- Mail
- Another method approved in writing by the state

In addition, both CWSs and NCWSs must use another method reasonably calculated to reach others if they would not be reached by the first method [40 CFR 141.203(c)]. Such methods could include newspapers, e-mail, or delivery to community organizations. If you mail, post, or hand deliver, EPA recommends printing your notice on your system's letterhead, if available.

The notice on the reverse is appropriate for mailing, posting, or hand delivery. If you modify this notice, you must still include all required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below). All posted notices must remain in place for as long as the violation or situation persists but in no case for less than seven days, even if the violation or situation is resolved.

Mandatory Language

Mandatory language on health effects (from Appendix B to 40 CFR 141 Subpart Q) must be included as written and is presented in this notice in italics with an asterisk on each end.

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found.

You are also required to include one or both of the following statements, also presented in this notice in italics with an asterisk on each end, as appropriate for the violation:

We failed to conduct the required assessment.

We failed to correct all identified sanitary defects that were found during the assessment that we conducted.

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also provided below and presented in this notice in italics with an asterisk on each end.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Corrective Action

The specific cause(s) of total coliforms in the distribution system that triggered the assessment will likely differ from system to system. Your notice must describe the corrective action(s) you are taking [40 CFR 141.205(a)(7)] to address the TT violation and when you expect to return to compliance or resolve the situation [40 CFR 141.205(a)(8)]. You can use one or more of the following statements, if appropriate, or develop your own text.

- We have begun to correct the sanitary defect(s) identified during an assessment of our water system by taking the following corrective actions: [Describe corrective actions].
- To ensure that our water system is protected against contamination, we are working with the state to implement the following corrective actions: [Describe corrective actions].
- We completed the required assessment and identified the cause of the sanitary defect to be addressed [describe the issue or problem found, for example, damage to the storage tank, a missing vent screen, etc.] We are currently correcting the problem on a schedule approved by [State Department of Public Health].

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

It is a good idea to inform your consumers when the violation has been resolved. See Template 1-6 of the Revised Public Notification Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010) and Template NC-7 of the Public Notification Handbook for Transient Non-community Water Systems, EPA 816-R-09-009, March 2010 for a “problem corrected” notice template.

Revised Total Coliform Rule (RTCR) Failure to Perform any Level 1 Assessment or a Level 2 Assessment that is Not Triggered by *E. coli* MCL Violations or the Related Corrective Actions – Template 2-21

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

[Water System Name] Failed to Perform Activities Required to Address Coliform Bacteria Contamination of the Water System

During recent routine monitoring, our water system tested positive for total coliforms. **Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution.*

*When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found.** [Describe the TT violation, using the mandatory language of **We failed to conduct the required assessment** by [Enter date the assessment was due] and/or **We failed to correct all identified sanitary defects that were found during the assessment(s)** by [Enter date correction was due].]

As our customers, you have a right to know what happened and what we are doing to correct this situation.

What should I do?

- You do not need to boil your water or take other corrective actions. However, if you have specific health concerns, consult your doctor.
- If you have a severely compromised immune system, are pregnant, or are elderly, you may be at increased risk and should seek advice from your healthcare provider about drinking this water. You should also seek advice from your healthcare provider about using the water if you have an infant. General guidelines on ways to lessen the risk of infection by bacteria and other disease-causing organisms are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

What does this mean?

Since total coliform bacteria are generally not harmful themselves, this is not an emergency. If it had been you would have been notified within 24 hours.

Failure to identify and correct the defects has the potential to cause continued distribution system contamination. Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

What is being done?

[Describe corrective action including when your water system expects to return to compliance or resolve the violation].

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [water system name]. State Water System ID#: _____.

Date distributed: _____.

Instructions for Revised Total Coliform Rule (RTCR) Failure to Perform a Level 2 Assessment Triggered by an *E. coli* MCL Violation or the Related Corrective Actions – Template 2-22

Template Follows Instruction Pages

Description of Violation or Situation

Beginning April 1, 2016, a public water system triggers a Level 2 assessment when:

- The public water system has an *E. coli* maximum contaminant level (MCL) violation;

A TT violation related to a Level 2 assessment that was triggered by an *E. coli* MCL violation requires Tier 2 public notice with mandatory health effects language stating *E. coli* was detected in the water system. Violations of Level 2 assessments related to *E. coli* require Tier 2 public notice and occur when any public water system has:

- Failed to conduct the triggered Level 2 assessment within 30 days after learning that it has exceeded the trigger; or
- Failed to correct any sanitary defect found through a Level 2 assessment within 30 days or in accordance with a schedule acceptable to the state.

TT violations for Level 2 assessments that are triggered by more than one Level 1 assessment require different mandatory health effects language and are addressed in Template 2-21.

You must provide public notice to persons served as soon as practical but no later than 30 days after you learn of the violation [40 CFR 141.203(b)]. You must issue a repeat notice every three months for as long as the violation persists. Check with your state to make sure you meet all its requirements.

Community water systems (CWSs) must use one of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Hand or direct delivery
- Mail, as a separate notice or included with the bill (if delivered within 30 days of the violation)
- Another method approved in writing by the state

Non-community water systems (NCWSs) must use one of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Posting in conspicuous locations
- Hand delivery
- Mail
- Another method approved in writing by the state

In addition, both CWSs and NCWSs must use another method reasonably calculated to reach others if they would not be reached by the first method [40 CFR 141.203(c)]. Such methods could include newspapers, e-mail, or delivery to community organizations. If you mail, post, or hand deliver, EPA recommends printing your notice on your system's letterhead, if available.

The notice on the reverse is appropriate for mailing, posting, or hand delivery. If you modify this notice, you must still include all required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below). All posted notices must remain in place for as long as the violation or situation persists but in no case for less than seven days, even if the violation or situation is resolved.

Mandatory Language

Mandatory language on health effects (from Appendix B to 40 CFR 141 Subpart Q) must be included as written and is presented in this notice in italics with an asterisk on each end.

**E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for E. coli, indicating the*

*need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found.**

You are also required to include one or both of the following statements, also presented in this notice in italics with an asterisk on each end, as appropriate for the violation:

We failed to conduct the required assessment.

We failed to correct all identified sanitary defects that were found during the assessment that we conducted.

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also provided below and presented in this notice in italics with an asterisk on each end.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Corrective Action

The specific cause(s) of *E. coli* in the distribution system will likely differ from system to system. Your notice must describe the corrective action(s) you are taking [40 CFR 141.205(a)(7)] and when you expect to return to compliance or resolve the situation [40 CFR 141.205(a)(8)]. You can use one or more of the following statements, if appropriate, or develop your own text.

- We have begun to correct the sanitary defect(s) identified during an assessment of our water system by taking the following corrective actions. [Describe corrective actions].
- To ensure that our water supplies are protected against contamination, we are working with the state to implement the following corrective actions. [Describe corrective actions].
- We completed the required assessment and identified the cause of the sanitary defect to be addressed [describe the issue or problem found, for example, damage to the storage tank, a missing vent screen, etc.] We are currently correcting the problem on a schedule approved by [State Department of Public Health].

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

It is a good idea to inform your consumers when the violation has been resolved. See Template 1-6 of the Revised Public Notification Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010) and Template NC-7 of the Public Notification Handbook for Transient Non-community Water Systems, EPA 816-R-09-009, March 2010 for a “problem corrected” notice template.

Revised Total Coliform Rule (RTCR) Failure to Perform a Level 2 Assessment Triggered by an *E. coli* MCL Violation or the Related Corrective Actions – Template 2-22

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

[Water System Name] Failed to Correct a Problem Discovered During an Assessment of the Water System after Testing Positive for *E. coli*

During recent monitoring, our water system tested positive for *E. coli*. *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for *E. coli*, indicating the need to look for potential problems in water treatment or distribution.

When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found.* [Describe the TT violation, using the mandatory language of **We failed to conduct the required assessment** by [Enter date the assessment was due] and/or **We failed to correct all identified sanitary defects that were found during the assessment(s)** by [Enter date correction was due]]

As our customers, you have a right to know what happened and what we are doing to correct this situation. You were notified of the *E. coli* in our water on [enter date when Tier 1 public notice of the MCL violation that triggered the assessment was provided] and on [enter date] that no additional contamination has been identified and that you do not need to boil your water or take other corrective actions. Although our recent sampling has indicated coliform bacteria are absent, we are still required to assess the system and correct any defects found.

What should I do?

- You still do not need to boil your water or take corrective actions. However, if you have specific health concerns, consult your doctor.
- If you have a severely compromised immune system, are pregnant, or are elderly, you may be at increased risk and should seek advice from your healthcare provider about drinking this water. You should also seek advice from your healthcare provider about using the water if you have an infant. General guidelines on ways to lessen the risk of infection by bacteria and other disease-causing organisms are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

What does this mean?

This is not an emergency. If it had been you would have been notified within 24 hours.

Failure to identify and correct system defects has the potential to cause distribution system contamination. Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

What is being done?

[Describe corrective action including when you expect to return to compliance or resolve the situation].

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [water system name]. State Water System ID#: _____.

Date distributed: _____.

3. Tier 3 Public Notification Instructions and Templates

The Revised Public Notification Rule Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010) and the Public Notification Handbook for Transient Non-community Water Systems (EPA 816-R-09-009, March 2010) contain instructions and templates for issuing Tier 3 public notification for monitoring and testing violations. The structure of providing Tier 3 public notification for these violations were not altered under the promulgation of the Revised Total Coliform Rule. Therefore, the following templates can be used for monitoring and testing violations under the Revised Total Coliform Rule (RTCR).

Revised Public Notification Rule Handbook (2nd Revision of Document: EPA 816-R-09-013, March 2010)

- Monitoring Violations Annual Notice–Template 3-1A
- Monitoring Violations Annual Notice–Template 3-1B
- Monitoring Violations Annual Notice–Template 3-1C
- Failure to Comply with a Testing Procedure Notice – Template 3-2

~~Public Notification Handbook for Transient Non-community Water Systems (EPA 816-R-09-009, March 2010)~~

- ~~• Monitoring Violation Notice – Template NC-6~~

New under the RTCR is the requirement to deliver public notice for failing to report required information to the state. The pages that follow contain instructions and templates for issuing Tier 3 public notification for failing to report required information **to the state**. Similar public notifications for reporting violations are grouped into one template that can be tailored to the specific situation with minor revisions. Along with each template are specific instructions, including the required method of delivery and suggestions for completing individual sections of the notice. The following templates are provided:

- Revised Total Coliform Rule (RTCR) Failure to Report *E. coli*-positive Sampling Events to the State – Template 3-4. This template addresses the following notifications:
 - Failure to notify the state within 24 hours of an *E. coli* MCL violation.
 - Failure to notify the state within 24 hours of an *E. coli*-positive sample result.
- Revised Total Coliform Rule (RTCR) Failure to Report Monitoring Events to the State that are Not Related to *E. coli*-positive Sample Results – Template 3-5. This template addresses the following notifications:
 - Failure to provide total-coliform sample results to the state in a timely manner.
 - Failure to notify the state that a routine or repeat sample monitoring violation occurred within 10 days of when the violation occurred.
 - Failure to notify the state within 24 hours of Revised Total Coliform Rule treatment technique (TT) violation.
 - Failure to submit the completed assessment form or monitoring report after properly conducting the assessment or monitoring.
 - Failure to notify the state when each scheduled corrective action is completed based on the state-approved timeframe.
- ~~• Revised Total Coliform Rule (RTCR) Failure to Provide the State a Certificate that Confirms Seasonal System Start-up Procedures have been Completed – Template 3-6~~
- Revised Total Coliform Rule (RTCR) Failure to do Recordkeeping – Template 3-7

Instructions for Monitoring Violations Annual Notice – Template 3-1A

Template on Reverse

If you are required to provide Tier 3 notification, you must provide public notice to persons served within one year after you learn of the violation [40 CFR 141.204(b)]. Multiple monitoring violations can be serious, and your primacy agency may have more stringent requirements. Check with your primacy agency to make sure you meet its requirements.

Community systems must use one of the following [40 CFR 141.204(c)]:

- Hand or direct delivery
- Mail, as a separate notice or included with the bill

Noncommunity systems must use one of the following [40 CFR 141.204(c)]:

- Posting in conspicuous locations
- Hand delivery
- Mail

In addition, both community and noncommunity systems must use *another* method reasonably calculated to reach others if they would not be reached by the first method [40 CFR 141.204(c)]. Such methods could include newspapers, e-mail, or delivery to community organizations. If you post the notice, it must remain posted until the violation is resolved. If the violation has already been resolved, you must post the notice for at least seven days [40 CFR 141.204(b)]. If you mail, post, or hand deliver, print your notice on your system's letterhead, if available.

The notice on the reverse is appropriate for insertion in an annual notice or the Consumer Confidence Report (CCR), as long as public notification timing and delivery requirements are met [40 CFR 141.204(d)]. You may need to modify the template for a notice for individual monitoring violations. This example presents violations in a table; however, you may write out an explanation for each violation if you wish. For any monitoring violation for volatile organic compounds (VOCs) or other groups, you may list the group name in the table, but you must provide the name of every chemical in the group on the notice, e.g., in a footnote.

You may need to modify the notice if you had any monitoring violations for which monitoring later showed a maximum contaminant level or other violation. In such cases, you should refer to the public notice you issued at that time. If you do modify the notice, you must still include all required PN elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Mandatory Language

Mandatory language for monitoring and testing procedure violations [40 CFR 141.205(d)] must be included as written (with blanks filled in) and is presented in this notice in italics and with an asterisk on either end.

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics and with an asterisk on either end.

Corrective Action

In your notice, describe corrective actions you took, or are taking. Listed below are some steps commonly taken by water systems with monitoring violations. You can use the following language, if appropriate, or develop your own:

- We have since taken the required samples, as described in the last column of the table above. The samples showed we are meeting drinking water standards.
- We have since taken the required samples, as described in the last column of the table above. The sample for [contaminant] exceeded the limit. [Describe corrective action; use information from public notice prepared for violating the limit.]
- We plan to take the required samples soon, as described in the last column of the table above.

After Issuing the Notice

Make sure to send your primacy agency a copy of each type of notice and a certification that you have met all the public notice requirements within ten days after issuing the notice [40 CFR 141.31(d)].

Monitoring Violations Annual Notice – Template 3-1A

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Monitoring Requirements Not Met for [System]

Our water system violated drinking water requirements over the past year. Even though these were not emergencies, as our customers, you have a right to know what happened and what we are doing (did) to correct these situations.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During [compliance period] we [‘did not monitor or test’ or ‘did not complete all monitoring or testing’] for [contaminant(s)] and therefore cannot be sure of the quality of your drinking water during that time.

What should I do?

There is nothing you need to do at this time.

The table below lists the contaminant(s) we did not properly test for during the last year, how often we are supposed to sample for [this contaminant/these contaminants], how many samples we are supposed to take, how many samples we took, when samples should have been taken, and the date on which follow-up samples were (or will be) taken.

Contaminant	Required sampling frequency	Number of samples taken	When samples should have been taken	When samples were taken
VOCs ¹ (example)	1 sample every three years	0	2009-2011	February 2012

What is being done?

[Describe corrective action.]

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [system]. State Water System ID#: _____.

Date distributed: _____.

¹VOCs, also known as volatile organic compounds, are tested by collecting one sample and testing that sample for all the regulated VOCs. VOCs are commonly used in industrial and manufacturing processes. Regulated VOCs include benzene, carbon tetrachloride, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichloroethane, cis-dichloroethane, trans-dichloroethane, dichloromethane, 1,2-dichloropropane, ethylbenzene, styrene, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, toluene, 1,2,4-trichlorobenzene, 1,1-dichloroethylene, 1,1,2-trichloroethane, vinyl chloride, and xylene.

Instructions for Monitoring Violations Annual Notice – Template 3-1B

Template on Reverse

The template on the reverse is another example of a monitoring violation. The example in this template is for Bromate under the Stage 2 DBPR. All of the instructions of Template 3-1A apply.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Monitoring Requirements Not Met for [System]

On [give date] we became aware that our system recently failed to collect the correct number of drinking water samples. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did (are doing) to correct this situation.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During [compliance period] we [‘did not monitor or test’ or ‘did not complete all monitoring or testing’] for bromate and therefore cannot be sure of the quality of your drinking water during that time.

We were allowed to take 1 sample per quarter rather than 1 sample per month. In [give date], we no longer qualified for reduced quarterly bromate monitoring. Beginning in [give date], we failed to begin monitoring monthly for bromate.

What should I do?

There is nothing you need to do at this time. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What is being done?

[Describe corrective action.] We began monitoring monthly for bromate on [give date] and will continue to monitor on this schedule [until/unless] we qualify for reduced monitoring.

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [system]. State Water System ID#: _____.

Date distributed: _____.

Instructions for Monitoring Violations Annual Notice – Template 3-1C

Template on Reverse

The template on the reverse is another example of a monitoring violation. The example in this template is for *Cryptosporidium* monitoring under LT2ESWTR. If a system fails to conduct *Cryptosporidium* monitoring of its source water for one or two months, it is required to issue Tier 3 notification. (Note: failure to conduct required *Cryptosporidium* monitoring for any three months or more requires Tier 2 notification and special notice. See Chapter 6 for an example template.) This notice can also be modified for *E. coli* or turbidity monitoring violations under LT2ESWTR. All the instructions of Template 3-1A apply.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Monitoring Requirements Not Met for [System]

Our water system violated a drinking water requirement over the past year. Even though this was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During [compliance period] we [‘did not monitor or test’ or ‘did not complete all monitoring or testing’] for Cryptosporidium and therefore cannot be sure of the quality of your drinking water during that time.

Cryptosporidium is a disease-causing microorganism that may be present in our raw water source.

What should I do?

There is nothing you need to do at this time. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What is being done?

[Describe corrective action.] We began collecting our monthly samples for *Cryptosporidium* on [give date] and will continue to follow our required monitoring schedule.

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [system]. State Water System ID#: _____.

Date distributed: _____.

Instructions for Failure to Comply with a Testing Procedure Notice – Template 3-2

Template on Reverse

Failure to comply with a testing procedure requires Tier 3 notification. You must provide public notice to persons served within one year after you learn of the violation [40 CFR 141.204(b)]. Multiple testing violations can be serious, and your primacy agency may have more stringent requirements. Check with your primacy agency to make sure you meet its requirements.

Community systems must use one of the following [40 CFR 141.204(c)]:

- Hand or direct delivery
- Mail, as a separate notice or included with the bill

Noncommunity systems must use one of the following [40 CFR 141.204(c)]:

- Posting in conspicuous locations
- Hand delivery
- Mail

In addition, both community and noncommunity systems must use *another* method reasonably calculated to reach others if they would not be reached by the first method [40 CFR 141.204(c)]. Such methods could include newspapers, e-mail, or delivery to community organizations. If you post the notice, it must remain posted until the violation is resolved. If the violation has already been resolved, you must post the notice for at least seven days [40 CFR 141.204(b)]. If you mail, post, or hand deliver, print your notice on your system's letterhead, if available.

The notice on the reverse is appropriate for insertion in an annual notice or the Consumer Confidence Report (CCR), as long as public notification timing and delivery requirements are met [40 CFR 141.204(d)].

This example is for a holding time violation. It will need to be modified for other types of testing violations. However, if you modify this notice, you must still include all required PN elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Mandatory Language

Mandatory language for monitoring and testing procedure violations [40 CFR 141.205(d)] must be included as written (with blanks filled in) and is presented in this notice in italics and with an asterisk on either end.

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics and with an asterisk on either end.

Corrective Actions

In your notice, describe corrective actions you took, or are taking. Listed below is a step commonly taken by water systems with a holding time violation. You can use the following language, if appropriate, or develop your own that is specific to your testing violation:

- On [give date] we collected (will collect) a new sample of our finished water in order to have it analyzed for [contaminant]. We sent (will send) the sample to the certified laboratory via courier to ensure that the sample arrived within the allowed holding time.

After Issuing the Notice

Make sure to send your primacy agency a copy of each type of notice and a certification that you have met all the public notice requirements within ten days after issuing the notice [40 CFR 141.31(d)].

Failure to Comply with a Testing Procedure Notice – Template 3-2

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

[System] Failed to Comply With a Testing Procedure

Our water system [name of system] recently failed to comply with a required testing procedure. Even though this was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During [compliance period], we did not complete all monitoring or testing for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.

Any sample we collect must be sent to and analyzed by a certified laboratory within a specified amount of time. We collected the sample on [give date], but did not get our sample to the laboratory within the allowed holding time.

What should I do?

There is nothing you need to do at this time. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

What is being done?

On [give date] we [collected/will collect] a new sample of our finished water in order to have it analyzed for [contaminant]. We [sent/will send] the sample to the certified lab via courier to ensure that the sample [arrived/arrives] within the allowed holding time. The sample was analyzed and [contaminant] was not found at detectable levels.

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [system]. State Water System ID#: _____.

Date distributed: _____.

Instructions for Revised Total Coliform Rule (RTCR) Failure to Report *E. coli*-positive Sampling Events to the State – Template 3-4

Template on Reverse

Description of Violation or Situation

Beginning April 1, 2016, failure to notify the state of events that are related to *E. coli*-positive sample results are reporting violations that require Tier 3 public notification. The reporting violations addressed by this Tier 3 template require similar public notification content and include:

- Failure to notify the state within 24 hours of an *E. coli* MCL violation.
- Failure to notify the state within 24 hours of an *E. coli*-positive sample result.

You must provide public notice to persons served within one year after you learn of the violation [40 CFR 141.204(b)]. Check with your state to make sure you meet all requirements.

Community water systems (CWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.204(c)]:

- Mail or hand delivery (public notice delivery may be provided by CCR if the one year requirement is met), and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

The notice on the reverse is appropriate for insertion in an annual notice or the Consumer Confidence Report (CCR) (CWSs only), as long as public notification content, timing and delivery requirements are met [40 CFR 141.204(d)]. If you do modify the notice, you must still include all 10 required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Non-community water systems (NCWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.204(c)]:

- Posting in a conspicuous place throughout the system, or by hand delivery or mail, and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

If you:

- Post the notice, it must remain posted until the violation is resolved.
- Post the notice and the violation has already been resolved, you must still post the notice for at least seven days [40 CFR 141.204(b)].
- Mail, post, or hand deliver, EPA recommends printing your notice on your system's letterhead, if available.

Repeat notice(s) are required annually if the violation or situation persists, unless otherwise directed by the state.

Mandatory Language

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics with an asterisk on each end.

Corrective Actions

In your notice, you must describe corrective actions you took, or are taking [40 CFR 141.205(a)(7)] and when you expect to return to compliance or resolve the situation [40 CFR 141.205(a)(8)]. You can use the following language, if appropriate, or develop your own:

- We have provided the missing reports to the state and have revised our procedures to ensure we comply with reporting requirements in the future. We are no longer in violation.

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

Revised Total Coliform Rule (RTCR) Failure to Report *E. coli*-positive Sampling Events to the State – Template 3-4

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Reporting Requirement(s) Not Met for [Water System Name]

Our system failed to notify the state drinking water program that we [enter either “detected *E. coli* bacteria in a water sample” or “have incurred an MCL violation for *E. coli* bacteria”]. We are required to notify the state of this information within 24 hours of when we learned of the situation but we failed to do so.

[If applicable, enter, “We notified you of the *E. coli* MCL violation on [enter date] and resolved the contamination problem on [enter date]”].

Although this situation does not create a risk to public health, as our customers you have a right to know what happened and what we did to correct the situation.

What should I do?

There is nothing you need to do at this time. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on [media source].

What is being done?

[Describe your corrective actions including when your water system expects to return to compliance or resolve the violation].

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [water system name]. State Water System ID# _____.

Date distributed: _____.

Instructions for Revised Total Coliform Rule (RTCR) Failure to Report Monitoring Events to the State that are Not Related to *E. coli*-positive Sample Results – Template 3-5

Template Follows Instruction Pages

Description of Violation or Situation

Beginning April 1, 2016, failure to notify the state of RTCR events that are not related to *E. coli*-positive sample results are reporting violations that require Tier 3 public notification. The reporting violations addressed by this Tier 3 template require similar public notification content and include:

- Failure to provide total coliform-positive or total coliform-negative sample results to the state in a timely manner.
- Failure to notify the state that an RTCR monitoring violation occurred within 10 days of when the violation occurred.
- Failure to notify the state within 24 hours of a Treatment Technique (TT) violation resulting from failure to perform assessments or corrective actions.
- Failure to submit the completed assessment form or monitoring report within 30 days of triggering the assessment.
- Failure to notify the state when each scheduled corrective action is completed based on the state-approved timeframe.

You must provide Tier 3 public notice to persons served within one year after you learn of the violation [40 CFR 141.204(b)]. Check with your state to make sure you meet all requirements.

Community water systems (CWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.204(c)]:

- Mail or hand delivery (public notice delivery may be provided by CCR if the one year requirement is met), and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

The notice on the reverse is appropriate for insertion in an annual notice or the Consumer Confidence Report (CCR) (CWSs only), as long as public notification content, timing, and delivery requirements are met [40 CFR 141.204(d)].

Non-community water systems (NCWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.204(c)]:

- Posting in a conspicuous place throughout the system, or by hand delivery or mail, and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

If you:

- Post the notice, it must remain posted until the violation is resolved.
- Post the notice and the violation has already been resolved, you must still post the notice for at least seven days [40 CFR 141.204(b)].
- Mail, post, or hand deliver, EPA recommends printing your notice on your system's letterhead, if available.
- Modify the notice, you must still include all required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Repeat notice(s) are required annually if the violation or situation persists, unless otherwise directed by the state.

Mandatory Language

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics with an asterisk on each end.

Corrective Actions

In your notice, you must describe corrective actions you took, or are taking [40 CFR 141.205(a)(7)] including when your water system expects to return to compliance or resolve the violation [40 CFR 141.205(a)(8)]. You can use the following language, if appropriate, or develop your own:

- We have provided the missing reports to the state and have revised our procedures to ensure we comply with reporting requirements in the future. We are no longer in violation.

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

Revised Total Coliform Rule (RTCR) Failure to Report Monitoring Events to the State that are Not Related to *E. coli*-positive Sample Results – Template 3-5

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Reporting Requirement(s) Not Met for [Water System Name]

We are required to report [describe the information not reported, such as “the results of monitoring of your drinking water for specific contaminants on a regular basis” or “the results of our water system’s assessment by [enter date]]. Results of [enter applicable text, such as “regular monitoring” or “the assessment”, as applicable] are an indicator of whether or not your drinking water meets health standards. During [compliance period], we did not [describe what you did not report, such as “report the results of monitoring or of the assessment] for [contaminant(s)]”].

Our system failed to notify the state drinking water program as required by [enter date]. Although public health was not impacted, as our customers, you have a right to know what happened and what we did to correct the situation.

What should I do?

There is nothing you need to do at this time. You do not need to boil your water or take other actions.

What is being done?

While we did not notify the state as quickly as we should have, we have [enter your corrective action] on [enter date]. We are no longer in violation.

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by [water system name]. State Water System ID# _____.

Date distributed: _____.

Instructions for Revised Total Coliform Rule (RTCR) Failure to do Recordkeeping – Template 3-7

Template on Reverse

Description of Violation or Situation

Beginning April 1, 2016, failure to keep records of any assessment forms completed by you or a third-party, documentation of corrective actions, or summary reports of sanitary defects, as well as records of repeat samples taken that meet the criteria of an extension for the 24-hours of collecting repeat samples are recordkeeping violations that require Tier 3 public notification [40 CFR 141.204(a)(6)].

You must provide public notice to persons served within one year after you learn of the recordkeeping violation [40 CFR 141.204(b)]. Check with your state to make sure you meet all requirements.

Community water systems (CWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Mail or hand delivery (public notice delivery may be provided by CCR if the one year requirement is met), and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

The notice on the reverse is appropriate for insertion in an annual notice or the Consumer Confidence Report (CCR) (CWSs only), as long as public notification content, timing and delivery requirements are met [40 CFR 141.204(d)].

Non-community water systems (NCWSs) must use all of the following methods to deliver the notice to consumers [40 CFR 141.203(c)]:

- Posting in a conspicuous place throughout the system, or by hand delivery or mail, and
- Another method as needed to reach consumers not likely to receive a notice from methods noted above and approved in writing by the state. Such methods could include newspapers, e-mail, or delivery to community organizations.

If you:

- Post the notice, it must remain posted until the violation is resolved.
- Post the notice and the violation has already been resolved, you must still post the notice for at least seven days [40 CFR 141.204(b)].
- Mail, post, or hand deliver, EPA recommends printing your notice on your system's letterhead, if available.
- Modify the notice, you must still include all required public notice elements from 40 CFR 141.205(a) and leave the mandatory language unchanged (see below).

Repeated notices are required annually if the violation or situation persists, unless otherwise directed by the state.

Mandatory Language

You must also include standard language to encourage the distribution of the public notice to all persons served, where applicable [40 CFR 141.205(d)]. This language is also presented in this notice in italics with an asterisk on each end.

Corrective Actions

In your notice, you must describe corrective actions you took, or are taking [40 CFR 141.205(a)(7)] including when your water system expects to return to compliance or resolve the violation [40 CFR 141.205(a)(8)]. You can use the following language, if appropriate, or develop your own:

- We have contacted the laboratories that performed the water testing and requested copies of the missing reports. We are no longer in violation.
- We have revised our procedures to ensure we comply with the recordkeeping requirements in the future. We are no longer in violation.

After Issuing the Notice

Make sure to send a copy of each type of notice and a certification that you have met all the public notification requirements to your state within 10 days after the original or any repeat notice(s) [40 CFR 141.31(d)].

Revised Total Coliform Rule (RTCR) Failure to do Recordkeeping – Template 3-7

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Recordkeeping Requirement(s) Not Met for [Water System Name]

[Water system name] failed to keep records of [describe the information not kept, such as “our water system’s assessment conducted on [enter date]” or “monitoring following a sample with coliform bacteria in which we received an extension to collect the sample from the state”]. We realize the importance of keeping complete records to document the quality of the water we provide and the efforts we take to ensure the water is safe to drink.

Although this situation does not create a risk to public health, as our customers you have a right to know what happened and what we did to correct the situation.

What should I do?

There is nothing you need to do at this time. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on [media source].

What is being done?

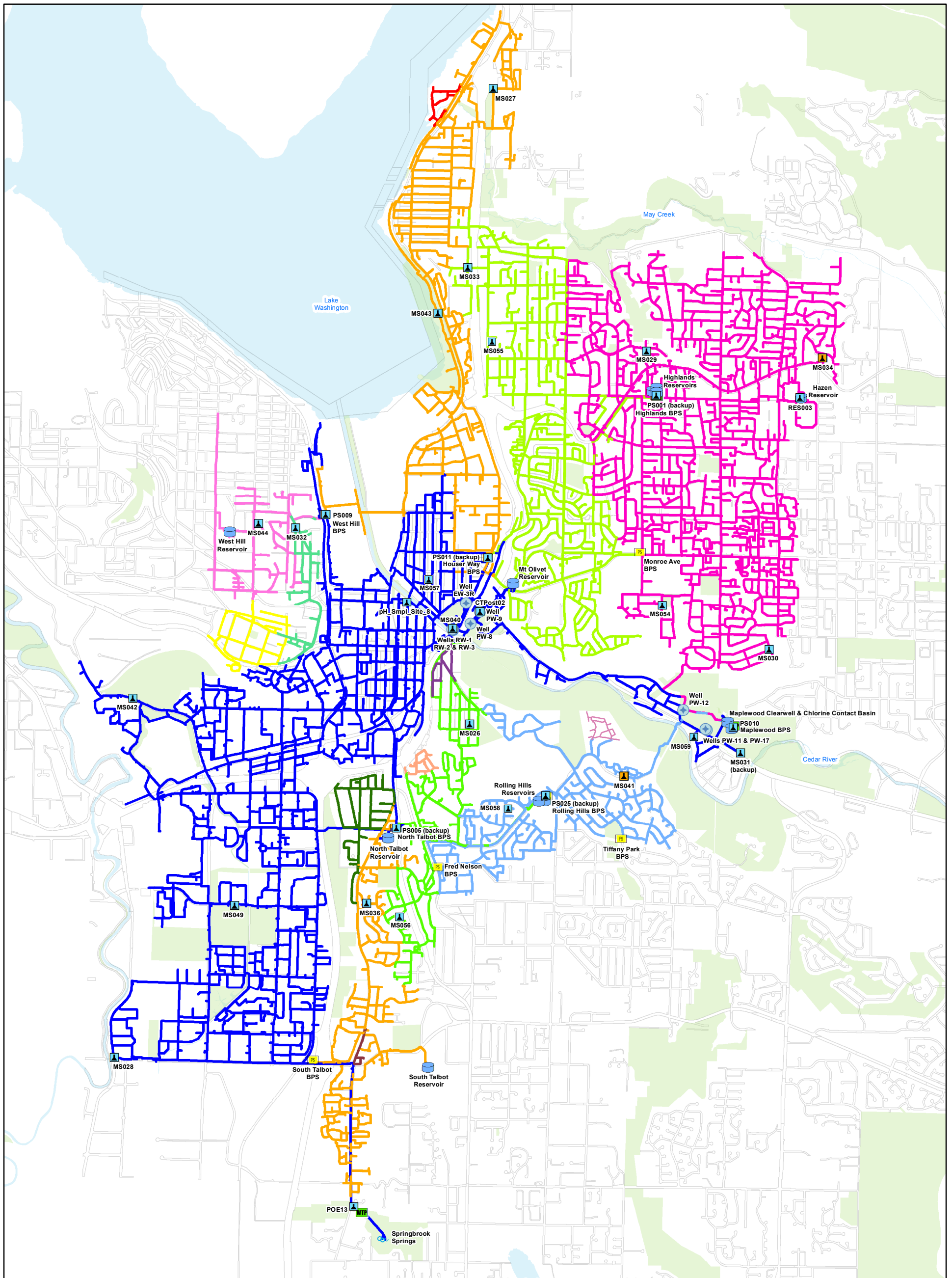
[Describe your corrective actions including when your water system expects to return to compliance or resolve the violation].

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

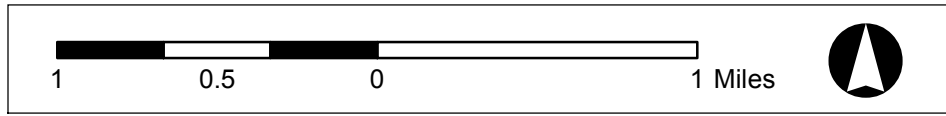
This notice is being sent to you by [water system name]. State Water System ID# _____.

Date distributed: _____.



Coordinate System: NAD 1983 HARN StatePlane Washington North FIPS 4601 Feet Projection: Lambert Conformal Conic Datum: North American 1983 HARN

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L



**Prepared by: Katie Nolan,
 Water Utility Engineering**
Prepared on: January 21, 2020

This document is a graphic representation, not guaranteed to survey accuracy, and is based on the best information available as of the date shown. This map is intended for City of Renton Water Utility display purposes only.

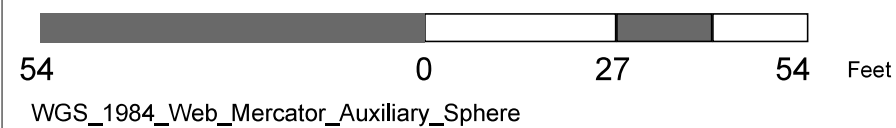
Legend			
	Coliform/DBPR Sampling Station		Rolling Hills 590 Pressure Zone
	Routine Coliform Sampling Station		East Talbot Hill 300 Pressure Zone
	Production Well		Highlands 435 Pressure Zone
	Spring		Highlands 565 Pressure Zone
	Enclosed Storage Facility		Kennydale 218 Pressure Zone
	Booster Pump Station		Kennydale 320 Pressure Zone
	Treatment Plant		Rolling Hills 395 Pressure Zone
			Rolling Hills 490 Pressure Zone
			Scenic Hill 370 Pressure Zone
			Talbot Hill 270 Pressure Zone
			Talbot Hill 350 Pressure Zone
			Valley 196 Pressure Zone
			West Hill 300 Pressure Zone
			West Hill 495 Pressure Zone
			West Talbot Hill 300 Pressure Zone

Coliform Sampling Sites - Wellhouse PW-9 Post-CT Pipeline



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Hydrant

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: CTPost02



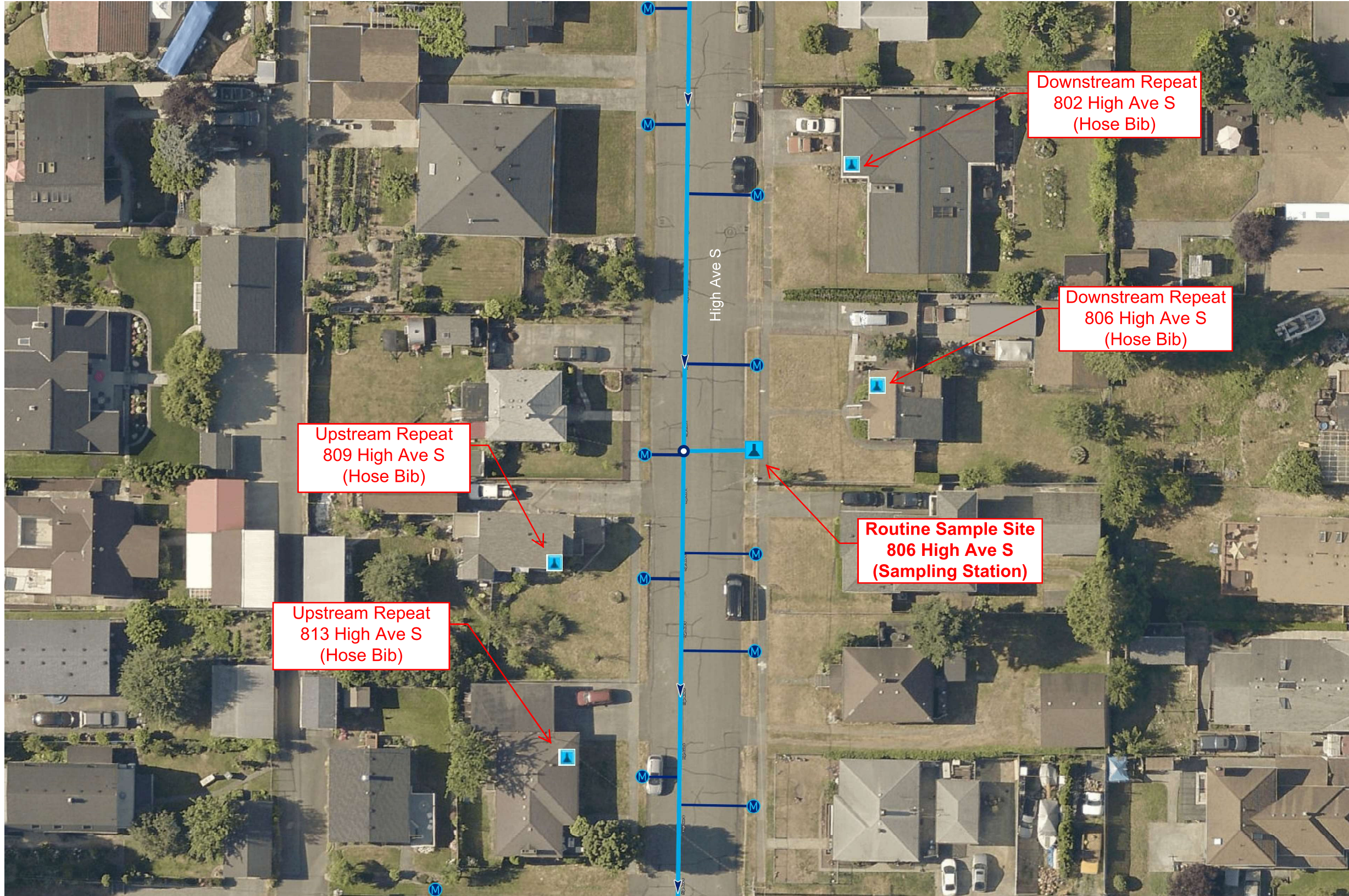
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **April 30, 2020**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION

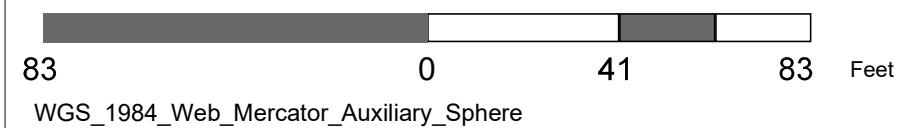


Coliform Sampling Sites - 806 High Ave S



- Legend**
- Service Connection
 - Sampling Point
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS026



Prepared by: Katie Nolan, **Water Utility Engineering**

Prepared on: **October 22, 2019**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION



Coliform Sampling Sites - Jones Ave NE & NE 43rd St



Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS027

Legend

- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- System Valve
- Water Main
- Lateral Line
- Domestic
- Fire
- Hydrant
- Irrigation



136 0 68 136 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere



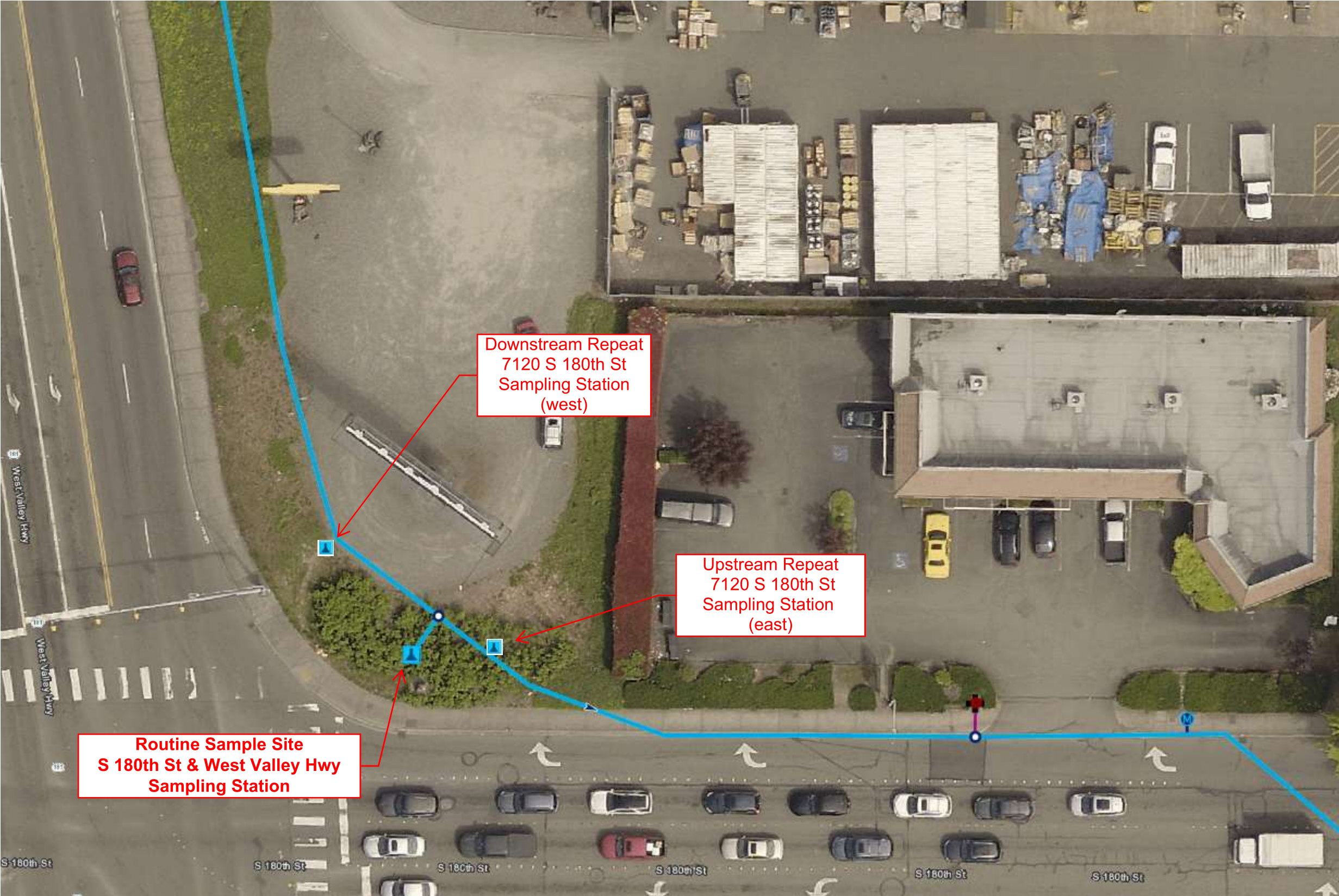
Prepared by: **Katie Nolan,**
Water Utility Engineering

Prepared on: **April 30, 2020**

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Coliform Sampling Sites - 7120 S 180th St

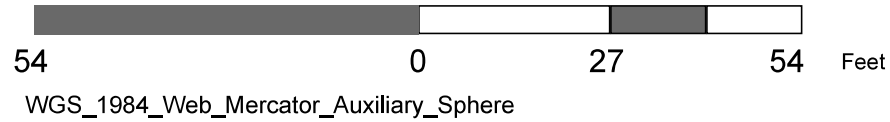


Legend

- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- Water Main
- Lateral Line
- Domestic
- Fire
- Hydrant
- Irrigation

Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS028



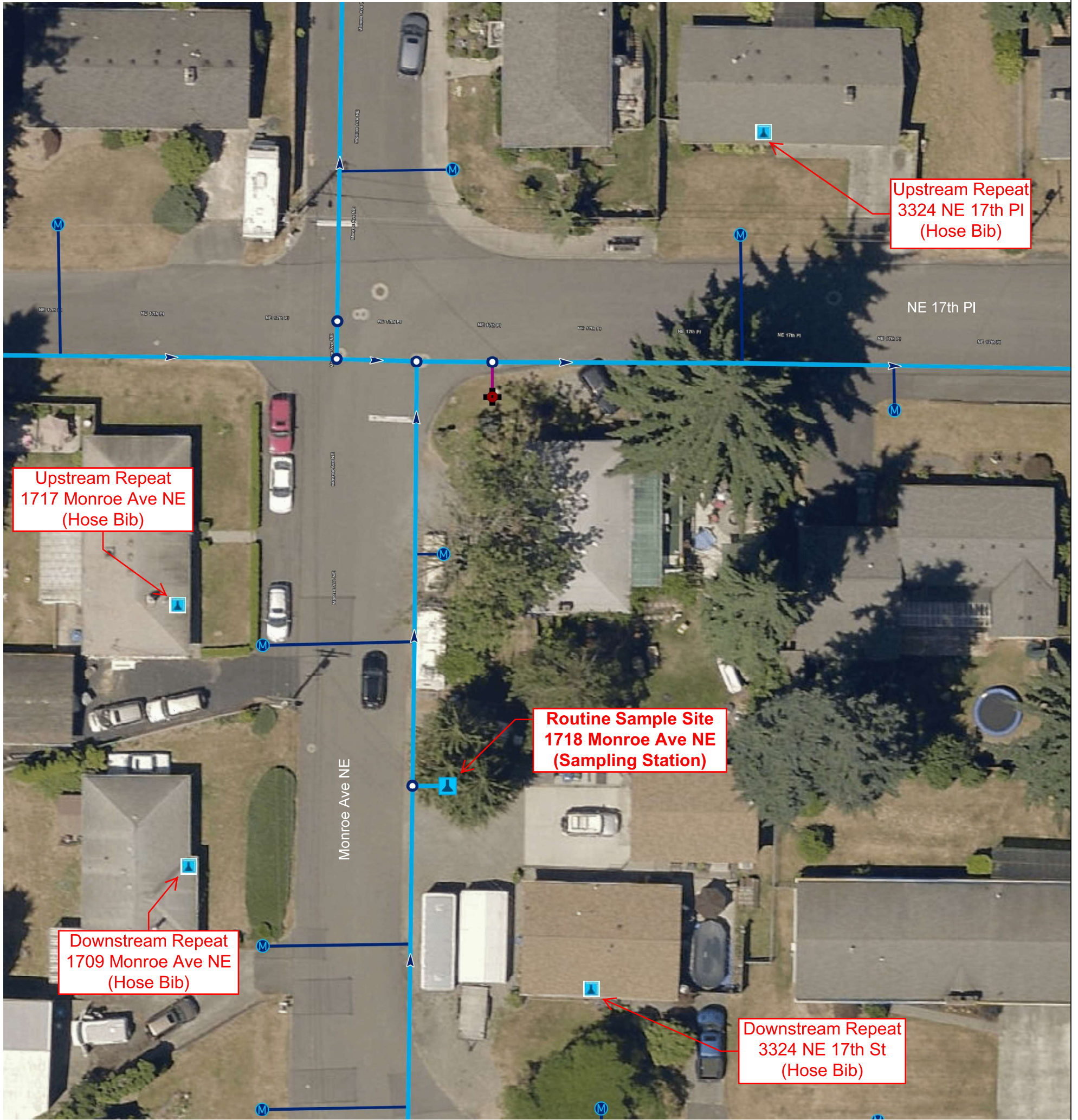
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **April 30, 2020**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION



Coliform Sampling Sites - 1718 Monroe Ave NE



Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS029

54 0 27 54 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

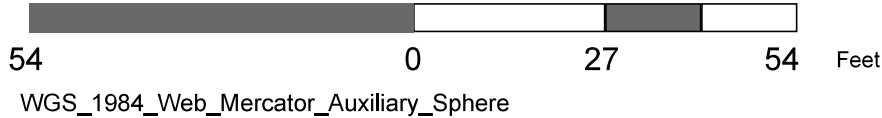
- Service Connection
- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- Water Main
- Lateral Line
- Domestic
- Hydrant

Coliform Sampling Sites - SE 4th St & Chelan Ave SE



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS030



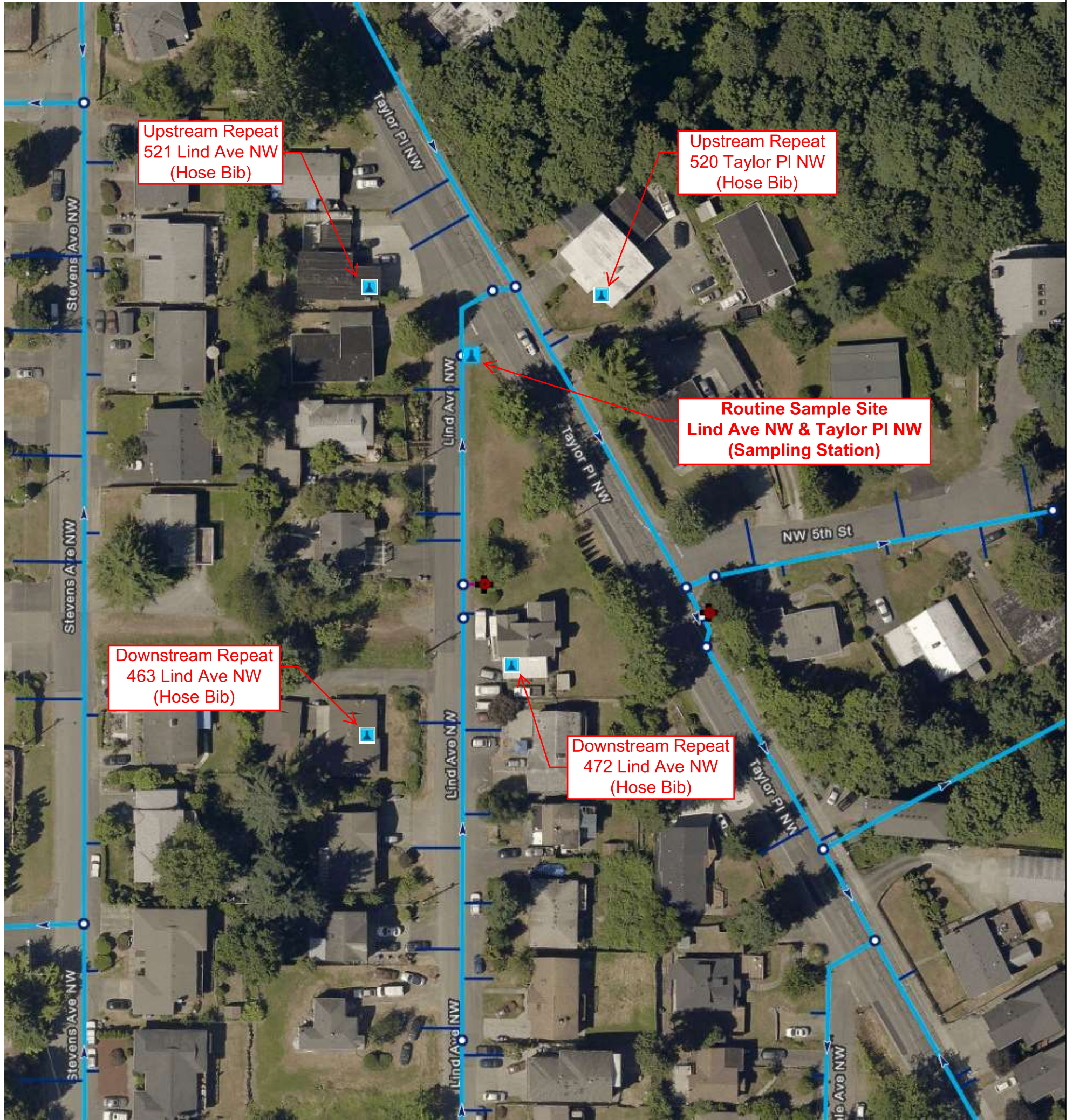
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **October 22, 2019**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION

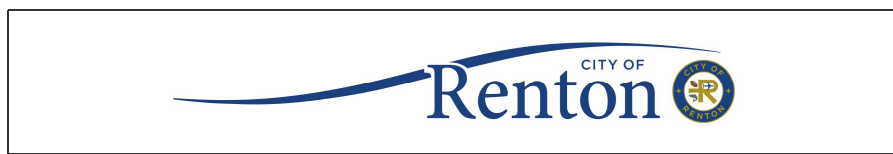
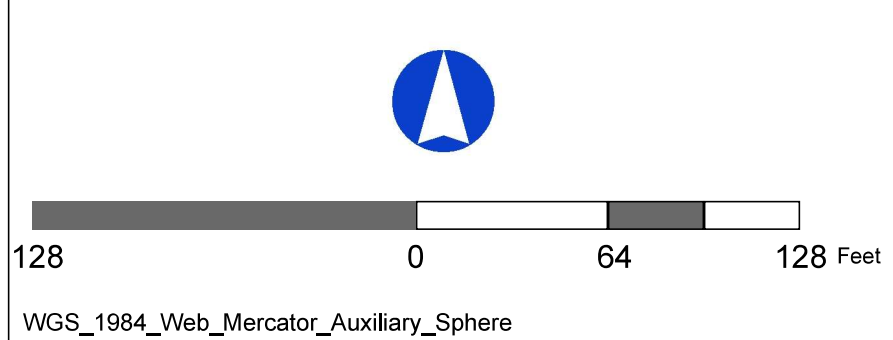


Coliform Sampling Sites - Lind Ave NW & Taylor PI NW



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS032

- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant



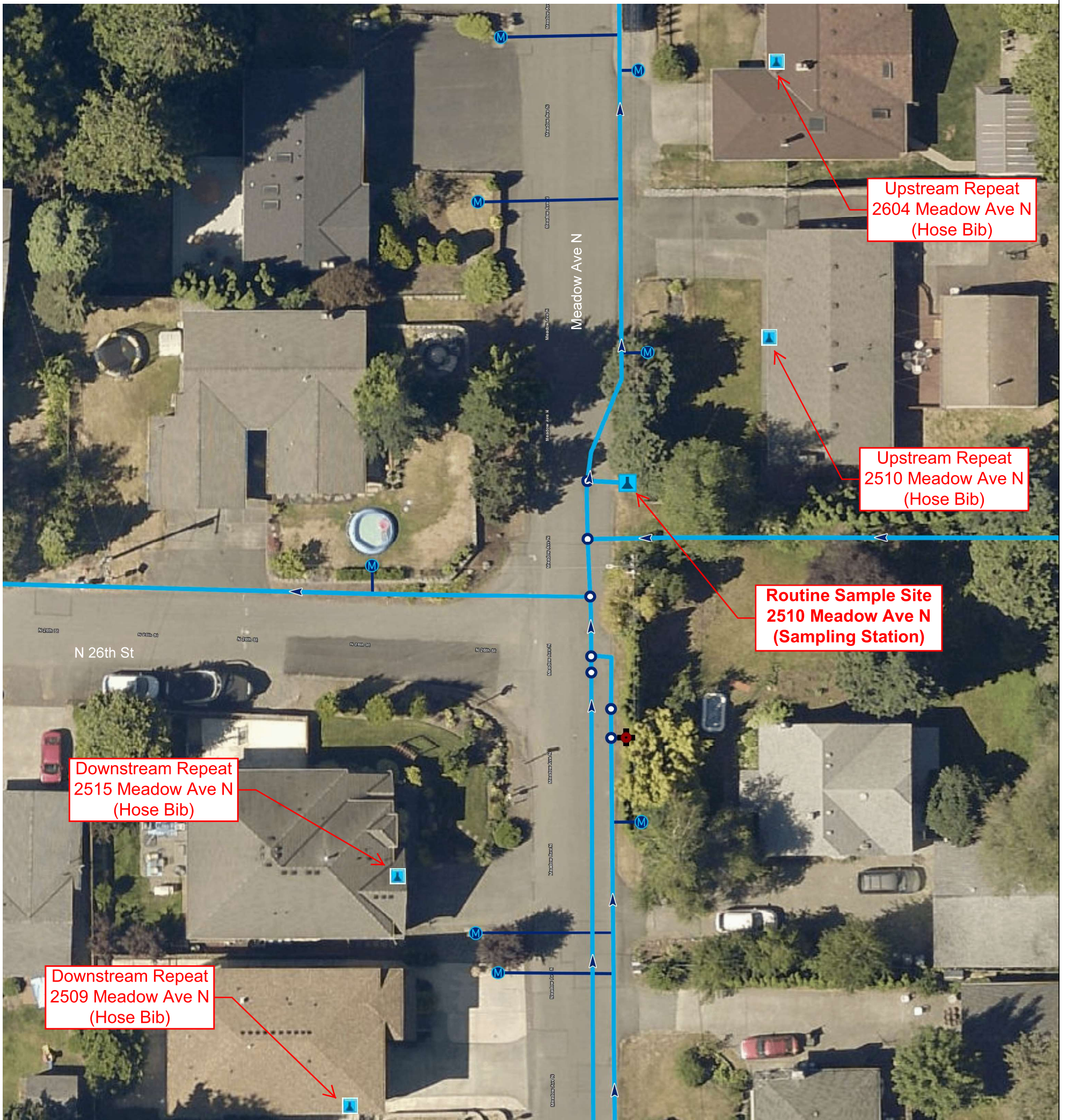
**Prepared by: Katie Nolan,
 Water Utility Engineering**

Prepared on: October 22, 2019

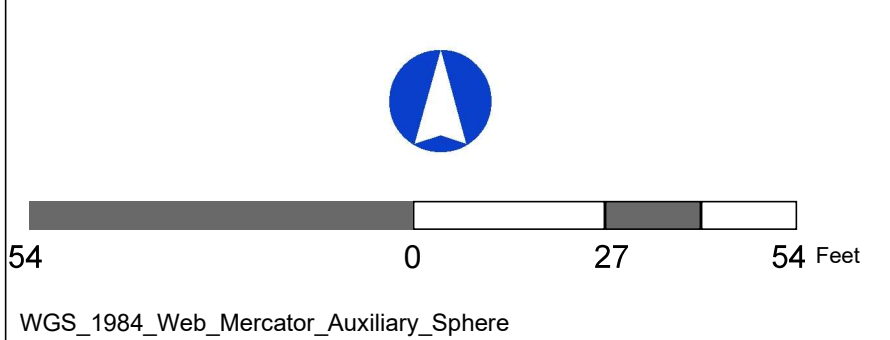
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

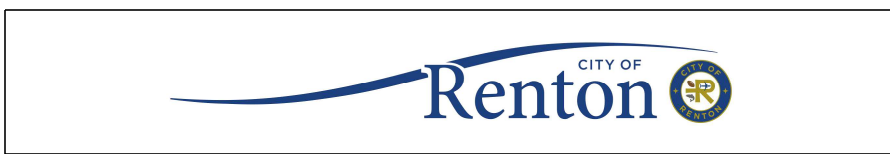
Coliform Sampling Sites - 2510 Meadow Ave N



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS033



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant

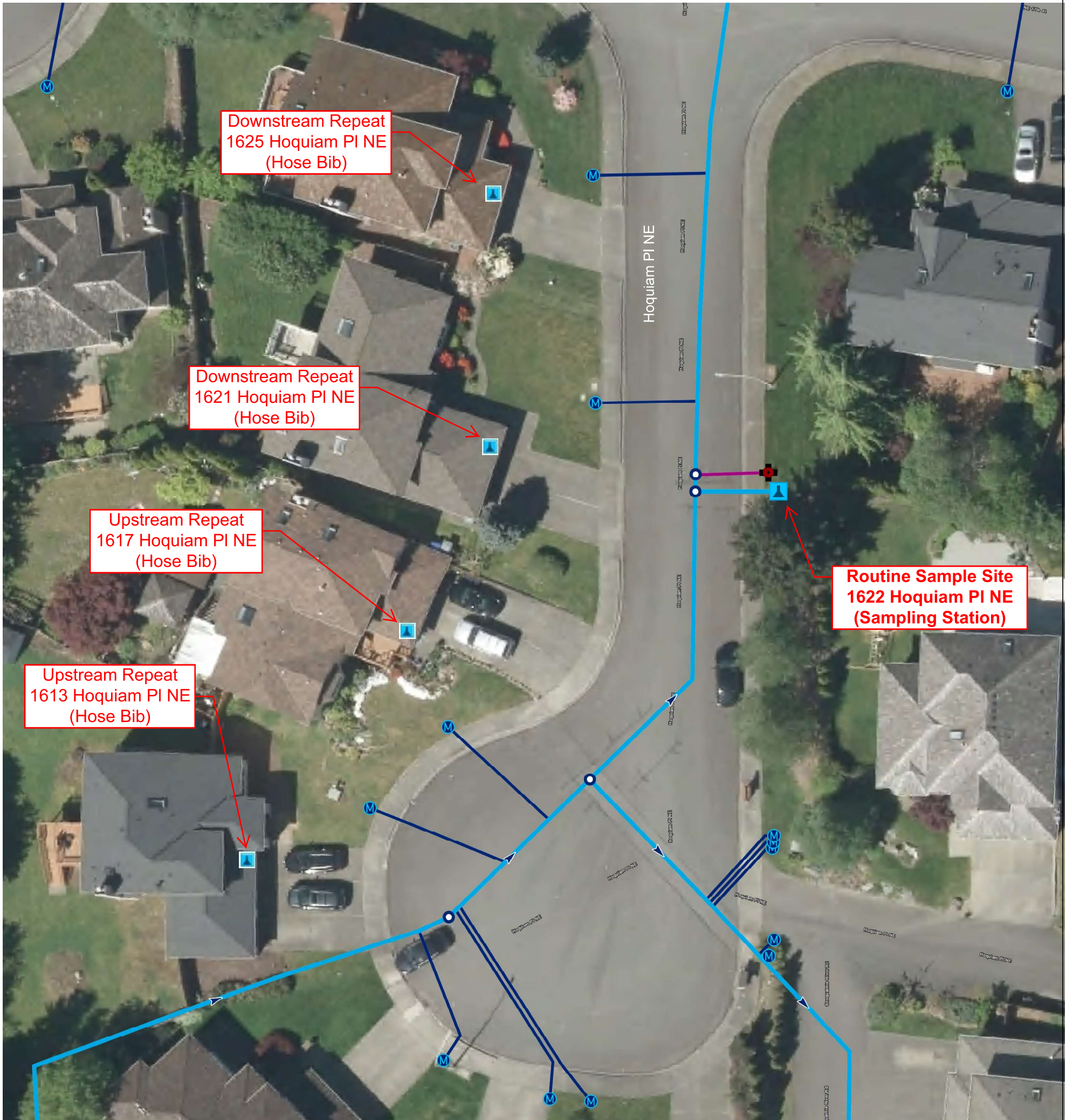


Prepared by: Katie Nolan, Water Utility Engineering
Prepared on: October 22, 2019

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Coliform Sampling Sites - 1622 Hoquiam PI NE



Notes

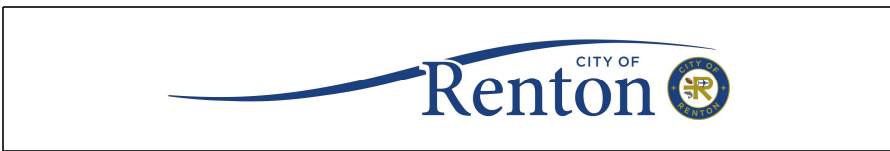
Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS034

54 0 27 54 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Service Connection
- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- Water Main
- Lateral Line
- Domestic
- Hydrant



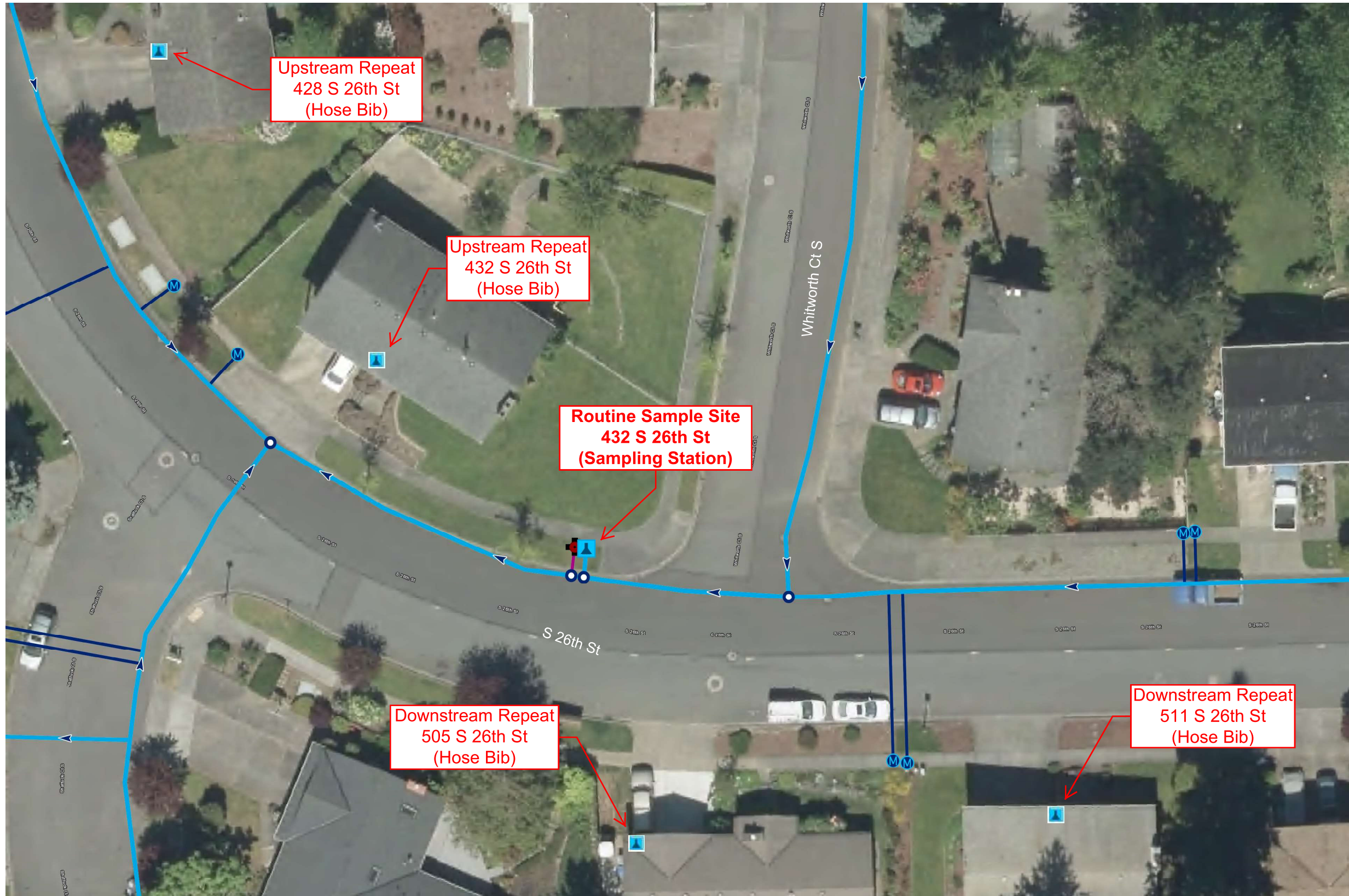
**Prepared by: Katie Nolan,
 Water Utility Engineering**

Prepared on: October 22, 2019

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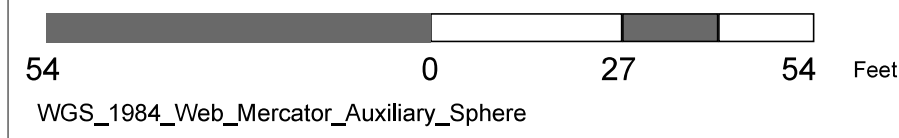
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Coliform Sampling Sites - 432 S 26th St



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS036



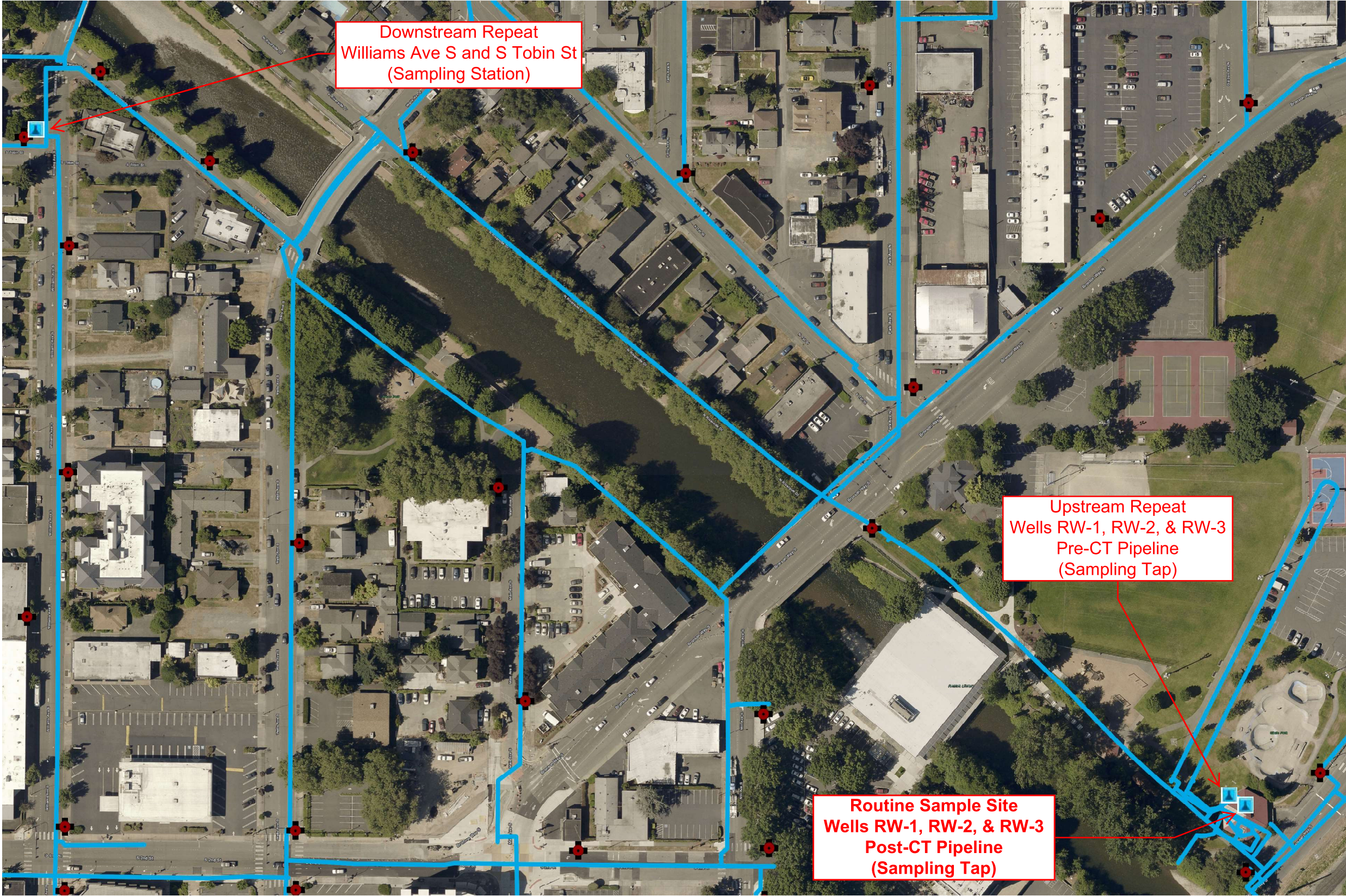
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **October 22, 2019**

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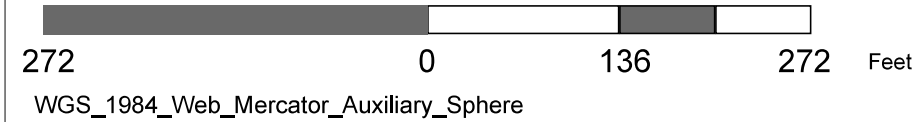


Coliform Sampling Sites - Wells RW-1, RW-2, & RW-3 Post-CT Pipeline



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Main

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS040



Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **October 22, 2019**

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Coliform Sampling Sites - 3000 SE Royal Hills Dr



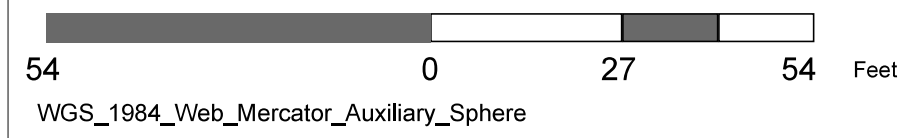
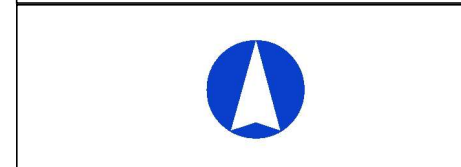
- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant

Downstream Repeat Sampling Station next to Apartment Bldg 13

Routine Sample Site 3000 SE Royal Hills Dr (Sampling Station)

Upstream Repeat Sampling Station near Hydrant SE 74

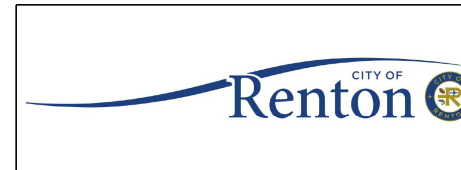
Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS041



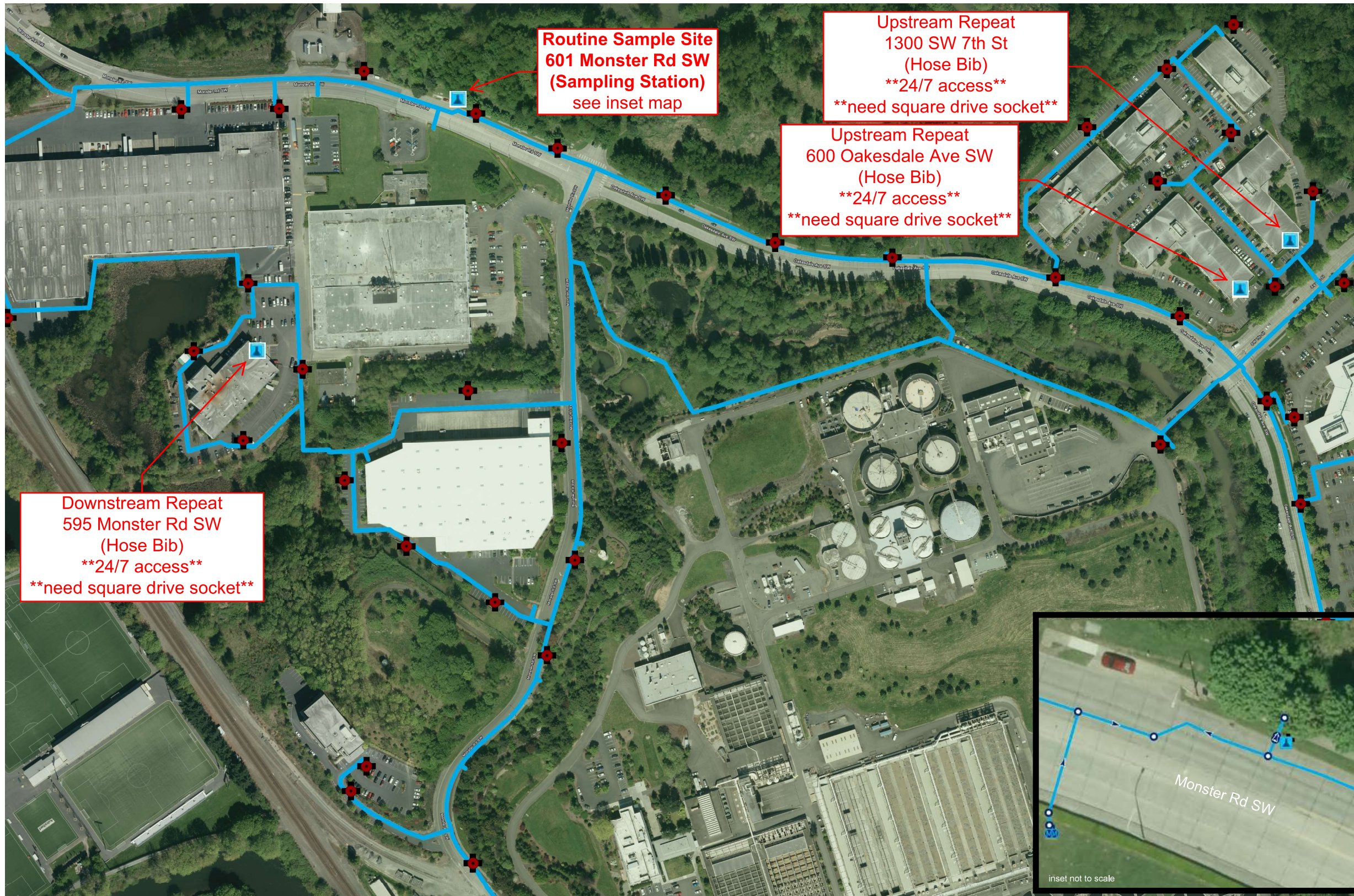
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **April 30, 2020**

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Coliform Sampling Sites - 601 Monster Rd SW



Routine Sample Site
601 Monster Rd SW
(Sampling Station)
 see inset map

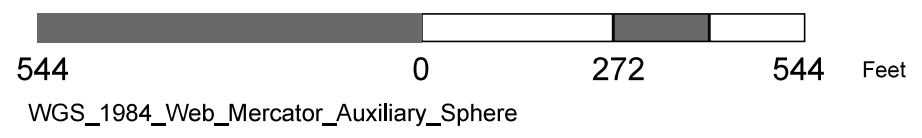
Upstream Repeat
 1300 SW 7th St
 (Hose Bib)
 24/7 access
 need square drive socket

Upstream Repeat
 600 Oakesdale Ave SW
 (Hose Bib)
 24/7 access
 need square drive socket

Downstream Repeat
 595 Monster Rd SW
 (Hose Bib)
 24/7 access
 need square drive socket

- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS042



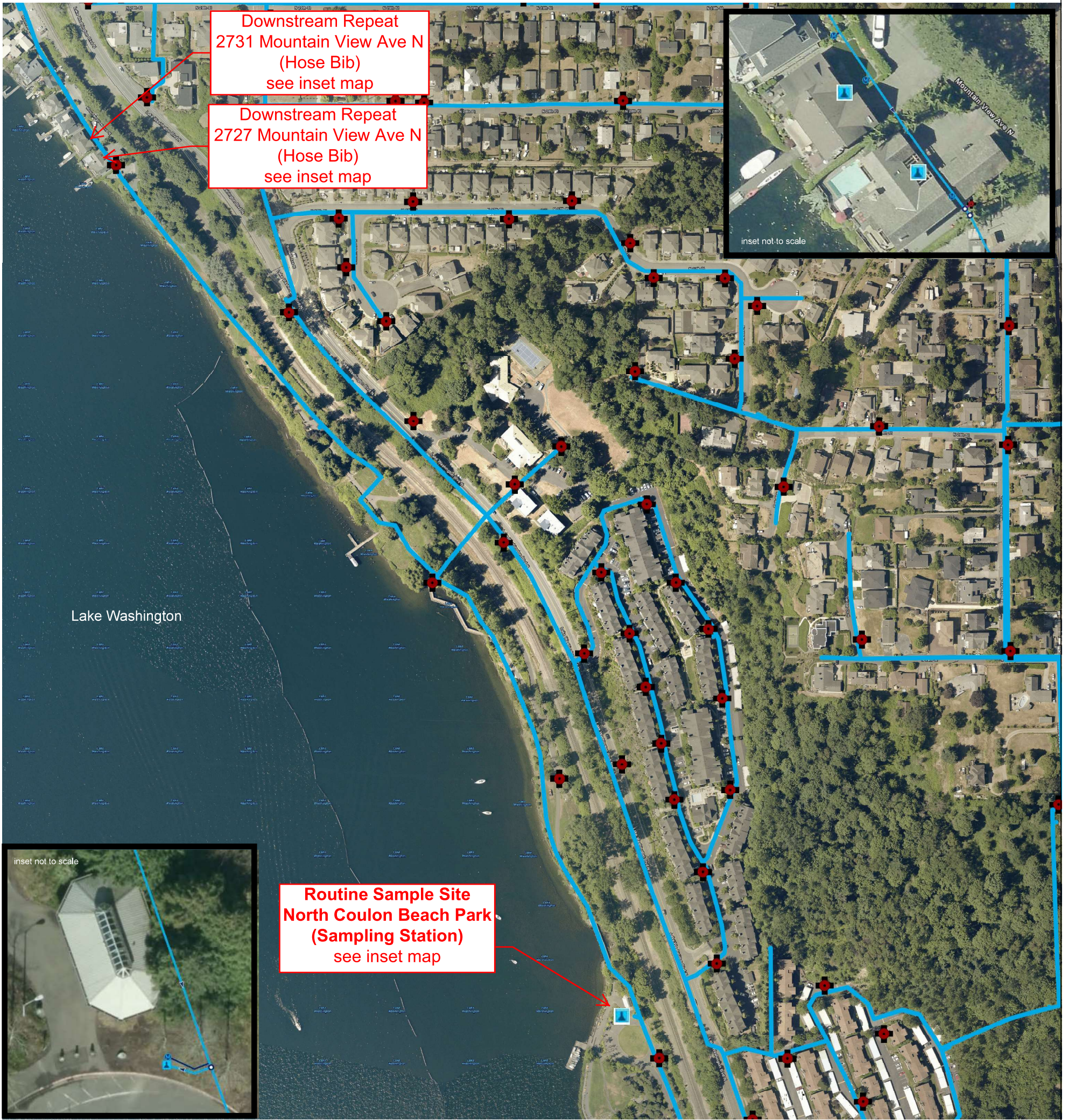
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **October 22, 2019**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION



Coliform Sampling Sites - Coulon Beach Park Downstream



Notes

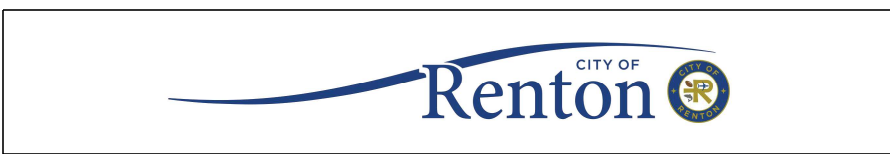
Coliform Monitoring Plan
Water System: City of Renton
Water System ID: 71850L
WQ Database ID: MS043

544 0 272 544 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Service Connection
- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- Water Main
- Lateral Line
- Domestic



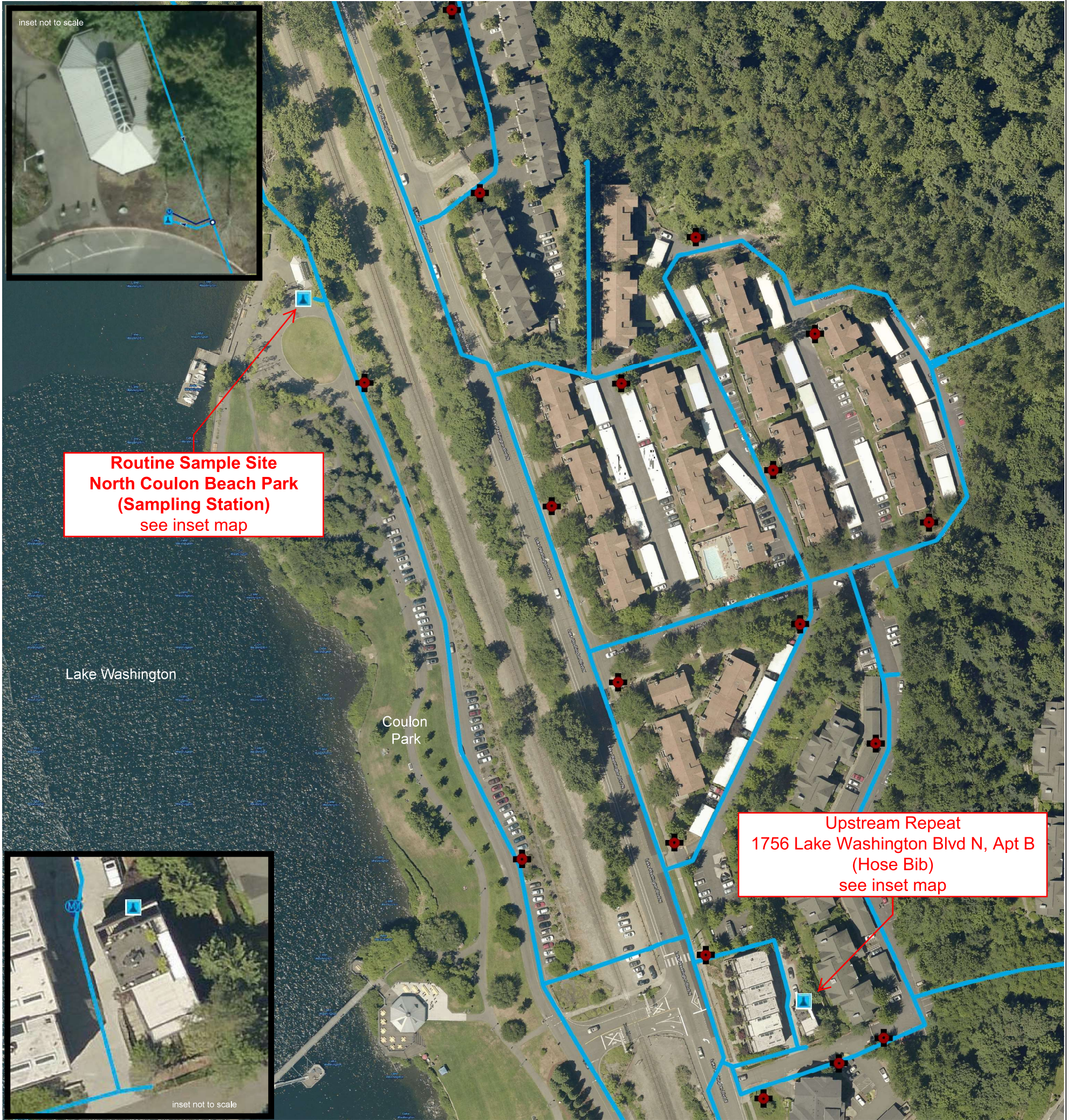
**Prepared by: Katie Nolan,
Water Utility Engineering**

Prepared on: October 22, 2019

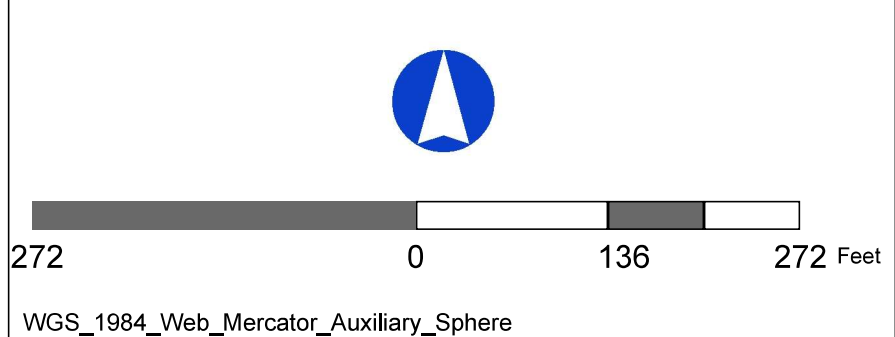
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

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Coliform Sampling Sites - Coulon Beach Park Upstream



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS043



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic



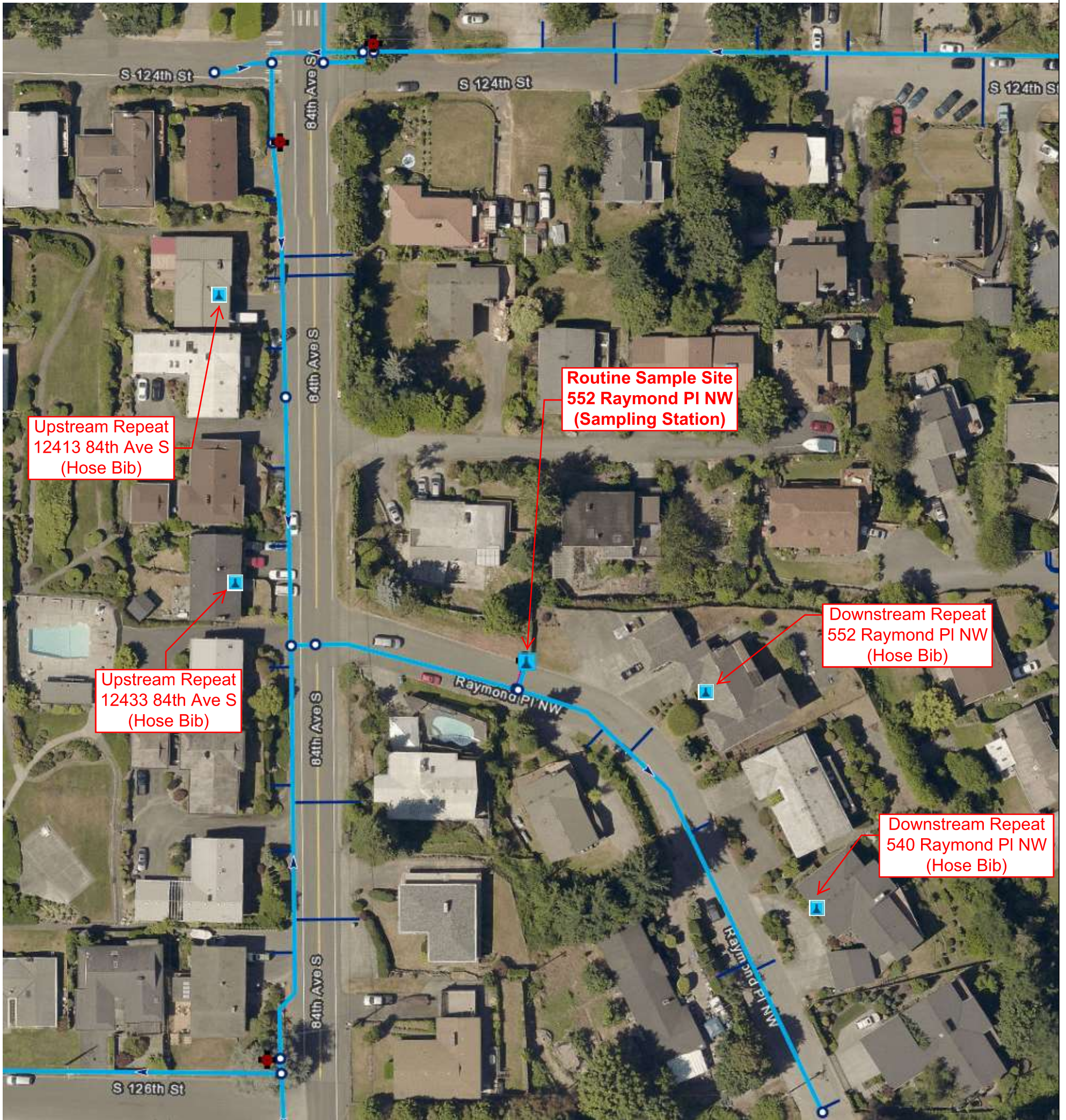
**Prepared by: Katie Nolan,
Water Utility Engineering**

Prepared on: October 22, 2019

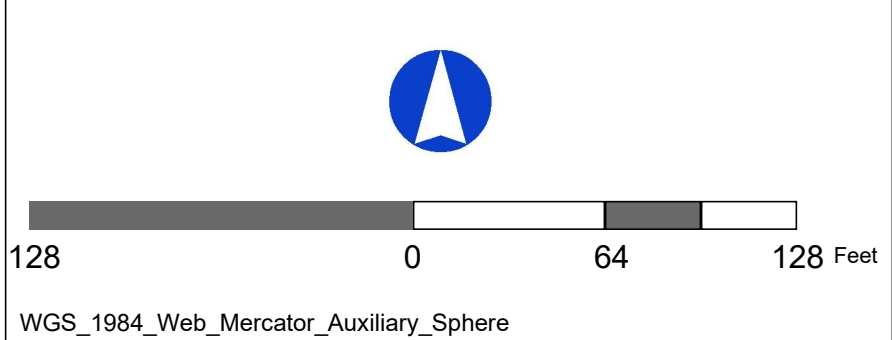
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THIS MAP IS NOT TO BE USED FOR NAVIGATION

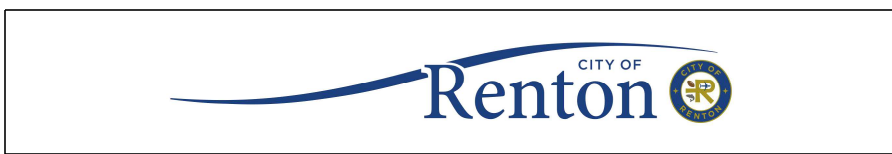
Coliform Sampling Sites - 552 Raymond PI NW



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS044



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant



Prepared by: Katie Nolan, Water Utility Engineering
Prepared on: October 22, 2019

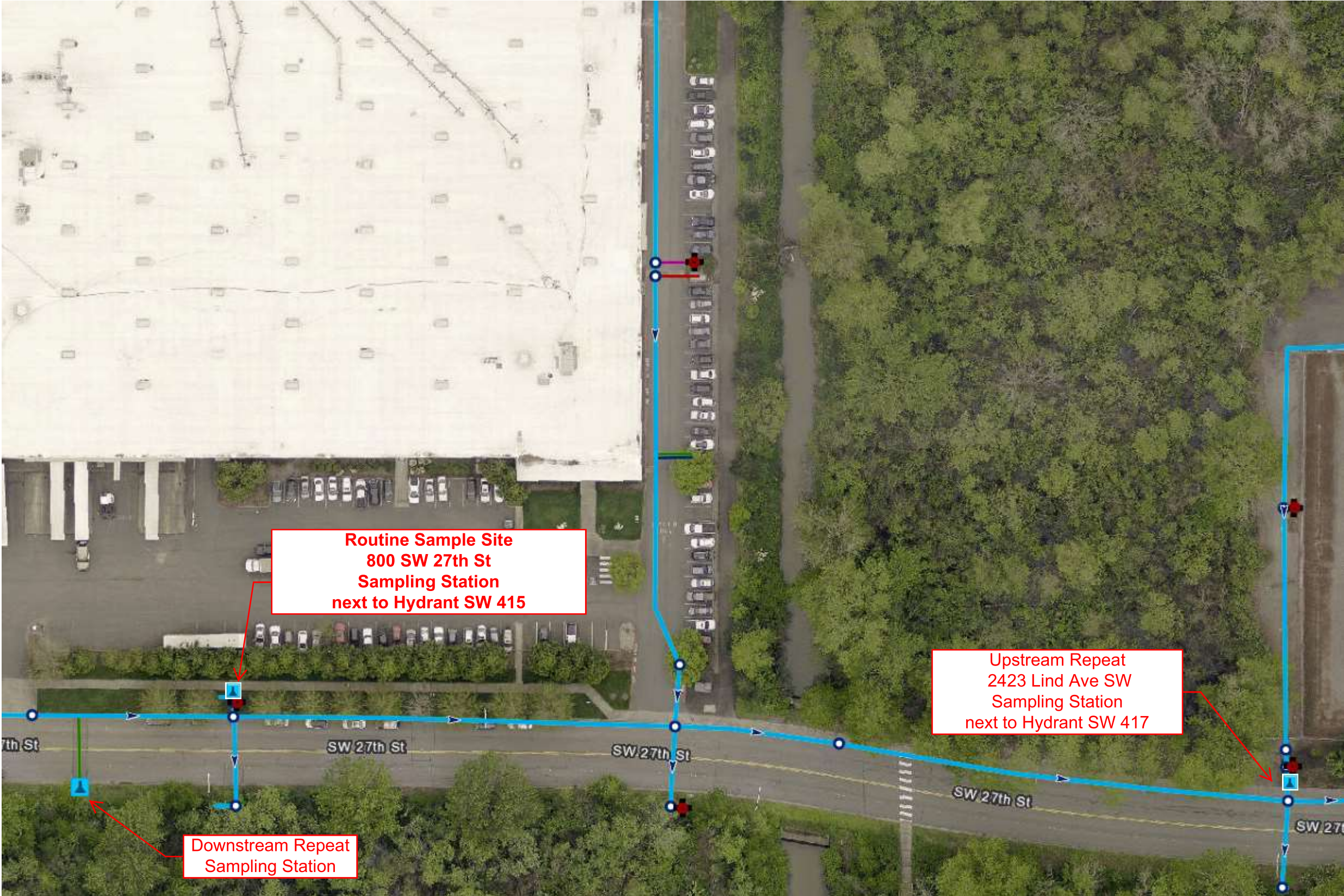
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

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Coliform Sampling Sites - 800 SW 27th St

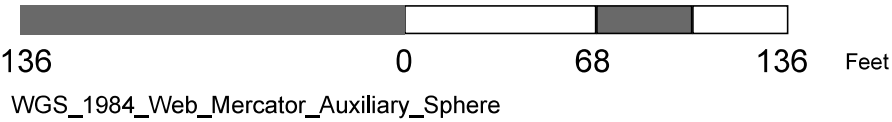
Legend

-  Sampling Point
-  Renton Fire Hydrant
-  Water Fitting
-  Water Main
-  Lateral Line
-  Domestic
-  Fire
-  Hydrant
-  Irrigation



Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS049



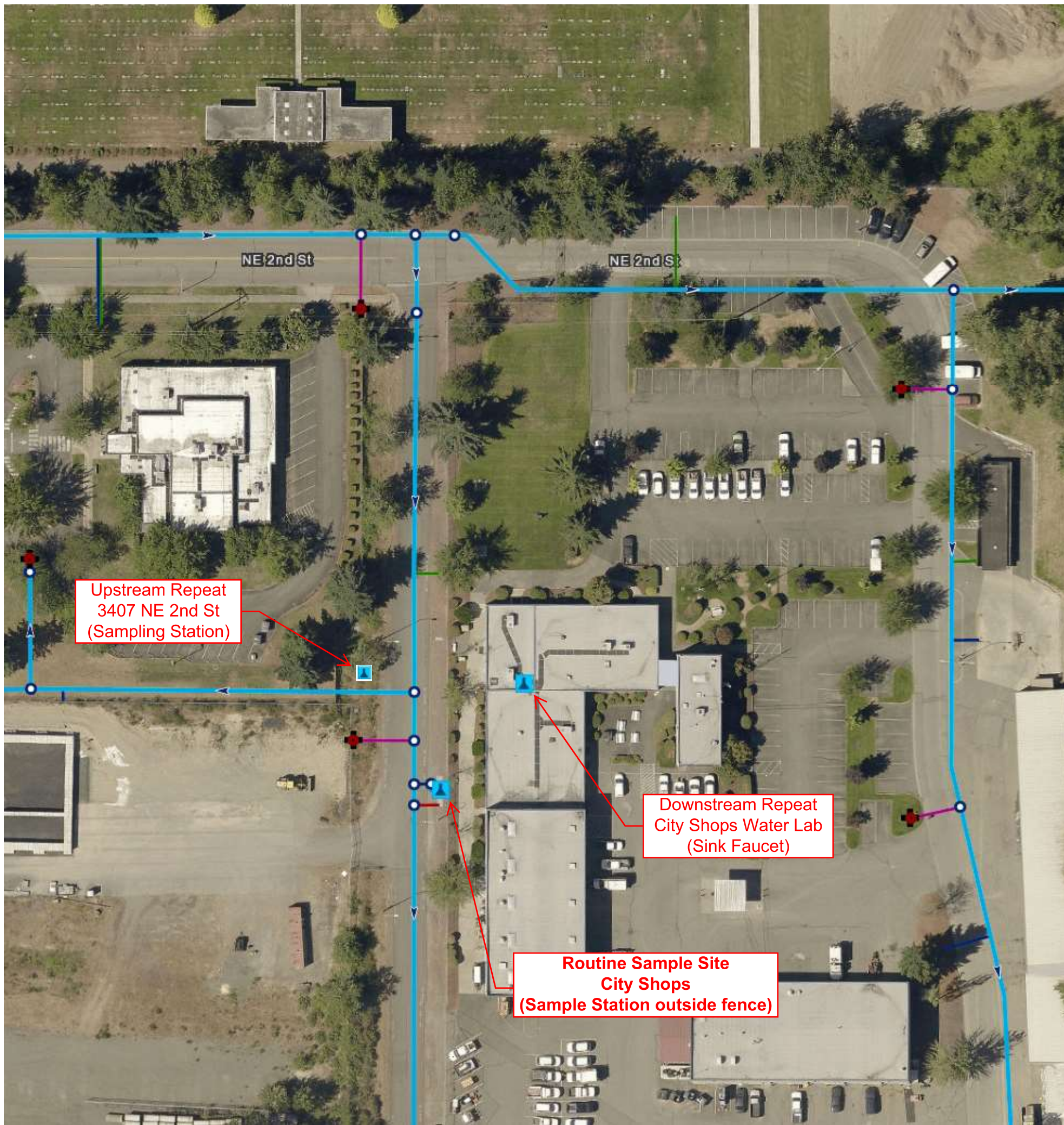
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **April 30, 2020**

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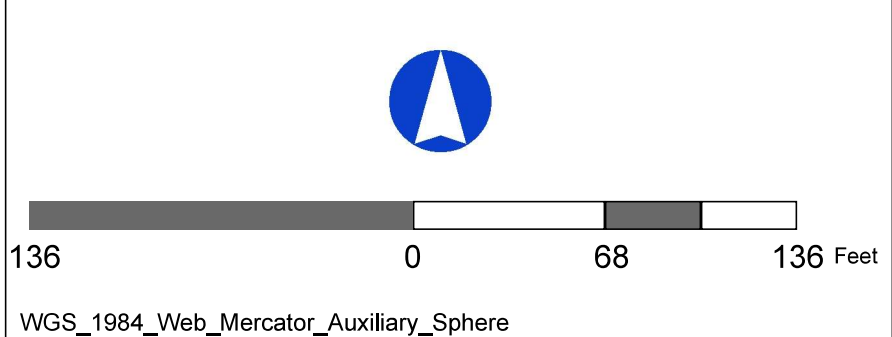
THIS MAP IS NOT TO BE USED FOR NAVIGATION



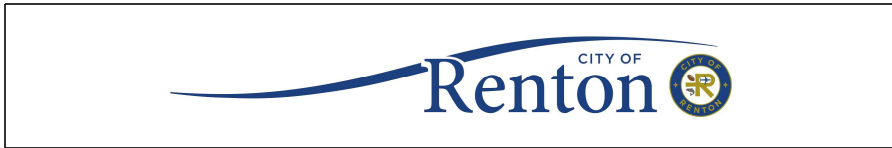
Coliform Sampling Sites - City Shops



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS054



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Fire
 - Hydrant
 - Irrigation



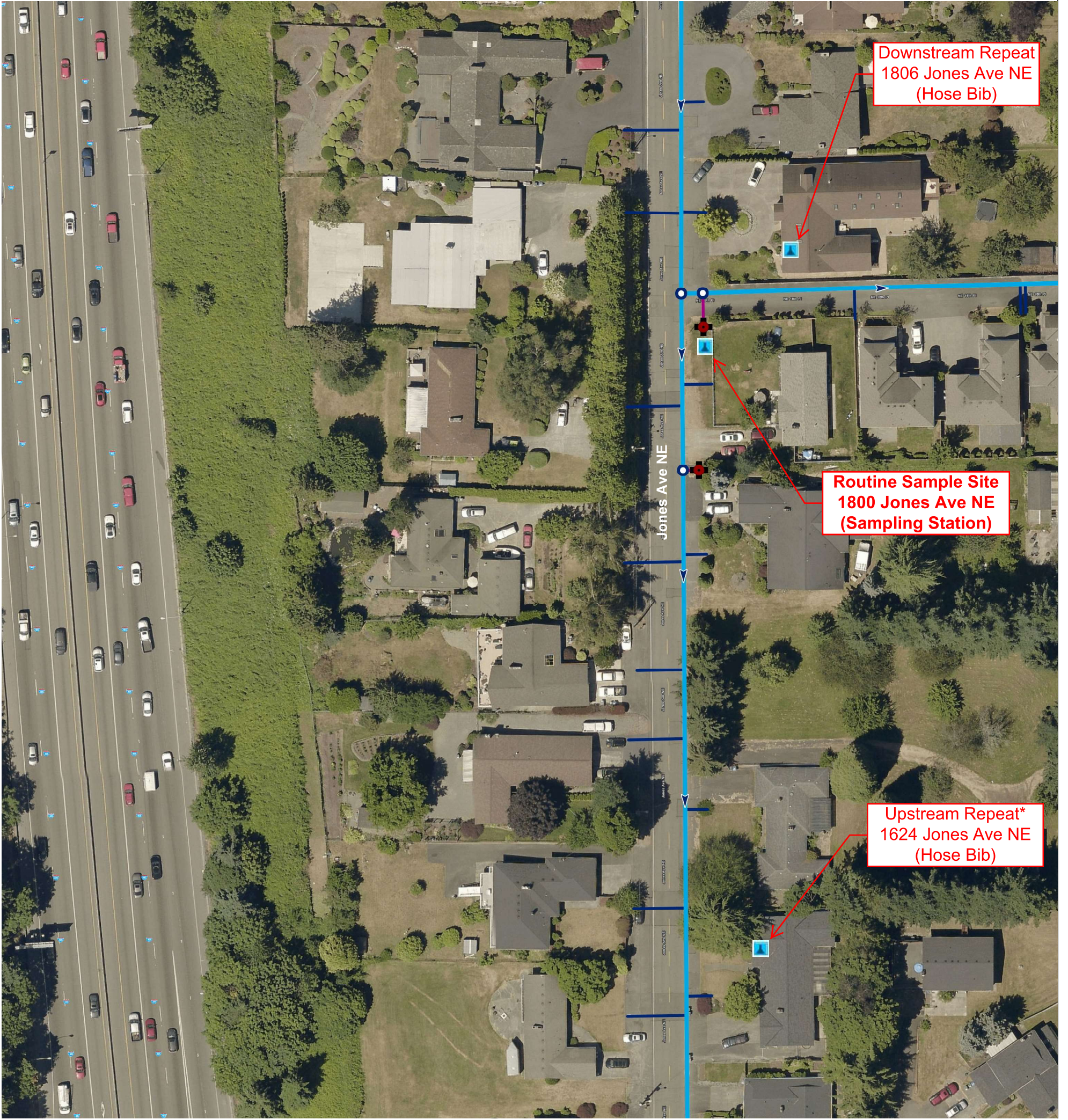
**Prepared by: Katie Nolan,
 Water Utility Engineering**

Prepared on: April 30, 2020

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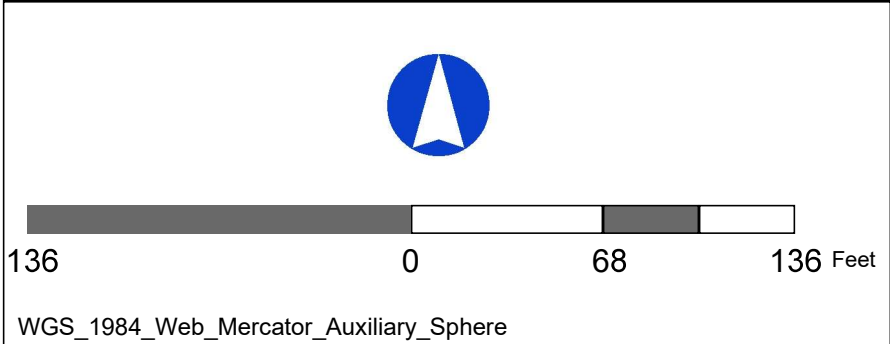
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Coliform Sampling Sites - 1800 Jones Ave NE



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS055

*Upstream Repeat Site selected based on operator's field observations (access issues with neighboring houses adjacent to sampling station)



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant



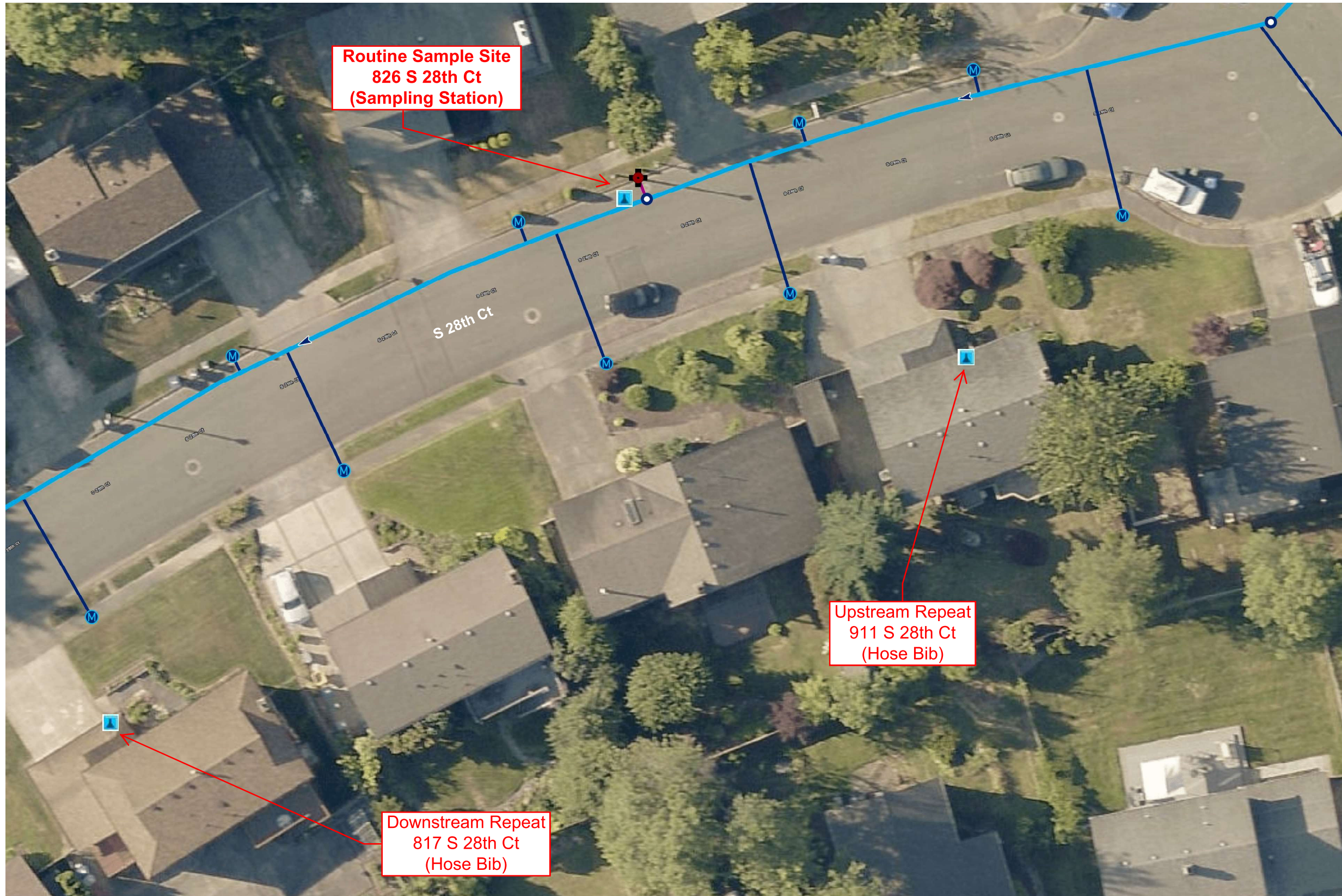
Prepared by: Katie Nolan, Water Utility Engineering

Prepared on: January 14, 2020

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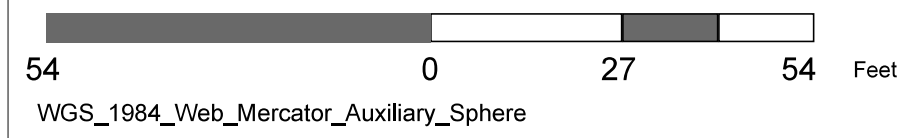
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Coliform Sampling Sites - 826 S 28th Ct



- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS056



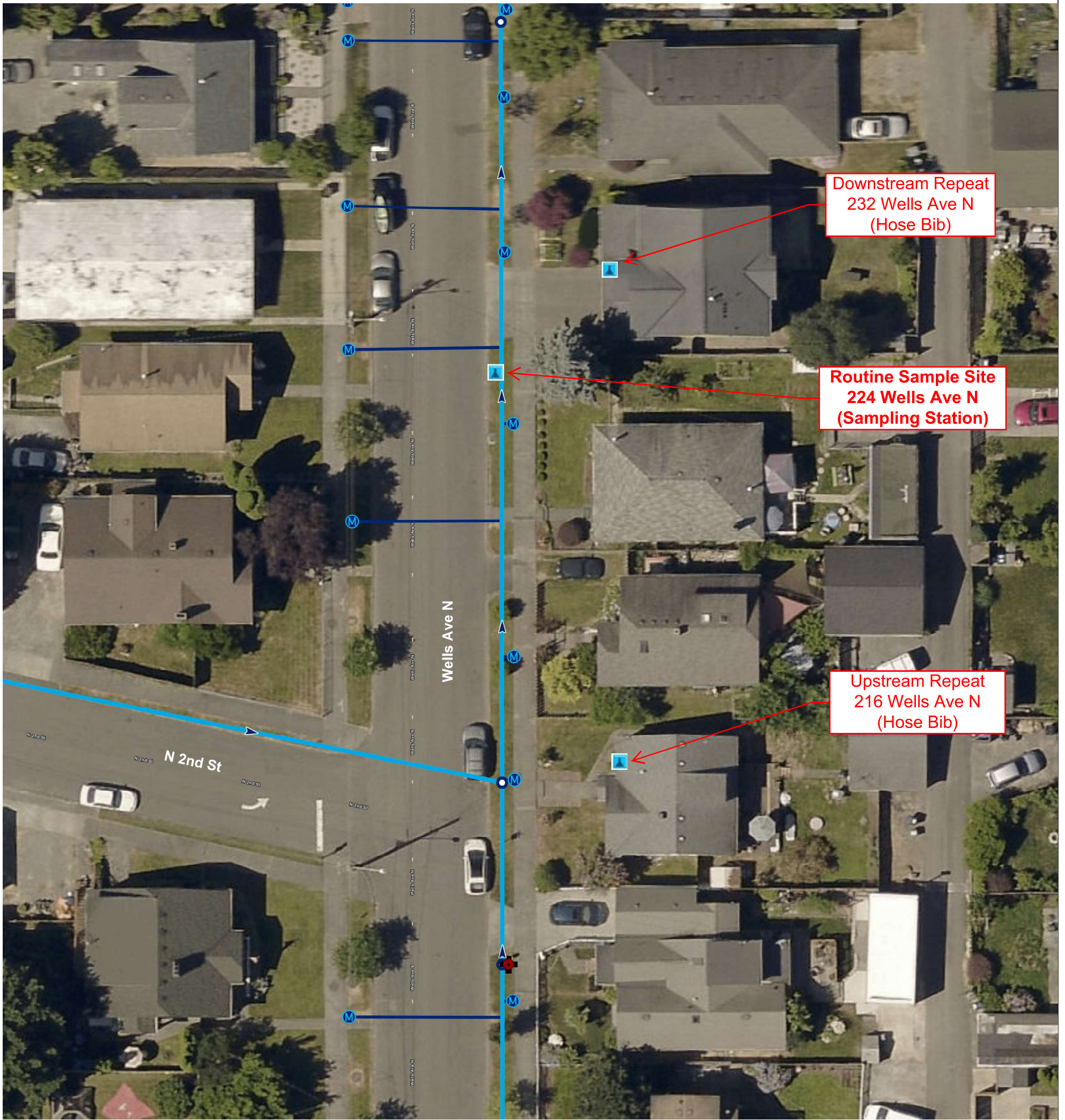
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **January 14, 2020**

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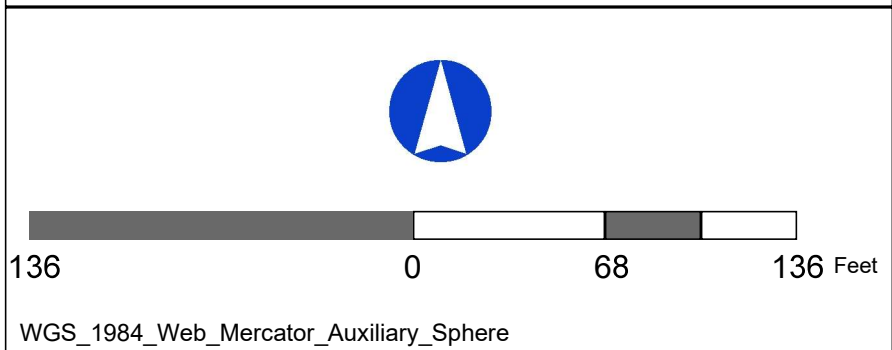
THIS MAP IS NOT TO BE USED FOR NAVIGATION



Coliform Sampling Sites - 224 Wells Ave N



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS057



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic

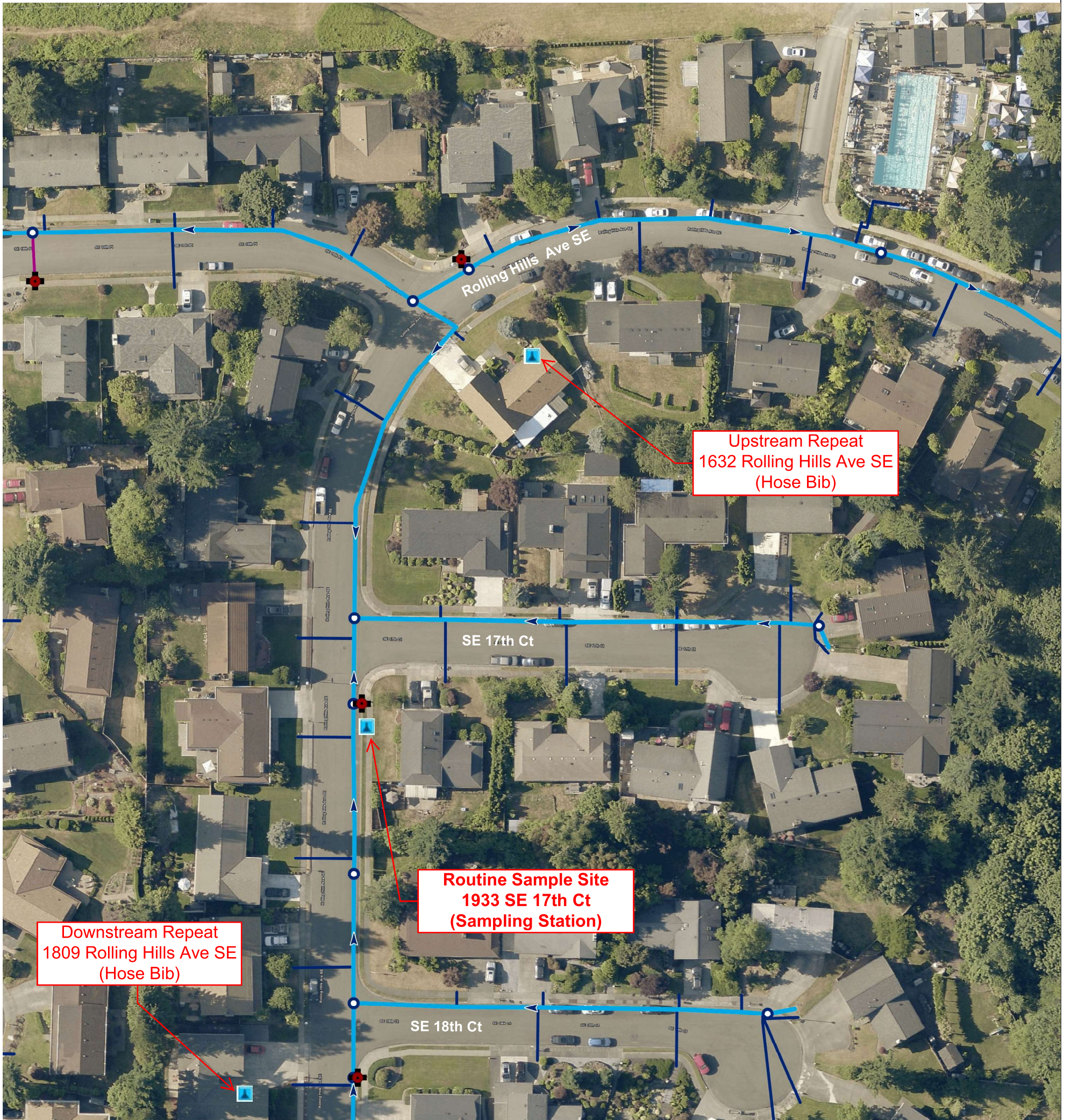


Prepared by: Katie Nolan, Water Utility Engineering
Prepared on: January 14, 2020

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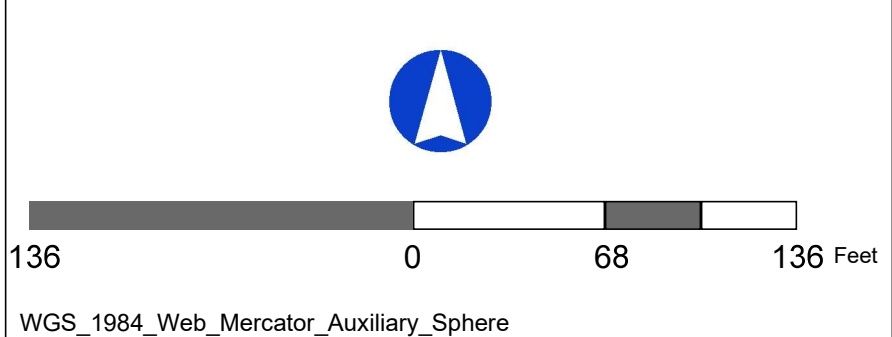
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Coliform Sampling Sites - 1933 SE 17th Ct



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS058

- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Hydrant



**Prepared by: Katie Nolan,
 Water Utility Engineering**

Prepared on: January 14, 2020

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Coliform Sampling Sites - 1000 Shelton Ave SE



Notes

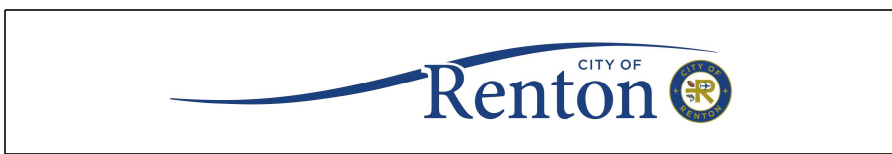
Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS059

272 0 136 272 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Sampling Point
- Renton Fire Hydrant
- Water Main



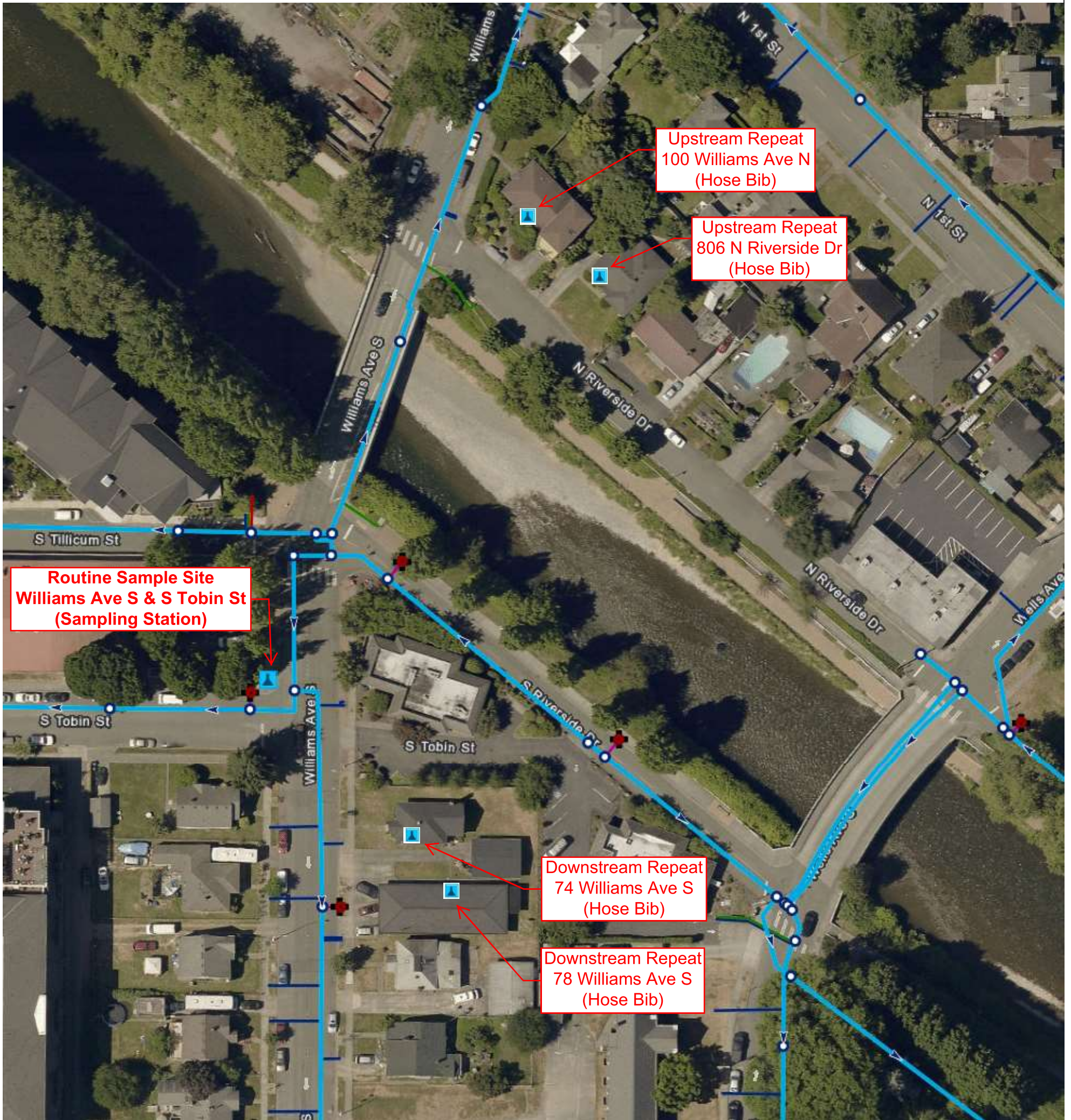
Prepared by: Katie Nolan, Water Utility Engineering

Prepared on: January 14, 2020

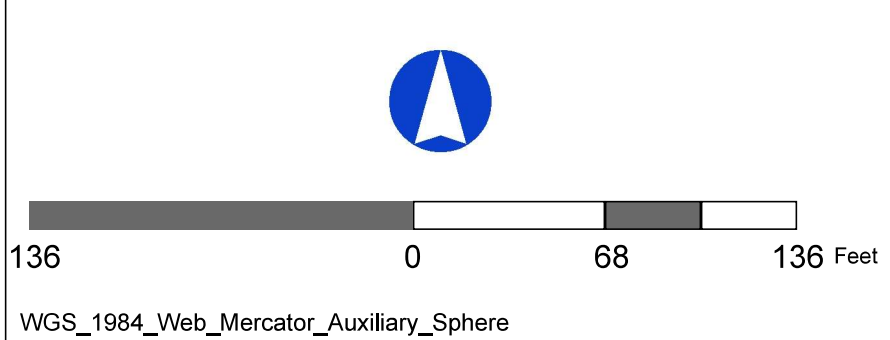
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

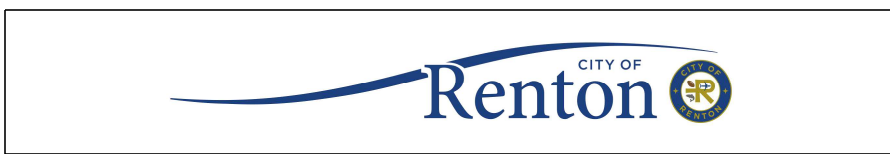
Coliform Sampling Sites - Williams Ave S & S Tobin St



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: pH_Smpl_Site_8



- Legend**
- Sampling Point
 - Renton Fire Hydrant
 - Water Fitting
 - Water Main
 - Lateral Line
 - Domestic
 - Fire
 - Hydrant
 - Irrigation



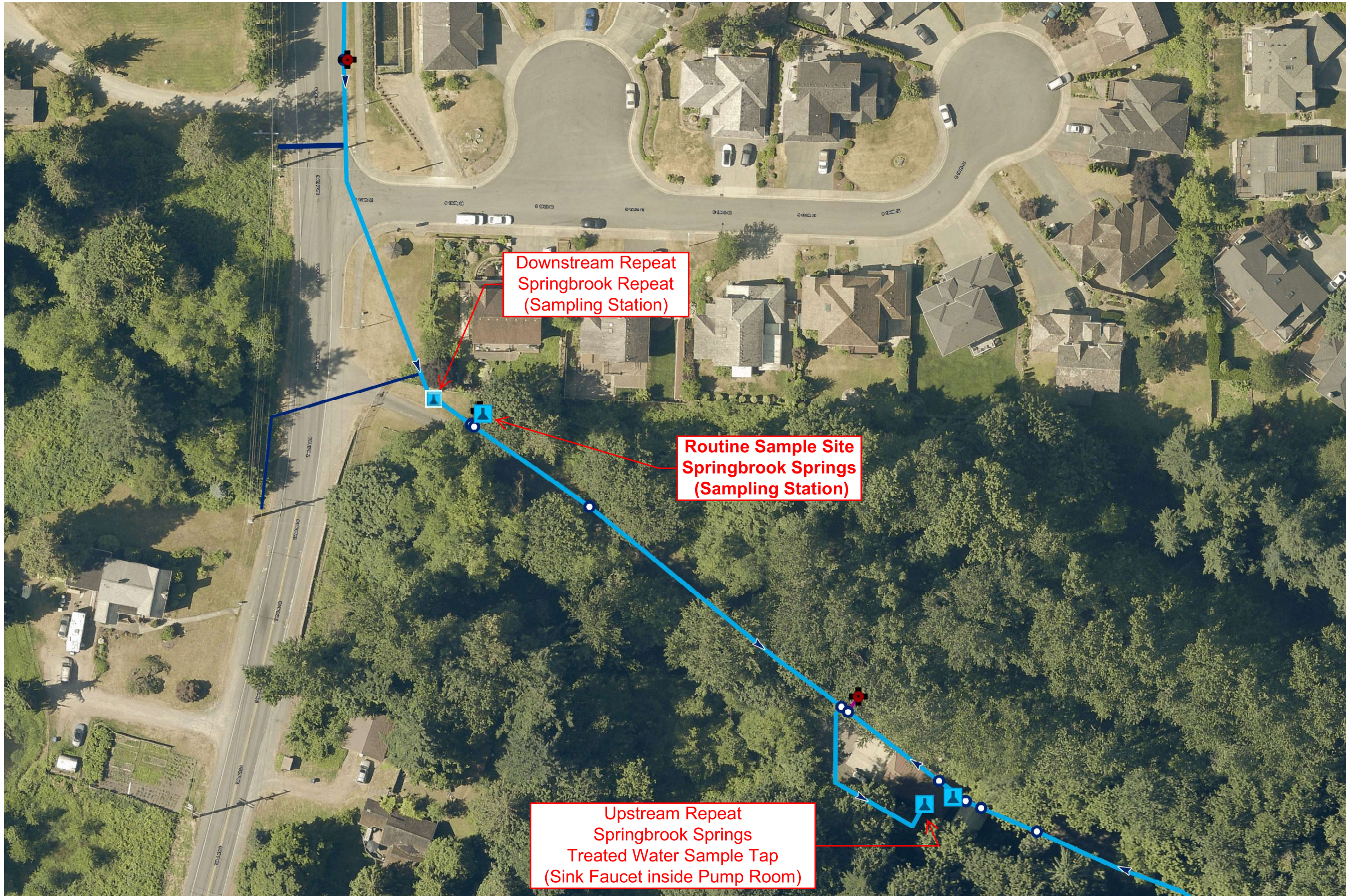
Prepared by: Katie Nolan, Water Utility Engineering
Prepared on: October 22, 2019

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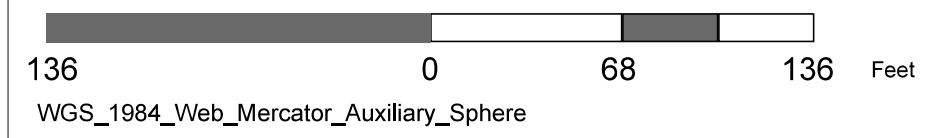
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Coliform Sampling Sites - Springbrook Springs

- Legend**
-  Sampling Point
 -  Renton Fire Hydrant
 -  Water Fitting
 -  Water Main
 -  Lateral Line
 -  Domestic
 -  Hydrant



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: POE13



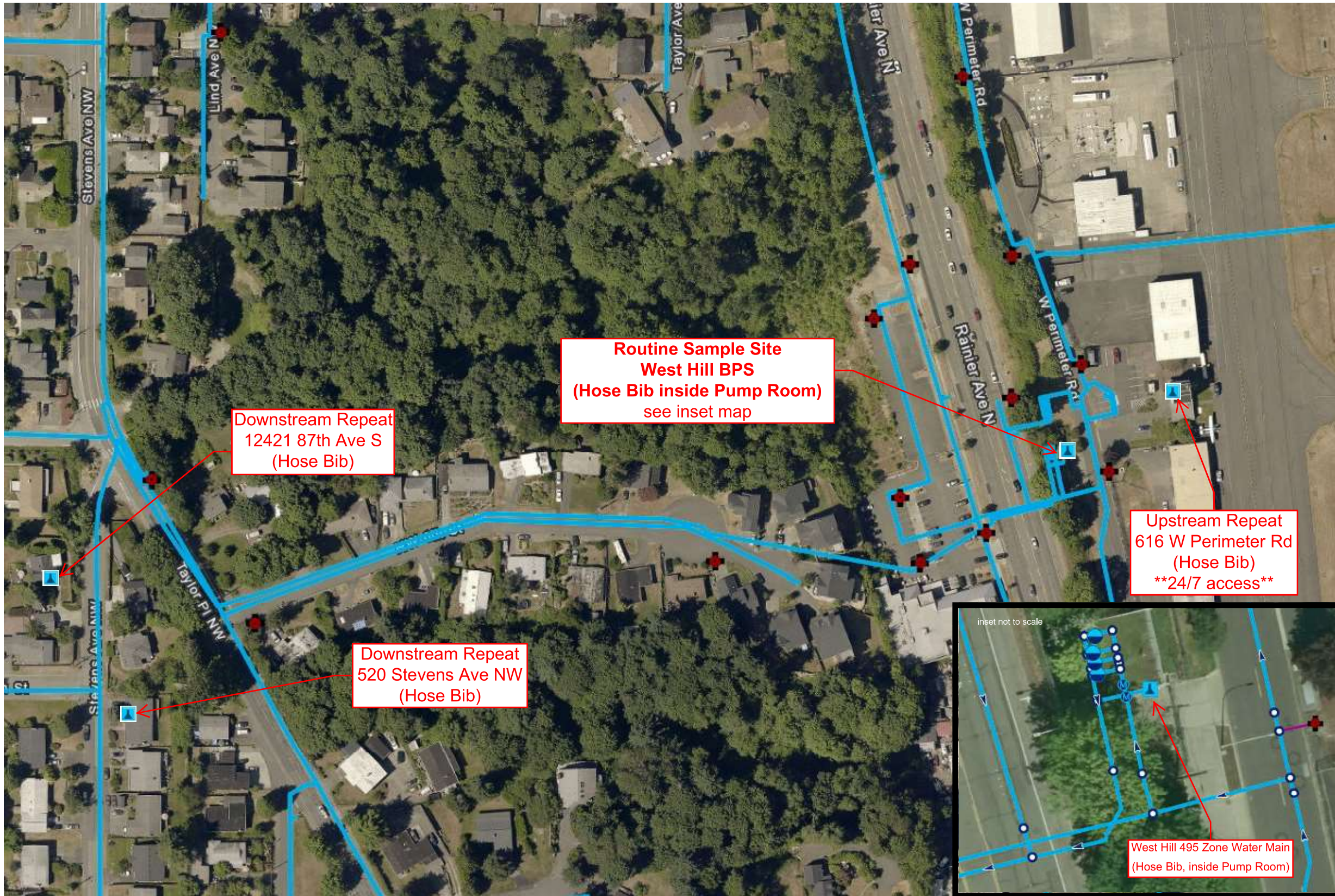
Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **October 22, 2019**

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Coliform Sampling Sites - West Hill Booster Pump Station



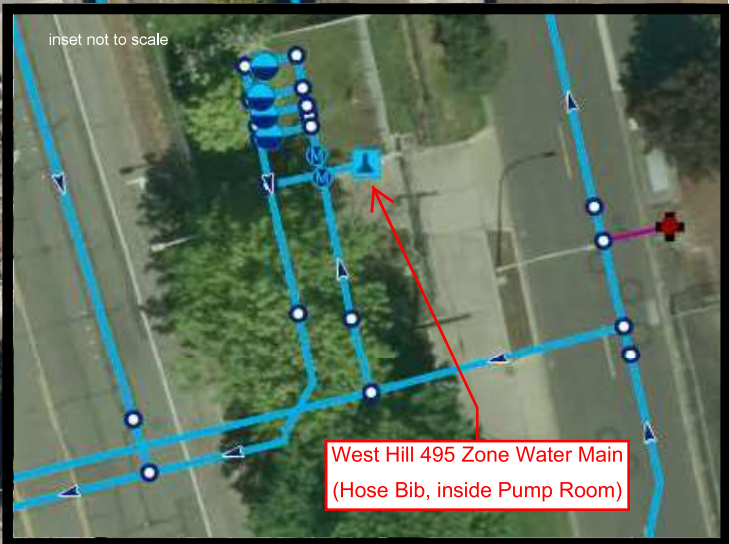
- Legend**
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Control Valve
 - Water Fitting
 - Water Main
 - Lateral Line
 - Hydrant

Downstream Repeat
12421 87th Ave S
(Hose Bib)

Routine Sample Site
West Hill BPS
(Hose Bib inside Pump Room)
see inset map

Upstream Repeat
616 W Perimeter Rd
(Hose Bib)
****24/7 access****

Downstream Repeat
520 Stevens Ave NW
(Hose Bib)



West Hill 495 Zone Water Main
(Hose Bib, inside Pump Room)

Notes
Coliform Monitoring Plan
Water System: City of Renton
Water System ID: 71850L
WQ Database ID: PS009



Prepared by: Katie Nolan, **Water Utility Engineering**
Prepared on: **October 22, 2019**

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Coliform Sampling Sites - Maplewood Treatment Plant



Legend

- Sampling Point
- Renton Fire Hydrant
- Water Main
- Lateral Line
- Hydrant

Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: PS010



Prepared by: Katie Nolan, **Water Utility Engineering**

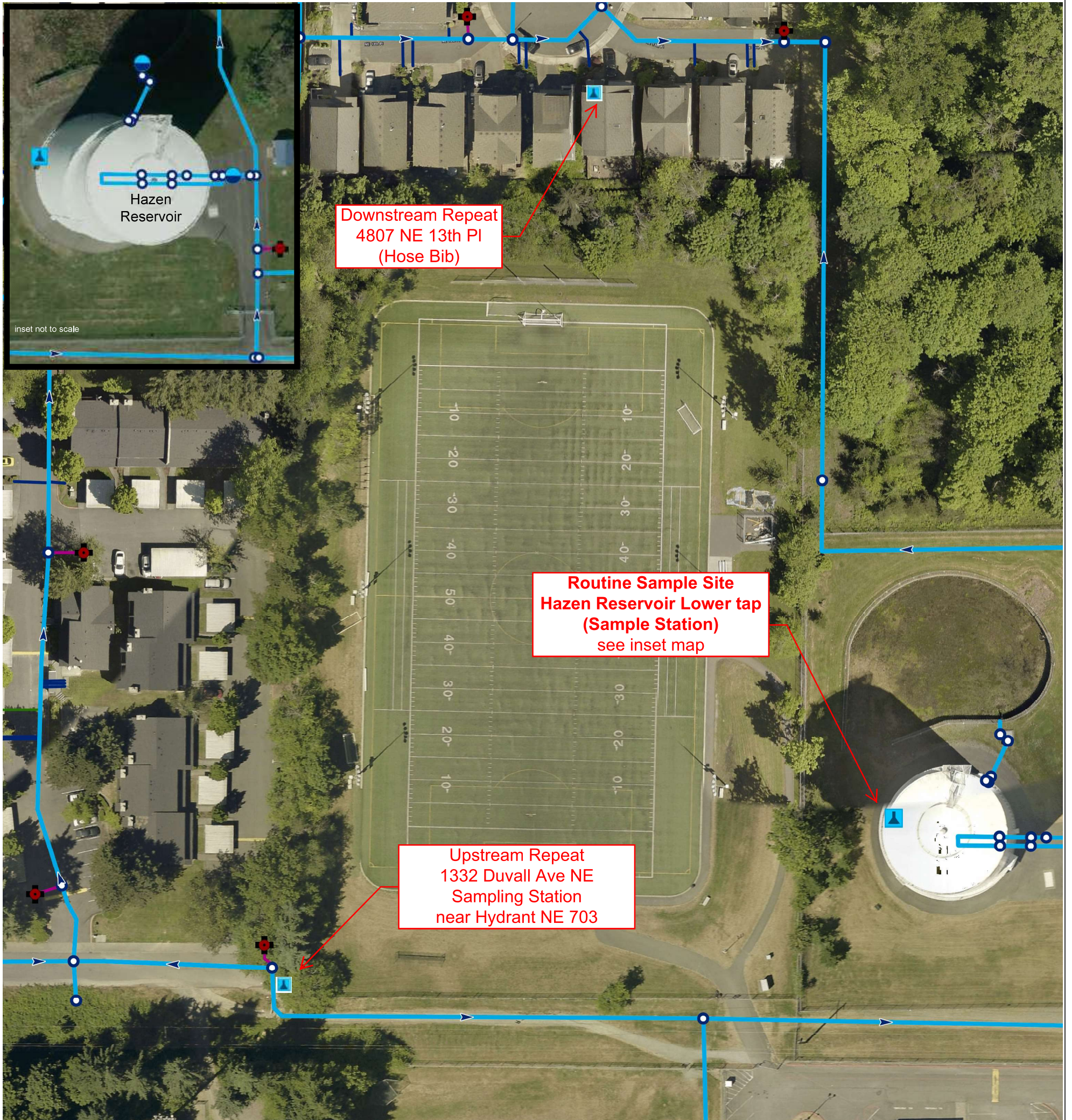
Prepared on: **April 30, 2020**

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Coliform Sampling Sites - Hazen Reservoir



Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: RES003



136 0 68 136 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Sampling Point
- Renton Fire Hydrant
- Control Valve
- Water Fitting
- Water Main
- Lateral Line
- Domestic
- Hydrant
- Irrigation






Prepared by: **Katie Nolan,**
Water Utility Engineering

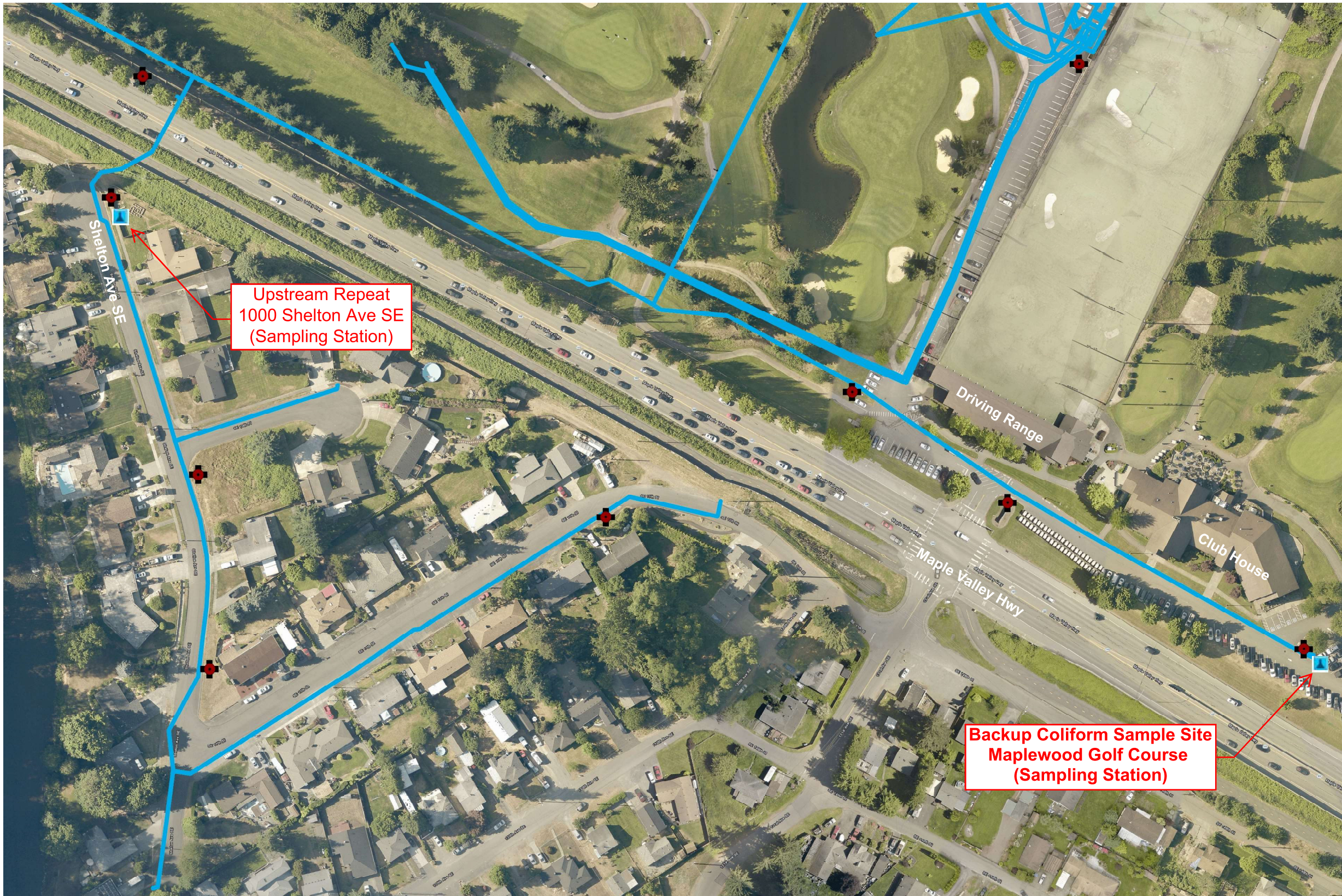
Prepared on: **April 30, 2020**

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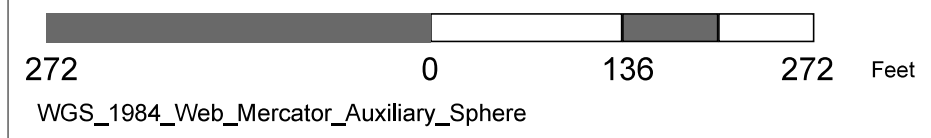
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Backup Coliform Sampling Sites - Maplewood Golf Course

- Legend
-  Sampling Point
 -  Renton Fire Hydrant
 -  Water Main



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: MS031











Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **January 21, 2020**

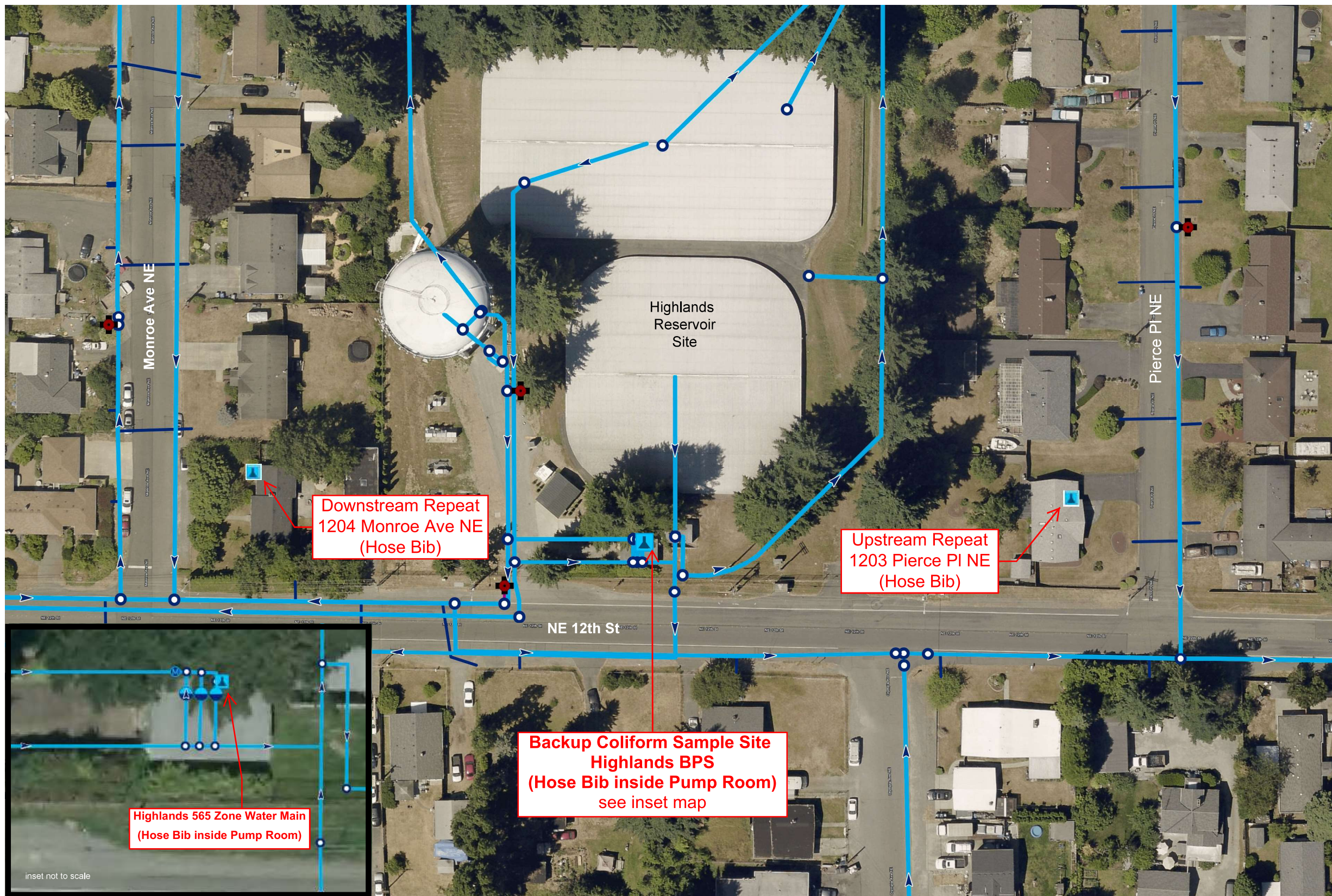
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Backup Coliform Sampling Sites - Highlands Booster Pump Station

- Legend**
-  Sampling Point
 -  Renton Fire Hydrant
 -  Control Valve
 -  Water Fitting
 -  Water Main
 -  Lateral Line
 -  Domestic
 -  Hydrant



Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: PS001



Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **January 21, 2020**

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THIS MAP IS NOT TO BE USED FOR NAVIGATION



Backup Coliform Sampling Sites - North Talbot Booster Pump Station



Legend

- Sampling Point
- Renton Fire Hydrant
- Water Fitting
- Water Main
- Lateral Line
- Domestic
- Hydrant

Notes

Coliform Monitoring Plan
Water System: City of Renton
Water System ID: 71850L
WQ Database ID: PS005



Prepared by: Katie Nolan, **Water Utility Engineering**

Prepared on: **January 21, 2020**










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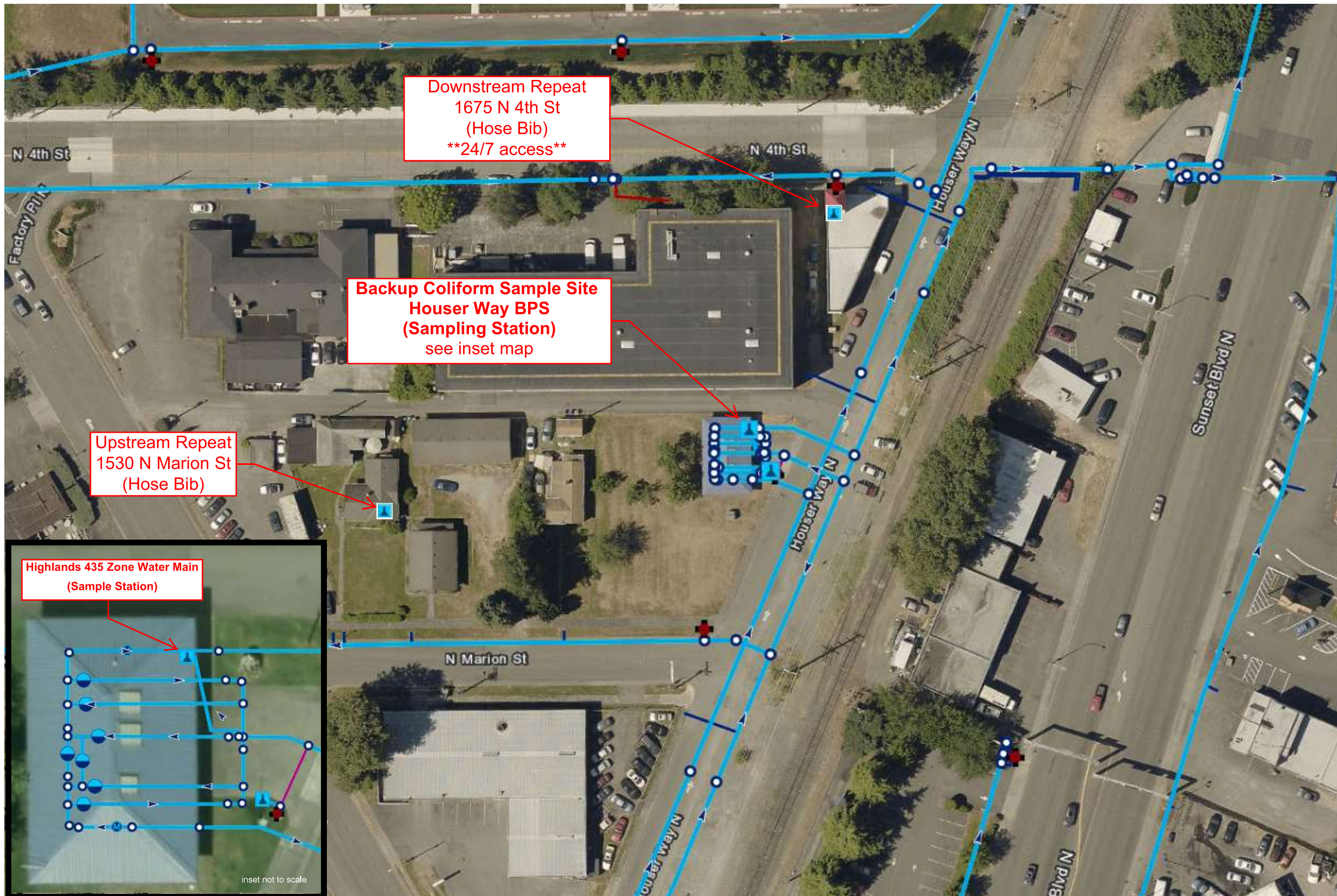
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Backup Coliform Sampling Sites - Houser Way Booster Pump Station

Legend

-  Service Connection
-  Sampling Point
-  Renton Fire Hydrant
-  Water Fitting
-  Water Main
-  Lateral Line
-  Domestic
-  Fire
-  Hydrant



Notes

Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: PS011



Prepared by: Katie Nolan, **Water Utility Engineering**

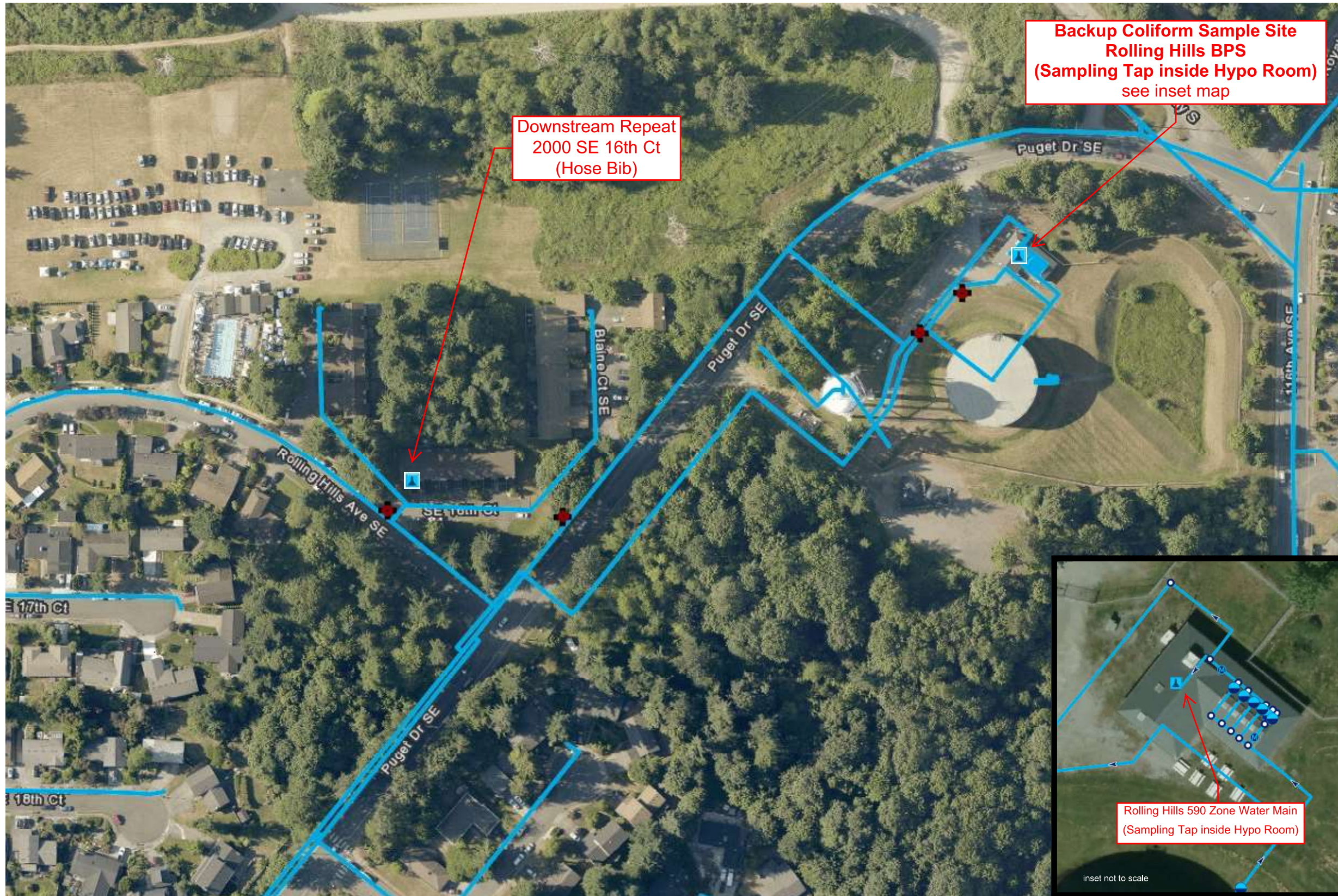
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Backup Coliform Sampling Sites - Rolling Hills Booster Pump Station



- Legend
- Service Connection
 - Sampling Point
 - Renton Fire Hydrant
 - Control Valve
 - Water Fitting
 - Water Main

Notes
 Coliform Monitoring Plan
 Water System: City of Renton
 Water System ID: 71850L
 WQ Database ID: PS025



Prepared by: Katie Nolan, **Water Utility Engineering**
 Prepared on: **January 21, 2020**

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Self-Assessment Guideline for Coliform Detection

The Revised Total Coliform Rule became effective on April 1, 2016. One of the significant requirements of the rule is that utilities must attempt to find and fix the source of coliform bacteria contamination by performing a “self-assessment” whenever treatment technique trigger occurs. The self-assessment is designed to identify whether any sanitary defects are present and correct the defects. The guideline below is designed to assist City staff with performing the self-assessment.

Office Level Review

The following questionnaire is designed to provide an office level review for possible sources of contamination that led to the positive coliform bacteria water sample. This questionnaire is not designed to replace field level investigation.

A **YES** answer to any of the questions below indicates further investigation is warranted.

Question:	Y or N
<u>Sampler, Sample Site, Laboratory Contamination:</u>	----- -
When coliform bacteria is found in a water quality sample, the first area of scrutiny should be the possibility of the sample becoming contaminated by a source outside of the distribution system. These outside sources of contamination include the sampler, the sample site, and the testing laboratory.	-----
1 Were procedures properly followed when the sample was collected?	
2 Is the sampler experienced in collecting coliform bacteria samples?	
3 Was the sample collected at a designated coliform bacteria sample sampling station?	
4 Has the sampling station been properly maintained?	
5 Did the sampler notice anything unusual about the sample station, the water flushed prior to collecting the sample or the surrounding environment when the sample was collected?	
6 Was the sample transported to the laboratory using proper procedures?	
7 Is the laboratory up to date on its sterility procedures and all other laboratory quality control & quality assurance procedures?	
8 Taking into consideration all of its clients, has the laboratory been seeing an increase in the number of positive coliform bacteria samples recently, which may indicate laboratory contamination of these samples?	

<u>Review of Existing Water Quality Data:</u>		-----
Recent water quality data may help expose problems within the distribution system which could have led to a coliform bacteria positive sample. A change in water quality parameters can also lead to a release of coliform bacteria from biofilms and sediments.		-----
9	In general has recent water quality data been consistent with past data?	
10	Are the chlorine residual levels that were measured when collecting the most recent round of bacteriological samples reflective of past chlorine residual levels?	
11	Has anything unusual been noticed or detected when collecting water quality samples for other parameters recently, for example during VOC, Inorganics, Nitrate or Disinfection By-products sampling?	
12	Is there any reason to believe the water temperature in the distribution system has increased or fluctuated?	
13	Does the SCADA data for the chlorine analyzers on the primary disinfection systems at the sources show any lapse in the chlorine injection to the raw water supply?	
14	Does the SCADA data for the pH adjustment systems located at the Downtown Wells and Springbrook Springs show any recent periods of high or low pH readings?	
<u>Water Main Repairs:</u>		-----
Coliform bacteria contamination of the distribution system via a water main break or main break repair is possible considering the sub-surface environment in which water mains are located.		-----
15	Have there been any water main repairs in the last few months?	
a.	If so were proper main repair procedures followed, including maintenance of positive water pressure at the break until the break was excavated and cleaned?	
b.	Was the repaired area of the damaged main disinfected and the main flushed prior to returning the main to service?	
c.	Does the AMI system show reverse flow through any meters at or near the time of the main break?	

<u>New Main Construction:</u>		-----
The connection of a newly constructed water main provides a conduit for contamination of the water system if the new water main has not been properly cleaned and disinfected.		-----
16	Have new water mains been connected to the water distribution system recently?	
a.	Is there documentation that shows that all procedures for the new main construction and tie-in procedure were properly followed?	
b.	Was there anything unusual noticed by the utility inspector who inspected the main construction or the maintenance crew who connected the main to the system?	
<u>Reservoirs:</u>		-----
Water storage tanks have multiple openings to the environment including air vents, overflow pipes, and access hatches which can provide conduits for contamination to enter the water distribution system.		-----
17	Has anything unusual been noticed at any of the reservoirs during routine station checks, for example unlocked gates, ladders or hatches?	
18	Were any screens (air vent and overflow) or hatches found damaged during the latest round of reservoir inspections?	
19	Is the reservoir cleaning program on schedule?	
<u>Distribution System Maintenance and Operation:</u>		-----
Coliform bacteria may be found in biofilms and sediment located in the water distribution system. Operations which disrupt biofilms and sediments may release large amounts of coliform bacteria into the free flowing water.		-----
20	Have any water mains been flushed lately?	
21	Have any valves been exercised recently or changed operational status (open to closed)?	
22	Have there been any operational changes that may have changed the typical flow path or velocity of water in the distribution system?	
23	Has there been a recent fire or fire training exercise which consumed large amounts of water?	
24	Have any control alarms been disabled that may have provided a warning of an event that can affect water system quality?	
25	Has there been any maintenance lately of systems that come into contact with the water supply? For example chemical dosing systems.	

<u>Sanitary Survey:</u>		-----
Sanitary Surveys are designed to locate and correct possible sources of contamination of the drinking water supply system.		-----
26	Have all issues discovered in the latest sanitary survey been addressed?	
<u>Cross Connection Control:</u>		-----
The City's Cross Connection Control Specialist (CCS) may be able to provide information that is relevant to bacteria contamination found in the distribution system.		-----
27	Is the CCS aware of any recently discovered cross connections or backflow incidents that may have led to bacteria contamination of the water distribution system?	
<u>Other:</u>		
28	Is there maintenance activity underway or recently completed which may have led to a positive bacteria sample? Consider all activity at all sites and all locations within the distribution system.	
29	Have any sources exceeded the allowable flow rate recently?	
30	Has there been a power outage or other disruption to the normal operation of the water supply system recently?	
31	Is it possible that the contamination is related to the time of year? For example irrigation system winterizing activities.	

Field Level Investigation

Maintenance Services field crews, operators and technicians repair, operate, and maintain the water system on a daily basis and as such may observe unusual events, activities, trends etc. These observations may provide a lead to investigators looking for the source of coliform bacteria contamination of the water system. Field level staff should be encouraged to report anything unusual they find as they perform their daily functions.

The following list is intended as a guide for performing field level investigation to locate the source of the bacteria contamination of the distribution system. The list is not presented in order of importance. Maintenance Services managers can schedule the field inspections based on staff availability and on the details of the bacteria contamination event, for example location of the positive sample.

Question:	Y or N
<u>Source Inspection</u>	
Any indication of vandalism?	
Are all locks secured, including infiltration gallery hatches, well house and treatment building doors and any site fencing?	
Are the treatment systems operating properly?	
Are the measurement, monitoring and reporting instruments functioning properly?	
Is the well vent properly screened?	
Is the pump to waste pipe air gap functioning properly?	
Has there been any flooding of the Springbrook Springs site?	
Is there any evidence of vandalism to any of the fire hydrants, blow offs, air vacs, etc. on site?	
Is there standing water in any of the vaults on site?	
Has maintenance been performed on the site recently?	

	<u>Reservoir / Tank Inspection</u>	
	Any indication of vandalism or unauthorized entry on the site or onto the reservoir or water tank?	
	Are all hatches and site fences properly secured?	
	Are the access hatches properly sealing, are the gaskets good, do the hinges work?	
	Is the air vent screen properly protecting the air vent opening?	
	Is the overflow pipe screen properly protecting the overflow pipe opening?	
	Is the drain / overflow piping plugged, crushed or in any other way compromised?	
	Is there any evidence of vandalism to any of the fire hydrants, blow offs, air vacs, etc. on site?	
	Is there standing water in any of the vaults on site?	
	Has maintenance been performed on the site recently?	
	What is the chlorine residual in the tank, taken at multiple locations if possible?	
	<u>Other Facilities – Treatment, Pump Stations Etc.</u>	
	Any indication of vandalism?	
	Are all locks secured, including building doors and site fencing?	
	Are the treatment systems operating properly?	
	Are the measurement, monitoring and reporting instruments functioning properly?	
	Were there any changes or adjustments to the treatment process recently?	
	Is there any evidence of vandalism to any of the fire hydrants, blow offs, air vacs, etc. on site?	
	Is there standing water in any of the vaults on site?	
	Has maintenance been performed on the site recently?	
	What is the chlorine residual in the distribution system at this site?	

	Distribution System Inspection (focus in the area of detected contamination and flooded or flood prone areas first)	
	Are all hydrant meters accounted for?	
	a. Can they be located in the field and are they properly installed?	
	b. Is testing up to date on the reduced pressure backflow assemblies on the hydrant meters?	
	Fire Hydrants	
	a. Do any fire hydrants appear to be damaged?	
	b. Are any fire hydrants located in flooded or flood prone areas?	
	Air Relief Valves	
	a. Do any air relief valves appear to be damaged?	
	b. Do any air relief valves terminate below grade?	
	c. Are any air relief valve vaults flooded or appear to have been flooded recently?	
	Blow-off Assemblies	
	a. Do any blow-off assemblies appear to be damaged?	
	b. Are any blow-off assembly vaults flooded or appear to have been flooded recently?	
	Vaults	
	a. Are any backflow assembly vaults flooded or appear to have been flooded recently?	
	b. Are any valve and large meter vaults flooded or appear to have been flooded recently?	

Appendix B

**STAGE 2 DISINFECTANTS AND DISINFECTION
BYPRODUCTS MONITORING PLAN**

The City has prepared this Stage 2 Disinfectants and Disinfection Byproducts Monitoring Plan in accordance with Washington Administrative Code (WAC) 246-290 Part 4 and 40 CFR 141 Subpart V. The Plan supplements the City's 2019 Water System Plan and updates the 2012 Stage 2 Disinfectants and Disinfection Byproducts Monitoring Plan. The purpose of this plan is to ensure the City's water quality monitoring program meets the regulatory requirements of the Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules (D/DBPR). This plan identifies D/DBPR sampling sites and provides a schedule for sample collection.

The City provides disinfection treatment to protect public health from possible harmful bacterial contamination. The City adds chlorine at each source and maintains a detectable chlorine residual throughout the distribution system. While chlorination is a proven method for ensuring safe drinking water, there is a possibility for disinfection byproducts to form when the chlorine reacts with naturally-occurring organic matter present in the water. The most common disinfection byproducts are Trihalomethanes (TTHM) and Haloacetic acids (HAA5). Because there is some concern that high concentrations of disinfectants and disinfection byproducts may cause adverse health effects, the City performs distribution system monitoring.

I. SYSTEM INFORMATION

Water System Name: City of Renton

Water System ID#: 71850L

Water System Type: Group A Public Water System – Community

County: King

Total Population Served: 98,350

Total Service Connections: 17,830

Plan Prepared on: January 21, 2020

Plan Prepared by: Katie Nolan
Civil Engineer III
425-430-7335

Plan Reviewed by: Craig Pray
Water Maintenance Supervisor
425-430-7400

Greg Durbin
Water Quality/Treatment Operator
425-430-7400

II. SAMPLING INFORMATION

The City is responsible for collecting samples for disinfection byproducts and disinfectant residuals in the distribution system. Samples are collected during normal system operating conditions.

Disinfection Byproducts

D/DBPR samples are required from locations where the highest levels of TTHM and HAA5 have been measured in the distribution system. The City has a 40/30 certification and is currently on a reduced monitoring schedule.

Maximum Contaminant Levels: 80 µg/L for TTHM and 60 µg/L for HAA5

Compliance Calculation Procedures: Compliance is based on the locational running annual average (LRAA) for TTHM and HAA5

Reduced Monitoring Frequency: Once per year, typically in August

Number of Samples Required for Reduced Monitoring: 2 dual sample sets: one at the location with the highest TTHM single measurement, one at the location with the highest HAA5 single measurement

Distribution System Sampling Locations for Reduced Monitoring:

Sampling Station Name	Water Quality Database ID
1622 Hoquiam PL NE Sampling Station	MS034
3000 Royal Hills Dr. Sampling Station	MS041

Reporting: The City reports the range of detected concentrations of TTHM and HAA5 in the annual Consumer Confidence Report (water quality report).

Disinfectant Residuals

Chlorine residuals are required to be measured at the same times and same locations as routine and repeat coliform samples.

Maximum Residual Disinfectant Level: 4.0 mg/L as Cl₂

Compliance Calculation Procedures: Compliance is based on the running annual average (RAA) of residual measurements for 12 consecutive months. The RAA is calculated by finding the average of all residual measurements for each month, adding 12 consecutive monthly averages together, and then dividing the sum by 12. The RAA must be calculated at the end of each calendar quarter. Daily residual measurements are included in the compliance calculations.

Monitoring Frequency and Sampling Locations: The City collects chlorine residual samples from 27 representative points throughout the distribution system on a weekly basis during RTCR compliance monitoring (see Appendix A for the designated routine sampling sites)

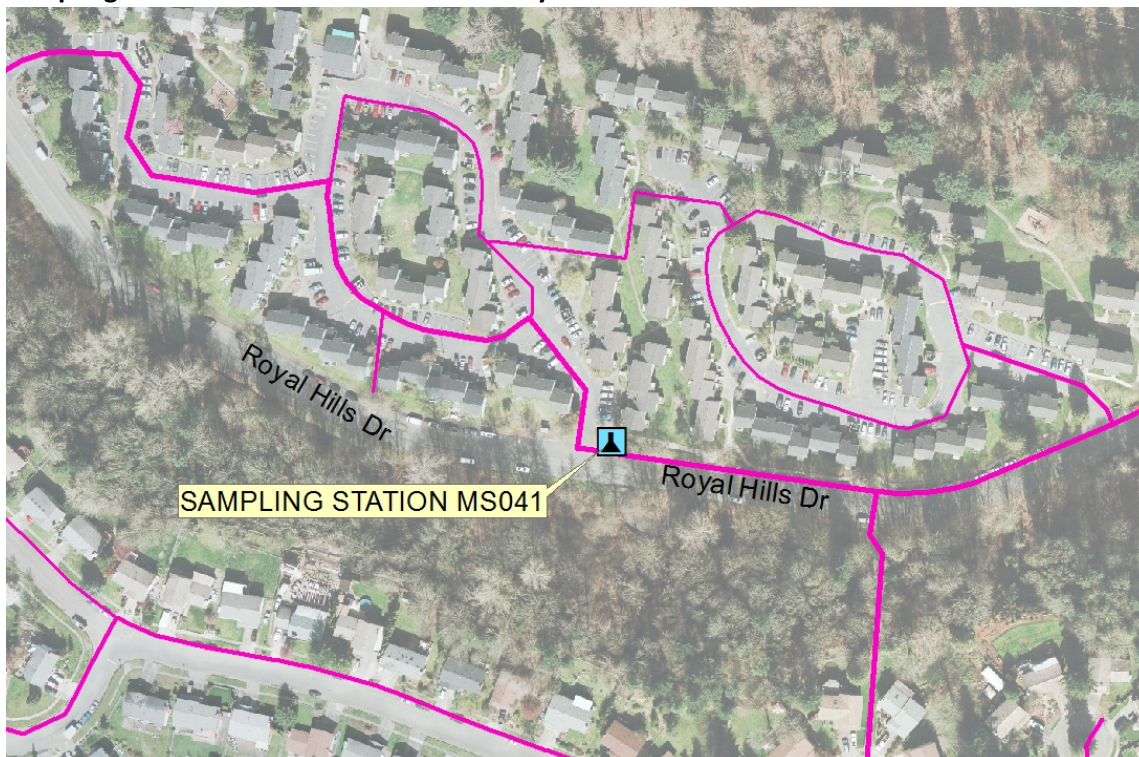
Reporting: The City reports the chlorine residual on each routine coliform sample form. In addition, the City reports the range of detected chlorine residuals in the annual water quality report.

III. MAPS

Sampling Station MS034 located at 1622 Hoquiam Pl NE



Sampling Station MS041 located at 3000 Royal Hills Dr



IV. PUBLIC NOTIFICATION

The DOH must be notified within 48 hours of a MCL (TTHM or HAA5) or MRDL (chlorine) violation. In addition, a Tier 2 public notification must be issued to customers within 30 days of the violation.

Failure to collect required chlorine residual samples is a monitoring violation that triggers a Tier 3 public notification, which must be issued within 1 year.

Public notice templates are provided in the Coliform Monitoring Manual.

V. LRAA Calculations

The locational running annual averages (LRAA) for TTHM and HAA5 were calculated at eight monitoring locations with the most recent quarterly data collected for Stage 2 D/DBPR compliance using:

$$\text{LRAA} = (Q1+Q2+Q3+Q4)/4 \text{ for each monitoring location}$$

Sampling Station Name	Water Quality Database ID	TTHM LRAA	HAA5 LRAA
1622 Hoquiam PL NE Sampling Station	MS034	9.9 µg/L	4.2 µg/L
3000 Royal Hills Dr. Sampling Station	MS041	7.4 µg/L	1.2 µg/L
601 Monster Rd SW Sampling Station	MS042	5.6 µg/L	0.3 µg/L
Fire Hydrant NW040	DBP_Smpl_Site_7	4.7 µg/L	1.0 µg/L
Fire Hydrant SW541	DBP_Smpl_Site_8	4.3 µg/L	0.7 µg/L
Fire Hydrant NW065	DBP_Stage2_8	4.2 µg/L	1.0 µg/L
Jones Ave NE & NE 43rd St Sampling Station	MS027	2.9 µg/L	0.5 µg/L
S 180th & West Valley Sampling Station	MS028	2.6 µg/L	0 µg/L

In accordance with WAC 246-290-300(6), a reduced monitoring schedule is allowed when the LRAA for TTHM is less than 40 µg/L and HAA5 is less than 30 µg/L at all monitoring locations. Based on the LRAA calculations above, the City is eligible for a reduced monitoring schedule.

The City may remain on reduced monitoring as long as each TTHM sample is less than 60 µg/L and each HAA5 sample is less than 45 µg/L. If either criteria is exceeded, the City must resume routine monitoring.

Appendix O
WATER SHORTAGE RESPONSE PLAN

City of Renton



Water System Plan Update

APPENDIX O

WATER SHORTAGE RESPONSE PLAN

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Table 2	Potential Customer Demand Reduction Actions

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Appendix A	Utility Customer Outreach Checklist
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Appendix C	Communication and Outreach Plan Framework

I. INTRODUCTION

A. Purpose

The City of Renton (City) has prepared this Water Shortage Response Plan (WSRP) to present viable options for reacting to a water supply shortage. The WSRP enables the City to maintain essential public health and safety while minimizing adverse impacts on economic activity, environmental resources, and the region's water use preferences. Water shortages could result from forecasted, progressive events such as droughts, as well as immediate crises such as water system failures.

This Plan supplements the City's 2019 Water System Plan and updates the 1989 WSRP. This document builds upon information provided in the 2019 Water Shortage Contingency Plan prepared by Seattle Public Utilities (SPU). Renton purchases a portion of its water from SPU and thus might need to implement a shortage response in concert with SPU if an SPU source is compromised. Water system planning is required by WAC 246-290-100.

The use and success of this Plan depends upon the accuracy of its contents. It is a working tool that needs to be maintained and updated on a regular basis. We recommend that this Plan be kept in the Operations Control Center at the City Shops, and in the Water Utility department in City Hall for easy reference. We also recommend that this Plan be incorporated into the Emergency Response Plan.

B. Water System Overview

The City's water system provides service to an area of approximately 17.25 square miles that is largely coincident with the city limits. The water distribution system serves the valley floor and parts of five surrounding hills: West Hill, the Highlands, Scenic Hill (also known as Renton Hill), Talbot Hill, and Rolling Hills. The City currently serves 17,830 customers (service connections) within an elevation range of 11 to 475 feet. Additionally, the city supplies wholesale water to Skyway Water and Sewer District (Skyway) through a single-metered connection. The City owns and operates a multi-source municipal water system including supply, treatment, storage, and distribution of potable water to residential, commercial, industrial, and wholesale customers. The City's water distribution system consists of more than 300 miles of pipeline.

Water supply sources include the Downtown Wellfield, encompassing wells RW-1, RW-2, RW-3, PW-8, and PW-9. These production wells draw from a relatively shallow aquifer (Cedar Valley Aquifer), which is an underground layer of sand and gravel that runs 3 1/2 miles long and at some points is only 23 feet below ground surface. The aquifer is fed by rain and snow falling on the aquifer and higher adjacent ground, as well as by groundwater flow from the Cedar Valley. As the City's primary water source, the Cedar Valley Aquifer has been designated a "sole source" by the U.S. Environmental Protection Agency. On average, water sourced from the Downtown Wellfield provides 60 to 65 percent of the City's total water supply. Springbrook Springs, an artesian spring located at the south end of the City's water service area, is used for normal supply as well. On average, water sourced from Springbrook Springs provides 15 to 20 percent of the City's total water supply. The Maplewood Wells provides an alternate source of supply in the event of the contamination of the Downtown Wellfield as well as supplementary (non-additive) supply during high demand periods. The three production wells (PW-11, PW-12, and PW-17) are located east of the downtown area, within the Maplewood Golf Course. On average, water sourced from the Maplewood Wells provides 15 to 20 percent of the City's total water supply.

In addition, the City is a wholesale customer of SPU, which gets its supply from the Cedar and Tolt Rivers. The City currently only buys wholesale water from SPU to sell directly to the Boeing Renton Plant, but the City has a long-term supply contract for backup supply during summer peak use periods and for future water demands. On average, water sourced from SPU provides 1 to 2 percent of the City's total water supply.

As a result of the City's topography and geography, the City has 16 hydraulically distinct pressure zones. Pumping throughout the water system is accomplished by 12 booster pump stations (BPS) that are located throughout the City. Currently there are 10 reservoirs in the system, strategically located to provide adequate equalizing and fire flow reserves for all pressure zones. Pressure reducing valves (PRVs) are used to supply lower pressure zones from higher pressure zones that contain water storage reservoirs. The City has seven metered interties with the SPU transmission mains and three additional emergency supply interties with other neighboring water systems.

The City's retail service area (RSA) is bordered by nine adjacent water systems. It is unlikely that the City's RSA will change much in the future due to the geography of the surrounding areas and the fact that all of the surrounding areas are currently served by other water purveyors. Copies of current service agreements between the City and the adjacent water purveyors are included in Appendix D of the Water System Plan.

C. Relationship to Seattle Public Utilities

This Plan covers both City and SPU strategies in the case of a water shortage. While most of the City's water is produced by its own wells and spring, the City supplies its Boeing Plant through SPU interties, purchasing approximately 43 million gallons of water in 2018. These interties also allow SPU to provide the City water in the event of a shortage.

The main concern for the City is a shortage caused by limited water production from the Cedar Valley Aquifer. This report focuses on what to do during a shortage of City-supplied water, however, it can also be used in the event of SPU implementing its own shortage response plan. This is because a water shortage affecting SPU's water supply not only affects their retail customers, but could affect SPU's wholesale customers and their respective retail customers. SPU's wholesale water contracts include a provision that wholesale customers will assist and support actions required to manage demand during a shortage or an emergency. When SPU activates its shortage response plan, it will request that each wholesale customer also activate their own shortage response plan at the same stage currently being implemented by SPU. Appendix A contains a list of customer outreach actions proposed by SPU, which can be applied during an SPU shortage event as well as a Renton-only shortage event.

SPU developed their shortage response plan in consultation with its wholesale customers and other participants, based on the premise that an effective demand management strategy must be regionally consistent. This is based on several considerations:

- **Shortage Should Be Shared:** Shortage and risk must be shared among all beneficiaries of the water resource, including all water utilities obtaining water from the Seattle regional water supply system.
- **Unified Message:** A unified/regional message and approach is easier to understand and distribute through the media, which is key in communicating information to the public.
- **Consistency Aids Forecasting:** Consistency makes it easier for SPU to forecast demand reductions, which is essential to effectively manage the system during a water shortage.

D. Overview of Water Shortage Response Stages

This Plan has four water shortage response stages – Advisory, Voluntary, Mandatory, and Emergency – which are typically implemented progressively depending on the magnitude of the water shortage. In the event of an immediate crisis, the WSRP may be activated at one of the more aggressive stages. Each stage contains a variety of strategies for managing aspects such as supply, utility operations, customer actions, and communications. The four stages of the WSRP are described below. The key aspects of each stage are provided in Table 1.

- **Advisory Stage:** The WSRP typically begins in the Advisory Stage when the City recognizes there is a serious potential for a water shortage. At this stage, the City implements supply management actions, planning activities, and coordination with other City departments, State agencies, and wholesale customers. No customer action is requested at this stage. However, customers and the media may start to inquire about the potential for a water shortage and the City should be ready to answer questions. The authority to enter the Advisory Stage, which in most cases will activate the WSRP, lies with the City's Public Works Administrator.
- **Voluntary Stage:** If supply conditions worsen, the WSRP moves to the Voluntary Stage. This stage relies on the voluntary cooperation and support of customers to meet target reduction goals. During the Voluntary Stage, specific voluntary actions are suggested for residential and commercial customers. The suggested customer actions are a combination of standard conservation practices (e.g., avoid watering mid-day) and curtailments that require customers to reduce their water use, which may result in sacrifice (e.g., take a shorter shower). The level of that sacrifice will depend on the severity of the water shortage. The authority to enter the Voluntary Stage lies with the City's Public Works Administrator.
- **Mandatory Stage:** If the Voluntary Stage does not produce needed water use reductions, or if supply conditions worsen, the Mandatory Stage would be implemented. This stage prohibits or limits certain actions, which may be accompanied by an enforcement plan, which could include fines for repeated violation, as well as exemptions. The customer actions in this stage reflect a more aggressive approach that requires deeper levels of customer sacrifice (e.g., restricting irrigation). This stage may also include rate surcharges, although careful consideration would be required of the impacts of those charges. The authority to enter the Mandatory Stage lies with the Renton City Council (Council).
- **Emergency Stage:** This stage addresses the most severe need for demand reduction and includes a combination of mandatory actions and rate surcharges. This would be the last stage used to address a progressive situation, such as a drought of increasing severity, or to respond to an immediate crisis, such as a major facility failure or contamination of the Cedar Valley Aquifer. The authority to enter the Emergency Stage lies with the Council, unless there is an immediate emergency, in which the City's Mayor may authorize these actions.

Table 1. Summary of Water Shortage Response Plan¹

Component	Stage			
	Advisory	Voluntary	Mandatory	Emergency
Hallmark	<ul style="list-style-type: none"> Formal internal planning Supply management actions No customer outreach 	<ul style="list-style-type: none"> Voluntary customer reductions 	<ul style="list-style-type: none"> Mandatory water use restrictions Potential fines and/or rate surcharges 	<ul style="list-style-type: none"> Mandatory water use restrictions Potential fines and/or rate surcharges
Triggers	<ul style="list-style-type: none"> Serious potential for water shortage 	<ul style="list-style-type: none"> Supply conditions worsen 	<ul style="list-style-type: none"> Supply conditions worsen 	<ul style="list-style-type: none"> Supply conditions worsen
Objectives	<ul style="list-style-type: none"> Prepare for Voluntary Stretch supply 	<ul style="list-style-type: none"> Achieve demand reduction Stretch supply Prepare for Mandatory 	<ul style="list-style-type: none"> Achieve demand reduction Stretch supply Prepare for Emergency 	<ul style="list-style-type: none"> Achieve demand reduction Stretch supply
Stage Activation	<ul style="list-style-type: none"> Public Works Administrator 	<ul style="list-style-type: none"> Public Works Administrator 	<ul style="list-style-type: none"> Council 	<ul style="list-style-type: none"> Council, if progressive Mayor, if immediate
Demand Reduction Goal	<ul style="list-style-type: none"> None (stage is internally focused) 	<ul style="list-style-type: none"> Based on supply conditions and demand reduction potential 	<ul style="list-style-type: none"> Based on supply conditions and demand reduction potential 	<ul style="list-style-type: none"> Based on supply conditions and demand reduction potential
Key Public Messages	<ul style="list-style-type: none"> Anticipate public and media inquiries and be ready to answer questions 	<ul style="list-style-type: none"> Moving to Voluntary Need customer assistance to meet demand reduction goal Request suggested demand reduction actions 	<ul style="list-style-type: none"> Moving to Mandatory Mandatory water use restrictions and potential rate surcharge Certain exemptions apply 	<ul style="list-style-type: none"> Moving to Emergency Increased water use restrictions and potential rate surcharge
Coordination and Communication	<ul style="list-style-type: none"> Develop communication/outreach plan 	<ul style="list-style-type: none"> Implement communication/outreach plan Implement coordination with SPU 	<ul style="list-style-type: none"> Implement communication/outreach plan Implement coordination with SPU 	<ul style="list-style-type: none"> Implement communication/outreach plan Implement coordination with SPU

Table 1. Summary of Water Shortage Response Plan (continued)

City Department Actions	<ul style="list-style-type: none"> • Develop potential demand reduction actions for City departments 	<ul style="list-style-type: none"> • Require demand reduction actions from City departments 	<ul style="list-style-type: none"> • Require demand reduction actions from City departments 	<ul style="list-style-type: none"> • Require demand reduction actions from City departments
Water Quality and Supply Management	<ul style="list-style-type: none"> • Increase data collection and modeling • Optimize supply • Ready emergency supplies 	<ul style="list-style-type: none"> • Ready or activate emergency supplies, as appropriate • Investigate interties 	<ul style="list-style-type: none"> • Activate emergency supplies and interties 	<ul style="list-style-type: none"> • Activate emergency supplies and interties
Retail Customer Demand Actions	<ul style="list-style-type: none"> • No requests for general public (stage is internally focused) • Prepare internally for Voluntary Stage demand action requests 	<ul style="list-style-type: none"> • Request voluntary demand reduction actions 	<ul style="list-style-type: none"> • Provide mandatory demand reduction actions (and exemptions) • Potential rate surcharges 	<ul style="list-style-type: none"> • Provide mandatory demand reduction actions (and exemptions) • Potential rate surcharges
Wholesale Customer Actions	<ul style="list-style-type: none"> • Activate their shortage response plans 	<ul style="list-style-type: none"> • Move to Voluntary in their WSRPs • Outreach to their retail customers • Activate alternative sources, if appropriate 	<ul style="list-style-type: none"> • Move to Mandatory in their WSRPs • Outreach to their retail customers, including enforcement as appropriate • Activate alternative sources, if not already done 	<ul style="list-style-type: none"> • Move to Emergency in their WSRPs • Outreach to their retail customers, including enforcement as appropriate • Activate alternative sources, if not already done

¹This table reflects how the WSRP would be implemented for a progressive event, such as a drought. Stages may be different for an immediate crisis.

II. IMPLEMENTATION CONSIDERATIONS

A. WSRP Principles

The City has learned how to operate effectively during water shortage events, while minimizing impacts to customers and water resources. This knowledge is reflected in this WSRP, and articulated in the following principles:

- **Plan Should Be Flexible:** Each water shortage situation has enough unique characteristics that a plan cannot specifically define all the scenarios and specific supply and demand management actions. The usefulness of a Water Shortage Response Plan lies in planning the range of supply and demand management actions in advance of the situation, and in defining the communication mechanisms by which decisions will be made during the event.
- **Shortage Should Be Shared:** A key assumption of this Plan is that abundance, shortage, and risk must be shared among all beneficiaries of the water resource. Since the City purchases water from SPU, the City will also participate in management of their water shortage. Similarly, all customer sectors of the City's water should participate.
- **Conservation versus Curtailment:** It is important to distinguish between the short-term *curtailment* actions necessitated by a water shortage event, and the *conservation* actions the City regularly promotes to its customers. *Conservation* focuses on long-term efficiencies which do not adversely affect customers' accustomed use of water, whereas *curtailment* actions involve short-term water use reductions or restrictions that can create customer hardships.
- **Voluntary Preferred over Mandatory:** Customers prefer the opportunity to meet targeted demand reduction levels through voluntary compliance actions. The decision to move to mandatory restrictions is more acceptable if the voluntary approach has been tried first, but has not resulted in sufficient demand reduction.
- **Safeguard Water Quality:** It is essential to closely monitor water quality during water shortages. The City water distribution system is designed to carry a large capacity of water during summer peak months and for fire-fighting. If demand is substantially lowered, water quality can significantly degrade. Additionally, the water quality of surface water can be affected by warmer air temperatures. The City does not rely on surface water as a drinking water source, however, there is cause for concern about water quality during warm weather events because the City shares several supply interties with SPU, which sources its drinking water from the Tolt and Cedar Rivers. Therefore, water quality during water shortages, particularly during warm weather drought, should be monitored and managed more carefully than normal.

B. Causes of Water Shortage

The City relies on the Cedar Valley Aquifer to provide the majority of Renton's drinking water, therefore it is the main source of concern during a water shortage. The amount of water available in the Cedar Valley Aquifer is contingent upon the amount of withdrawal versus replenishment. In the case of a drought, less water will infiltrate via precipitation into the City's aquifer, potentially putting Renton's water availability at risk. If the water provided by the Cedar Valley Aquifer is limited or unavailable, suggestions for next steps are available in this Plan.

Droughts are the most common reason a WSRP would be implemented. Droughts are naturally occurring, unpredictable weather events of varying frequency, duration, and severity. Renton's water service area has experienced several short-term droughts, however, available data indicates a very low probability of a multi-year drought.

Details on the three main types of droughts are provided below. Due to interties with SPU, some conditions that affect the Tolt and Cedar Rivers streamflow, such as low snowpack, are also addressed. Since the nature of these droughts varies, the City's responses will also vary.

Types of Droughts by Season

Summer/Fall Drought: Droughts in the summer and fall are characterized by drier conditions and hotter temperatures. This typically results in both decreased supply and increased demand. Supply is decreased because less rain results in less infiltration of water into the aquifer. Demand is increased because outdoor water use (mostly irrigation) is higher at this time of year.

The City attempts to manage for these types of droughts by carefully monitoring summer demands and water supply. Unfortunately, it is not possible to accurately predict in advance the timing and amount of the fall rains. A key management tool for this type of drought is helping customers to reduce irrigation use.

Fall/Early Winter Drought: Droughts in the fall and early winter are characterized by the fall rainy season developing later than normal. Fall droughts are particularly challenging because that is when water demands for fish habitat needs are especially high and when the ability for people to reduce water is limited since the irrigation season is ending.

Winter/Spring Drought: Droughts in the winter and spring are characterized by low snowpack. While low snowpack may not lead to poor water supply conditions if ample spring rains occur, caution is used in managing the water supply in these situations because rainfall is inherently difficult to forecast. Low snowpack can occur when mountain temperatures are warm, when precipitation is below average, when intense rainfall events melt low to mid-elevation snow, or through a combination of these factors.

These types of droughts can be managed in several ways. Tracking El Niño events, which are typified in the Pacific Northwest by warmer and drier than average winter conditions, can alert water managers to the increased potential of a winter/spring drought.

When winter/spring drought conditions result in low water supply availability, implementation of the WSRP may be necessary because the potential for water use reductions by customers is greater in the spring and summer, there is much uncertainty about impending summer weather which is so influential on demand, and weather forecasts of when the fall rains will begin are not reliable. These conditions generate uncertainty about whether water stored in the aquifer will be sufficient to meet demands until supplies are replenished in the fall. This can make implementation of the WSRP in the spring and summer necessary, despite the fact that in some of these years no water shortfall actually develops.

C. Demand Reduction

A key strategy to managing a water shortage event is having customers reduce their water use. The WSRP does not pre-identify specific demand reduction actions for each stage. Rather, a comprehensive list of potential actions customers can take to reduce water use is provided at the end of each section in Section III, *Implementation for a Progressive Event*. The actual actions requested or required for each stage will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed.

There are several criteria for deciding which demand reduction actions are appropriate during a water shortage.

- **Magnitude of Savings:** Will the action result in enough savings to make a meaningful difference?
- **Timing:** Can the action produce results in the necessary timeframe?
- **Duration of Event:** What is the anticipated duration of the event (e.g. customers may tolerate certain mandatory curtailments if the event is expected to last a few weeks rather than months)?
- **Season:** Is the action relevant to the time of year (e.g. banning lawn watering during summer irrigation season vs. during non-irrigation season)?
- **Costs:** How severe are the cost implications of the action to the customer relative to the need for action?
- **Enforcement:** For mandatory curtailment actions, is it desirable and practical to enforce the action?
- **Equity:** Do the suite of actions cover all customer sectors and types of uses?

D. Exemptions

Appendix B provides background and a framework for developing and implementing exemptions to customer water use restrictions that are part of the Mandatory and Emergency stages of the WSRP.

E. Financial Considerations

Reducing water demand as needed to address a water shortage event can reduce revenues at a time when there is an increased need for these funds to cover costs associated with implementing the WSRP. The following issues should be considered:

- **Reprioritize Current Revenue:** This consists of reducing revenue contributions to the capital program and lowering the year end operating cash target. These are the most flexible resources to offset revenue and expenditure problems.
- **Reprioritize Expenses:** Reducing planned operations and maintenance expenditures can ease the demand on revenues or free up money to meet unexpected needs.
- **Rate Surcharge:** In the mandatory and emergency stage, rate surcharges can be used to send a strong signal to customers to reduce water use. Rate surcharges can also help to make up revenues lost due to decreased demand.
- **State Drought Relief Funds:** In a Washington State emergency drought declaration, funds in the form of grants or loans may be available to the City to mitigate the impacts of a water shortage.

III. IMPLEMENTATION FOR A PROGRESSIVE EVENT

For each stage, the following information is provided. Note that if a particular stage is not entered into progressively, actions listed in the previous stage(s) may be appropriate as well. This section is written to apply regardless of whether the shortage is related to City-supplied water, SPU water, or both.

1. **Triggers** – Describes the general, qualitative conditions that would trigger the stage.
2. **Objectives** – Describes the overall objective of the stage.
3. **Stage Activation** – Describes who has the authority to enter the stage.
4. **Demand Reduction Goal** – Discusses the general, qualitative nature of the goal for the stage.
5. **Key Public Messages** – Describes the key public messages for the stage.
6. **Coordination and Communication Actions** – Describes a variety of work necessary to coordinate and communicate with key stakeholders such as wholesale customers, SPU, Department of Ecology (Ecology), Department of Health (DOH), natural resource agencies, tribes, City employees, the general public, etc.
7. **City Department Actions** – Describes actions recommended to departments within the City in order to reduce water usage.
8. **Water Quality and Supply Management Actions** – Describes work necessary to safeguard water quality and to maximize supply.
9. **Retail Customer Demand Actions** – Describes work necessary to reduce customer demand.
10. **Wholesale Customer Actions** - Describes actions required for wholesale customers. Skyway is a wholesale customer of the City.

A. Stages of a Water Shortage

In order to reduce water demand throughout the city, demand reduction options have been developed for each of the four water shortage stages (Voluntary, Mandatory, Emergency), with an initial Advisory stage to notify residents that reductions may be occurring in the near future. These options have been adapted from SPU's 2019 Water Shortage Contingency Plan.

After determining that a serious potential for a water shortage exists, implementation of the WSRP begins with the activation of the WSRP. Plan initiation consists of two steps:

1. The City's Public Works Administrator identifies a City staff member to lead the water shortage response effort; and
2. The City's Public Works Administrator communicates the nature and scope of the WSRP stage actions and strategies to the Council (prior to activating the WSRP) and receives their input.

Once the WSRP is activated, a two-prong effort ensues. The first effort is focused on implementing the initial stage (typically the Advisory Stage). The following effort is to begin planning for possible implementation of a subsequent stage. Typically, a minimum of two weeks is recommended before moving to a new stage, although four weeks may be more realistic to allow for carefully considered decision-making and appropriate planning time. When considering moving from one stage to another, the decision inputs are the same as for initiating the WSRP.

A key aspect of implementing the WSRP is determining how and when to ramp down the stages and/or exit the WSRP. As soon as actual and forecasted supply conditions substantially improve, the City will either inform the public of the return to normal use of water, or inform them that the utility is moving to a lesser

stage of this Plan. This latter process would occur until there was a return to normal operations. Stages could be skipped in this process as conditions and forecasts warrant.

B. Stage 1 – Advisory

The WSRP typically begins in the Advisory Stage when the City recognizes there is a serious potential for a water shortage. At this stage, the City implements supply management actions, as well as formal planning activities and coordination with other City departments and State agencies. No customer action is requested at this stage. However, customers and the media may start to inquire about the potential for a water shortage and the City should be ready to answer questions.

Triggers

The City will enter the “Advisory Stage” if supply conditions and supply forecasts raise significant concerns about the utility’s ability to meet demand later in the year.

Objectives

- To prepare the Water Utility department, City, and relevant agencies for a potential water shortage, thereby allowing all parties adequate planning and coordination time in the event there is a need to move to the Voluntary Stage.
- Stretch available supply through supply management actions.

Stage Activation

The authority to enter the Advisory Stage, which in most cases is effectively activating the WSRP, lies with the City’s Public Works Administrator.

Demand Reduction Goal

There is no demand reduction goal for the Advisory Stage because this stage is an internally focused stage that does not include outreach to customers.

Key Public Messages

Although the Advisory Stage is not intended to be a public stage, the City should be prepared to answer inquiries from the public and media as follows:

- **Planning:** Due to the potential for a water shortage, the City has entered the planning phase of the WSRP to coordinate actions in the event we need to move to the Voluntary Stage.
- **Supply Conditions:** Report on supply conditions and forecasts.
- **No Customer Action:** At this time, customers are not being asked to take special action. If pressed: the City, in partnership with SPU, has an ongoing conservation program and always encourages customers to use water wisely. See www.savingwater.org for ways to use water wisely, indoors as well as outdoors, especially during the summer irrigation season.
- **Future Customer Action May Be Needed:** Customers may be asked to reduce their water use if conditions worsen and we move to the next stage, the Voluntary Stage.

Coordination and Communication Actions

- **General Customer Actions:**

- No demand reduction actions will be requested of general customers for the Advisory Stage. Some proactive outreach to customers may occur reminding them to use water wisely.
- Determine the list of customer demand reduction actions that would be requested if the WSRP advances to the Voluntary Stage. A list of potential actions customers can take to reduce water use is provided in Table 2. The actual actions selected for use will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed.
- **Wholesale Customers:** Inform wholesale customers about the current water supply conditions that the Advisory Stage has been triggered, and that planning is underway in the event that elevation to the Voluntary Stage is needed. Request their cooperation.
- **Seattle Public Utilities:** Implement coordination with SPU on goals and outreach for Voluntary Stage, if shortage is related to SPU water.
- **Outreach:** Develop the initial communication and outreach plan, focusing primarily on the Voluntary Stage, including overall purpose, goals, audiences, and tools (e.g. FAQs, press releases, tips flyers). Include:
 - We are experiencing a drought/shortage.
 - We are asking everyone to help by...
 - We have suggestions/requirements on how to reduce water use.
 - Also see “Key Public Messages”.

City Department Actions

Develop potential demand reduction actions for City departments, including Parks department.

Water Quality and Supply Management Actions

- **Data Collection:** Increase data collection actions and monitoring of weather forecasts.
- **Modeling:** Increase computer modeling runs of projected supply, storage, demand, and revenue scenarios.
- **Water Quality:** Assess water quality in reservoirs and in distribution system to identify areas that may experience degradation with reduced consumption. Increase monitoring if appropriate. Additionally, assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- **Optimize Supplies:** Identify and implement supply side management techniques to optimize existing sources.
- **Emergency Supplies:** Ready emergency water supplies for use and activate if appropriate.

Retail Customer Demand Actions

- **Current Demand Reduction Actions:** No demand reduction actions will be requested of general customers for the Advisory Stage. Some proactive outreach to customers may occur reminding them to use water wisely.
- **Potential Demand Reduction Actions:** Determine the list of customer demand reduction actions that would be requested if the WSRP advances to the Voluntary Stage. A list of potential actions

customers can take to reduce water use is provided in Table 2. The actual actions selected for use will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed.

Wholesale Customers (Skyway)

- **Plan for Voluntary:** Plan for the potential move to the Voluntary Stage.
- **Alternative Sources:** Determine feasibility of activating independent or emergency supply sources, as appropriate.
- **Flushing:** Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.

Table 2. Potential Customer Demand Reduction Actions

WSRP Stage	Demand Reduction Action	Communications Message
Indoor Residential		
N/A Conservation Message	Low-Flow Toilets	If buying a new toilet, consider purchasing a low-consumption model. Look for a “WaterSense” or “Premium WaterSense” label, which uses far less water than older models. According to the Saving Water Partnership, 70 percent of residential water is used indoors, with toilets being the largest home water user.
N/A Conservation Message	Efficient Clotheswashers and Dishwashers	If buying a new clotheswasher or dishwasher, consider buying a high-efficiency model that saves water and energy. Look for an “Energy Star” certified model.
N/A Conservation Message	Wash Full Loads	Wash only full loads of laundry and dishes.
N/A Conservation Message	Don’t Hand-Wash or Pre-Rinse Dishes	Dishwashers save more water than washing dishes by hand. Don’t pre-rinse dishes unless heavily soiled. Most new dishwashers don’t require pre-rinsing. Scrape plates instead.
N/A Conservation Message	Turn Off Tap	Turn off the tap while brushing your teeth or shaving.
N/A Conservation Message	Minimize Garbage Disposal	Put food waste in your compost bin, rather than using your garbage disposal.
N/A Conservation Message	Thaw in Fridge	Thaw frozen food in the refrigerator, rather than under running water.
N/A Conservation Message	Efficient Fixtures	Replace older bathroom faucets and showerheads with WaterSense models, which use far less water, or add a water-saving aerator or flow-restrictor to the existing plumbing fixture. Using low-flow showerheads will also save you money on your energy bills, by reducing the demand on your water heater.
N/A Conservation Message	Fix Leaks (Indoor)	Check for and fix indoor leaks, such as faucets. Also, check your toilets for silent leaks. Put several drops of food coloring in your toilet tank. After 10 minutes, if you have color in the toilet bowl, you have a flapper leak.
N/A Conservation Message	Equipment Not in Use	Turn off water-using equipment when not in use, including dishwashers, garbage disposals, and food troughs.
N/A Conservation Message	Efficient Showerheads	Replace older showerheads with WaterSense models, which use far less water.
N/A Conservation Message	Other Water-Using Equipment	Consider upgrading any other water-using equipment to models that are more efficient.
Voluntary	Shorter Showers (a)	Reduce your showering time.
Voluntary	Shorter Showers (b)	Reduce your showering time by one minute.
Voluntary	Shorter Showers (c)	Reduce your showering time by two minutes.
Voluntary	Shower Showers (d)	Limit shower to five minutes or less.
Mandatory	Less Toilet Flushing	Flush your toilet less often. As the saying goes, “If it’s yellow, let it mellow.” Toilet flushing is the largest water use inside the home.
Outdoor Residential		
N/A Conservation Message	Use a Broom Not Hose	Use a broom, rather than a hose, to clean sidewalks, driveways, and patios. Reducing water runoff also helps

		to protect contaminants from entering storm drains, lakes, and rivers.
N/A Conservation Message	Hose Shut-Offs	Never leave a hose running; always use an automatic shut-off nozzle.
N/A Conservation Message	Water Deeply, but Infrequently	It's better to have one or two deep waterings, rather than several shallow waterings.
N/A Conservation Message	Tune Up Automatic Systems	Do an efficiency tune up of your automatic irrigation system such as fixing overspray onto sidewalks and ensuring sprinkler heads reach adjacent sprinkler heads.
N/A Conservation Message	Get Water to the Roots	Use soaker hoses, drip irrigation, or watering wands to deliver water where it's needed.
N/A Conservation Message	Water Young Trees Efficiently	Water young trees efficiently using a water bag. Trees planted five or fewer years ago need 15 to 20 gallons of water twice a week to thrive.
N/A Conservation Message	Upgrade Automatic Systems	Consider efficiency upgrades to your automatic irrigation system such as weather-based or soil-based controllers.
N/A Conservation Message	Two Inches of Mulch	Put two inches of mulch on planting beds and around trees, which reduces evaporation. Keep the mulch a hands-width away from the trunk.
N/A Conservation Message	Mow High	Set your lawn mower blade to cut grass two inches high, which reduces evaporation.
N/A Conservation Message	Water Early or Late	Water before 8am or after 7pm, which reduces evaporation.
N/A Conservation Message	Pool and Hot Tub Covers	Use covers on swimming pools and hot tubs when not in use to reduce evaporation.
N/A Conservation Message	Wash Vehicles Wisely	Wash your vehicle(s) at locations that recycle the water. This saves water and avoids washing contaminants, such as soap, into storm drains and surface water.
N/A Conservation Message	Fix Leaks (Outdoor)	Check for and fix outdoor leaks, such as hose bibs, spray heads, valves, and broken pipes.
N/A Conservation Message	Rain Barrels	Consider using rainwater collection barrels. These can be used for watering gardens.
Voluntary	Eliminate One Watering Day	Cut one day from your typical weekly watering schedule (except for young trees as noted elsewhere).
Voluntary	Eliminate Two Watering Days	Cut two days from your typical weekly watering schedule (except for young trees as noted elsewhere).
Voluntary	Eliminate Three Watering Days	Cut three days from your typical weekly watering schedule (except for young trees as noted elsewhere).
Voluntary	Water Twice a Week Maximum	Limit plant watering to twice a week (except for young trees as noted elsewhere).
Voluntary	Water Once a Week Maximum	Limit plant watering to once a week (except for young trees as noted elsewhere).
Voluntary	Water Young Trees Efficiently	Water young trees efficiently using a water bag. Trees planted five years or fewer years ago need 15-20 gallons of water once a week to survive. (Note: this is only appropriate if the maximum temperatures are in the low 70's with occasional showers and not peak daylight hours.)

Voluntary	Let Lawn Go Dormant	If your lawn isn't already dormant (brown), let it go dormant until the fall rains return. Just water deeply once each month to keep roots alive.
Voluntary	Plant in Fall	Consider delaying new plantings. Fall is the best time for planting new trees, shrubs and perennials, since rain provides natural irrigation.
Voluntary	Minimize Filling Pools and Hot Tubs	Minimize refilling swimming pools and hot tubs.
Voluntary	Minimize Pressure Washing	Do only essential pressure washing.
Voluntary	Minimize Vehicle Washing	Reduce the frequency of, or eliminate, washing vehicles.
Voluntary	Turn off Water Features (a)	Turn off non-recirculating water features such as certain fountains.
Voluntary	Turn off Water Features (b)	Turn off all water features.
Mandatory	No Hose Washing	Using a hose to clean sidewalks, driveways, and patios is prohibited. Must use a broom instead.
Mandatory	Water Twice a Week Maximum	Plant watering is only allowed twice a week, in accordance with a schedule. The schedule will be developed, dividing watering days by address.
Mandatory	Water Once a Week Maximum	Plant watering is only allowed once a week, in accordance with a schedule. The schedule will be developed, dividing watering days by address.
Mandatory	No Automatic Irrigation	Use of automatic irrigation systems is prohibited. Watering by hand, soaker, and/or drip irrigation is allowed.
Mandatory	No Irrigation	Irrigation is prohibited.
Mandatory	No Lawn Watering	Watering of lawns is prohibited.
Mandatory	Water Early or Late	Watering between 8am and 7pm is prohibited, due to high evaporation.
Mandatory	No Pools and Hot Tubs	Filling swimming pools and hot tubs is prohibited (include information about safety around empty pools/tubs).
Mandatory	No Pressure Washing	Pressure washing is prohibited.
Mandatory	No Vehicle Washing	Washing of vehicles is prohibited, unless at a location that recycles the water.
Mandatory	No Water Features (a)	Use of non-recirculating decorative water features such as fountains is prohibited.
Mandatory	No Water Features (b)	Use of decorative water features, including those that recirculate, is prohibited.
Non-Residential		
N/A Conservation Message	Employee Awareness	Increase employee awareness about using water wisely and encourage their suggestions.
N/A Conservation Message	Efficient Fixtures	Replace older toilet, faucets, and other plumbing fixtures with newer, more efficient models.
N/A Conservation Message	Towels on Request	Ask hotels to provide new towels only on request.
N/A Conservation Message	Check Cooling Towers	Check cooling towers for overflow and excessive blowdown.
N/A Conservation Message	Commercial Kitchen Equipment	If buying new food steamers, dishwashers, or ice machines, select water-efficient models.

Voluntary	Water on Request	Serve water only on request, and then ask before refilling.
Mandatory	No Fire Line Testing	Fire line testing within buildings is prohibited.

C. Stage 2 – Voluntary

If supply conditions worsen, the WSRP moves to the Voluntary Stage. This stage relies on the voluntary cooperation and support of customers to meet target consumption goals. During the Voluntary Stage, specific voluntary actions are suggested for residential and commercial customers. The suggested customer actions are a combination of standard conservation practices (e.g. avoid watering mid-day) and curtailments that require customers to reduce their water use, which may result in sacrifice (e.g. take a shorter shower). The level of that sacrifice will depend on the severity of the water shortage.

Triggers

The “Voluntary Stage” will be implemented when one or both of the following factors applies:

1. Supply conditions have not improved, or have worsened.
2. Demand levels need to be reduced.

Objectives

- Achieve the demand reduction goal by voluntary customer action, as well as by utility actions.
- Stretch available supply through supply management actions.
- Prepare for potentially moving to the Mandatory Stage.

Stage Activation

The authority to enter the Voluntary lies with the City’s Public Works Administrator. This is the case whether entering the Voluntary Stage is done as the initial activation of the WSRP or as a progressive step if the WSRP is activated at a lower stage.

Demand Reduction Goal

Set Demand Reduction Goal based on supply conditions and demand reduction potential and, if appropriate, consistent with neighboring utilities and SPU.

Key Public Messages

- **Moving to Voluntary:** We are moving to the second stage of our WSRP, the Voluntary Stage, because our supply conditions have worsened.
- **Meet Demand Reduction Goal:** We are asking customers to voluntarily reduce their water use to meet the demand reduction goal.
- **Customers Choose Methods:** How customers achieve reduction is up to them. A full list of options will be available on the Water Utility’s website, with links to additional information from SPU at www.savingwater.org.
- **Top Suggestions:** Top suggestions include: (to be determined in the previous stage; e.g. let your lawn go dormant and limit plant watering to twice a week, assuming shortage is during irrigation season).

- **Cooperation Lessens Possibility of Mandatory Restrictions:** If everyone cooperates, we may avoid moving to the Mandatory Stage where specific water use restrictions are mandated.

Coordination and Communication Actions

- **Wholesale Customers:** Update wholesale customers about current water supply conditions and that the Voluntary Stage has been formally triggered. Note that in the Advisory Stage, wholesale customers would have been involved in planning for the potential of moving to the Voluntary Stage. The City will give wholesale customers advance notice of the intent to formally move to the Voluntary Stage, so wholesale customers can do final preparations (e.g. get their website ready). The advance notice will likely be short in order to reduce the risk of unintended leaks to the press, which would complicate the process. Request continued cooperation, as identified under the Wholesale Customer Actions section.
- **Customer Inquiries:** Establish a regular communication mechanism to keep department employees up to date on goals, conditions, and actions.
- **Revenue:** Assess revenue implications and potential remedies, including reprioritizing expenses.
- **City Legislation:** Request Council to adopt legislation on water use restrictions, enforcement, and any surcharges, if anticipate needing for Mandatory Stage and not already in place.
- **Seattle Public Utilities:** Implement coordination with SPU on goals and outreach for Voluntary Stage if shortage is related to SPU water.
- **Outreach:** Implement communication and outreach plan elements developed for Voluntary Stage. Also, develop the elements (including any exemptions enforcement) for the Mandatory Stage.
 - Provide recommendations for customer actions to reduce consumption. Encourage customers to visit the Water Utility website for more details on reducing water use. If the shortage is SPU-related, publicize the SPU water supply conditions webpage, which is updated regularly.
 - Develop and initiate a strategic public information, media, and advertising campaign appropriate to the severity of the problem and the goal for demand reductions. This could include publishing consumption information in daily newspapers to communicate the goal and ways to reduce consumption.
 - Establish routine timing for press releases that provide current status and outlook; present information in standardized format that becomes familiar to media and public.
 - Include drinking water quality information in public information so that if flushing is necessary, the public understands that it is essential for drinking water quality maintenance.
 - Establish regular communication mechanism to keep City employees up to date on goals, conditions, and actions, especially utility account representatives that are tracking costs associated with the water shortage.
 - Respond to customer correspondence regarding the shortage as quickly as possible and acknowledge receipt of correspondence if information is not readily available.

City Department Actions

Require that City departments reduce their water use. The specific actions requested for this stage will be determined during implementation of the WSRP, however likely actions include the following (if not already implemented under the Voluntary Stage):

- **All Departments:**
 - Establish a regular communication mechanism to keep department employees up to date on goals, conditions, and actions.
 - Let City-owned lawns go dormant and limit plant watering to twice a week. Avoid mid-day watering. Post explanatory signage if these recommendations cannot be implemented. Certain exemptions will apply.
 - Wash fleet vehicles only if using facilities that recycle the water.
 - Do not wash plazas, foyers, sidewalks, etc. with a hose. Use a broom instead. Certain exemptions will apply where necessary for health and safety.
 - Any applicable actions requested of general retail customers.
 - Turn off decorative fountains.
 - Post signage throughout buildings to encourage City employees (and the public where applicable) to reduce their water use.
- **Water Utility Department**
 - Suspend meter testing.
 - Accelerate schedule to fix distribution system leaks.
 - Eliminate all operating system water uses determined to be non-essential to maintain drinking water quality such as pipeline flushing and reservoir overflows. Complete cleaning of any reservoirs only as needed.
- **Parks:** Work directly with Parks department to implement feasible demand reduction actions.
- **Transportation:** Suspend street washing.
- **Hydrant Permits:** Restrict new hydrant permits for temporary water service to essential purposes.

Water Quality and Supply Management Actions

- **Data Collection:** Continue increasing data collection and monitoring of weather forecasts.
- **Modeling:** Continue increased computer modeling runs of projected supply, storage, demand, and revenue scenarios.
- **Flushing:** If necessary, implement flushing to maintain water quality. Include flushing information in public communication and outreach so the public understands it is essential for drinking water quality.
- **Emergency Supplies:** Ready emergency supplies for use and activate if appropriate.
- **Interties:** Investigate using existing interties to increase supply availability and activate if appropriate.

Retail Customer Demand Actions

- Implement the Voluntary Stage customer demand reduction actions (that were determined in the Advisory Stage).

- Determine the list of customer demand reduction actions that would be requested if the WSRP advances to the Mandatory Stage. A list of potential actions customers can take to reduce water use is provided in Table 2. The actual actions selected for use will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed. Appendix B includes possible exemptions to water use restrictions for the City to consider in creating actual exemptions at the time of the event. Finally, determine appropriate enforcement strategies.

Wholesale Customer Actions (Skyway):

- **Move to Next Stage:** Implement the Voluntary Stage of their WSRP, consistent with City and, potentially, SPU.
- **Plan for Mandatory:** Plan for the potential move to the Mandatory Stage.
- **Flushing:** Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- **Alternative Sources:** Activate alternative supply sources, if appropriate.

D. Stage 3 – Mandatory

If the Voluntary Stage does not produce needed water use reductions, or if supply conditions worsen, the Mandatory Stage would be implemented. This stage prohibits or limits certain actions, which may be accompanied by an enforcement plan, which could include fines for repeated violations, as well as exemptions. The customer actions in this stage reflect a more aggressive approach that requires deeper levels of customer sacrifice (e.g. restricting irrigation). This stage may also include rate surcharges, although careful consideration would be required of the impacts of those charges.

Triggers

The “Mandatory Stage” will be implemented when one or both of the following factors applies:

1. Supply conditions have not improved, or have worsened.
2. Demand levels need to be further reduced.

Objectives

- Achieve the demand reduction goals by restricting specific water uses.
- Further stretch available supply through additional supply management actions.
- Prepare for potentially moving into the Emergency Stage.

Stage Activation

The authority to enter the Mandatory Stage lies with the Council. This is the case whether entering the Mandatory Stage is done at the initial activation of the WSRP or as a progressive step if the WSRP is activated at a lower stage.

Demand Reduction Goal

Set Demand Reduction Goal based on supply conditions and demand reduction potential consistent with water use restrictions and, if appropriate, adjust with neighboring utilities and SPU.

Key Public Messages

- **Moving to Mandatory:** We are moving to the third stage of our WSRP, the Mandatory Stage, because our supply situation has worsened and/or the voluntary approach in the previous stage has not resulted in the necessary demand reduction.
- **Mandatory Water Restrictions:** It is necessary to impose mandatory restrictions on certain water uses. Those restrictions are as follows: *(to be determined in the previous stage)*. There are exemptions for the following: *(to be determined in the previous stage)*.
- **Rate Surcharge:** If applicable, the rate surcharge is as follows: *(to be determined in the previous stage)*.

Coordination and Communication Actions

- **Wholesale Customers:** Update wholesale customers about current water supply conditions and that the Mandatory Stage has been formally triggered. Note that in the Voluntary Stage, wholesale customers would have been involved in planning for the potential of moving to the Mandatory Stage. The City will give wholesale customers advance notice of the intent to formally move to the Mandatory Stage, so wholesale customers can do final preparations (e.g. get their website ready). The advance notice will likely be short in order to reduce the risk of unintended leaks to the press, which would complicate the process. Request continued cooperation, as identified under the Wholesale Customer Actions section.
- **City Employees:** Continue regular communication with department employees to keep them up to date on goals, conditions, and actions.
- **Customer Inquiries:** Continue responding to customer inquiries, using the strategy established in the Voluntary Stage. Note that customer inquiries could show up in various ways, including social media, which may require a different strategic communication approach.
- **Revenue:** Continue assessing revenue implications and potential remedies, including reprioritizing expenses.
- **City Legislation:** Request Council to adopt legislation on water use restrictions, enforcement and any surcharges, if anticipate needing for the Emergency Stage and not already in place.
- **Seattle Public Utilities:** Implement coordination with SPU on goals and outreach for Mandatory Stage, if shortage is related to SPU water.
- **Renton Regional Fire Authority:** Request that the Renton Regional Fire Authority limits training exercises that use water.
- **Outreach:** Implement communication and outreach plan elements developed for Mandatory Stage. Also, develop the elements for the Emergency Stage, if likely needed.
 - We are experiencing a drought/shortage.
 - We are asking everyone to help by...
 - We have suggestions/requirements on how to reduce water use.
 - Also see “Key Public Messages”.
- Urge customers who irrigate with private wells, reclaimed, or recycled water to install signs to let the public know the type of water being used.

- Prohibit water waste including untended hoses without shut-off nozzles, obvious leaks, and water running to waste such as gutter flooding and sprinklers/irrigation whose spray pattern unnecessarily and significantly hits paved areas.
- In communicating mandatory restrictions to the public, distinguish clearly between lawn/turf watering and watering gardens since lawns and turf can go dormant in the summer. The type and amount of watering allowed will need to be clearly defined.

City Departments Actions:

Require that City departments reduce their water use. The specific actions requested for this stage will be determined during implementation of the WSRP, however likely actions include the following (if not already implemented under the Voluntary Stage):

- **All Departments**
 - Let lawns go dormant and limit plant watering to twice a week. Avoid mid-day watering. Post explanatory signage if these recommendations cannot be implemented. Certain exemptions will apply.
 - Wash fleet vehicles only if using facilities that recycle the water.
 - Do not wash plazas, foyers, sidewalks, etc. with a hose. Use a broom instead. Certain exemptions will apply where necessary for health and safety.
 - Any applicable actions required of general retail customers.
 - Turn off decorative fountains.
 - Post signage throughout buildings to encourage City employees (and the public where applicable) to reduce their water use.
- **Water Utility Department**
 - Suspend meter testing.
 - Accelerate schedule to fix distribution system leaks.
 - Increase drinking water quality monitoring as necessary to ensure the water supply and demand management strategies will not result in unacceptable drinking water quality.
- **Parks:** Work directly with Parks department to implement feasible demand reduction actions.
- **Transportation:** Suspend street washing.
- **Hydrant Permits:** Restrict new hydrant permits for temporary water service to essential purposes.

Exemptions from Water Use Restrictions: Implement the exemptions for the Mandatory Stage water use restrictions. Determine appropriate exemptions for the Emergency Stage water use restrictions. Appendix B includes possible exemptions to water use restrictions for the City to consider in creating actual exemptions at the time of the event.

Rate Surcharges: Consider implementing rate surcharges to accelerate customer compliance with the restrictions and/or recover lost revenue.

Water Quality and Supply Management Actions

- **Data Collection:** Continue increased data collection actions and monitoring of weather forecasts.

- **Modeling:** Continue increased City’s computer modeling runs of projected supply, storage, demand, and revenue scenarios.
- **Emergency Supplies:** Activate emergency supplies, as appropriate.
- **Interties:** Activate interties, if not already implemented.

Retail Customer Demand Actions

- Implement the Mandatory Stage customer demand reduction actions (that were determined in the Voluntary Stage).
- Determine the list of customer demand reduction actions that would be requested if the WSRP advances to the Emergency Stage. A list of potential actions customers can take to reduce water use is provided in Table 2. The actual actions selected for use will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed.

Wholesale Customer Actions (Skyway):

- **Move to Next Stage:** Implement the Mandatory Stage of their WSRP, consistent with City and, potentially, SPU.
- **Plan for Emergency:** Plan for the potential move to the Emergency Stage.
- **Enforcement:** Enforce water use restrictions within their own service areas.
- **Flushing:** Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- **Alternative Sources:** Activate alternative supply sources, if appropriate.

E. Stage 4 – Emergency Curtailment

At this stage, the City recognizes that a critical water situation exists and that, without additional significant curtailment actions, a shortage of water for public health and safety is imminent. This type of situation has never occurred in the City water system’s history. The stage is characterized by two basic approaches. First, increasingly stringent water use restrictions are established. Second, significant rate surcharges are used to increase customer compliance. A surcharge is a key component to the success of this stage.

This would be the last stage used to address a progressive situation, such as a drought of increasing severity, or to respond to an immediate crisis, such as a major facility failure.

Triggers

The “Emergency Curtailment” stage will be implemented when any of the following factors apply:

- Supply conditions have worsened.
- Demand levels need to be further reduced.
- The prospects of a water shortage are imminent if immediate action is not taken.

Objectives

- Achieve the demand reduction goals by additional restrictions on water use, recognizing that for this stage, customers’ lives and businesses may be significantly impacted.

- Stretch available supply through supply management actions.

Stage Activation

The authority to enter the Emergency Curtailment Stage lies with the Council, unless there is an immediate emergency, in which the City's Mayor has the authority to enter this stage.

Demand Reduction Goal

Set Demand Reduction Goal based on supply conditions and demand reduction potential consistent with water use restrictions and, if appropriate, adjust with neighboring utilities and SPU.

Key Public Messages

- **Moving to Emergency:** We are moving to the final stage of our WSRP, the Emergency Stage, because our supply situation has worsened and/or the approach in the previous stage has not resulted in the necessary demand reduction.
- **Additional Water Restrictions:** There are additional water restrictions as follows: *(to be determined in the previous stage)*. There are exemptions for the following: *(to be determined in the previous stage)*.
- **Rate Surcharge:** If applicable, the rate surcharge is as follows: *(to be determined in the previous stage)*.
- **Taste and Odor:** If applicable, taste and odor water quality problems may occur with system-wide reduced water consumption.
- **Pressure Reduction:** If applicable, pressure reduction problems may occur with system-wide reduced water consumption.

Coordination and Communication Actions:

- **Formal Declaration of Emergency:** The Council or Mayor declare a water supply emergency including instituting formal procedures for declaration.
- **Wholesale Customers:** Update wholesale customers about current water supply conditions and that the Emergency Stage has been formally triggered. Note that in the Mandatory Stage, wholesale customers would have been involved in planning for the potential of moving to the Emergency Stage. The City will give wholesale customers advance notice of the intent to formally move to the Emergency Stage, so wholesale customers can do final preparations (e.g. get their website ready). The advance notice will likely be short in order to reduce the risk of unintended leaks to the press, which would complicate the process.
- **City Employees:** Continue regular communication with department employees to keep them up to date on goals, conditions, and actions.
- **Customer Inquiries:** Continue responding to customer inquiries, using the strategy established in the Voluntary Stage. Note that customer inquiries show up in various ways, including social media, which may require a different strategic communication approach.
- **Revenue:** Continue assessing revenue implications and potential remedies, including reprioritizing expenses.

- **Police and Fire Enforcement:** Coordinate with police and Renton Regional Fire Authority requesting their assistance in promoting and enforcing emergency water restrictions.
- **Seattle Public Utilities:** Implement coordination with SPU on goals and outreach for Emergency Stage, if shortage is related to SPU water.
- **Outreach:** Implement communication and outreach plan elements developed for Emergency Stage. Include:
 - We are experiencing a drought/shortage.
 - We are asking everyone to help by...
 - We have suggestions/requirements on how to reduce water use.
 - Also see “Key Public Messages”.

City Department Actions:

Require that City departments reduce their water use. The specific actions requested for this stage will be determined during implementation of the WSRP, however likely actions include the following (if not already implemented under the Voluntary Stage):

- Continue letting lawns go dormant and limit plant watering to twice a week. Continue avoiding mid-day watering. Post explanatory signage if these recommendations cannot be implemented. Certain exemptions will apply.
- Suspend all washing of fleet vehicles.
- Continue not washing plazas, foyers, sidewalks, etc. with a hose. Use a broom instead. Certain exemptions will apply where necessary for health and safety.
- Continue keeping decorative fountains off.
- Continue using signage throughout buildings to encourage City employees (and the public where applicable) to reduce their water use.
- **Water Utility Department**
 - Continue to suspend meter testing.
 - Continue to accelerate schedule to fix distribution system leaks.
- **Parks:** Prohibit all lawn and sport field watering.
- **Transportation:** Continue suspension of street washing.
- **Exemptions from Water Use Restrictions:** Implement the exemptions for the Emergency Stage water use restrictions. Appendix B includes possible exemptions to water use restrictions for the City to consider in creating actual exemptions at the time of the event.
- **Rate Surcharges:** Consider implementing rate surcharges to accelerate customer compliance with the restrictions and/or recover lost revenue, as authorized by the Public Works Administrator.
- **Hydrant Permits:** Restrict all hydrant permits to essential purposes.

Water Quality and Supply Management Actions

- **Data Collection:** Continue increased data collection actions and monitoring of weather forecasts.
- **Modeling:** Continue increased City’s computer modeling runs of projected supply, storage, demand, and revenue scenarios.
- **Emergency Supplies:** Activate emergency supplies, as appropriate.

- **Interties:** Activate interties, if not already implemented.

Retail Customer Demand Actions

- Implement the Emergency Stage customer demand reduction actions (that were determined in the Mandatory Stage).

Wholesale Customer Actions (Skyway):

- **Move to Next Stage:** Implement the Emergency Stage of their WSRP, consistent with City and, potentially, SPU.
- **Enforcement:** Continue to enforce water use restrictions within their own service areas.
- **Flushing:** Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- **Alternative Sources:** Activate supply sources, if appropriate.

IV. IMPLEMENTATION FOR AN IMMEDIATE CRISIS

A. Background

This section focuses on implementing the WSRP when an event, such as a system failure, hinders the City's ability to supply enough water to meet customer demands, and requires immediate action. Implementing the WSRP under these circumstances has both differences and similarities from implementation for a progressive event such as a drought.

Implementation of the WSRP for an immediate crisis is different in the following ways:

- **Lack of Preparation Time:** In a typical progressive event, the City has weeks or months to prepare for action. In an immediate crisis, there is typically little to no preparation time and the City takes action within minutes, hours, and/or days.
- **Initial Stage:** In a typical progressive event, the WSRP is activated at the Advisory Stage and progresses sequentially through stages as necessary. In an immediate crisis, the WSRP is activated at one of the more aggressive stages, likely either the mandatory or emergency stage.
- **Larger Volume:** The volume of the water shortage for an immediate crisis could be more significant, thereby requiring larger-scale demand reductions.
- **Localized:** The immediate crisis could be localized, thereby requiring demand reduction for only a limited geographic area.
- **Heightened Public Health and Safety:** The need to protect water quality and availability to support public health and safety are heightened, including issues such as minimizing any outages and having sufficient water and pressure for firefighting.
- **City Emergency Response Plans:** Implementation of the WSRP would likely join with implementation of other higher-level and/or more specific City emergency response plans. The City has broader, all-hazards plans that describe how their emergency management system is organized and managed in order to prepare for, prevent, mitigate, respond to, and recover from emergencies. The City has hazard-specific (e.g., earthquake) emergency response plans that might be applicable.
- **Incident Command System:** The response would most likely be implemented under an Incident Command System (ICS), which is a nationally-sanctioned, standardized approach to the command, control, and coordination of emergency response. ICS is integral to the City emergency response plans.

Implementation of the WSRP for an immediate crisis is similar to that of a progressive event in many considerations and principles including flexibility, sharing the burden of the shortage, and the importance of addressing financial implications.

There are numerous crisis situations that could necessitate implementing the WSRP. Several examples are described below. The need to activate the WSRP would depend on the amount of the supply impacted, the amount of time needed to restore the system to normal functions, how easily water could be rerouted to customers in the affected area, and the amount of water being used by customers given the season.

- **Cedar Valley Aquifer:** Most of Renton’s drinking water is pumped from five wells that draw from a shallow aquifer, only 23 feet below land surface in some areas.
 - **Contamination:**
 - Chemicals that spill on the ground travel through the soil, sand, and gravel and can pollute the aquifer. Because Renton’s aquifer is so shallow, it is particularly susceptible to pollution. With such a heavy reliance on the water produced by the Cedar Valley Aquifer, contamination of this resource would require activation of the WSRP in an immediate crisis mode.
 - **Loss of Access to Aquifer:**
 - In the event of a natural disaster, infrastructure malfunction, or other incident leading to failure of the City’s main drinking water wells, access to the aquifer may be cut off. With such a heavy reliance on the water produced by the Cedar Valley Aquifer, loss of this resource would require activation of the WSRP in an immediate crisis mode.
- **Major Transmission Pipeline Break:** A major transmission pipeline break, in the Renton or SPU system, could require activation of the WSRP in an immediate crisis mode.
- **Temporary Treatment Plant Shut Down:** A temporary unplanned shut down of a major water treatment plant, in the Renton or SPU system, could require activation of the WSRP in an immediate crisis mode.

B. Components

The following nine components are discussed below. These are the same components as Section 3, *Implementation for a Progressive Event*, and the content is a hybrid of information from all four stages in Section 3. Therefore, while a stage is declared when implementing the WSRP for an immediate crisis, that stage may look slightly different than under a progressive event.

1. **Triggers** – Describes the general, qualitative conditions that would trigger the stage.
2. **Objectives** – Describes the overall objective of the stage.
3. **Stage Activation** – Describes who has the authority to enter the stage.
4. **Demand Reduction Goal** – Discusses the general, qualitative nature of the goal for the stage.
5. **Key Public Messages** – Describes the key public messages for the stage.
6. **Coordination and Communication Actions** – Describes a variety of work necessary to coordinate and communicate with key stakeholders such as: wholesale customers, SPU, Ecology, DOH, natural resource agencies, tribes, City employees, the general public, etc. The overall work will likely be led by the ICS Incident Commander, who makes assignments as appropriate.
7. **Water Quality and Supply Management Actions** – Describes work necessary to safeguard water quality and to maximize supply.
8. **Retail Customer Demand Actions** – Describes work necessary to reduce customer demand.
9. **Wholesale Customer Actions (Skyway)** - Describes actions required by each wholesale customer.

Triggers

The appropriate stage (Voluntary, Mandatory, or Emergency) will be implemented when an event occurs that would prevent the City from supplying enough water to meet customer demands and requires immediate action. The selection of the appropriate stage will be based on the severity of the shortage.

Objectives

- Maximize the amount of water delivered to customers and restore full supply capabilities as soon as possible.
- Achieve the demand reduction goals by voluntary or mandatory customer action. If activated at the Emergency Stage, restrictions may significantly impact customers' lives and businesses.
- Prepare for potentially moving to the next aggressive stage, if not already in the Emergency Stage.

Stage Activation

The authority to declare a water supply emergency and activate the WSRP for an immediate crisis lies with the Mayor.

Demand Reduction Goal

Set demand reduction goal based on supply conditions and demand reduction potential consistent with any water use restrictions.

Key Public Messages

- **Activated WSRP:** We have activated the WSRP due to an immediate crisis. The details of the crisis are as follows (*to be developed at the time of the crisis*).
- **Meet Demand Reduction Goal:** We are asking customers to reduce their water use to meet the demand reduction goal.
- **Mandatory Water Restrictions (if activating at the Mandatory or Emergency Stage):** It is necessary to impose mandatory restrictions on certain water uses. Those restrictions are as follows: (*to be determined at the time of the crisis*). There are exemptions for the following: (*to be determined at the time of the crisis*).
- **Rate Surcharge:** If applicable, the rate surcharge is as follows: (*to be determined at the time of the crisis*).
- **Water Quality:** If applicable, customers may find taste, odor or discolored water issues with their water due to changes in water supply operations (be more specific if appropriate). While the water may not be pleasing, it is safe to drink.
- **Pressure Reduction:** If applicable, customers may experience a loss of pressure due to system operations. Customers with no water should call the City at: (*contact to be determined at time of the crisis*).

Coordination and Communication Actions

- **Formal Declaration of Water Supply Emergency:** Depending on the event, the City's Public Works Administrator, City Council, or Mayor make formal declarations of emergencies and activation of the WSRP.
- **Incident Commander and Team:** Identify the Incident Commander and the team members.
- **Wholesale Customers:** Inform wholesale customers about the crisis and that the WSRP has been activated. Request their cooperation, as identified under the Wholesale Customer Actions section.
- **DOH:** Inform the DOH about the crisis and the activation of the WSRP.
- **Public Agencies:** Coordinate with other City departments and public agencies (e.g., county, state and federal resource agencies, tribes, and other regional water suppliers) as appropriate.
- **Seattle Public Utilities:** Implement coordination with SPU on goals and outreach for Emergency Stage, if shortage is related to SPU water.
- **Outreach:** Develop and implement the initial communication and outreach plan. As described in the Communication and Outreach Framework in Appendix C, the WSRP should include the overall purpose, goals, audiences, and tools (e.g., FAQs, press releases, tips flyers). Additional outreach tools such as highway message boards, social media, or dial out phone systems might be used in an immediate crisis.
- **City Employees:** Establish a regular communication mechanism to keep Water Utility employees up to date on goals, conditions, and actions.
- **Customer Inquiries:** Establish one point of contact for responding to customer inquiries.
- **Revenue:** Assess revenue implications and potential remedies, including reprioritizing expenses.
- **City Legislation:** Request Council to adopt legislation on water use restrictions, enforcement and any surcharges, if anticipate needing and not already in place.
- **Renton Regional Fire Authority:** Request that the Renton Regional Fire Authority either limit or suspend training exercises that use water, depending on the severity of the crisis.

City Departments Actions

Request that City departments reduce their water use in affected areas. The specific actions requested will be determined during implementation of the WSRP, however likely actions include the following:

- **All Departments:**
 - Post signage throughout buildings to encourage City employees (and the public where applicable) to reduce their water use.
 - Let lawns go dormant and limit plant watering to twice a week. Avoid mid-day watering. Post explanatory signage if these recommendations cannot be implemented. Certain exemptions will apply.
 - Either wash fleet vehicles only if using facilities that recycle the water or suspend all washing of fleet vehicles, depending on the severity of the crisis.

- Do not wash plazas, foyers, sidewalks, etc. with a hose. Use a broom instead. Certain exemptions will apply where necessary for health and safety.
- Turn off decorative fountains.
- Any applicable actions requested of general retail customers.
- **Water Utility:**
 - Suspend water main flushing and reservoir cleaning unless needed to support restoration to normal operations.
 - Suspend meter testing.
- **Police:** Coordinate with police department requesting their assistance in promoting and enforcing any water restrictions, if entering the Emergency Stage.
- **Parks:** Request that the Parks and Recreation Department reduce water usage.
- **Transportation:** Suspend street washing.
- **Hydrant Permits:** New hydrant permits for temporary water service will be either restricted to essential services or rescinded (unless necessary for public health), depending on the severity of the crisis.
- **Rate Surcharges:** Consider implementing rate surcharges to accelerate customer compliance with the restrictions and/or recover lost revenue.

Water Quality and Supply Management Actions

- **Maximize Supplies:** Make system operational changes as needed to maximize the amount of water delivered to customers and restore system to normal operations.
- **Additional Wells:** Ready the alternative supply (Maplewood Wellfield) and emergency production wells (Wells EW-3R and PW-5A), if available, and commence pumping when current well production is no longer sufficient.
- **Interties:** The City has seven supply interties with SPU and three emergency interties with other neighboring water systems. Investigate using existing interties to increase supply availability and activate if appropriate.
- **Water Quality:** Assess water quality in the distribution system to identify areas that may experience degradation with reduced consumption or changes to system operations. Increase monitoring if appropriate.

Retail Customer Demand Actions

Determine and implement the list of customer demand reduction actions requested/required. A list of potential actions customers can take to reduce water use are provided in Table 2. The actual actions selected will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed. Additionally, establish and implement appropriate exemptions. Appendix B includes possible exemptions to water use restrictions for the City to consider. Finally, determine appropriate enforcement strategies, if appropriate.

Wholesale Customer Actions (Skyway)

- **Activate Plans:** Activate their own WSRPs, in a manner consistent with the City and, potentially, SPU.
- **Alternative Sources:** Activate alternative supply sources, if appropriate and necessary.
- **Flushing:** Assess current water main flushing and reservoir cleaning activities to determine whether they should be suspended.
- **Enforcement:** Enforce any water use restrictions within their own service areas.

Appendix A of Appendix O

UTILITY CUSTOMER OUTREACH CHECKLIST

Utility Customer Outreach Checklist

This checklist is intended to be used by every utility that is a wholesale customer of Seattle Public Utilities (SPU) during implementation of SPU’s Water Shortage Contingency Plan. The checklist differentiates between actions that SPU will perform on behalf of its wholesale customers and actions that each individual utility is responsible for. If the water shortage is only related to Renton’s water supply, it would be expected that wholesale customers, such as Skyway, follow the suggestions under “Expected by Each Utility” and “Suggested for Each Utility”.

Check Box	Customer Outreach Action
SPU Does for the Region	
	Statewide Actions and Messaging: Coordinate with Ecology, DOH, and the Governor’s Office.
	Tri-County Actions and Messaging: Coordinate with Tacoma and Everett, as needed.
	Seattle Water Supply System Actions and Messaging: Lead coordination of the Operating Board and the Conservation Technical Forum.
	Regional Press Release: Issue regional press releases to major media outlets (and conduct subsequent media interviews).
	Regional Traditional Media: Purchase regional traditional media ads such as TV, radio, print, as appropriate.
	Regional Drought Website: Host a website to serve as the main drought website. This would likely be www.savingwater.org with a link to the SPU Water Supply page.
	Tips Flyer – Create: Create a flyer that helps customers: 1) understand there is a shortage situation and 2) understand ways to reduce their water use.
	Landscaping Community: Outreach to key landscaping community contacts including nurseries, industry organizations (WALP, WSNLA), the Garden Hotline, and parks/recreation departments. For contacts that are in wholesale customers’ service areas, SPU will coordinate the outreach with the appropriate wholesale customer.
Expected by Each Utility	
	Utility Websites: Post drought information prominently on the utility’s homepage and link to the regional drought website.
	Tips Flyer – Utilize: Make the tips flyer readily available (e.g. on utility website, in utility lobby, distribute in public areas such as community centers, libraries, etc.).
	Utility Bill/Insert/Newsletter: Include drought messages in existing utility “publications” such as bills, bill inserts, newsletter, etc.
	Social Media: Include drought messages in any social media vehicles used by the utility.
	Signage: Post signage in appropriate locations (e.g. at utility buildings, on utility vehicles, in key locations in service area).
	Brief Staff: Brief utility staff regarding the drought, using the SPU-produced FAQ as one tool.
	Events: Highlight the drought message at any community events the utility is participating in.
Suggested for Each Utility	
	Key Customers: Contact key customers directly (e.g. large water users, significant irrigators, highest billing tier, etc.).
	Local Press Release: Issue press releases to local media outlets (and conduct subsequent media interviews).
	On-Hold Message: Put a drought message on the telephone “on hold” messages for customers.
	Email Signature Line: Add a drought message in the email signature for utility staff.

Appendix B of Appendix O

POTENTIAL EXEMPTIONS FOR WATER USE RESTRICTIONS

Potential Exemptions for Water Use Restrictions

This document provides a framework for developing and implementing exemptions to customer water use restrictions that are part of the Mandatory and Emergency stages of the WSRP.

Background

Water use restrictions are key components of the Mandatory and Emergency Stages of the WSRP. For some water use restrictions, exemptions for continued water use may be appropriate. Exemptions can be useful in balancing the need to reduce overall water demand with minimizing hardships imposed on customers and certain industries, as well as protecting health and safety. For example, in the Mandatory stage, the City may prohibit irrigation for established plants, while allowing irrigation for newly planted landscapes because of their need for water to survive their establishment period.

As described previously, the WSRP does not pre-identify specific demand reduction actions for each stage. Rather a list of potential actions customers can take to reduce water use is provided at the end of each stage description. The actual actions requested or required for each stage will depend on the severity, likely duration, and timing of the shortage, as well as the demand reduction needed.

Similarly, the exact exemptions for the water use restrictions eventually selected for implementation in the Mandatory and Emergency Stages are not pre-identified. Rather this document provides a framework to be used during each implementation of the WSRP for how to develop and implement the restrictions.

Potential Exemptions:

Potential exemptions that should be considered include, but are not limited to, the following:

- **Irrigation:**
 - Newly planted landscapes. Plantings completed after restrictions are announced are not eligible unless done as part of a capital project and necessary for a functional purpose such as slope stabilization.
 - Sports fields. These areas contribute to physical and psychological benefits of children and adults, and can be dangerous if not kept watered.
 - Golf course tees and green. Restrictions may apply to the fairways.
 - High traffic turf in City parks.
 - Trees. They cannot be quickly or inexpensively replaced.
 - Plant nurseries and garden centers.
 - Food crops.
 - Disabled gardeners who cannot hand water. Applicable to prohibition of automatic systems. Likely do not publicize.
- **Vehicle Washing:**
 - Vehicle washing at commercial car washing facilities.
- **Pressure Washing**
 - Pressure washing necessary to protect public health and safety such as washing downtown parks/sidewalks to clear trash, food, and human waste. Not exempt for aesthetic purposes.
 - Pressure washing that is part of scheduled building rehabilitations, such as preparing a surface for painting.

- **Hose Washing**
 - Hose washing necessary to protect public health and safety such as washing downtown parks/sidewalks to clear trash, food, and human waste. Not exempt for aesthetic purposes.
- **Swimming Pools and Hot Tubs**
 - Health care facilities such as hospital physical therapy pools.
 - Commercial businesses where swimming pools or hot tubs are central to their business and shutting them down would have a significant negative financial impact.
- **Construction**
 - Use of water for dust control in construction areas when necessary for compliance with air quality requirements.
- **Fire Line Testing**
 - Testing necessary to protect public health and safety.
- **Private Wells/Reclaimed Water**
 - Any use of water that is not from the public water system but is from private wells or reclaimed water. The City does not have the authority to restrict use of these sources, but could encourage users to post signs to indicate that alternative sources of water are being used.

Development Process:

The recommended process to develop and implement the exemptions is as follows:

- Once the water use restrictions have been determined, develop any associated exemptions. The development of the exemptions should include input from the impacted parties.
- Decide whether each exemption will require pre-approval by the City Council.
- Develop the process and system necessary for processing exemption requests.
 - Customer contacts the City
 - Need to determine City contact.
 - Need to determine submission method (e.g. email, phone, or website).
 - Need to determine submission contents (e.g. name, address of water use, water account number, description of how they fit the exemption, any required proof).
 - Enter request into tracking system
 - Need to develop tracking system (e.g. Excel spreadsheet).
 - Determine whether request qualifies or not
 - Need to set criteria to be considered for qualifying exemptions, with some discretion on behalf of the City (e.g. undue financial hardship, public health and safety, etc.).
 - Need to determine who can authorize exemptions.
 - Notify customer of result
 - Need to determine notification method (e.g. email, phone, or website).
 - Need to determine whether customer will be required to post notice of exemption from the City.
- Publicize the exemptions and the process to request an exemption when the restrictions are announced, including noting that exemptions may be revoked if the water supply situation worsens.

Appendix C

COMMUNICATION AND OUTREACH PLAN FRAMEWORK

Communication and Outreach Plan Framework

This document is intended to provide a framework for communication and outreach efforts during implementation of the WSRP. The actual Communication and Outreach Plan (COP) will be developed during implementation of the WSRP. The initial COP will be developed in the Advisory Stage, during which the City plans for the potential of moving into the Voluntary Stage. The COP will be modified as implementation of the WSRP continues, especially if the City moves into the Mandatory and/or Emergency Stage.

The COP should include the following elements: overall purpose, goals, audience, and tools. More information on each of these elements is provided further below.

The following steps should be used to develop the COP:

1. Confirm/modify the overall purpose.
2. Confirm/modify the goals.
3. Identify which audiences to target and/or to prioritize.
4. Identify which tools to develop.
5. Match the audiences and the tools.
6. Identify staff responsible for developing the tools.
7. Identify staff responsible for implementing the communication/outreach.
8. Track the implementation.
9. Modify as necessary.

Overall Purpose

The overall purpose of the COP is to make sure everyone is aware of the "drought/shortage message", which consists of the following components:

1. We are experiencing a drought/shortage.
2. We are asking everyone to help by.....(*to be determined for appropriate WSRP stage*).
3. We have suggestions/requirements on how to reduce water use.
 - Also see the "Key Public Messages" under each WSRP stage.

Goals

There are three goals of the COP, as follows:

1. Build awareness
2. Create a community presence
3. Targeted messaging

Audiences

There are a variety of audiences for the COP. Some audiences are broad in nature, while others are very specific. The seven main audiences, including locations/organizations/other subcategories, are as follows:

1. General Public
 - City of Renton community centers

- City of Renton library
 - Community events
 - Farmers markets
 - Multifamily property management associations
 - Churches
2. Irrigation Community
 - Area parks and recreation departments
 - Schools (if shortage occurs during the school year when irrigation of ballfields is most likely)
 - Local plant nurseries
 - Professional landscape/nursery organizations
 - Garden Hotline
 - Customers with particularly high use of irrigation water
 3. Large Users (other than irrigation community)
 - Large consumers such as:
 - i. King County South Plant
 - ii. Skyway Wholesale
 - iii. Boeing
 - iv. Valley Medical Center
 - v. G&K Services
 - vi. Service Linen Supply
 4. Business Community
 - Chambers of commerce
 - Business improvement districts
 - Commercial building operator associations
 - Hotel and restaurant association(s)
 5. Environmental Community
 6. Non-English Speakers
 7. City of Renton Employees

Tools

There are a variety of tools that can be used for the COP. Tools considered for WSRP implementation are show below. The list includes both paid and “earned” media. Note that tools may change over time, especially as changes occur in technology and customers’ preferences.

1. 4-Stages infographic
2. City websites

3. Tips/restrictions flyer
4. Regular utility publication (bills, bill inserts, newsletters, etc)
5. Press release
6. FAQ
7. Advertisements (newspaper, television, radio, etc)
8. Social media posting (Facebook, Instagram, Twitter, Nextdoor, blogs, etc)
9. Signage (building, vehicle, park, etc)
10. Email
11. Letter/postcard
12. Phone call
13. Presentations at public meetings
14. Industry newsletter
15. Drought message in email signature line
16. Recording for on-hold callers to utility customer service phone number

